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Full papers

The development of digital trust – research directions

Joanna Paliszkiewicz[1], Markus Arthur Launer[2]

ABSTRACT

In many publications, researchers have confirmed the enormous role of trust in business and private life. Trust influences many aspects of life, such as communication, collaboration, adoption of technologies, and Internet usage. The purpose of the publication will be presenting the idea for future research in the area of digital trust linked with social media, mobile, analytics, the Internet of Things, and cloud computing. In the article, the importance of trust in science and business will be emphasized. Besides, gaps in the current body of knowledge, which justify proposed future research directions will be identified.

Keywords: trust, digital trust, future directions,
JEL Classification System: M12, M15

Introduction

Practitioners and researchers have explored the significance of digital trust in organizations. Nowadays, in the era of Covid -19, there is a great need for digital trust. Trust is difficult to establish and sustained and very easy to destroy. Trust has a positive impact on our life. It helps people cooperate (Putnam, 1995; Misztal, 1996; Isik, Timuroglu, Aliyev, 2015) to live in risky and uncertain situations (Deutsch, 1962; Mayer, Davis, Schoorman, 1995). Trust is foundations of any relationships and influence on communication, satisfaction at work and workplace security, organizational commitment, effectiveness in the organization, employee loyalty, and organizational performance (Costigan, Ilter, Berman, 1998; Young and Daniel, 2003; Tyler, 2003; Paliszkiewicz, Koohang, Horn Nord, 2014; Pangil, Chan, 2014; Eikeland, 2015; Paliszkiewicz, Gołuchowski, Koohang, 2015; Lewicka, Krot 2015). According to many researchers, building trust in an organization should be a desirable goal for all employers (Zhang, Tsui, Song, Ch, Jia, 2008; Paliszkiewicz, 2013).

The purpose of the publication will be presenting ideas for future research in the area of digital trust linked with social media, mobile, analytics, the Internet of Things, and cloud computing. Consistent with its objective, this paper is organized in the following manner. First, a review of the literature delineates the characteristics of the definition of trust and digital trust. Secondly, the article asserts how to build trust. Next, the future

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directions related to social media, mobile, analytics, the Internet of Things, and cloud computing are presented. The conclusion rounds out the paper.

The meaning of trust and digital trust

Trust is deemed as a multidimensional phenomenon that cannot be defined in a singular way. It is under constant discussion in many disciplines. As a result, in the literature, there are propositions of different definitions of trust.

Psychologists characterize trust as a personality trait (Rotter, 1967). According to Gibb (1978), trust is instinctive, and, as a feeling, is similar to love. Trust can be considered as a mix of feelings and rational thinking. Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior (Rousseau, Sitkin, Burt, Camerer, 1998, p. 395). According to Sako (1992), trust can be treated as a state of mind, an expectation held by one partner about another, that the other behaves or responds in a predictable and mutually acceptable manner. Mayer, Davis, Schoorman (1995, p. 712) proposed the Integrative Model of Organizational Trust and defined trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party." In this definition, trust represents an intention to take a risk in a relationship. Parkhe, (1998) and Dyer, Chu, (2000) describe it as one party's confidence that the other party in the exchange relationship will not exploit its vulnerabilities. A similar definition was presented by Six (2007). According to this proposition trust is a psychological state comprising the intention to accept vulnerability to the actions of another party, based upon the expectation that the other will perform a particular action that is important to you. Paliszkiewicz (2010) described trust as the belief that another party a) will not act in a way that is harmful to the trusting firm, b) will act in such a way that it is beneficial to the trusting firm, c) will act reliably, and d) will behave or respond in a predictable and mutually acceptable manner. According to Turilli, Vaccaro, Taddeo (2010, p. 335). "Trust is generally understood as a decision taken by an agent A (the trustor) to rely on another agent B (the trustee) to perform a given action. A's decision to trust B rests on the assessment of B's trustworthiness". Hosmer (1995, p. 390) underlined that "trust is generally associated with willing, not forced, cooperation and with the benefits resulting from that cooperation."

Digital trust occurs in environments where physical and direct contacts do not occur, where moral and social pressures can be differently perceived, and digital devices mediate interactions. According to Wang and Jeong (2018, p. 163), digital trust "means general beliefs in online service providers that result in behavioral intentions".

Digital trust can be successful when the communication is honest and transparent (Demolombe 2004). Lack of transparency and dishonesty are the ways of betraying online trust (Turilli, Vaccaro, Taddeo, 2010). Research in the online environment has consistently found trust to be strongly related to user acceptance (Mou, Shin, 2018; Shin, 2011). Shin (2017) confirmed a significant impact of trust on behavioral outcomes. With a trusted service, users experienced the ease of use as they have less need for checking authenticity

and legitimacy (Bianchi, Brockner, 2012). In online contexts, trust has been consistently found to be a critical factor in exchanges involving risk. According to Mattila and Seppälä (2017), digital trust requires three elements:

- *Security* - that the products and services provided are secure against malware and data abuse
- *Identifiability* - that the parties involved are who they say they are.
- *Traceability* - that the parties involved will make good on their commitments, and if not, our contractual rights can be effectively demonstrated and enforced.

Trust and digital trust have been defined in the following ways: personality trait, foundations of relations, as a probabilistic evaluation of trustworthiness, and as an attitude. Trust cannot be compulsory. It springs from choice. We cannot force anybody to trust. It is dynamic, sometimes temporal. The time helps build trust, but it is straightforward to destroy at every moment of their development. Trust is usually complicated to rebuild.

Building trust

The process of building trust needs time, and it is related to a certain amount of risk. The people are creating expectations toward others that they will behave in a way, which is beneficial and not harmful. Trust is built up gradually, usually at the beginning, it is conditional. There are several factors, which affect initial decisions to trust:

- personality (Evans, Revelle, 2008),
- current moods and emotions (Dunn, Schweitzer, 2005; Lount, 2010),
- cognitive processes outside one's awareness (Huang, Murnighan, 2010; Svenson, Roy Chaudhuri, Das, Launer, 2020),
- an individual's physical appearance (Krumhuber, Manstead, Cosker, Marshall, Rosin, Kappas, 2007),
- dispositions to trust (e.g., Righetti, Finkenauer, 2011),
- previous experiences (Zand, 1972; McAllister, 1995; Lewicki, Bunker, 1996).

Trust is always fragile, and an even minor signal of distrust can freeze the relationship's attempt. Usually, people's readiness to trust others grows with their ability to trust themselves. If you believe you are dependable and reliable and see yourself as trustworthy, others will be more willing to trust you.

In the literature, different behaviors which support trust-building are described, for example:

- Show that you understand the needs of the person, establish the guiding principles of how you will operate, explain the resources you will use in this work, keep to the principles you have elaborated, engage in constant, honest, two-way communication, reinforce through consistent behaviors (Galford, Seibold, Drapeau, 2002);
- Be transparent, be responsive, use caring, be sincere, be trustworthy (Bracey, 2002);
- Create authentic communication, be competent, support processes, create boundaries, contact people, have positive intent, be able to forgive (Bibb, Kourdi, 2004);
- Be open, share influence, delegate, manage mutual expectations (Six, 2005).

Besides, in the literature, different personality traits, which support trust building, are described, for example:

- Reliability, consistency, predictability, keeping promises, fairness, loyalty, honesty, discretion credibility (Sprenger, 2004).
- Humility, integrity, truth, responsiveness, unblemished fair play, support and encouragement, team care (Armour, 2007);
- Reliability, openness, competence, compassion (Mishra, Mishra, 2008).

Trust evolves according to the development of the relationship (Porras, 2004). It needs time and interactions to be developed, but there is no absolute certainty that the trust will be honored in the future (Möllering, 2001).

Development of digital trust – proposition of future research

Social media

The popularity of social media is giving many new possibilities to develop digital trust. Social media became a place for communication, networking, and content sharing (Paliszkiewicz, Koohang, 2016). Social media, which become part of life, gave many new possibilities to develop interactions between people. The research is needed in the area of using social media for building trust in companies and products. The development of social media has also created some problems related to privacy issues, for example: cyberstalking & location disclosure, social profiling & third-party disclosure, and invasive privacy agreement (Paliszkiewicz, Koohang, 2016). This area is also worth to research concerning the digital trust. Social media usage growth opens up new opportunities for analyzing several aspects of and patterns (Hruska, Maresova, 2020), for example, developing trust, especially between business and its stakeholders. This includes relationship management through online communities (Svenson, 2018). The term "Social Media Analytics" has gained a great deal of attention in the literature. It is defined as "an emerging interdisciplinary research field that aims to combine, extend, and adapt methods for the analysis of social media data" (Zeng, Chen, Lusch, Li, 2010). It is giving new opportunities to develop research related to the digital trust.

Mobile

Smartphones offer new opportunities for businesses, and trust is essential for people to feel safe using it. The mobile device has become a necessary, everyday experience, and people are consuming information, transacting, and communicating from them. Despite the importance of trust for mobile commerce, there has been little academic effort to study the relationships between mobile devices' unique components of interactivity and customer trust or the relationship between offline, online, and mobile trust (Giovannini, Ferreira, da Silva, Ferreira, 2015). Knowing the nature of trust and its determinants, particularly in mobile environments, becomes essential to the building of competitive advantage and the acquisition and retention of consumers. The idea of how to transfer trust from existing channels to m-commerce should be researched. According to Stewart (2003), consumer trust can be transferred from one context to another, which could turn previously extant channels into powerful tools for building trust. According to Giovannini, Ferreira, da Silva, Ferreira (2015), trust has a considerable influence on consumers' attitudes and intentions related to mobile commerce, thus influencing their actual purchase behavior. It becomes essential to do more research in this area.

Analytics

Researchers emphasize the importance of trust in data production, collection, usage, and sharing (Angrist, 2009; Sterckx, Cockbain, Howard, Huys, Borry, 2013). Management needs to trust the data and the analyses that are driving business decisions. Big data analytics involves evaluating large data sets to improve decision-making and enhance predictions through the study of patterns and connections within the data. According to Srinivasan and Swink (2018, p. 3): "*an organizational facility with tools, techniques, and processes that enable a firm to process, organize, visualize, and analyze data, thereby producing insights that enable data-driven operational planning, decision making, and execution*." Agarwal and Dhar (2014) argue that big data analytics enables an organization to collect and analyze data to gain critical insights. It would be essential to understand how big data analytics capability as an organizational culture can enhance trust (Dubey, Gunasekaran, Childe, Roubaud, Wamba, Giannakis, Foropon, 2019). Other studies in this area are also needed.

Internet of Things

Internet of Things (IoT) is considered a crucial emerging technology of the 21st century. Gubbi, Buyya, Marusic, Palaniswami (2013) described the IoT as the interconnection of devices that can exchange information across platforms through a unified framework. The IoT is easy to hack and difficult to survive from various cyber-attacks (Falco, Viswanathan, Caldera, Shrobe, 2018). Security issues are fundamental parameters to develop trust in IoT (Nord, Koohang, Paliszkiewicz, 2019). Operational safety and security practices on the Internet of Things vary significantly across industries. It is essential to analyze the best practices in business and document how the trust is developing and maintaining. The studies are also needed to check how to create trust in society to the Internet of Things Technologies (Yan, Zhang, Vasilakos, 2014).

Cloud computing

Cloud computing has become a significant paradigm of computing and IT service delivery (van der Werff, Fox, Masevic, Emeakaroha, Morrison, Lynn, 2019). One of the core barriers facing adoption and the exploitation of the cloud's benefits is trust (Hwang, Li, 2010). It is a critical factor in cloud computing, and many questions arise in this area worth studying, for example (Huang, Nicol, 2013): how to develop trust to cloud service? What is the basis of this trust? What exactly does "trust" mean in the context of cloud computing? Who are authorities to monitor, measure, assess, or validate cloud attributes, and on what basis should users believe the features claimed by cloud providers? The issues and challenges of trust in cloud computing have been widely discussed from different perspectives (Everett, 2009; Habib, Hauke, Ries, Muhlhauser, 2012). Most current work on trust in the cloud focus narrowly on specific aspects of trust, but lacking still is a complete picture illustrating trust and cloud computing. Future research can also focus on mathematically formal frameworks for reasoning about trust, including modeling, languages, and algorithms for computing trust (Huang, Nicol, 2013).

Conclusion

This paper contributes to the debate concerning digital trust and evaluating the role this type of trust plays in the online social environment. The review of empirical studies has brought about several possible research

directions, for example, the role of digital trust in social media, mobile, analytics, Internet of Things, cloud computing.

Besides, the authors see general areas that need more attention and development:

1. Country and cultural comparison – more studies are needed that take into consideration country and cultural differences in developing digital trust;
2. Long-term studies – could enable to observe how digital trust has changed over time in organizations or countries.
3. Mix-methods approach – combine qualitative and quantitative measures to get a better view of digital trust.

The present study has some limitations. By restricting itself to the ProQuest, Google Scholar and Elsevier databases, this publication may not have allowed complete coverage of all empirical studies in the field. Still, it was possible to observe the main trends.

The review of the literature conducted reveals that the body of knowledge regarding digital trust is still limited. Existing literature provides only fragmented insights into digital trust, and further interdisciplinary research is needed. It is believed that the digital trust field will become a more prominent academic field.

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Digital trust and workplace contexts: A regional comparative analysis on digital trust theory

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ABSTRACT

As today's digital economies around the world take a larger share of the global economic pie, there are more and more calls from both the academia and the industry involving a substantial revisit of the information technologies (IT) that are being developed and used to facilities all sorts of business activities. But with different countries having different stages of IT development, growth, and maturity, there is a need to take a step back and re-analyze previous preconceptions and knowledge of user attitudes and behaviors towards IT employed at work. This research, therefore, presents an initial assessment of a very important indicator of such user attitudes and behaviors – digital trust – based on a developed framework reflecting present-day concerns and issues. Specifically, this research looks at the concept of digital trust from a cross-regional perspective, recognizing that digital economies now span across regions as well. Further theoretical and managerial implications and recommendations are also discussed in this research.

Keywords: Digital trust, workplace, cross-country, cross-economic, cross-cultural

Introduction

The use of information technology (IT) and information and communication technologies (ICT) has spawned an entirely new generation of academic and practical discourse on human behaviors. Over time, IT has proven to be a disruptive phenomenon (Marcial & Launer, 2019), changing the way people behave and perceive other human behaviors in many different contexts, from simple person-to-person conversations and interactions to cross-border commercial activities and transactions. There have been many observable changes that both academics and practitioners have noted regarding the use of IT in many different ways.

However, as much as the research and discussion on digital trust has been around for decades, it is exactly because of the disruptive nature of IT that warrants constant analyses and discourse into this phenomenon. Among the many facets of IT adoption and use within the context of digital trust, this research looks into one interesting area: The differences of digital trust amongst a number of geographic, demographic, and cultural considerations. As organizations become more globalized, so does their IT use. And this transcends borders and boundaries.

However, despite its worldwide impact and effects, the applicability of approaches, practices, policies, regulations, and other forms of actions addressing digital trust in the workplace still inevitably varies from country to country, or from region to region (Chen et al., 2015). This is why the need for research on this topic on several different geographic, demographic, and cultural contexts are still ongoing and very much alive. In

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other words, it is still difficult to craft overarching programs that would ensure that digital trust in the workplace is upheld. Henceforth, this research presents several initial insights, based on an analysis of a worldwide data set collected from various individuals, that would provide some directions as to what is important as far as digital trust is concerned, and what are the important and appropriate steps to take to make sure that it is upheld in a fair manner. Therefore, the following research questions are posited as:

RQ1: What can potentially contribute to the similarities and differences in digital trust in the workplace perceptions across the world?

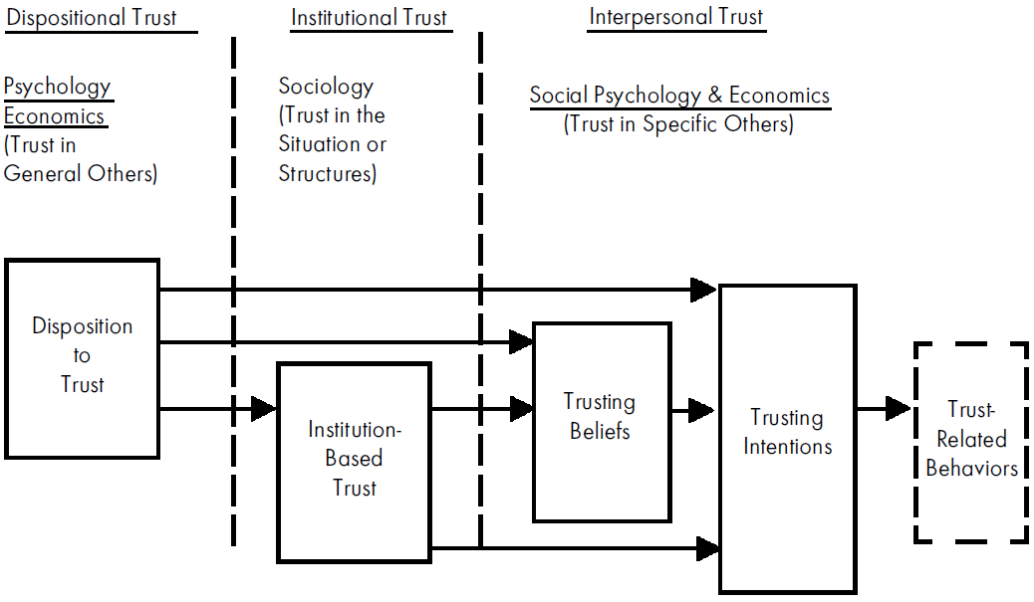
RQ2: What are the similarities and differences in digital trust in the workplace perceptions across some geographic, demographic, and cultural contexts?

Literature Review

Fundamentals of digital trust

The fundamental understanding of digital, or online, trust can be traced back to the seminal typology proposed by McKnight and Chervany (2001), arguing that the proper discourse on digital or online trust must be based on a multidisciplinary approach. To summarize, there are many ways in which online trust can be built and developed (McKnight & Chervany, 2001; McKnight et al., 2002) *(See Figure 1)*.

Figure 1: An interdisciplinary model of high-level trust concepts (McKnight & Chervany, 2001)



Over time, the study on online trust has gained different and varying degrees of influence towards different online behaviors. Throughout this period, it has been discussed that trust is one of the most overriding and one of the most significant determinants of these favorable behaviors and intentions. Trust is an important factor towards perceptions of adoption and continued use (Beldad et al., 2012).

Originally, McKnight and Chervany (2001) and McKnight et al. (2002) argued that determinants of trust can come from different sources. Trust in the entity providing the service and trust in the technology delivering the service are some of these significant sources influencing digital trust (Beldad et al., 2012). And other

researchers have built on this, identifying more specific IT and ICT artefacts that contribute to the formation of digital trust. The first is the examination of the institution which has established and is managing an online presence. Specifically, there are the perceptions of importance and relevance of online security measures (Cecere & Rochelandet, 2013). The second is the infrastructure and the environment in which the online presence is established. This involves the perceptions and evaluations of quality of the online presence (Beldad et al., 2012), such as perceptions regarding website information, data and information security, and website experience (Thakur & Summey, 2007). Therefore, trust is all about the company's ability to use personal information properly and appropriately; and to deliver the rewards that the company has promised in exchange for acquiring that information. These lead to observations on their effects on willingness to provide personal information (J. C. Zimmer et al., 2010) and to transact (Fang, 2014).

An offshoot of the discussion on digital trust is privacy concerns. Many studies on trust in the workplace have drawn significant insights on privacy concerns. Fundamentally, trust is negatively related to privacy concerns (Taylor et al., 2009; Tsarenko & Tojib, 2009), making privacy is a key driver in online trust (Hoffman et al., 1999; McKnight & Chervany, 2001; Tsarenko & Tojib, 2009; J.C. Zimmer et al., 2010). In other words, the greater the trust, the lesser privacy concerns will be.

What is also interesting about trust is that while in itself is already a multidimensional construct, its understanding varies from context to context. Relevant to this research is the context that even if the IT systems and infrastructures are pretty much similar or even the same regardless of which country it is implemented, it has been found that there are still many differences, both incremental and significant, that contributes to the complexity of digital trust. For instance, in a study of a particular set of online transactions in the Philippines, Chen et al. (2015) even made comparisons with past literature involving other countries that have similar experiences, such as the United States, Canada, Taiwan, Saudi Arabia, Kuwait, the Netherlands, and Greece, while Capistrano (2020) further expanded the study on the Philippine context by adding the experiences of Jordan, Turkey, Mauritius, South Africa, China, India, Malaysia, and Indonesia. Both studies on the Philippine context recognized that there are many similarities and difference even with the adoption and use of the same, or similar, ICTs, and have called for more intensive cross-cultural and cross-border comparisons.

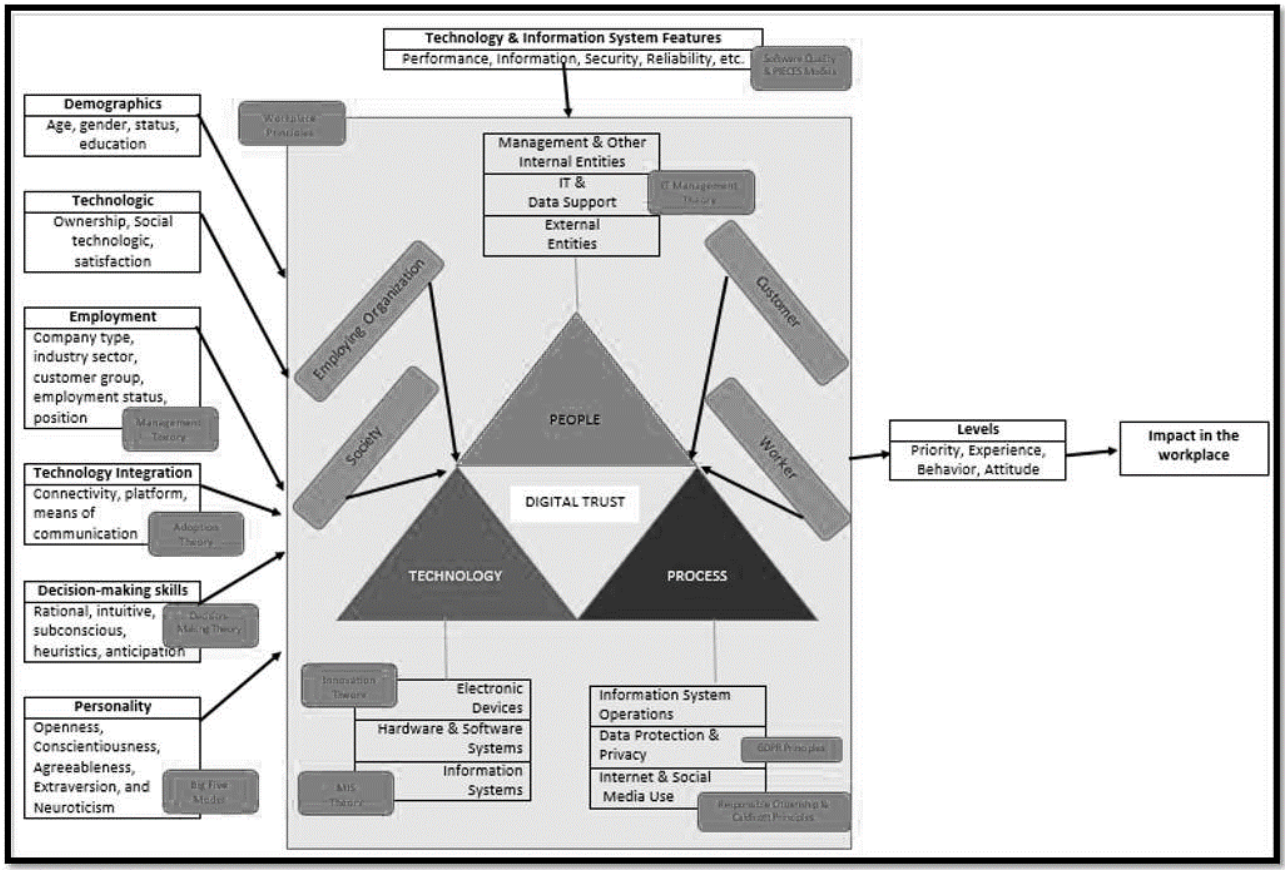
The context: Trust theory in the organizational workplace

It is no surprise that advances in technology have exacerbated many organizational issues related to workplace themes such as corporate security, employee privacy, and task performance (Miller & Stuart Wells, 2007). Organizations have been increasingly utilizing all sorts of technologies in a bid to improve effectiveness and efficiency (Mackenzie, 2010). But the increased use of technologies has always invited increased risks, and therefore intensified tendencies to exert and implement control and surveillance mechanisms to mitigate such risks (Cecere & Rochelandet, 2013; Thakur & Summey, 2007). In turn, this chain of events raised concerns regarding employees' privacy (Ball & Stride, 2012) and security of corporate proprietary information (Molok et al., 2018), among many others, especially if the organization is finding it difficult to reach an agreeable compromise with its employees (Miller & Stuart Wells, 2007). On the other hand, consistent with other studies, a lack of trust, or worse a degree of distrust, is detrimental to the organization (Mackenzie, 2010).

The common emphasis of previous studies is that since many organizations handle personal and proprietary data and information of varying degrees of sensitivity for them to execute transactions and do business effectively and efficiently, they must prove to their stakeholders that they are trustworthy enough to secure and protect such data and information (Capistrano, 2020).

For this particular context, this research adopts portions of the digital trust framework as proposed by Marcial and Launer (2019) *(See Figure 2).* As the framework implies, there is a number of complementing and competing factors influencing the role of digital trust in the workplace.

Figure 2: Digital trust in the workplace theoretical framework (Marcial & Launer, 2019)



For the purposes of this research, the particular proposed measurements of people, technology, and processes are given a closer examination. Aside from conducting extensive analysis regarding its validity and reliability, other concerns must be introduced as well. As mentioned, despite its overarching global impact, the discernment of what digital trust is, what are important as far as digital trust in concerned, and what are the appropriate perspectives, approaches, and courses of action to uphold digital trust, is very much dependent on a number of factors that can involve geographic, demographic, and cultural considerations (Chen et al., 2015).

Methods

This research makes use of the data initially collected and spearheaded by Marcial and Launer (2019), which was done via an international network of researchers. The self-developed questionnaire, measured on a four-point Likert scale, was distributed online through various channels, including email and social media communications. As mentioned, the variables determining levels of digital trust in the workplaces were singled out for this particular research, namely variables on technology, on people, and on processes.

To introduce the desired variables of geographic, demographic, and cultural variables, secondary data from the United Nations' Geoscheme, the World Bank's Gross National Income (GNI) per capita classification, and Hofstede's Cultural Dimensions, respectively, were acquired. These variables are coded as categorical variables, and the collected survey data was further classified along these categorical variables. SPSS 21 statistical software was employed for all of the data analysis done for this research.

Analysis and results

Descriptive analysis

The following tables show the descriptive analysis of the data set.

Table 1: Respondent distribution by continent

Continent		
	N	%
Africa	487	9.1
North America	277	5.1
South America	728	13.5
Asia	1943	36.1
Europe	1944	36.1
Total	5379	100.0

As the results show, many of the respondents for this research are based in either Europe or Asia, each accounting for 36.1% of the total respondents. South America came in third with 13.5%.

Table 2: Respondent distribution by UN Geoscheme

UN Geoscheme		
	N	%
South America	728	13.5
West Europe	755	14.0
East Asia	808	15.0
East Europe	899	16.7
West Africa	235	4.4
South Asia	351	6.5
East Africa	209	3.9
Southeast Asia	790	14.7
South Europe	137	2.5
South Africa	47	0.9
North Europe	147	2.7
North America	273	5.1
Total	5379	100.0

Breaking the geographic distribution further, the respondents were mostly coming from, in order from highest to lowest, East Europe (16.7%), East Asia (15.0%), Southeast Asia (14.7%), West Europe (14.0%), and South America (13.5%).

Table 3: Respondent distribution by World Bank GNI per Capita classification

World Bank GNI Per Capita		
	N	%
Lower-middle income	1368	25.4
Upper-middle income	1467	27.3
High income	2544	47.3
Total	5379	100.0

Almost half of the respondents came from countries that were classified as high income (47.3%), according to the estimates made by the World Bank.

Table 4: Respondent distribution by Hofstede's Cultural Dimensions

Hofstede's Cultural Dimensions												
	Power distance		Individualism		Masculinity		Uncertainty avoidance		Long-term orientation		Indulgence	
	N	%	N	%	N	%	N	%	N	%	N	%
Low	1356	25.2	3654	67.9	2119	39.4	1718	31.9	2456	45.7	3906	72.6
High	4023	74.8	1725	32.1	3260	60.6	3661	68.1	2923	54.3	1473	27.4
Total	5379	100.0	5379	100.0	5379	100.0	5379	100.0	5379	100.0	5379	100.0

And lastly, according to the results obtained from Hofstede's Cultural Dimension scores, almost three-fourths of the respondents came from countries that have high power distance. At least two-thirds exhibit low individualism, or high collectivism. A little over 60% have high masculinity. Furthermore, of the total

respondents, 68.1% came from countries with high uncertainty avoidance. The respondents were almost closely distributed amongst short-term and long-term orientation. Finally, almost three-fourths exhibited low indulgence.

Validity and reliability

Because of the exploratory nature of the research and the fact that the survey questionnaire was self-developed, exploratory factor analysis (EFA) on the scale question items was employed to determine its validity and reliability. The following table shows the EFA results, depicting only the question items that were retained, as there were a number of items that were deleted due to a variety of reasons involving validity and reliability issues.

Table 5: Exploratory factor analysis results

Exploratory factor analysis results							
Constructs and Variables	**Mean**	**Std. Dev.**	**Factor Loadings**	**Comm.**	**KMO**	**Cum. Var. (%)**	**Cronbach α**
CONFIDENCE_WORKPLACE_TECH					0.914	57.339	0.893
CONTROL_SEC	3.174	0.890	0.801	0.642			
SAFETY	3.149	0.900	0.791	0.625			
ACCURACY	3.280	0.892	0.778	0.605			
PERSONAL_DATA_PROT	3.246	0.914	0.766	0.587			
RELIABILITY	3.249	0.897	0.746	0.557			
PERFORMANCE	3.182	0.912	0.737	0.543			
LEGIT	3.059	0.945	0.727	0.528			
SYS_ACCOUNT	2.867	0.968	0.708	0.501			
TRUST_WORK_TECH_PERSONAL					0.704	74.383	0.827
SMART_WATCH	2.037	1.425	0.894	0.799			
OTHERS_SMART	2.201	1.452	0.861	0.741			
TABLET	2.453	1.399	0.831	0.691			
TRUST_WORK_TECH_INSTALLED					0.929	64.515	0.908
WORKFLOW_MGMT	2.916	1.242	0.828	0.685			
ID_CAFE	2.736	1.339	0.824	0.679			
ID_PRINTING	2.854	1.261	0.822	0.675			
ID_DOOR	2.953	1.217	0.813	0.661			
ID_DTR	2.868	1.276	0.805	0.648			
EMAIL_TRACK	2.862	1.229	0.779	0.607			
GPS_CARS	2.705	1.330	0.749	0.560			

Exploratory factor analysis results							
Constructs and Variables	**Mean**	**Std. Dev.**	**Factor Loadings**	**Comm.**	**KMO**	**Cum. Var. (%)**	**Cronbach α**
TRUST_WORK_TECH_INFOSYS					0.946	56.272	0.913
MGMT_REPORT	2.772	1.199	0.773	0.597			
SALES_MGMT	2.580	1.318	0.767	0.588			
LOGISTICS	2.656	1.310	0.766	0.587			
FIN_PLAN	2.676	1.216	0.765	0.585			
GROUP_DSS	2.612	1.246	0.762	0.580			
INV_CONTROL	2.506	1.311	0.755	0.570			
BUDGET	2.534	1.253	0.737	0.543			
HRM	2.769	1.179	0.732	0.536			
EIS	2.813	1.226	0.732	0.535			
RESERVE	2.603	1.337	0.711	0.506			
TRUST_WORK_PEOPLE_ACCESS					0.843	61.199	0.839
MIDDLE_MGMT	2.951	1.087	0.800	0.640			
FIRST_LVL_MGMT	2.927	1.041	0.799	0.639			
COWORK_STRAT	2.769	1.205	0.781	0.610			
CONTRIBUTORS	2.780	1.116	0.768	0.590			
COWORK_RDU	2.769	1.278	0.763	0.582			
TRUST_WORK_PEOPLE_SUPPORT					0.849	63.272	0.852
SYS_SUPER	2.870	1.101	0.828	0.686			
SYSDEV_TEAM	2.853	1.122	0.821	0.674			
DATA_ENCODE	2.654	1.267	0.789	0.623			
PER_INFO_PROC	2.863	1.090	0.778	0.605			
IT_LIB	2.594	1.298	0.759	0.576			
TRUST_WORK_PEOPLE_EXTERNAL					0.878	68.459	0.885
DEALER	2.490	1.248	0.854	0.730			
RETAILER	2.501	1.219	0.843	0.710			
SUPPLIERS	2.677	1.176	0.827	0.684			
MANUFAC	2.603	1.249	0.815	0.664			
LOG_SERVICE	2.630	1.211	0.797	0.635			
TRUST_WORK_PROCESS_PROTECT_ISSUES					0.887	59.908	0.866
EFFORT_EXCESSIVE	2.633	1.060	0.790	0.623			
MATERIALS_EXCESSIVE	2.555	1.060	0.788	0.620			
CONTAINS_ERRORS	2.555	1.096	0.782	0.612			
INCOMPATIBLE	2.547	1.115	0.770	0.593			
TOO_MUCH_INFO	2.529	1.071	0.760	0.577			
NOT_EASY	2.569	1.072	0.754	0.569			

Exploratory factor analysis results							
Constructs and Variables	**Mean**	**Std. Dev.**	**Factor Loadings**	**Comm.**	**KMO**	**Cum. Var. (%)**	**Cronbach α**
TRUST_WORK_PROCESS_PROTECT_GOOD					0.914	56.458	0.870
USEFUL_FORMAT	2.854	0.951	0.772	0.596			
SECURE_ACCIDENT	2.779	1.037	0.766	0.587			
ADEQUATE_THROUGHPUT	2.851	0.950	0.756	0.571			
FLEXIBLE	2.735	1.026	0.755	0.570			
FLEXIBLE_SITUATION	2.682	1.044	0.748	0.559			
ADEQUATE_EDIT	2.748	0.988	0.747	0.558			
NO_VIOLATION_PRIV	2.731	1.086	0.715	0.512			
TRUST_WORK_PROCESS_ORG					0.946	61.357	0.896
ACCURATE	2.955	1.026	0.813	0.661			
SAFEGUARDS	2.935	1.044	0.802	0.643			
HELD_ACCURATE	2.938	1.031	0.802	0.643			
NECESSARY	2.973	1.011	0.796	0.634			
NO_LONGER	2.900	1.050	0.790	0.623			
PROCESS_TRANS	3.025	1.001	0.779	0.607			
SPECIFIC_PURP	2.930	1.073	0.769	0.592			
SPECIAL_CASES	2.835	1.094	0.710	0.505			
TRUST_WORK_PROCESS_SOCIETY					0.897	63.477	0.884
UNDERSTAND_RESPO	2.483	1.048	0.821	0.668			
UNDERSTAND_COMP	2.483	1.057	0.818	0.674			
SOCMED_SAFE	2.320	1.140	0.801	0.641			
CONFI_NECESS	2.531	1.063	0.790	0.625			
HABITS_NOT_TRACKED	2.362	1.124	0.786	0.618			
NOT_PASSED_THIRD	2.453	1.079	0.763	0.582			

As shown, the resulting measures for validity and reliability show acceptable levels enough to proceed to the next steps of the analysis. To reiterate, these dimensions of digital trust in the workplace measured in terms of a Likert scale, were extracted as follows: (1) Confidence in the workplace technology (CONFIDENCE_WORKPLACE_TECH), (2) Trust in the personal technology gadgets issued in the workplace (TRUST_WORK_TECH_PERSONAL), (3) Trust in the technology installed in the workplace (TRUST_WORK_TECH_INSTALLED) (4) Trust in the information systems in the workplace (TRUST_WORK_TECH_INFOSYS), (5) Trust in the people having access in the workplace (TRUST_WORK_PEOPLE_ACCESS), (6) Trust in the people providing IT support (TRUST_WORK_PEOPLE_SUPPORT), (7) Trust in the external people transacting with the workplace (TRUST_WORK_PEOPLE_EXTERNAL), (8) Perceived issues on the protection processes (TRUST_WORK_PROCESS_PROTECT_ISSUES), (9) Perceived strengths of the protection processes

(TRUST_WORK_PROCESS_PROTECT_GOOD), (10) Trust in the organizational processes (TRUST_WORK_PROCESS_ORG), and (11) Trust in the social processes.

Table 6: Correlation matrix

	CONFIDENCE_WORKPLACE_TECH	TRUST_WORK_TECH_PERSONAL	TRUST_WORK_TECH_INSTALLED	TRUST_WORK_TECH_INFOSYS	TRUST_WORK_PEOPLE_ACCESS	TRUST_WORK_PEOPLE_SUPPORT	TRUST_WORK_PEOPLE_EXTERNAL	TRUST_WORK_PROCESS_PROTECT_ISSUES	TRUST_WORK_PROCESS_PROTECT_GOOD	TRUST_WORK_PROCESS_ORG	TRUST_WORK_PROCESS_SOCIETY	CONTINENT	UN_GEOSCHEME	WB_GNICAPITA	HOF_POWERDIS	HOF_INDIVI	HOF_MASCU	HOF_UNCER	HOF_LONGT	HOF_INDULG
CONFIDENCE_WORKPLACE_TECH	1	.172**	.408**	.370**	.432**	.409**	.273**	.308**	.463**	.472**	.294**	.082**	-.008	.032*	-.088**	.057**	.078**	-.056**	.083**	-.050**
TRUST_WORK_TECH_PERSONAL	.172**	1	.372**	.526**	.426**	.482**	.510**	.229**	.429**	.364**	.469**	.060**	-.021	.144**	-.042**	.000	-.039**	-.044**	.084**	.010
TRUST_WORK_TECH_INSTALLED	.408**	.372**	1	.484**	.517**	.536**	.392**	.214**	.517**	.519**	.447**	.097**	-.057**	.154**	-.052**	.079**	.011	.003	.123**	-.053**
TRUST_WORK_TECH_INFOSYS	.370**	.526**	.484**	1	.621**	.628**	.669**	.300**	.528**	.489**	.474**	.000	.048**	.073**	-.069**	.032*	.026	-.099**	.056**	.040**
TRUST_WORK_PEOPLE_ACCESS	.432**	.426**	.517**	.621**	1	.704**	.594**	.213**	.603**	.605**	.489**	.069**	.021	.139**	-.120**	.107**	.056**	-.079**	.096**	.003
TRUST_WORK_PEOPLE_SUPPORT	.409**	.482**	.536**	.628**	.704**	1	.602**	.186**	.611**	.632**	.528**	.088**	.014	.155**	-.126**	.102**	.051**	-.088**	.123**	-.012
TRUST_WORK_PEOPLE_EXTERNAL	.273**	.510**	.392**	.669**	.594**	.602**	1	.299**	.505**	.434**	.492**	.051**	.014	.123**	-.108**	.072**	.044**	-.067**	.088**	.010
TRUST_WORK_PROCESS_PROTECT_ISSUES	.308**	.229**	.214**	.300**	.213**	.186**	.299**	1	.221**	.155**	.283**	.070**	-.111**	-.057**	-.003	-.054**	.026	.002	.050**	-.076**
TRUST_WORK_PROCESS_PROTECT_GOOD	.463**	.429**	.517**	.528**	.603**	.611**	.505**	.221**	1	.672**	.647**	.115**	.025	.175**	-.097**	.122**	.068**	-.080**	.139**	-.046**
TRUST_WORK_PROCESS_ORG	.472**	.364**	.519**	.489**	.605**	.632**	.434**	.155**	.672**	1	.542**	.125**	.002	.175**	-.102**	.129**	.058**	-.037**	.137**	-.057**
TRUST_WORK_PROCESS_SOCIETY	.294**	.469**	.447**	.474**	.489**	.528**	.492**	.283**	.647**	.542**	1	.129**	-.039**	.122**	-.021	.028*	.023	-.082**	.176**	-.089**
CONTINENT	.082**	.060**	.097**	.000	.069**	.088**	.051**	.070**	.115**	.125**	.129**	1	-.230**	.431**	-.095**	.302**	.027*	.114**	.636**	-.590**
UN_GEOSCHEME	-.008	-.021	-.057**	.048**	.021	.014	.014	-.111**	.025	.002	-.039**	-.230**	1	-.208**	-.078**	.127**	.138**	-.542**	-.301**	.021
WB_GNICAPITA	.032*	.144**	.154**	.073**	.139**	.155**	.123**	-.057**	.175**	.175**	.122**	.431**	-.208**	1	-.457**	.620**	-.037**	.390**	.278**	.032*
HOF_POWERDIS	-.088**	-.042**	-.052**	-.069**	-.120**	-.126**	-.108**	-.003	-.097**	-.102**	-.021	-.095**	-.078**	-.457**	1	-.739**	-.415**	.015	-.142**	-.233**
HOF_INDIVI	.057**	.000	.079**	.032*	.107**	.102**	.072**	-.054**	.122**	.129**	.028*	.302**	.127**	.620**	-.739**	1	.442**	.087**	.177**	.024
HOF_MASCU	.078**	-.039**	.011	.026	.056**	.051**	.044**	.026	.068**	.058**	.023	.027*	.138**	-.037**	-.415**	.442**	1	-.417**	.177**	-.232**
HOF_UNCER	-.056**	-.044**	.003	-.099**	-.079**	-.088**	-.067**	.002	-.080**	-.037**	-.082**	.114**	-.542**	.390**	.015	.087**	-.417**	1	-.037**	-.002
HOF_LONGT	.083**	.084**	.123**	.056**	.096**	.123**	.088**	.050**	.139**	.137**	.176**	.636**	-.301**	.278**	-.142**	.177**	.177**	-.037**	1	-.536**
HOF_INDULG	-.050**	.010	-.053**	.040**	.003	-.012	.010	-.076**	-.046**	-.057**	-.089**	-.590**	.021	.032*	-.233**	.024	-.232**	-.002	-.536**	1

Based on all of the analysis for validity and reliability, the data collected is adequate to proceed to the main analyses to achieve the research objectives.

MANOVA

To test the effects of the selected secondary data variables representing the aforementioned geographic, demographic, and cultural considerations affecting perceptions on digital trust, multiple analysis of variance (MANOVA) was carried out.

Table 7: MANOVA results

Tests of Between-Subjects Effects			
Source		**F-value**	**Sig.**
CONTINENT	CONFIDENCE_WORKPLACE_TECH	10.729	0.000
	TRUST_WORK_TECH_PERSONAL	0.391	0.676
	TRUST_WORK_TECH_INSTALLED	2.479	0.084
	TRUST_WORK_TECH_INFOSYS	0.057	0.945
	TRUST_WORK_PEOPLE_ACCESS	1.729	0.178
	TRUST_WORK_PEOPLE_SUPPORT	1.388	0.250
	TRUST_WORK_PEOPLE_EXTERNAL	1.573	0.207
	TRUST_WORK_PROCESS_PROTECT_ISSUES	0.636	0.529
	TRUST_WORK_PROCESS_PROTECT_GOOD	1.995	0.136
	TRUST_WORK_PROCESS_ORG	2.413	0.090
	TRUST_WORK_PROCESS_SOCIETY	0.300	0.741
UN_GEOSCHEME	CONFIDENCE_WORKPLACE_TECH	14.063	0.000
	TRUST_WORK_TECH_PERSONAL	13.309	0.000
	TRUST_WORK_TECH_INSTALLED	22.041	0.000
	TRUST_WORK_TECH_INFOSYS	7.263	0.000
	TRUST_WORK_PEOPLE_ACCESS	24.805	0.000
	TRUST_WORK_PEOPLE_SUPPORT	24.853	0.000
	TRUST_WORK_PEOPLE_EXTERNAL	5.576	0.000
	TRUST_WORK_PROCESS_PROTECT_ISSUES	4.583	0.000
	TRUST_WORK_PROCESS_PROTECT_GOOD	36.227	0.000
	TRUST_WORK_PROCESS_ORG	28.180	0.000
	TRUST_WORK_PROCESS_SOCIETY	19.150	0.000
WB_GNICAPITA	CONFIDENCE_WORKPLACE_TECH	17.841	0.000
	TRUST_WORK_TECH_PERSONAL	14.232	0.000
	TRUST_WORK_TECH_INSTALLED	17.753	0.000
	TRUST_WORK_TECH_INFOSYS	14.220	0.000
	TRUST_WORK_PEOPLE_ACCESS	22.814	0.000
	TRUST_WORK_PEOPLE_SUPPORT	30.275	0.000
	TRUST_WORK_PEOPLE_EXTERNAL	20.109	0.000
	TRUST_WORK_PROCESS_PROTECT_ISSUES	20.432	0.000
	TRUST_WORK_PROCESS_PROTECT_GOOD	71.537	0.000
	TRUST_WORK_PROCESS_ORG	45.080	0.000
	TRUST_WORK_PROCESS_SOCIETY	45.660	0.000

Tests of Between-Subjects Effects			
Source		**F-value**	**Sig.**
HOF_POWERDIS	CONFIDENCE_WORKPLACE_TECH	24.615	0.000
	TRUST_WORK_TECH_PERSONAL	1.755	0.185
	TRUST_WORK_TECH_INSTALLED	59.860	0.000
	TRUST_WORK_TECH_INFOSYS	4.222	0.040
	TRUST_WORK_PEOPLE_ACCESS	56.461	0.000
	TRUST_WORK_PEOPLE_SUPPORT	23.448	0.000
	TRUST_WORK_PEOPLE_EXTERNAL	0.034	0.853
	TRUST_WORK_PROCESS_PROTECT_ISSUES	6.650	0.010
	TRUST_WORK_PROCESS_PROTECT_GOOD	119.720	0.000
	TRUST_WORK_PROCESS_ORG	65.559	0.000
	TRUST_WORK_PROCESS_SOCIETY	28.769	0.000
HOF_INDIVI	CONFIDENCE_WORKPLACE_TECH	2.936	0.087
	TRUST_WORK_TECH_PERSONAL	1.022	0.312
	TRUST_WORK_TECH_INSTALLED	3.113	0.078
	TRUST_WORK_TECH_INFOSYS	1.066	0.302
	TRUST_WORK_PEOPLE_ACCESS	0.593	0.441
	TRUST_WORK_PEOPLE_SUPPORT	0.195	0.659
	TRUST_WORK_PEOPLE_EXTERNAL	0.084	0.773
	TRUST_WORK_PROCESS_PROTECT_ISSUES	3.179	0.075
	TRUST_WORK_PROCESS_PROTECT_GOOD	1.053	0.305
	TRUST_WORK_PROCESS_ORG	0.227	0.633
	TRUST_WORK_PROCESS_SOCIETY	0.026	0.873
HOF_MASCU	CONFIDENCE_WORKPLACE_TECH	4.678	0.031
	TRUST_WORK_TECH_PERSONAL	2.224	0.136
	TRUST_WORK_TECH_INSTALLED	0.950	0.330
	TRUST_WORK_TECH_INFOSYS	1.065	0.302
	TRUST_WORK_PEOPLE_ACCESS	0.021	0.884
	TRUST_WORK_PEOPLE_SUPPORT	5.750	0.017
	TRUST_WORK_PEOPLE_EXTERNAL	0.950	0.330
	TRUST_WORK_PROCESS_PROTECT_ISSUES	0.888	0.346
	TRUST_WORK_PROCESS_PROTECT_GOOD	2.609	0.106
	TRUST_WORK_PROCESS_ORG	0.035	0.851
	TRUST_WORK_PROCESS_SOCIETY	3.626	0.057

Tests of Between-Subjects Effects			
Source		**F-value**	**Sig.**
HOF_UNCER	CONFIDENCE_WORKPLACE_TECH	8.273	0.004
	TRUST_WORK_TECH_PERSONAL	3.840	0.050
	TRUST_WORK_TECH_INSTALLED	0.003	0.954
	TRUST_WORK_TECH_INFOSYS	9.752	0.002
	TRUST_WORK_PEOPLE_ACCESS	0.873	0.350
	TRUST_WORK_PEOPLE_SUPPORT	10.150	0.001
	TRUST_WORK_PEOPLE_EXTERNAL	6.492	0.011
	TRUST_WORK_PROCESS_PROTECT_ISSUES	2.109	0.146
	TRUST_WORK_PROCESS_PROTECT_GOOD	5.482	0.019
	TRUST_WORK_PROCESS_ORG	0.308	0.579
	TRUST_WORK_PROCESS_SOCIETY	26.036	0.000
HOF_LONGT	CONFIDENCE_WORKPLACE_TECH	1.715	0.190
	TRUST_WORK_TECH_PERSONAL	2.699	0.100
	TRUST_WORK_TECH_INSTALLED	0.151	0.698
	TRUST_WORK_TECH_INFOSYS	0.011	0.917
	TRUST_WORK_PEOPLE_ACCESS	0.508	0.476
	TRUST_WORK_PEOPLE_SUPPORT	3.454	0.063
	TRUST_WORK_PEOPLE_EXTERNAL	2.116	0.146
	TRUST_WORK_PROCESS_PROTECT_ISSUES	0.145	0.704
	TRUST_WORK_PROCESS_PROTECT_GOOD	0.848	0.357
	TRUST_WORK_PROCESS_ORG	1.359	0.244
	TRUST_WORK_PROCESS_SOCIETY	3.730	0.053
HOF_INDULG	CONFIDENCE_WORKPLACE_TECH	4.577	0.032
	TRUST_WORK_TECH_PERSONAL	0.012	0.914
	TRUST_WORK_TECH_INSTALLED	0.591	0.442
	TRUST_WORK_TECH_INFOSYS	2.633	0.105
	TRUST_WORK_PEOPLE_ACCESS	3.543	0.060
	TRUST_WORK_PEOPLE_SUPPORT	0.167	0.683
	TRUST_WORK_PEOPLE_EXTERNAL	1.905	0.168
	TRUST_WORK_PROCESS_PROTECT_ISSUES	8.376	0.004
	TRUST_WORK_PROCESS_PROTECT_GOOD	2.853	0.091
	TRUST_WORK_PROCESS_ORG	0.709	0.400
	TRUST_WORK_PROCESS_SOCIETY	0.000	0.986

The MANOVA results show interesting insights. The first set of results with the continent groupings as the point of consideration shows that there is not much differences in the respondents' perceptions of digital trust in the workplace. This actually demonstrates the one aspect of reality wherein there are indeed some common perceptions and conceptions of what digital trust is across the globe. However, as the research delves deeper in to it, the second set of MANOVA results show that in fact, there are significant differences across the different geographic areas according to the UN Geoscheme. To recall, the UN Geoscheme further segments the

continents into sub-regions, and as the results show, there are statistically significant differences in the respondents' perceptions of digital trust in the workplace at this particular geographic classification. The same is true with the economic aspect, measured by the country classifications of the World Bank according to GNI per capita. Lastly, across the six cultural dimensions according to Hofstede, there are varying degrees of statistical differences, both significant and not significant, that were found in these sets of MANOVA results.

Post-hoc analysis

The MANOVA results do present a very interesting overview of the effects of geographic, demographic, and cultural factors in deep-diving into the discussion on digital trust. To further explore and analyze the MANOVA results, and to extract more detailed insights into the dynamics of digital trust, post-hoc analysis employing the Duncan method was made. The Duncan method was applied on the independent variables of continent, UN Geoscheme, and World Bank GNI per capita classification, since these have at least three distinct groups of respondents. The Hofstede's cultural dimensions were excluded from the post-hoc analysis, since there are only two distinct groups of respondents, high and low.

Overall, the post-hoc analyses results show which among the categories within the geographic and demographic groups of variables can be classified together in terms of their attitudes and perceptions towards a particular dimension of digital trust in the workplace.

Table 8: Post-hoc (Duncan) analysis for Confidence towards workplace technology

CONFIDENCE_WORKPLACE_TECH

CONTINENT		Subset			
	N	1	2	3	4
Africa	487	2.909			
South America	728		3.050		
Europe	1944			3.161	
Asia	1943			3.219	3.219
North America	277				3.288
Sig.		1.000	1.000	0.133	0.066

UN GEOSCHEME		Subset				
	N	1	2	3	4	5
South Africa	47	2.476				
South Europe	137		2.755			
East Africa	209			2.933		
West Africa	235			2.991		
East Europe	899			3.030		
South America	728			3.050		
East Asia	808				3.183	
North Europe	147				3.226	
Southeast Asia	790				3.231	
South Asia	351				3.269	3.269
North America	273				3.280	3.280
West Europe	755					3.380
Sig.		1.000	1.000	0.104	0.194	0.106

WB GNI PER CAPITA		Subset	
	N	1	2
Upper-middle income	1467	3.041	
Lower-middle income	1368		3.173
High income	2544		3.202
Sig.		1.000	0.221

Regarding the confidence in the workplace's technology, it is interesting to see how Asian countries are more closely associated with North American and European countries, both at the continent and at the sub-regional levels. But delving deeper into this also show that South Europe and East Europe break away from this closeness with North America and Asia, whereas the Asian countries remain intact. In general, countries from Asia, North Europe and West Europe, and North America show more favorable confidence in the workplace's technology compared to the rest of the respondent sample. The results also show that interestingly, respondents from upper-middle income countries exhibit less confidence compared to the lower-middle income and high-income ones.

Table 9: Post-hoc (Duncan) analysis for Trust in the workplace technology (personal gadgets)

TRUST_WORK_TECH_PERSONAL

CONTINENT		Subset		
	N	1	2	3
Africa	487	1.726		
Europe	1944		2.152	
South America	728		2.223	
Asia	1943			2.411
North America	277			2.420
Sig.		1.000	0.281	0.894

UN GEOSCHEME		Subset				
	N	1	2	3	4	5
South Africa	47	1.206				
East Africa	209		1.595			
South Asia	351			1.868		
East Europe	899			1.884		
West Africa	235			1.957		
South America	728				2.223	
Southeast Asia	790				2.237	
South Europe	137				2.265	
West Europe	755				2.302	
North America	273				2.421	
East Asia	808					2.819
North Europe	147					2.889
Sig.		1.000	1.000	0.467	0.127	0.544

WB GNI PER CAPITA		Subset	
	N	1	2
Lower-middle income	1368	1.905	
Upper-middle income	1467		2.301
High income	2544		2.365
Sig.		1.000	0.117

As for the digital trust dimension of trust in the personal technology gadgets in the workplace, countries from Africa are less trusting compared to the rest, while respondents currently in East Asia and North Europe are the most trusting. Interestingly enough, South America, Southeast Asia, South Europe and West Europe, and North America, geographically dispersed regions, share statistically similar degrees of trust towards the personal technology gadgets issued to them in the workplace. As for income levels, upper-middle income and high-income countries exhibit more favorable degrees of trust in this particular dimension.

Table 10: Post-hoc (Duncan) analysis for Trust in the workplace technology (technology installed)

TRUST_WORK_TECH_INSTALLED

CONTINENT		Subset			
	N	1	2	3	4
Africa	487	2.464			
South America	728		2.669		
Europe	1944			2.875	
Asia	1943			2.945	2.945
North America	277				3.007
Sig.		1.000	1.000	0.207	0.263

UN GEOSCHEME		Subset					
	N	1	2	3	4	5	6
South Africa	47	1.614					
East Africa	209		2.354				
South Europe	137			2.566			
East Europe	899			2.669	2.669		
South America	728			2.669	2.669		
South Asia	351			2.697	2.697		
West Africa	235			2.751	2.751		
Southeast Asia	790				2.814	2.814	
North Europe	147					2.950	
North America	273					2.999	2.999
West Europe	755						3.167
East Asia	808						3.176
Sig.		1.000	1.000	0.083	0.178	0.064	0.077

WB GNI PER CAPITA		Subset	
	N	1	2
Lower-middle income	1368	2.668	
Upper-middle income	1467	2.691	
High income	2544		3.023
Sig.		0.503	1.000

The post-hoc analysis on the trust towards the workplace technology installed in their workspaces exhibit a wider variety of responses. But what is interesting here as well is that there are further subdivisions and overlapping within East Europe, South America, South Asia, and West Africa regarding this particular dimension. The same is true in Southeast Asia, and in North America. Furthermore, lower-middle income and upper-middle income countries share statistically similarities in their less trusting of the installed technology in their workspaces, apart from the high-income ones.

Table 11: Post-hoc (Duncan) analysis for Trust in the workplace technology (information systems)

TRUST_WORK_TECH_INFOSYS

CONTINENT		Subset		
	N	1	2	3
Africa	487	2.504		
South America	728	2.570		
Europe	1944	2.588		
Asia	1943		2.745	
North America	277			2.927
Sig.		0.130	1.000	1.000

UN GEOSCHEME		Subset						
	N	1	2	3	4	5	6	7
South Africa	47	2.287						
East Europe	899	2.381	2.381					
East Africa	209	2.442	2.442	2.442				
South Europe	137		2.520	2.520	2.520			
South America	728		2.570	2.570	2.570			
West Africa	235			2.609	2.609			
Southeast Asia	790			2.623	2.623			
South Asia	351				2.702	2.702		
West Europe	755				2.709	2.709		
East Asia	808					2.884	2.884	
North America	273						2.928	
North Europe	147							3.282
Sig.		0.104	0.054	0.072	0.065	0.055	0.622	1.000

WB GNI PER CAPITA		Subset	
	N	1	2
Lower-middle income	1368	2.570	
Upper-middle income	1467	2.596	
High income	2544		2.729
Sig.		0.405	1.000

A similar pattern is observed in the digital trust towards the information systems in the workplace, where there is both a wider variety of responses, but at the same time, there are overlapping of responses within geographical sub-regions. North Europe exhibits the most favorable trust, while interestingly enough, East Africa, South Europe, and South America exhibit a wide variety of responses and at the same time overlap with each other as well. High-income countries exhibit more favorable trust compared to the rest of the income levels.

Table 12: Post-hoc (Duncan) analysis for Trust in the workplace people (who have access)

TRUST_WORK_PEOPLE_ACCESS

CONTINENT		Subset				
	N	1	2	3	4	5
Africa	487	2.486				
South America	728		2.712			
Europe	1944			2.830		
Asia	1943				2.937	
North America	277					3.170
Sig.		1.000	1.000	1.000	1.000	1.000

UN GEOSCHEME		Subset						
	N	1	2	3	4	5	6	7
South Africa	47	1.864						
East Africa	209		2.439					
East Europe	899		2.519	2.519				
South Europe	137		2.609	2.609	2.609			
West Africa	235			2.665	2.665			
South America	728				2.712	2.712		
South Asia	351					2.841		
Southeast Asia	790					2.865		
East Asia	808						3.050	
West Europe	755						3.131	
North America	273						3.170	
North Europe	147							3.396
Sig.		1.000	0.051	0.095	0.242	0.080	0.170	1.000

WB GNI PER CAPITA		Subset	
	N	1	2
Upper-middle income	1467	2.687	
Lower-middle income	1368	2.720	
High income	2544		2.991
Sig.		0.260	1.000

As far as trusting the people who have access to the technology in the workplace is concerned, the results show interesting differences as well. At the continent level, North America is the most trusting, but deep-diving into the sub-regions show North Europe as an outlier to the rest of the continent, displaying even more favorable trust than North America. In fact, even West Europe is a significant outlier compared to the other sub-regions in the continent. East Asia is also statistically apart from South Asia and Southeast Asia. On the other hand, the same pattern is seen at the income levels, where high-income countries are more trusting.

Table 13: Post-hoc (Duncan) analysis for Trust in the workplace people (who provide support)

TRUST_WORK_PEOPLE_SUPPORT

CONTINENT		Subset				
	N	1	2	3	4	5
Africa	487	2.325				
South America	728		2.599			
Europe	1944			2.773		
Asia	1943				2.873	
North America	277					3.199
Sig.		1.000	1.000	1.000	1.000	1.000

UN GEOSCHEME		Subset						
	N	1	2	3	4	5	6	7
South Africa	47	1.481						
East Africa	209		2.293					
East Europe	899			2.479				
South Europe	137			2.488				
West Africa	235			2.534				
South America	728			2.599	2.599			
Southeast Asia	790				2.731	2.731		
South Asia	351					2.803		
East Asia	808						3.044	
West Europe	755						3.065	
North America	273						3.201	3.201
North Europe	147							3.328
Sig.		1.000	1.000	0.205	0.122	0.399	0.082	0.140

WB GNI PER CAPITA		Subset	
	N	1	2
Upper-middle income	1467	2.590	
Lower-middle income	1368	2.627	
High income	2544		2.944
Sig.		0.227	1.000

As for trusting the people in the workplace providing IT support, the results are very similar, if not the same, as the previous set of post-hoc analyses on people having access. East Europe and East Asia are also statistical outliers compared to the rest of their respective continental sub-regional neighbors. The same pattern is also shown in the income levels.

Table 14: Post-hoc (Duncan) analysis for Trust in the workplace people (external entities)

TRUST_WORK_PEOPLE_EXTERNAL

CONTINENT		Subset			
	N	1	2	3	4
Africa	487	2.297			
South America	728		2.476		
Europe	1944		2.565	2.565	
Asia	1943			2.673	
North America	277				2.804
Sig.		1.000	0.111	0.053	1.000

UN GEOSCHEME		Subset					
	N	1	2	3	4	5	6
South Africa	47	2.094					
East Africa	209	2.233	2.233				
East Europe	899		2.305	2.305			
West Africa	235		2.393	2.393	2.393		
South Europe	137		2.431	2.431	2.431		
South America	728			2.476	2.476		
South Asia	351			2.513	2.513		
Southeast Asia	790				2.566		
West Europe	755					2.777	
North America	273					2.813	
East Asia	808					2.850	
North Europe	147						3.171
Sig.		0.147	0.058	0.052	0.109	0.483	1.000

WB GNI PER CAPITA		Subset		
	N	1	2	3
Lower-middle income	1368	2.424		
Upper-middle income	1467		2.497	
High income	2544			2.712
Sig.		1.000	1.000	1.000

Similar patterns are also shown in the post-hoc analyses on trusting the people external to the workplace, but do transaction with one's organization. In addition, West Africa and South Europe exhibit a wide range of perceptions towards trusting these external entities. East Africa, East Europe, South America, and South Asia also exhibit a limited range of trust perceptions as well. But as for income levels, these are very distinct, with lower-middle income showing a lesser degree of trusting perceptions and high-income ones showing the most favorable degree of trust.

Table 15: Post-hoc (Duncan) analysis for Trust in the workplace processes (issues on protection)

TRUST_WORK_PROCESS_PROTECT_ISSUES

CONTINENT		Subset		
	N	1	2	3
North America	277	2.075		
Africa	487		2.455	
Europe	1944			2.562
South America	728			2.624
Asia	1943			2.643
Sig.		1.000	1.000	0.096

UN GEOSCHEME		Subset					
	N	1	2	3	4	5	6
North America	273	2.067					
North Europe	147		2.252				
East Africa	209		2.387	2.387			
West Africa	235			2.431			
South Europe	137			2.438			
East Europe	899			2.482	2.482		
East Asia	808				2.613	2.613	
South Asia	351				2.622	2.622	
South America	728				2.624	2.624	
Southeast Asia	790					2.684	
West Europe	755					2.737	2.737
South Africa	47						2.887
Sig.		1.000	0.089	0.282	0.104	0.167	0.061

WB GNI PER CAPITA		Subset		
	N	1	2	3
High income	2544	2.476		
Lower-middle income	1368		2.553	
Upper-middle income	1467			2.730
Sig.		1.000	1.000	1.000

As for any issues on current protection processes designed to ensure trust, the results follow an interestingly pattern. Respondents in North America found little issue with their protection processes, while on the other hand, South Africa found many issues. In addition, East Asia and South Asia, South America, Southeast Asia, and West Europe also found more issues with their respective protection processes. Furthermore, respondents in high-income countries found little issue, while those in upper-middle income found the most issues.

Table 16: Post-hoc (Duncan) analysis for Trust in the workplace processes (good protection)

TRUST_WORK_PROCESS_PROTECT_GOOD

CONTINENT		Subset			
	N	1	2	3	4
Africa	487	2.417			
South America	728		2.581		
Europe	1944			2.801	
Asia	1943			2.859	
North America	277				3.018
Sig.		1.000	1.000	0.147	1.000

UN GEOSCHEME		Subset					
	N	1	2	3	4	5	6
South Africa	47	1.623					
East Africa	209		2.431				
East Europe	899		2.534	2.534			
West Africa	235		2.571	2.571			
South America	728			2.581			
Southeast Asia	790				2.749		
South Europe	137				2.766		
South Asia	351				2.840		
East Asia	808					2.974	
North America	273					3.020	
West Europe	755					3.034	
North Europe	147						3.282
Sig.		1.000	0.052	0.516	0.211	0.411	1.000

WB GNI PER CAPITA		Subset		
	N	1	2	3
Upper-middle income	1467	2.546		
Lower-middle income	1368		2.673	
High income	2544			2.949
Sig.		1.000	1.000	1.000

Conversely, the post-hoc analysis for what is good about the protection processes show complementary results. However, what is interesting to highlight here is the Asian numbers. While Asia, and all of its sub-regions, exhibited some degree of issues pertaining to protection processes, the respondents from these countries also show favorable stances towards what is good about the respective protection processes as well. As for income, the same complementary pattern is also present.

Table 17: Post-hoc (Duncan) analysis for Trust in the workplace processes (in the organization)

TRUST_WORK_PROCESS_ORG

CONTINENT		Subset			
	N	1	2	3	4
Africa	487	2.551			
South America	728		2.742		
Europe	1944			2.999	
Asia	1943			3.004	
North America	277				3.210
Sig.		1.000	1.000	0.906	1.000

UN GEOSCHEME		Subset						
	N	1	2	3	4	5	6	7
South Africa	47	1.574						
East Africa	209		2.604					
West Africa	235		2.712	2.712				
South America	728		2.742	2.742	2.742			
South Europe	137			2.769	2.769			
East Europe	899			2.773	2.773			
Southeast Asia	790				2.897	2.897		
South Asia	351					2.957		
East Asia	808						3.127	
North America	273						3.209	
West Europe	755						3.233	
North Europe	147							3.399
Sig.		1.000	0.081	0.469	0.057	0.418	0.185	1.000

WB GNI PER CAPITA		Subset		
	N	1	2	3
Upper-middle income	1467	2.707		
Lower-middle income	1368		2.827	
High income	2544			3.126
Sig.		1.000	1.000	1.000

For trust in the workplace processes within the organization, similar assessments were found as well in the post-hoc analysis. South Africa is still the least trusting, while East Asia, North America, West Europe, and North Europe are the most trusting on these organizational processes. South America exhibits some variety of trusting behaviors, overlapping with other sub-regions as a result. As for income levels, it is still the high-income ones that are the most trusting among the three groups.

Table 18: Post-hoc (Duncan) analysis for Trust in the workplace processes (in society)

TRUST_WORK_PROCESS_SOCIETY

CONTINENT		Subset			
	N	1	2	3	4
Africa	487	2.046			
South America	728		2.236		
North America	277			2.389	
Europe	1944			2.431	
Asia	1943				2.627
Sig.		1.000	1.000	0.365	1.000

UN GEOSCHEME		Subset						
	N	1	2	3	4	5	6	7
South Africa	47	1.394						
East Africa	209		1.911					
East Europe	899			2.226				
South America	728			2.236				
South Europe	137			2.282				
West Africa	235			2.301				
North America	273			2.389	2.389			
Southeast Asia	790				2.476			
South Asia	351				2.495	2.495		
West Europe	755					2.643	2.643	
North Europe	147						2.753	2.753
East Asia	808							2.829
Sig.		1.000	1.000	0.065	0.213	0.063	0.165	0.337

WB GNI PER CAPITA		Subset	
	N	1	2
Upper-middle income	1467	2.318	
Lower-middle income	1368	2.332	
High income	2544		2.565
Sig.		0.608	1.000

For the last dimension on digital trust in the workplace, pertaining specifically to what society does, the most surprising result found is that North America is less trusting here, compared to the other measures of trust. It is less trusting than Southeast Asia, South Asia, West Europe, North Europe, and East Asia. East Asia is the most trusting of what society is expected to do to contribute to digital trust in the workplace, while South Africa and East Africa are the least trusting. The post-hoc analysis for income levels is the same as the previous discussion as well.

Discussions

Overall, this research heeds the call for further cross-border and cross-cultural examinations on the discourse of digital trust made by the likes of Chen et al. (2015), Marcial and Launer (2019), and Capistrano (2020). This paper emphasizes that theoretical discussions and practical applications of trust should be

context-based. Additionally, this paper emphasizes that trust can be a static construct within a certain context, but is a dynamic construct when perceived across multiple domains, more so across technological developments, within and across social and cultural boundaries.

RQ1: What can potentially contribute to the similarities and differences in digital trust in the workplace perceptions across the world?

The MANOVA and post-hoc results show that certain sub-regional groupings, specific economic classifications, and a number of cultural factors can contribute to the similarities and differences in the formation of digital trust in the workplace. As seen in this research, it is intuitive that some geographical neighbors will have similar takes on what contributes to digital trust in the workplace. But what needs to be highlighted is that there are also instances wherein geographical neighbors have distinctly different takes on other dimensions. The same is true with some cultural contexts, where some sub-regions that are culturally close have both statistically significantly similar and different takes on a number of these dimensions. Furthermore, income levels do not always follow the pattern wherein higher income levels lean towards higher trusting behaviors as well. There are also times wherein the three income levels as dictated in this research are similar, and there are other times that they are different as well.

RQ2: What are the similarities and differences in digital trust in the workplace perceptions across some geographic, demographic, and cultural contexts?

One must go back to the post-hoc analysis to see the detailed breakdown of these similarities and differences. In general, those located in the African continent tend to exhibit less favorable perceptions towards all dimensions of digital trust in the workplace, whereas the respondents located in North America, West Europe, North Europe, and East Asia exhibited the most favorable perceptions. The rest of the sub-regions are hovering in the middle, and are the most oftentimes sharing similar sentiments regarding digital trust, especially among South America, South Europe, South Asia, and Southeast Asia. As for income levels, lower-income levels tend to be less trusting, while higher-income levels tend to be more trusting.

These sentiments are also similar when looking at the larger picture of the three main dimensions of digital trust as posited by Marcial and Launer (2019). In essence, one can now look at the larger picture, instead of the individual variables as extracted in the factor analysis, and make certain generalizations on a per sub-regional and income levels with a larger degree of confidence as well. But the results also point out that there are enough differences to caution, even prevent, making generalizations at a global scale.

Theoretical implications

This research contributes further to the original multidimensionality arguments that McKnight and Chervany (2001) and McKnight et al. (2002) have emphasized. Furthermore, the results lend further empirical support to the concerns raised regarding the several mechanisms applied to ensure trust and mitigate risks. To reiterate, these include control and surveillance (Cecere & Rochelandet, 2013; Thakur & Summey, 2007), security of information (Molok et al., 2018), privacy intrusions (Ball & Stride, 2012), and getting employees on board with the organization's efforts to implement these mechanisms (Miller & Stuart Wells, 2007). Also, these results also lend further support to the arguments that there are also many other factors aside from the

aforementioned ones that also influence evaluations towards building digital trust (Beldad et al., 2012). In both cases, the results show not only the importance of these issues in the formation of digital trust in the workplace, but also places a critical academic spotlight on further discourse that such issues can vary across different contexts.

Managerial implications

The most significant managerial implication for this research is the emphasis that it is near impossible, or even very impractical, to come up with an overarching global argument encompassing the different dimensions, considerations, and issues surrounding the building and development of digital trust in the workplace. While there can be some common ground for this discussion as what was shown in the research framework as proposed by Marcial and Launer (2019), it cannot be helped that there are many contextual realities that must be taken into account, and these create different, and probably even unique situations that present new insights as to what digital trust is, what should be the focus, and what should be prioritized (Capistrano, 2020; Chen et al., 2015). In other words, in some practical applications, such as the appropriate crafting of rules, regulations, and practices regarding digital trust protection mechanisms, where are these going to be applied and who will be affected must be taken into consideration to avoid any possible conflicts and problems along the way, and to ensure a better and smoother buy-in from those who will be affected.

Limitations and directions for future research

As this is an initial foray into a global data set geared towards measuring digital trust, further validation of this phenomenon using similar and different approaches is an obvious direction for future research. Similar researches integrating what was done in academic research and what industry has done can be made to also determine and explain the similarities and differences in digital trust across these different domains. This will provide a greater and deeper explanation on how digital trust works, which is important in this present world where more and more devices and workspaces are being connected to the Internet and the World Wide Web, and more and more organizations are taking their businesses and activities online. Furthermore, the MANOVA and post-hoc results actually opens new opportunities for research exploring the reasons behind the similarities and differences of the responses to the digital trust in the workplace dimensions, most especially across different contexts as mentioned in this research.

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Intuition and Digital Trust at the Workplace in Slovakia

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ABSTRACT

The purpose of this article is to investigate the role of different thinking preferences with regard to data protection, personal data protection and digital literacy in the context of workplaces in Slovakia. We test the most well-known concepts from intuition research and practice simultaneously. The study's findings suggest that both intuitive and analytical styles are relevant in the context of digital trust. Interestingly, the main predictors for confidence towards digital literacy became a preference for rational thinking style and intuitive thinking style – also referred to as unconscious thought. The findings of this study can help managers in reflecting about the way in which they employ different thinking processes for decision-making about digital policy in their organizations.

Keywords: decision-making, intuition, management, digital trust, privacy, citizenship
JEL codes: D81, D81, L14

Introduction

At the modern workplace, many organizations compete for a pole position in the race for technological leadership (McGuigan 1993). Even traditional organizations are implementing more information and communication technologies (ICTs). The digitization of workplaces challenges public values threatening a demise of privacy as a recurring theme (Royakkers et al. 2018). Often, the individual level calculus on decisions about whether privacy is valued higher than the release of personal data is studied for the consumer-market level (Pomfret et al. 2020). Less work has focused on organizational conduct that shapes digital citizens at the workplace (Aladalah et al. 2016). After all, the majority of the workforce spend more time at work than at home. The CoVid-19 pandemic that struck Europe in early 2020 dramatically changed this, with the majority of computer-mediated workplace communication being transferred from office buildings to homes at an unprecedented pace.

Work-related ICTs are more enmeshed in our social lives than before, giving rise to a new quality of integration. Organizations are institutions that introduce and re-enforce doings and sayings of computer-mediated communication. This means that corporate visions of technology integration shape peoples' conduct

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to a degree, where divisions between work and private life break down. Now, more than before, walls between online and offline work practices disappear, and many people now have a more intense connection to digital contexts. The skills business practitioners want graduates to have are among others: analytical thinking and the capability to make ethical judgements (Yeoh 2019). The dual-process theory of thinking captures analytical thinking, so that our piece contributes to the question of whether issues of trust and ethics at the workplace are decided upon with the aid of rational-analytical or intuitive thinking style. To enable responsible decisions at work, we bring our research to the attention of decision architects and educators, so people's individual differences may be taken into account (Phillips et al. 2016).

This article examines how preferences for intuitive thinking and rational-analytic thinking relate to the endorsement of trust in data protection, personal data protection and the digital society at the workplace in present day Slovakia. In business practice, we tend to associate personality traits like openness and agreeableness to tasks in which intuitive thinking is valuable. We discuss how personality characteristics and expertise in the domain of ICT use relate to the endorsement of trust in data protection, personal data protection and the digital society. We also want to find out how the dual-process theory of thinking relates to digital literacy and assumptions about responsible use of private information.

Possessing relevant knowledge and skills and even knowing, when to use them are not sufficient, if a person is not inclined to use them, that is, if the person lacks the right […] disposition [for Type 2 thinking] (Bensley 2020:75-76)

In our contribution, we take a broader view of intuition. The development of hypotheses related to intuition is rooted in the review of literature that presents both the theoretical and empirical studies supporting the likely (positive or negative) effects of deploying intuitive information processing. In the present study in addition to the dual-process theory, we use the theories of Gigerenzer, Dijksterhuis, and Radin as theoretical stances. Through selecting topics and formulating scales around rationality, heuristics, intuition and anticipation (RHIA) we take the breadth of intuitive practice into account. Intuitive practice refers to applied scholarship as well as research that contributes to knowledge about intuition, as it is understood outside of academia.

Gigerenzer and Todd (1999) assume that the decision maker selects heuristics—simplifying 'rules of thumb' actors use under conditions of uncertainty—while adapting to the environment and the context. This domain specific selection stresses that people use pattern recognition to make decisions. In different areas of everyday life intuition scholars observe that much rational analysis does not necessarily lead to a better decision. Sometimes these observations of everyday practice do not hold up to the scientific method, which is why intuition research is constantly struggling with knowledge claims from both academically acclaimed and not scientifically proven studies (Dörfler/Bas 2020). This article takes a pragmatic approach to un-substantiated knowledge claims about intuition, in order to explore the prevalence of preferences for diverse types of intuitions (see also Pratt/Crosina 2016; Vince 2019). Based on the studies of social psychologist Ap Dijksterhuis (et al., 2006) there is evidence that with increasing complexity of a choice, the intuitive decision is superior to the rational alternative. Recent literature examines controversial claims about the merit of 'unconscious thought' made by Ap Dijksterhuis for making complex decisions. There was little evidence for the

superiority of choices made ‘unconsciously’, but some evidence that conscious deliberation can lead to better choices (Newell et al. 2009). Reliable support for these assumptions have been contested (Nieuwenstein et al. 2015). Unconscious information processing is associated with taking time for decisions, e.g. to sleep on it or to distract oneself, before a decision is taken.

The concepts presented so far cannot yet handle all phenomena of intuitive decision-making we know from everyday practice. In various experiments, Radin (2004) was able to demonstrate that humans anticipate the future. Research subjects displayed anticipation measured through skin resistance (lie detector principle) and the enlargement of pupils. Meta-studies examining up to 90 experiments on anticipation confirm the effects measured by Radin and Borges (2009). Although many of us might have heard about anticipation as part of intuition, wide ranging acknowledgement of this research strand has been missing. It is an example of ‘anomalous retroactive influences on cognition and affect’ (Bem 2011:407). This research stream investigates, if people have feelings for things or events that are about to happen, they are therewith anticipating the future.

‘Unfortunately, academic hubris can push to dismiss everything about a particular phenomenon […] Their understanding of intuiting is typically rejected within the realm of science because it is not based on evidence acquired through a scientific method. Still, it does not prevent practitioners from using their intuiting.’ (Dörfler/Bas 2020:300)

An important factor is the type of task to which thinking is applied. Intuitive thinking has been shown to be more effective in moral, political, ethical and behavioral tasks (Dane/Pratt 2007). People tend to resort to intuitive responses during times of great workloads, time compression, little information and other characteristics of uncertainty. We locate this article in the realm of tasks that touch on data protection, privacy and digital literacy, therewith addressing sensitive domains and ethical issues of digital trust.

Lanier and Weyl (2018) criticize privacy regulation for having ‘impossible-to-understand terms’, requiring ‘too complex decisions’ of users:

Vast terms and conditions, or choices so large and complex that members concede to whatever they are presented with, will not work. (Unfortunately, this happens frequently today with consent-driven relationships online.) (Lanier/Weyl 2018:11)

Hypotheses

If, the assumption holds, that issues of data protection and privacy are difficult to understand, then a preference for intuitive thinking could explain digital trust to a certain extend. Likewise, if these issues are perceived as being highly complex, then a preference for rational thinking is a likely candidate to explain digital trust. To sum up, we expected that:

Hypothesis 1

Digital Trust in Data Protection, Personal Data Protection and Digital Literacy is partially a result of experience with ICTs.

Hypothesis 2

Digital Trust in Data Protection, Personal Data Protection and Digital Literacy relates positively to a preference for intuitive thinking.

Hypothesis 3

Digital Trust Data Protection, Personal Data Protection and Digital Literacy relates positively a preference for rational thinking.

Experience and expertise

Hogarth (2010) calls attention to the importance of experience within a domain or expertise, when it comes to intuition. Taking into account experience and skills as prerequisites for intuition shines a light on avenues for developing intuitive decision-making (Harteis/Billet 2013). So, we hypothesize that trust in data protection and privacy at the workplace is partially a result of people's experience. For example, people know how much they can trust specific digital technologies based on their experience with systems in their organizations (Taddeo 2017). Moreover, intuitive thinking can be improved by experience within the domain (e.g. Hogarth 2010), in this case use of ICTs.

The psychologist Gary Klein is a pioneer in the field of naturalistic decision-making. His works are mainly concerned with intuition in the world of professions (Klein 2008). He deals with professional groups that have to make important and quick decisions in their job. Klein's work has been applied to groups of police officers, firefighters, doctors, nurses, exchange traders, lawyers and managers; also, the intersection of this work with organization studies has been explored (Lipshitz et al. 2006). Klein (2008) defines intuition as the way we translate our experiences into judgments and decisions. In his model, there is a strong link between the experiences of experts in their respective profession and intuition; his work is therefore mostly associated with intuition based on expertise.

Personality

Do intuitive thinkers share certain personality traits? Anecdotal evidence seems to confirm this idea. However, it is difficult to determine exactly which ones are most common (Witteman et al. 2009). To take into account this aspect, we conceptualize personality according to the Big Five personality model. Building on research on trust and citizenship (Dinesen et al. 2014), we consider personality traits likely to be related to digital trust. The personality traits we find most relevant are extraversion, agreeableness and open-mindedness, which have been tested in earlier empirical research on thinking processes (Giancarlo et al. 2004; Ku/Ho 2010). This means we hypothesize that people carry some individual differences, which may generally lead to a more trusting stance vis-à-vis data protection.

Hypothesis 4

Digital Trust positively relates to personality traits of extraversion, agreeableness and open-mindedness.

Methods

Sample and data collection

The survey took the form of an online questionnaire. The data were collected as part of a larger study on digital trust at the workplace. The present sample consisted of 230 managers who filled in the online survey through an invitation from a participant recruitment agency. Data collection was carried out between March 26

and April 22, 2020, in CoVid-19-related restrictions on social life, mandated by the government of Slovakia. Participants took 10 to 15 minutes to fill out the entire survey. The survey questionnaire had the following structure (as can be seen in the annex).

Table 1 Age and experience of participants

	N	%
Age		
18 or younger	1	0.4
19-28 years	36	15.8
29-38 years	67	29.4
39-48 years	72	31.6
49-58 years	43	18.9
59 and older	9	3.9
Experience		
less than 1 year	12	5.3
1-3 years	55	24.1
4-10 years	83	36.4
11-20 years	58	25.4
21-30 years	15	6.6
31-40 years	3	1.3
more than 41 years	2	0.9

Instruments

Digital trust and digital literacy. Digital trust in data protection and personal data protection, as well as digital literacy, were measured by three questions in the Survey eTrust (Launer et al. 2020). This Survey eTrust was tested on a pilot group of 376 people from Germany, the Philippines, China, Japan, South Korea, Paraguay, Russia, Brazil, Thailand, USA and the United Kingdom (Launer et al. 2020). They were asked to fill out the 162-question, 4-point and 5-point Likert scale survey. After analyzing their responses with an SPSS statistics program, Pearson r was used for the test-retest and Cronbach alpha for measuring the internal consistency. The test-retest was conducted in Germany and the Philippines in a week interval in January 2019. The results show that the r values are 0.7 (technologies, privacy and protection, netizenship) and 0.8 (features, people operation), which indicates acceptable evidence of test-retest reliability and validity properties (Launer et al. 2020). Following the pretest, questionnaire items with a low r-value were removed in the final survey. The question on digital trust in data protection contained 15 items, digital trust in personal data protection 8 items, and in digital literacy 10 items. Participants were asked to assess each item on the 4-points scale (1 = strongly disagree; 4 = strongly agree).

IT expertise. We measured expertise as a composite score for IT expertise. Participants were given one point if they work in virtual organizations, their organization was connected to gaming sector or ICT/BPO/Business Services sector, their customers were connected to gaming sector or ICT/BPO/Business Services sector, suppliers of their organization were connected to gaming sector or ICT/BPO/Business Services sector, they were creators or conversationalists or critics on the social technographic ladder, and if they had at least one active account of the social media (Facebook, Twitter, blog, LinkedIn, YouTube. The

possible maximum for IT expertise score was 6 points; the higher the composite score was, the higher was the IT expertise.

Thinking preferences. To measure thinking preferences – rationality, heuristics, intuition and anticipation (RHIA) – we created the battery of 21 items which were assessed on the 4-points scale (1 = strongly disagree; 4 = strongly agree). The measure takes into account a range of constructs from cognitive psychology to form scales. Most items (13) were inspired by the Preference for intuition and deliberation scales (PID; Betsch 2004, 2008; Ballová Mikušková et al. 2015), the questionnaire measuring people's habitual preference for intuition or deliberation. 2 items were inspired by Gigerenzer's work (Gigerenzer/Todd 1999) and asked about the use of 'rules of thumb' under conditions of uncertainty. 2 items were based on Dijksterhuis' unconscious thought theory (Dijksterhuis/Nordgren 2006) and assessed taking time for decisions (e.g. to sleep on it or to distract oneself before a decision is taken). The last 4 items measured the anticipation of the future as understood in Radin's (2004) research (REF).

Although earlier works (Ballová Mikušková et al. 2015) have already confirmed the usability of the PID for the Slovak population (the study engaged in verifying their psychometric parameters, confirming their structure, and exploring the gender and age differences of the PID for Slovakia), the combination of item from different authors required the application of factor analysis. Principal component analysis (PCA) was conducted on 21 items with orthogonal rotation (varimax). Bartlett's test of sphericity, $\chi 2(210) = 1585.27$, $p > .001$, indicated that correlations between items were sufficiently large for PCA. An initial analysis was run to obtain eigenvalues for each component in the data. Five components had eigenvalues over Kaiser's criterion of 1 and in combination explained 58.44% of the variance (for more details see Table 2). The scree plot showed inflexions that would justify retaining 3 factors (supported also by meanings of items) that in combination explained 46.19% of the variance. Component 1 represented a general preference for intuitive thinking (12 items; reliability $\omega = .893$), Component 2 represented preference for rational thinking (6 items; reliability $\omega = .776$), and Component 3 represented preference for taking time before a decision (3 items; reliability $\omega = .670$). We computed the mean score for all three components; the higher score indicated the higher preference of intuitive/rational thinking.

Table 2 Rotated component matrix

	Components				
	1	**2**	**3**	4	5
EF01_10 For most decisions, it makes sense to feel.	**.688**				
EF01_11 I carefully watch my innermost feelings.	**.682**				
EF01_20 I can often predict emotional events	**.674**			.309	-.306
EF01_12 I prefer emotional persons.	**.649**				
EF01_16 I frequently make quick and spontaneous decisions based on my insights into humanity.	**.647**	-.314			.332
EF01_19 I frequently have a premonition as to what will happen.	**.624**				-.367
EF01_09 Emotions play a significant role in my decision-making patterns.	**.596**			-.333	
EF01_22 I can frequently predict the outcome of a transaction	**.581**		.310	.384	
EF01_21 Before the phone rings, I frequently know in advance who the caller is.	**.580**		.419		
EF01_08 If I am supposed to determine whom I can trust, I make intuition-driven decisions.	**.566**		-.373		
EF01_17 I frequently make quick and spontaneous decisions based on my life experience.	**.560**		-.3		.394
EF01_18 I make quick decisions by rules of thumb.	**.507**	-.387			.39
EF01_07 I am an intuitive individual.	**.502**		-.428		
EF01_01 I tend to be a rational thinker.		**.672**		.303	
EF01_02 Before I make a decision, I usually think about it for quite some time.		**.668**			
EF01_06 I prefer to make elaborate plans rather than leave anything to chance.		**.644**			
EF01_05 I think first before I act.		**.642**			
EF01_14 I never make decisions right away, and I always wait for a while.		**.543**			
EF01_15 Before I make a decision, I first focus on doing something else.	.520		**.523**	-.320	
EF01_13 If I have to make a decision, I always sleep on it.	.369		**.307**	-.596	
EF01_03 I think more about my plans and goals than other people.	.306	.324	**.327**		.532

Personality traits. To measure personality traits (extraversion, agreeableness, conscientiousness, negative emotionality, and open-mindedness), a short version of the Big Five Inventory (BFI-2-XS; Soto/John 2017) was used. We asked participants to assess 10 items on a 4-point scale (1 = strongly agree; 6 = strongly disagree). All scores were re-coded so the higher mean score indicated the stronger personality trait.

Demography. All participants indicated the category of their age (6 categories) and years of experience (7 categories).

Results

Descriptive statistics

Total of 228 managers (90 women) completed a battery of questions. Participants were adult and had from minimal to whole life experience (Table 1). Descriptive statistics of all measured variables are in Table 3;

means of all variables were computed, the scores had ranged from 1 to 4; all measures had satisfactory internal consistency.

Table 3 Descriptive statistics of all digital trust, thinking preferences and personality traits

					digital trust		
	Ω	N	M	SD	trust in DP	trust in PDP	digital literacy
Age							
Age	-	228	3.65 [a]	1.09	-.003	.088	-.087
Experience							
Experience	-	228	3.11[a]	1.11	.120	.075	.116
Expertise							
IT expertise	-	228	1.45	0.65	.058	.-.011	.083
digital trust							
trust in data protection	.914	225	2.63	0.45			
trust in personal data protection	.907	224	3.09	0.63	.384**	—	
digital literacy	.863	227	2.52	0.57	.508**	.413**	—
thinking preferences							
intuition (general)	.893	228	2.53	0.51	**.489****	**.210****	**.330****
intuition (time)	.670	228	2.44	0.60	**.383****	.052	**.343****
Rationality	.776	228	3.05	0.50	**.368****	**.377****	**.193****
personality traits							
Extraversion	-	228	2.27	0.54	**-.184****	-.081	**-.193****
Agreeableness	-	228	2.60	0.56	**-.140***	.030	-.063
conscientiousness	-	228	2.25	0.53	-.023	-.087	.082
negative emotionality	-	228	2.33	0.51	-.108	-.058	-.060
open-mindedness	-	228	2.19	0.59	**-.133***	-.060	-.085

Note: ω – reliability (omega), N – number, M – mean, SD – standard deviation, DP – data protection, PDP – personal data protection; ** $p < .010$; * $p < 0.050$; [a] the age and the experience were measured as ordinal variables, the score for age 3.65 corresponded to the age 29-48, and the score for experience corresponded to the 4-10 years in a company

Relationship between digital trust and preference for rational and intuitive thinking

We examined relationships between digital trust (trust in data protection, trust in personal data protection, and digital literacy) and preference for rational and intuitive thinking and we found weak to medium positive correlations between digital trust and preferences for both rational and intuitive thinking (Table 2). Digital trust related negatively with extraversion, agreeableness and open-mindedness, and there were no correlations with age, experience or IT expertise of participants.

We revealed relationships between digital trust and thinking preferences, so we conducted a regression analysis to examine the effect of rational/intuitive thinking on digital trust/literacy. Hierarchical multiple regression was conducted separately for trust in data protection, trust in personal data protection, and digital literacy as the dependent variables. The intuitive/rational thinking style was entered in the first step, and year in company in the second step. Regression statistics are in Table 4, separately for trust in data protection, trust in personal data protection, and digital literacy.

Table 4 Summary of hierarchical regression analysis for variables predicting digital trust

		trust in data protection					trust in personal data protection					digital literacy				
	Predictors	*B*	*SE*	*β*	*T*	*p*	*B*	*SE*	*β*	*t*	*p*	*B*	*SE*	*β*	*t*	*P*
1	(Constant)	1.536	0.134		11.486	.000	1.64	0.242		6.792	.000	1.852	0.231		8.026	.000
	general intuitive TS	0.433	0.052	**0.489**	8.373	.000	0.475	0.078	**0.377**	6.074	.000	0.220	0.075	**0.193**	2.952	.003
		F(1.223) = 70.105, *p* < .001, R^2 < .239					*F*(1.223) = 36.891, *p* < .001, R^2 < .142					*F*(1.223) = 8.716, *p* = .003. R^2 < .037				
2	(Constant)	0.795	0.183		4.331	.000	1.193	0.290		4.111	.000	1.110	0.266		4.173	.000
	general intuitive TS	0.395	0.049	**0.447**	8.069	.000	0.450	0.078	**0.357**	5.785	.000	0.174	0.072	**0.152**	2.426	.016
	rational TH	0.274	0.049	**0.307**	5.546	.000	0.207	0.077	0.166	2.695	.008	0.349	0.071	**0.31**	4.941	.000
		F(2.222) = 55.109, *p* < .001, R^2 = .332, *R2Δ* = .093					*F*(2.222) = 22.598, *p* < .001, R^2 = .170, *R2Δ* = .027					*F*(2.222) = 17.017, *p* < .001, R^2 = .132, *R2Δ* = .095				
3	(Constant)	0.736	0.183		4.028	.000	1.282	0.293		4.379	.000	0.994	0.263		3.787	.000
	general intuitive TS	0.347	0.052	**0.392**	6.664	.000	0.481	0.079	**0.383**	6.076	.000	0.112	0.072	0.098	1.54	.125
	rational TH	0.242	0.050	**0.271**	4.793	.000	0.263	0.082	**0.211**	3.193	.002	0.260	0.074	**0.231**	3.505	.001
	intuitive TS (time)	0.115	0.045	**0.153**	2.523	.012	-0.134	0.073	-0.124	-1.832	.068	0.218	0.065	**0.227**	3.338	.001
		F(3.221) = 39.749, *p* < .001, R^2 = .350, *R2Δ* = .019					*F*(3.221) = 16.345, *p* < .001, R^2 = .182, *R2Δ* = .012					*F*(3.221) = 15.572, *p* < .001, R^2 = .173, *R2Δ* = .041				
4	(Constant)	0.611	0.193		3.172	.002	1.206	0.309		3.901	.000	0.822	0.277		2.969	.003
	general intuitive TS	0.342	0.052	**0.387**	6.613	.000	0.479	0.079	**0.381**	6.034	.000	0.106	0.072	0.093	1.477	.141
	rational TH	0.237	0.050	**0.266**	4.729	.000	0.258	0.083	**0.207**	3.128	.002	0.252	0.074	**0.224**	3.413	.001
	intuitive TS (time)	0.12	0.045	**0.161**	2.654	.009	-0.130	0.074	-0.12	-1.773	.078	0.226	0.065	**0.236**	3.474	.001
	Experience	0.044	0.023	0.106	1.960	.051	0.028	0.036	0.047	0.774	.440	0.061	0.032	0.114	1.876	.062
		F(4.220) = 31.156, *p* < .001, R^2 = .362, *R2Δ* = .011					*F*(2.166) = 12.386, *p* < .001, R^2 = .184, *R2Δ* = .002					*F*(2.166) = 12.691, *p* < .001, R^2 = .186, *R2Δ* = .013				

Notes. TH = thinking style

Trust in data protection

The hierarchical multiple regression revealed that at step 1, the preference for general intuition contributed significantly to the regression model (F(1.223) = 70.105, p < .001, R^2 < .239). Introducing the rational thinking style explained an additional 9.3% of the variation in trust in data protection (change in R^2 was significant, F(2.222) = 55.109, p < .001). Finally, introducing the intuitive thinking style - taking the time before decision explained only an additional 1.9% of the variation. Introducing experience explained only an additional 1.1% of the variation in trust in data protection. This is to say that the main predictors of trust in personal data protection are the preference for intuitive thinking style and the preference for rational thinking style.

Trust in personal data protection

The hierarchical multiple regression revealed that at step 1, the preference for general intuition contributed significantly to the regression model (F(1.223) = 36.891, p < .001, R^2 < .142). Introducing the rational thinking style, the intuitive thinking style – taking the time before decision, and experience explained only an additional 0.2% - 2.7% of the variation in trust in personal data protection. Accordingly, the main predictor of trust in personal data protection was the preference for intuitive thinking style.

Digital literacy

The hierarchical multiple regression revealed that at step 1, the preference for general intuition contributed significantly to the regression model ($F(1.223) = 8.716$, $p = .003$, $R^2 < .037$). Introducing the rational thinking style explained an additional 9.5% of the variation in digital literacy (change in R^2 was significant, $F(2.222) = 17.017$, $p < .001$). Introducing the intuitive thinking style – taking the time before decision explained an additional 4.1% of the variation (change in R^2 was significant, $F(2.222) = 15.572$, $p < .001$) in digital literacy, and interestingly, the main predictors became a preference for rational thinking style and intuitive thinking style – taking the time before the decision. The preference for rational thinking style and intuitive thinking style – taking the time before decision remained the main predictors also after introducing the experience construct (which explained only an additional 1.3% of the variation in digital literacy).

Managerial implications

Essentially, organizations are small cultures within larger macro-cultural contexts (Dane/Pratt 2009), shaping intuitions of their members. Organizational dynamics encourage people to adhere to organizational conduct, and to refrain from morally dubious decisions (Ellemers 2017). For the sociotechnical imaginaries evolving in the workplaces, organizations institutionally stabilize 'doing the right thing' with regard to intuitive decisions. Managers must be aware of the importance of experiences within the relevant decision domain of data protection and privacy issues. Management educators should therefore create scenarios during which people can attain a clear sense of morality in decision-making (Dane/Sonenschein 2015: 86). With regard to socially acceptable behavior in the digital society, organizations are advised to determine the status quo of their organization, therewith framing deviations from the organizational norm as an active decision (Cushman/Young 2011).

Future research

Uhlmann et al. (2019) argue that confidence-building measures that only take on behavioral changes of consumers don't do justice to the challenges of data protection architectures. Work that looks into the socio-cultural changes underway is a further sensible area to take into account (Svenson et al. 2020). Therefore, management education can help to shape intuitive decision-making to realize the democratic potential of digital society.

Conclusion

The experiences of organizational members are shaped by many different factors. Repeatedly, the upper echelons of European industry have given rise to decisions that are morally wrong. Caught in the midst of striving for competitiveness in their field, intuitions can also lead to bad decisions. Reflective use of decision-making will avoid bad outcomes for organizations. This article has highlighted how people in Slovakian workplaces make decisions, looking into different kinds of intuitive thinking as it relates to digitization issues. A general recommendation is to increase awareness for the use of intuition when it comes to digital trust issues. Through this people can be enabled to carry out active participation, generating opportunities to practice doing the right thing, while realizing that they shape society.

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Appendix (supplementary materials)

Table 5 Data Protection

Please indicate your level of agreement with the following statements regarding data protection and privacy using the scales below:
The information systems have adequate throughput – the maximum rate of production or the maximum rate at which something can be processed.
The output has too much information and not accurate.
The output contains information that is in a useful format.
The input data is not accurately captured – contains errors.
Data is secure from accident or vandalism.
Data is flexible.
The cost to implement and sustain the information system is too high.
Input data is adequately edited in the computer system.
No one violated data privacy regulations or guidelines.
There are excessive data controls in my workplace.
The effort required for tasks is excessive.
Materials required for tasks is excessive.
The system is not easy to learn and use.
The system is flexible to new or exceptional situations and changes.
The system is incompatible with other systems, and it is not coordinated with other systems.
EF01_06 I prefer to make elaborate plans rather than leave anything...
EF01_05 I think first before I act.
EF01_14 I never make decisions right away, and I always wait...
EF01_15 Before I make a decision, I first focus on doing something else
EF01_13 If I have to make a decision, I always sleep on it.
EF01_03 I think more about my plans and goals than other people.

Table 6 Personal Data Protection

Please indicate your level of agreement with the following statements regarding data protection and privacy using the scales below: Our company or organization…
processes personal data lawfully and transparently, ensuring fairness towards the individuals.
has specific purposes for processing the data and they indicate those purposes to individuals when collecting their personal data. The company does not simply collect personal data for undefined purposes.
collects and processes only the personal data that is necessary to fulfill that purpose.
ensures the personal data is accurate and up-to-date, having regard to the purposes for which it is processed, and correct it if not.
ensures that personal data is stored for no longer than necessary for the purposes for which it was collected.
installs appropriate technical and organizational safeguards that ensure the security of the personal data, including protection against unauthorized or unlawful processing and accidental loss, destruction or damage, using appropriate technology.
in special cases, personal data is kept for a longer period for archiving purposes in the public interest or for reasons of scientific or historical research, provided that appropriate technical and organizational measures are put in place.
ensures that the data held is accurate and kept up-to-date.

Table 7 Digital Literacy
Please indicate your level of agreement with the following statements about responsible netizenship using the scales below: In the digital society, I am confident that …
registering with a Web site (i.e., giving my name, e-mail address, medical registration number, etc.) may enable that site to keep track of what I view or spend online.
information given to a company website will not be passed on to third parties.
my web-browsing habits are not being tracked.
that providing personal information in social media is safe.
my co-workers do not spread unverified information on social media – especially those that do nothing but provoke fear in the community.
my co-workers do not post information on social media that would tend to worsen the situation.
my countrymen use confidential information when absolutely necessary.
my countrymen understand their responsibilities, and they are responsible netizens.
my countrymen understand and comply with the data and privacy law.
my government protects our personal information.

Posthuman Organization and Digital Trust

Arindam Das[7]

ABSTRACT

The paper offers a theoretical critique of the concept of "digital trust" in a posthuman organization (vis-à-vis transhuman organization) and tries to fathom the scopes of the same. The argument portrays "digital trust" as an oxymoron that intends a collapse-commune between the two antipodal—the digital, which is technology-driven, and trust, which is driven through human instincts. Hence, "digital trust" is integral to the posthuman condition of an organization. Beyond the post-dualistic frame of reality, organizations that straddle the synthetic and the human and go to create a technobiological zone of liminality can be dubbed as posthuman organizations. Moving beyond the anthropocentric paradigm, such organizations create its anthropomorphic conditions of the management system, production process, and production agents. The paper intends to theoretically probe how a digital-physical organizational ecosystem of hybrid character accommodates trust, which is otherwise primarily a psychological outcome of human interaction (hence anthropocentric), through the digital lenses. The posthuman condition of an organization (as theorized by Matthew E. Gladden) devalorizes the human-centric "trust" and provides a space for the articulation of the hybrid "digital trust". The paper further raises concerns about the capitalistic appropriation of digital trust within a posthuman workplace and how the same may be salvaged through Foucauldian ethics of curiosity for the other.

Keywords: Digital trust, posthuman organization, capitalism, ethics, Gladden, Foucault

Trust ... tends to be somewhat like a combination of the weather and motherhood; it is widely talked about, and it is widely assumed to be good for organizations. When it comes to specifying just what it means in an organizational context, however, vagueness creeps in (Porter et al., 1975, p. 497).

Introduction

The aforementioned fuzziness about organizational trust remains no less unsolved even with the organizations going digital. Rather, in the last two decades, more has gone into the understanding of digital distrust than digital trust within an organization (Ryan, 2019, p.6). However, digital trust, with all the opaqueness about its understanding, remains a cornerstone in comprehending digitized organizational culture. It is the lynchpin to communication and cooperation that involves both human agents and artificial agents or e-agents (Lagenspetz, 1992). However, as the very phrase suggests, "digital trust" is an oxymoron that intends a collapse-commune between the two antipodal—the digital, which is technology-driven, and trust, which is driven through human instincts. Hence "digital trust" is integral to the posthuman condition of an organization. In this paper, I probe how digital trust within a posthuman organization, which functions amidst an

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anthropomorphic condition, subverts the logic of human trust to create a hybrid condition. However, many critics decry digital trust as a dehumanizing process (Bainbridge, 1983; Starter and Woods, 1995; Endsley and Kiris, 1995; Stanton, et al., 2007; Eriksson-Zetterquist, et al., 2008; Grote, et al. 2014) that hampers man-technology ergonomics. At its extreme level, overreliance on the digital is projected to be akin to that of Chaplinesque *Modern Times* erasure of human autonomy (Wang and Parker, 2020, 31). There is no denying that capitalism had appropriated the potencies of digital trust in a posthuman organization. Yet, I intend to assert that the liberatory and democratic potency of digital trust within a posthuman workplace may be salvaged through ethical discourses of Foucault.

Posthuman (as opposed to Transhuman): An Introduction

The Kantian dare of knowledge, *sapre audre*, which leads to human Enlightenment from his otherwise self-incurred immaturity (Unmündigkeit) of not using the rational faculty, intellect, and wisdom, had been instrumental in the creation of suprahuman, nay, the transhuman condition. The transhumanist project is an enhancement of human beings by the reduction of the human beings to machinery/digital conditions. Nick Bostrom, observes transhumanism to be an extension of aspirational Renaissance humanism "with the influence of Isaac Newton, Thomas Hobbes, John Locke, Immanuel Kant, the Marquis de Condorcet, and others to form the basis of rationalism, which emphasises empirical science and empirical reason rather than revelation and religious authority…. Transhumanism has its root in rational humanism" (Bostrom. 2005, p. 2). However, posthumanism is a trajectory beyond the discourses of transhumanism. Posthumanism rejects the grand discourse of the humanist rationale that leads to transhumanism, it rather critiques the paradigm of humanism by liquidating its very signifiers. Rightly Braidotti, the critical posthuman critic, comments:

> Anti-humanism consists in de-linking the human agent from this universalistic posture, calling him to task, so to speak, on the concrete actions he is enacting. Different and sharper power relations emerge, once this formerly dominant subject is freed from his delusions of grandeur and is no longer allegedly in charge of historical progress (Braidotti, 2012, p.3).

Transhumanism or extropianism foresee the suppression of the human through the suprahuman machine. However, posthumanism is a critique of such digital/machinery triumphalism. Transhumanism further accelerates the condition of e-capitalism by no mere creation of man-technology hierarchy but even a hierarchy between the digital haves and the digital have nots. For, example the *IMAJINE* project, funded by the European Commission's Horizon 2020 program envisions a future world where the digital haves exist amidst climate-protected citadels (highly digitized gated-community) that may protect them from a pandemic situation, such as the one we face now. At the same time, the project raises its grave concern about the digital have nots of the future world and the digital inequality blind spots aggravated by climatic conditions, migrations, and pandemic (*Imagine*, 2020). Such suppressive capitalist narratives of transhumanism are supposed to be interrogated by the posthuman condition. Further, the emancipatory potential of the posthuman condition can subvert the anachronistic logic of the class hierarchies and patriarchy (Banerji and Paranjape 2016, p. 2). Transhumanism facilitates the logics of trans-border global e-economy through the flow of data, information,

digital products, services, and experiences. Transhumanism thus generates de-territorialized digital capitalism by the creation of the new digital elites and accentuation of the condition of the digital subalterns. On the other hand, posthumanism is supposed to be a more democratic condition with an ethical perspective that moves beyond the dystopic and ultra-materialist condition of transhumanist rationalism. Posthumanism questions the banal profitability and commodity fetishism of transhuman global capitalism engendered through computational networks. For example, the transhuman project of bioengineering that controls human reproduction through ART (Artificial Reproductive Technology) has been castigated by feminists based on the principles of patriarchal coercion, compulsiveness towards women to reproduce, or even subjugation of surrogates (Courduriès, 2014; Sarojini and Marwah, 2014; Saravanan, 2018). However, from a more pro-ethical posthumanist perspective, ART is seen as liberatory for the single person, same-sex couples, and unmarried heterosexual couples who have the "positive right to reproduce noncoitally through the intermediacy of donors and surrogates" (Choker, 1992, p. 323). Hence, the elements of posthumanism can easily fall prey to transhumanism through selfish commodity fetish and ethicless utilitarian motives. Hence, posthumanism tends to become what Harraway labels as "capitalocene" (Haraway, 2014). Rosi Braidotti rightly observes, "the advocates of advanced capitalism seem to be faster in grasping the creative potential of the posthuman than some of the well-meaning and progressive neo-humanist opponents of this system" (Braidotti, 2013, p. 45). Invested with capitalistic values of informational power, posthumanism as Braidotti reminds is, "not *post*-power" (Braidotti, 2016, p. 21). Further, the Big Data democracy of the posthumanist project, concerning "privacy, social sorting and preemption" (Lyon, 2014), becomes questionable and this brings us to the concerns of digital trust. Digital discrimination, data racism, digital divide, and data panopticon through surveillance capitalism (Skrah, 2017; Clegg, 2018) thereby become the bywords of 'digital trust'. Here one is rightly reminded of Herbrechter's comment on Best and Kellner's analysis of posthumanism, "Economic neoliberalism, free market ideology and late capitalist individualism can no longer be separated from the various technological and cultural posthumanization processes" (Herbrechter, 2013, p. 55).

A Critical Understanding of Posthuman Organization: A Gladdenian Perspective

It was perhaps Gareth Morgan who in his *Images of Organization* (1986) for the first time conceived the organization, its systems, functions, and management processes as a matter of predominant left-brain rationalistic, mechanized articulation of AI: "The information processing perspective has created a fresh way of thinking about organization. But there are two major criticisms…The first is that most decision-making and information processing views have had a 'left-brain bias' and an overcentralized view of the nature of the organizational intelligence…The emphasis was placed on rational, analytical, reductive approaches to information processing and problem solving. More intuitive nonlinear approaches, characteristic of a more 'right-brain' orientation, were underemphasized" (Morgan, 2006, p. 78). This over mechanized/digitized perspective of an organization gives an idea of a lopsided transhuman organization with an uneven man-machine power balance. No wonder Morgan cautions about digital preponderance in an organization, "But in practice it needs to be accompanied by an awareness of the cybernetic limits that will help make it a positive

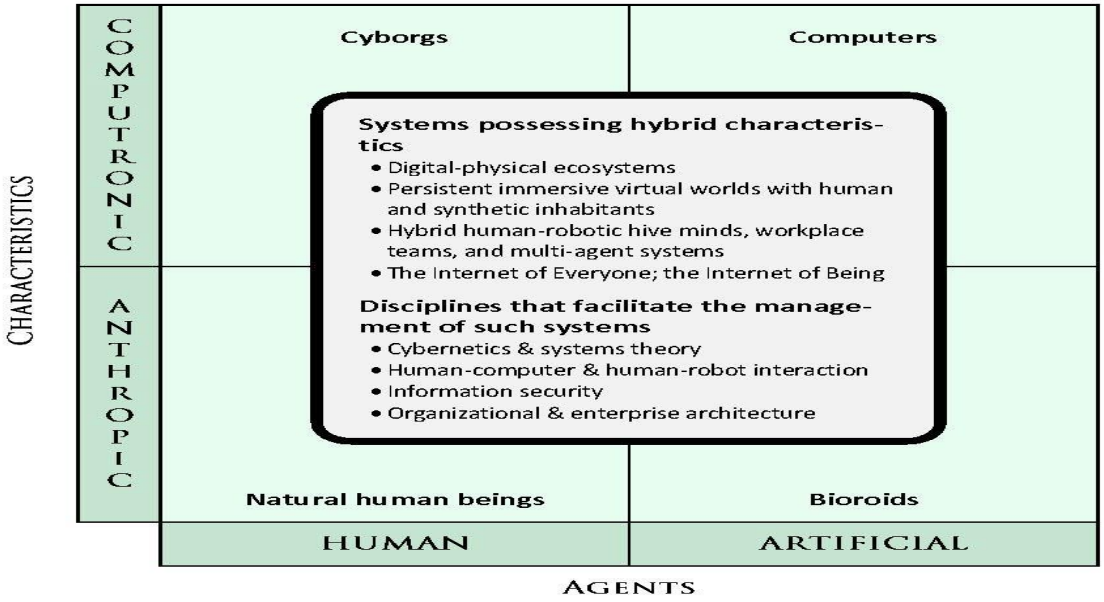
process from societal perspective" (Morgan, 2006, p.114). It is this cautious trading with the digital in the organization that engenders the true spirit of a posthuman organization.

In understanding a posthuman organization I would take recourse to Matthew E. Gladden's *Posthuman Management: Creating Effective Organizations in an Age of Social Robotics, Ubiquitous AI, Human Augmentation, and Virtual Worlds* (2016). Taking a selective recourse to critical posthumanism (and abjuring the all-embracing aethical transhumanism), Gladden asserts:

> Organizational posthumanism does not naïvely embrace all forms of posthumanization; unlike some strains of transhumanist thought, it does not presume that all emerging technologies for genetic engineering or nanorobotics are inherently beneficial and free from grave dangers. But at the same time, organizational posthumanism does not directly join bioconservatism in attempting to block the development of particular technologies deemed to be hazardous or destructive. Instead, organizational posthumanism focuses on analyzing posthumanizing technologies that are already available or whose development is expected in order to assess their (potential) impact on organizations and develop strategies for utilizing such technologies in ways that are ethical, impactful, and efficient. Organizational posthumanism recognizes that emerging technologies are likely to possess both benign and harmful applications, and the role of a manager as such is to identify and creatively exploit the beneficial aspects of a technology within a particular organizational context while simultaneously avoiding or ameliorating the technology's more detrimental effects. (Gladden, 2016, pp. 26-27)

For Gladden, in the posthuman organization, five different types of agents shall co-exist in the digital-physical organizational ecosystem (see *Fig. 1.*). This transformative convergence of various agents in the posthuman organizational space demands a new posthumanized human-artificial organizational theory and practice (Gladden, 2016, p. 217). Such "xeno-" or "meta-" theories that intend a conceptual framework to account for the performance of human-artificial dynamics (Gladden, 2016, p. 217) are not without certain concerns. The new posthuman workspace will raise new concerns about power relations between the human and the cybernetically enhanced human being, with the latter having a better capacity to think organize, empathize, and manipulate (Gladden, 2016, p. 247). This may be solved through ethical intervention and recognition of the posthuman organization as a socio-technological space (Gladden, 2016, p. 251). However, Gladden admits the unavailability of any such ethical document that holistically addresses the challenges of newly found posthuman organizational space. (Gladden, 2016, p. 251).

Figure1. Gladden's Posthuman Management Matrix for organizational management in the Posthuman Age (Gladden, 2016, p. 216)



The next important concern raised by Gladden is the concern of human "trust" towards the robotic leader. For Gladden, a social-robot serving as a CEO in a posthuman organization must be able to engender loyalty and trust in the strategic vision enunciated by it (Gladden, 2016, p. 305). To have such a social-robot may seem an improbability. Yet, Gladden asserts that such social-robot with "social and emotional intelligence, wisdom, ethical insight, moral courage, and selfless personal commitment to an organization that inspires loyalty and trust" is inevitably in the offing (Gladden, 2016, p. 305).

Thus, for Gladden, a posthuman organization of the future is a socio-technological space that is ethically designed for a positive outcome and where various agents (human, artificial, cyborg, bioroid, and hybrid) perform together. Further, to democratically resolve the issues of power-dynamics among such agents there is a need to create an ethical framework. Moreover, pitching the posthumanized e-leaders of the future, Gladden believes that trust can be generated by such posthuman leaders if they have a socio-emotional-ethical design in their vision.

Digital Trust in a Workplace as a Posthuman Condition

Gladden while considering trust as a posthuman management discourse considers it to be a matter of upward vertical communication from that of the human subordinates towards that of an e-CEO. However, trust within the organization can flow in any communication channel—horizontal and/or vertical (both upward and downward)—and among a combination of all performing agents. Hence, trust is not only a strategic vision promulgated by an e-leader but can also be a commitment of a machine towards a man working at the same hierarchy, or of a hybrid employee towards a human CEO. However, when we talk about any posthuman organizational space the trust that is thereby generated is a combination of human-socio-emotional-ethical values on one hand and digital-technological on the other hand. The very phrase "digital trust", as mentioned

earlier, is an oxymoron that combines digital elements of the machine and social elements (i.e. trust) of humans. Hence, “digital trust” across any communication channel, among any performing agents, in a posthuman organization is anthropomorphic by definition. Digital trust is posthuman. And, like any hybrid posthuman element, digital trust, has the potency to subvert the anthropocentricity of human trust. Anthropocentric trust in an organization is biased (Pepper, 2018), rooted in duality (Möllering, 2005), hierarchically designed (Kolarić and Slobodan, 2011), privileged in unconditional monoism (Mayer et al., 1995), and value-laden (Barber, 1983), rather than being thought pluralistic, postmodern and slippery by definition. Even in the case of postmodern organizations trust is an important anthropocentric discourse, albeit dialogic in its formation (Lončar, 2005). It is perhaps only through digital trust in a posthuman organization that any postmodern possibility is generated. The trust/distrust, digital/human duality is dissolved.

Salvaging Digital Trust from Capitalism: Foucauldian Ethics as Way Forward

Digital trust—an unease postmodern assemblage of pro-social and pro-technological—oftentimes than not is usurped by the capitalistic powers for the profit motives. “Global virtual hypercapitalism”, Herbrechter reminds, needs a “plastic and flexible individual subject” (Herbrechter , 2013, p. 25) and Gladden adds that “popular posthumanist narratives that emphasize the pliability, dissolubility, and reconfigurability of the human being support the development of subjects that are ready-made for control by corporate interests” (Gladden, 2016, p.97). No wonder, any sense of unquestionable trust on such anthropomorphic subjects are meant for profiteering capitalist motives of the corporate. Further, this leads to the overreliance and thereby the overdominance of the anthropomorphic agents at workplace. This generates posthuman anxiety that affects the digital trust whereby the apprehensions of digital data breaches and digital panoptic surveillance in an organization loom large. Thus, digital trust is liquefied (Bauman, 2006): “Away from any solid sense of attachment, due to the lack of trust thereby generated, an organizational subject enters into an until-further-notice arrangement, with no strings attached commitment, and seeking fast-paced satisfaction and profit with the place of work” (Svenson, et al., 2020). It is here that the question of Foucauldian ethics (and not Baumanian morality [see Kelemen and Peltonen, 2001]) comes in.

Lots have been written about the need for robots being good and pro-ethical (Vallor, 2011; Sharkey and Sharkey, 2012; Sorrell and Draper, 2014; Winfield et al., 2014; Sharkey, 2016; Sharkey, 2020). However, I don’t intend to probe the ethical dimensions of bioroid or cyborg agents in an organization. My concern is about all performing agents across every communication channel in the posthuman organization (see Fig. 1). The ethical concern addresses the breach otherwise created by the capitalist concerns that liquidate the digital trust in the posthuman workplace. The philosophy of ethics that comes most handy is perhaps that of Foucault. The Foucauldian postmoral ethics is a matter of positive curiosity for the other and being open and courageous to the experiences of resistance (Kelemen and Peltonen, 2001, p.160). Such ethical curiosity “enables one to get free of oneself” (Foucault, 1990, p.8). This also prepares one to acknowledge the strange elements of others in the self. In a posthuman organization, a man intends to be curious about the machine, its other, and vice versa. For example, if a man suffers from the anxieties of harming others as the digital panopticon has

the potential of, then this is supposed to ethically prepare the man to avoid the same. The same goes for the digital agent which should be thus programmed. This desire of the knowledge for its other—*la volonté de savoir*— (Foucault, 1976, p.87) may hopefully engender a likelihood of trusting the other. Digital trust in a workplace, a posthuman condition, thus would remain an interesting, positive, unfinished project in continuity.

Conclusion

So how do we position digital trust in a posthuman organization? What are the implications of the same in the study of organizational theory? If the anthropocentric organization promulgates a human version of trust, then posthuman organization projects trust as digital. Yet, power structures of postmodern neoliberal capitalism may appropriate digital trust to achieve their profit-based strategic objectives and business goals. This leads to an investment of greater power to the digital than the human. This disrupts the man-digital balance in a posthuman workplace. It is here that Foucauldian ethics of being curious towards the other works as a supplementary element. The Foucauldian ethics engages two individuals (here human-digital) in an open-ended playful organizational friction (Kelemen and Peltonen, 2001, p. 161) that not only results in the constant newly formed subject positions but even engenders the hope to trust the self/other.

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Exploring Digital Trust in India: The case of Online Micro Entrepreneurs

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ABSTRACT

Trust, in today's context, Digital trust, plays an important factor to influence purchase intention and digital transaction of consumers, and therefore drives the online micro entrepreneurs to build trustworthiness. In India, online micro entrepreneurs are a unique group of sellers who use Whatsapp and Facebook to run business. In many cases, they do not have a physical shop and the online platform provides them with the stimulated workplace. Trust is an important predictor of digital transaction. The paper talks about how micro entrepreneurs are building trust and promoting their product and service without traditional system of promotion.

Keywords: Trust, Digital, Micro Entrepreneurs, Online workplace, purchase intention

Introduction & Literature Review

Trust can be defined as "Expectation that other individuals or companies with whom one interacts will not take advantage of or depend upon. It is the belief that trusted party will behave in ethical, dependable and socially appropriate manner and will fulfill their expected commitments." (Gefen, 2003)p. 308). Trust is belief that allows consumers to willingly become vulnerable to web retailers after having taken retailer's characteristics into consideration (Mcknight, 2002). These studies show that trust underlies consumer beliefs on safety of shopping online. Trust in context of online purchase behavior may be explored via a TPB-based model. In that case, trust must be defined with respect to behavior through a specified target, action, context and time frame (Ajzen, Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior, 2002). In context of the current study, target is online seller, action is to create intention to purchase online, context is online promotional communications in by online micro entrepreneurs, and the time frame is when consumers go through or come across these communications.

Earlier studies show consumer's trust on web retailer is major influence of consumer's attitude toward online purchasing (Chen, 2004), (George, 2004), (Ha, 2009), (Jarvenpaa Sirkka L., 2000), (Pavlou, 2006), (Suh, 2003). Trust enables favorable expectations that a web retailer will fulfill its promises and no harmful outcomes will occur with this engagement, and therefore creates positive attitudes (Pavlou, 2006). Beliefs in the trustworthiness of the Internet should be associated with willingness to buy online. If an individual believes Internet is trustworthy channel for conducting personal business, then beliefs should positively influence individual's attitude towards using Internet for buying.

Online micro entrepreneurs are small business owners, who employ a small number of people (usually operates with fewer than 10 people) and has started business with a small amount of capital advanced from a bank or other organization. Many of these businesses have no employees other than the self-employed

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owners. In general, to become successful micro entrepreneurs, they need to access their income needs, set business goals, pay off debts as much possible, manage cash flow over long time, control all expenses, revisit and reassess business process regularly and remain flexible.

In India, business catering to different product and service categories come under this category, e.g. boutique, parlor, agro and food processing, online web-based business, handicrafts, consultancy etc. come under this category. Uniqueness of the business category is one of the key strength for micro entrepreneurs.

Micro and Small businesses contribute to local economies by bringing growth and innovation to the community and help stimulate economic growth by providing employment opportunities to people who may not be employable by larger corporations.

In India, a huge number of women turn into micro entrepreneurs. Many of them deal with innovative and unique niche products or services, and in many cases can offer customized product or service as per the consumers' need. Some of the unique areas are garments, costume jewelry, paper products, handbags, herbal and beauty products, bamboo products, yellow tea etc. The subject of empowerment of women has become a burning issue all over the world including India since last few decades. Women's need for equality emerged from ancient times and they have made enormous contributions to economies, whether in businesses, on farms, as entrepreneurs or employees, or by doing unpaid care work at home. Investing in women's economic empowerment sets a direct path towards gender equality, poverty eradication and inclusive economic growth. Since women perform the bulk of household work, they often have little time left to pursue economic opportunities. Empowering women economically, help building better livelihoods, earn more income, and create businesses that provide jobs and boost local economies. With improved financial security, other areas of women's lives also improve in terms of Healthcare, Hygiene and access to the modern technological advancements.

Women entrepreneurs constitute around 14% of the total entrepreneurship in India. It is needless to mention that the growing statistics favoring women strength in the business world is boosting the morale of Indian women. However, in fast changing economical and global environment, it becomes imperative for any women entrepreneur to remain dynamic and updated to face-off the new challenges to improve the bottom line and maintain a sustainable growth rate. They also need to keep on analyzing the new opportunities in the market to enjoy the first mover advantages. Besides this, they need to optimize the resource utilization. The emergence of women to the strategic positions in the social structures has given way to a relatively better understanding and identification of the oppressive practices.

Many of these women micro entrepreneurs do not have a physical shop and the online platform provides them with the stimulated workplace. They promote their product and service through Whatsapp and Facebook/ Social media via consumer- generated Classifieds advertising. Consumer-generated classified advertising are 'short' advertisements carried in print, electronic, radio and online media and are subjective decision of individuals for personal gain, driven by personal opinion and trust on the publication/ channel/ website/ social media platform, unlike costly Display Ads that are structured campaign plans by experts/ corporate.

CGA (Consumer-Generated Advertising) is defined as “any publicly disseminated, consumer-generated advertising message whose subject is a collectively recognized brand/product.” (Berthon, 2008). Online CGA (Consumer-Generated Advertising) communications have ‘consumer made’ characteristics (Lawrence Benjamin, 2013) where communicator delivers a commercial message to receiver. Social Influence research shows people are likely to be influenced by those who are judged to be more similar to them in values or other characteristics (Hilmert, 2006)(Wilson, 1993). ‘Consumer-initiated CGA is seen as more authentic, credible, discernible, engaging, non-corporate consumer source and therefore highly reliable’ (Lawrence Benjamin, 2013). Motivation of CGA creators plays a major role in establishing credibility, authenticity and trustworthiness (Eagly, 1978).

Until 1990, firms focused on customer transactions was measured by recency and frequency of customers along with monetary value. Commitment Trust Theory by (Morgan, 1994) conceptualized relationship marketing that says ‘Firms majorly focus on creating positive relationships with customers through developing loyalty and trust.’ ‘Establishing a long-term relationship with customer is aimed at relationship marketing. (Berry, 1991) As per (Morgan, 1994), long-term relationship with customer endorses efficiency, productivity, effectiveness and cooperativeness. Thus in mid-1990s and early 2000s, firms focused on establishing customers’ trust and demonstrating their commitment to the firm. Now with evolved technology, relationship marketing has reached new heights based on analysis of search, customer purchase data and taking customized approach powered by artificial intelligence, thus increasing Consumer Engagement. Modern internet technologies e.g. cookies, can individually record consumer decision patterns and personalize environments for individuals visiting a virtual store.

(Brodie, 2011) conceptualized customer engagement as psychological state that occurs context-specific. A study by (Brodie Roderick J. Ana Ilic, 2013), explores complex multidimensional and dynamic consumer engagement with different level of intensity over time in context of online brand community. The study states: ‘Consumer engagement comprises of a range of sub-processes reflecting their interactive experience within online brand communities and value co-creation among participants.’ Enhanced consumer loyalty, satisfaction, empowerment, connection, emotional bonding, trust and commitment are shown by engaged consumers.

Similar to bigger firms, online micro entrepreneurs put huge effort in building trust with the consumers. Trust play vital role for digital transactions and sustain consumers in long term. They build trust via delivering good quality products, on time delivery, informal interaction, positive word of mouth, reference by peer group, continuous communication of their product or service with as much option available via Whatsapp group and Facebook pages, interaction with group members with personal touch and more.

Qualitative Study

A qualitative method applied to the current study to understand perceptions of individuals forming a convenient sample of study, and to elaborate pertinent theories drawn from perspectives described in face-to-face interviews (Creswell, 2005).

The findings from the qualitative study establishes that, Perceived Internet Trustworthiness is important factor to influence Purchase Intention.

Respondent's views on whether online platforms adopted by online micro entrepreneurs keep customer's best interests in mind, act as important influencing factor for Purchase Intention.

In general, the Seller forms Whatsapp groups of Facebook pages with like-minded people, and promotes products of latest trends and common interests to the group. Whatsapp group or Facebook pages work as virtual workplace for the seller. Many of them do not run any physical workplace. Therefore, maintaining the group with at high interest level and positive interaction is extremely important. For example, saree groups are formed with female consumers who love to wear saree, scan saree pictures, or buy for her or others. It is always important to study the psychology of target consumers in terms of their changing need and keep their varying best interest. It is always better for the seller, especially for micro entrepreneurs with higher capacity, to form bigger Whatsapp group, and increase customer base. Bigger groups take less effort and response swiftly to interact with the buyers. Personal touch in communication plays important role here. Selling will depend on individual trust, and continue until business is established.

Online purchase is more dependent on trust factor than offline, since Buyer and Seller do not meet physically. Buyers do not take risk if they hearing about bad experience by any other buyer from that particular seller. Therefore, handling negative customer feedback is very important to online micro entrepreneurs. Trust in the quality of product very important. Any low quality or defective product sold needs to be replaced immediately, if not possible money should be returned. There is a common belief that product quality difference exists between products purchased offline and online, as offline products are checked physically before purchase. Specially, for food product sellers, quality control by the time of delivery is extremely important.

This is highly important to maintain basic trust and goodwill of the seller, here micro entrepreneurs. There must be online feedback option and respond to that. Dissatisfied customers can put negative feedback on Facebook or Whatsapp group. Any online transaction is more of trust since seller and buyer do not meet offline. Once the buyer hears somebody's bad experience, they do not take risk. Reading customer review is very important before purchasing online.

Therefore, whether the micro entrepreneurs keep users best interests in mind is a very important antecedent towards Purchase intention.

Customers' belief on honesty of micro entrepreneurs plays important role to influence Purchase Intention. In general they prefer to buy from established or known or referred or closed group online micro entrepreneur. The buyer trusts the digital transaction more if he/she knows the seller informally. In addition, buyers prefer if communication is clear and excludes hidden amount like delivery charge, GST etc.

Therefore, buyers' belief on the honesty of the group plays as very important antecedent to Purchase Intention.

Buyers views on overall trustworthiness of online group or site is important factor to study. Selling via Whatsapp group or Facebook pages depends on personal trust. Therefore, products delivered to the buyer should be as per the order placed. The trust between buyer and seller depends on personal experience. In

case of micro entrepreneur, since the business size is smaller, in many cases, also if the product is trusted easily offline, it can create doubt in case of online transaction. Therefore, many a times, the buyer initially tests the buying experience with low cost, low involvement products. Many buyers only buy if Cash on Delivery option is available. In Indian context, slight deviation is often accepted by both the buyer and seller.

Therefore, whether user feels that overall, groups are trustworthy, is a very important antecedent to Purchase intention.

*Hence, Perceived Internet Trustworthiness plays important role in Purchase Intention***.** Study also indicates whether online micro entrepreneurs keep user's best interests in mind, whether user selects honest online platform and user's overall feeling on trustworthiness of online platform are important indicators to Purchase Intention. Along with other influencing factors, *internet trustworthiness* serves as primary variables in examining drivers of Consumer Engagement in context of online micro enterprises, resulting in purchase intention.

Contribution

Establishing digital trust in context of online micro enterprises is one of the strongest criteria for the business to sustain, generate profit, and grow. The present study developed conceptual framework in Indian context keeping in mind different type of communication and promotion by online micro entrepreneurs and the power of present day social media. The current paper contributes to the literature on computer mediated communications and advertising, and adds a new perspective towards Theory of Engagement.

From a managerial perspective, this research finding will provide marketers with valuable information to establish their long-term relationships with consumers and create profitable online business on groups of micro entrepreneurs, and monetize the platform by strong promotion serving both social and economic need of the country.

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“Digital transformation and the transformation of work”
- A Human Resources Management (HRM) perspective -

Liliana K. Bianchi[10]

ABSTRACT

The purpose of this paper is to reflect on the basic concept of work and its implications for human life. It provides a brief historical overview to understand the evolution and multiple views of “What is work?” In addition, how reality is transformed through it. We will address some notions of the digital paradigm and how it impacts on the definition of roles, tasks and work within companies, and consequently on Human Resources Management (HRM). We contextualise current circumstances characterised as VUCA (Volatile, Uncertain, Complex, and Ambiguous) to describe transformation in the world of work.

Keywords: 1-Work 2-Digital 3-Transformation 4-Human Resources 5-VUCA 6-Teleworking

Introduction

The purpose of this paper is to reflect on the basic concept of work and its implications for human life. It provides a brief historical overview to understand the evolution and multiple views on “What is work?” Moreover, how reality is transformed through it. We will address some notions of the digital paradigm and how it impacts on the definition of roles, tasks and work organisation within companies, and consequently on Human Resources Management. When we speak of transformation in the world of work we cannot fail to contextualise current circumstances characterised as VUCA (Volatile, Uncertain, Complex and Ambiguous) and how these, together with digital transformation, impose changes on the paradigm in relation to the world of work. Technology drives new ways of connecting to each other, of doing business, of conceiving the world and of working. Teleworking, as a form of labour management, has become globalised and is no longer a trend but a reality. A reality that was unexpectedly accelerated by the pandemic unleashed by COVID-19. A lack of trust in workers and a labour paradigm where distributed work is not possible was one of the main reasons why the advance of telework had hitherto been delayed. This was especially marked in countries or companies with high levels of control and/or low levels of trust. Workers were thought to require direct supervision rather than be allowed autonomy and self-management. By means of an exploratory journey with different perspectives, this document aims to answer some questions and raise others in relation to these issues, which are of such great interest in business, academic and social environments.

Work is inseparable from human life.

What is work? Is work the same as employment? Can we call work what an independent professional, a freelancer, a self-employed worker or a volunteer does?

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What is the real meaning that work has in our lives? What is the impact that technological transformation has in the world of work? What will be the future of work? These and perhaps other questions will give us the starting point towards some answers. This paper will try to offer an entry door to an understanding of what is happening these days in companies and in the life of workers who make strenuous efforts to maintain a high level of employability.

Throughout history work has been a transcendental and structural part of society at economic, cultural and social levels. It offers a means of exchange and an outlet to creative capacity. Work gives us the means for our existence to transcend beyond our biological limits. Elton Mayo (1933), the father of humanist theories applied to the work environment held that “If our social skills (that is, our ability to secure co-operation between people) had advanced step by step with our technical skills, there would not have been another European War” That is, recognising that a human being is composed of biologic, social and psychological dimensions as an integrated system. For this reason their maximum potential is achieved by working on integrating all dimensions.

Various Business Administration schools suggested that the best way to optimize productivity in companies was to standardise processes, tasks, roles and functions in what is known as economies of scale. And it was at this point in our recent development that we started to apply the same concept to humans as we did for materials by calling them resources. This is how we get to the present, which we call reductionism and standardisation of the concept of work. In his book “What do we work for?” Sergio Sinay wrote “When we do our work… we create memories”. We create memories and facts, and we print prints. Moreover, Julio César Neffa PhD., in a paper written in 1999 held: “According to ethnologists and anthropologists, in primitive societies work could not be easily distinguished from other human activities. Work has been defined as a coherent set of technical operations aimed at producing the material means necessary for human existence". Labour is inseparable from human life.

Labour is inseparable from human life and human life is inseparable from economics, political social, cultural and technological changes, and these affect the kind of work, activities and skills demanded. The most significant discoveries and transformations from the 1700s to the present have changed the world in which we live today. We have lately experienced a digital transformation that we cannot fail to undergo, and which will transform us along with our environment. We live in a digital, global and hyper-connected world, characterised by continuous, accelerating and unexpected change, and the continuous irruption of new actors, mobility and connectivity. We live in a world in which paradigms that have been sustained over decades are not only changing, but are also in turn creating new paradigms.

Ubiquity, Omni-channel strategies, connectivity, teleworking, live broadcasts, artificial intelligence, robotisation, time constraints, public and private lives, professional and personal images, the use of contents, they all blur the boundaries. Although man has progressed over the last 200 years, their mental capacity and physical functionality has not changed substantially.

Technology, on the other hand, is evolving at an exponential rate and we get the feeling that we are running to catch a train called technology which always leaves the platform without us, and that if we are lucky we can

at best jump on to the last carriage. As Carlos Magro and Josep Salvatella maintain in their book Digital Culture and the Transformation of Organisations, "We form part of a networked world in which hierarchies and power relations between people and structures are being questioned constantly, in which analogue, physical or conventional logics coexist and interact with digital logics, and in which information and knowledge flow abundantly and are accessible at any time and at any place. This is a world in constant transformation that influences and feeds back on changes in the way we see things." Daily behaviour attitudes and values turn citizens, professionals, customers and markets into tensors of change according to new forms and businesses conventions. A multitude of changes are taking place simultaneously, highlighting two fundamental issues: firstly, a profound change of paradigm that requires us to redefine not only the concept of work and the way we work, but also the way we link up, do business, educate ourselves and form civil society, among others. And secondly, acceptance of living in permanently volatile, uncertain contexts becomes necessary. Predictability turns out to be a utopia, especially in underdeveloped countries such as Argentina. This characteristic of the context refers us to the ideas of Nassim Nicholas Taleb in his work "Anti-Fragile - how to protect oneself from uncertainty". Taleb addresses the concept of fragility and the context in which fragility occurs, and develops the concept of anti-fragility to explain everything that is not fragile and not necessarily robust. "A fragile object will not do well with an earthquake or a visit from a hyperactive nephew. Everything that abhors volatility abhors stressors, damage, chaos, events, disorder, unforeseen consequences, uncertainty and, above all, time." However, as we have previously mentioned, we are immersed in a VUCA world so following Taleb's ideas, in this context we should become anti-fragile: "Anti-fragility is more than resilience or robustness. Robustness withstands shocks and stays the same; anti-fragility improves with shocks. This quality is behind everything that has changed over time: revolutions, technological innovation, cultural success, business survival, good recipes, the rise of cities, resistant bacteria - even our existence as a species. ... Let us think, for example, of Switzerland, the most anti-fragile place on the planet, as it benefits from the crises that are occurring in the rest of the world" So, can we become anti-fragile ourselves and generate anti-fragile jobs in this context of digital transformation?

Digital transformation: the new mind-set applied to business and human resources management.

Lately we have become used to dealing with new expressions such as digital mind-set. But, what does it mean? People normally think it is something linked to technology or software, but it is not. First of all we will try to understand the concept of mind-set. According to Susana Von Der Heide "Mind-set is more than our thinking brain. It's what results from the inseparable link between reason, emotions and desire. It is the most complete expression of our beliefs and our will. In the face of the new, which awakens insecurities, the mind-set creates the possibility for improvement and progress by people. This is because our capacity to learn and unlearn is intimately linked to our aptitude for openness and detachment. It is the mind-set that activates the "Wanting to Do" by releasing curiosity and giving us the courage to leave behind our powerful anchors to "know-how". Developing our mind-set further will allow us to *surf* the radical transformations that are shaking businesses that have operated until now on the margins of digitalization." When we started to learn about this

topic we thought that Mind-set might be a synonym for paradigm. However, according to Thomas Kuhn, a paradigm is a prism through which we see, feel and understand the world. We now realise that the situation appears to be more complex. This is because it includes the anchors of our knowledge and knowhow, and of our personal values. So we are facing a context that cannot be dealt with or understood through the same skills and values as it was in the past, even the recent past.

Digital is an attribute which demands the development of a new and different type of knowledge and learning. Moving on to practical applications: in Human Resources, we used to manage through skills models. These models consisted of defining the general and specific skills required by the company, definition that established the alignment needed to develop general HRM processes. Job descriptions, employee recruitment, training, career development and performance appraisal. Well, all this is in the past. Now, each company has to re-create a new mind-set that adds agility, resilience, flexibility, and an understanding that the way knowledge is anchored is through a “beta mode”. A beta mode allows us to launch initiatives in a VUCA context, which means that we don’t have to perfect our product before launching it, as by the time the product is totally ready, the market opportunity might have totally passed us by.

People centricity is a key concept to the digital mind-set: the customer holds centre stage, approving or disapproving of our service, product, image, or employer branding through social media. Employees work better in structures without a structure, which are less hierarchical.

These days it is much more challenging to develop career plans for talent in companies than it has been in recent years: if you have talent in your company, you have to offer a tailor made plan that achieves the perfect balance between the organization's needs and their personal needs and motivation. Although talent has always been a key focus of Human Resources management, in the current context it has become one of the most critical aspects. Pilar Jericó argues in her book “A New Way to Manage Talent - Building Commitment", “The only thing that can be said is that, thanks to technological transformation, talent has become the main asset of enterprises and, as technology develops and competitive pressure and social change accelerate, its role will become even more strategic.” So, what is talent these days? In the past, talent meant people whom were highly qualified and who were high performers in the company. The digital framework currently demands more than high qualifications, degrees, post graduate degrees, etc.

Creativity, innovation, empathy, flexibility, nimbleness and an apprentice’s attitude is much more valuable. Yuval Noah Harari points out in “21 Lessons for the 21st Century” that “To survive and flourish in such a world, you will need a lot of mental flexibility and great reserves of emotional balance. You will have to repeatedly let go of some of what you know best, and feel at home with the unknown.” Being productive and comfortable in an unknown and unstable context requires the development of skills which have not yet been taught in formal education. So as HR professionals we have here a major challenge to secure these skills, this talent for the work place.

Before COVID-19 many companies thought about digital transformation in terms of their own business model, and they expected the impact inside organizations to be positive but not absolutely necessary.

Before COVID-19 HRM evaluated tasks and roles suitable for remote work. After COVID-19 HRM evaluated reasons for returning to the office.

Working from home is a controversial idea. In the past, work was a place to go to, but teleworking placed the focus on tasks and roles. In the COVID-19 context, despite the impossibility of using public transport or moving between states and cities, some workers (knowledge workers) were able to continue being productive through ITCs (Information Technology Communications). To face this reality companies adapt their process, technology and the team work dynamic, trying to obtain a remote work experience that is similar to the physical work experience, or better. Skills such as collaboration, digital communication, continuous learning, strategic vision and virtual leadership are necessary to manage successfully in the virtual environment.

However, teleworking is not a new practice, in fact, teleworking started in the "US State of California in the mid-1970s (Nilles 1975) and was promoted by California-based companies … in the 1980s under the term telecommuting, which later came to be known as telework. Three decades later, markets have become flooded with cheaper, smaller and increasingly connected devices, the so-called new ICTs such as smartphones and tablet computers, accompanied by a vast dispersion Internet and the World Wide Web" Since the starts of the 21th century, teleworking has been growing rapidly. Companies now include teleworking as a benefit to attract talent; mainly younger generations because they have a different relationship with work and pursue life experiences more intensely than stability at work. However, teleworking is still controversial because, although it can generate some worker satisfaction, it can also lead to cost reductions in connection with employers' infrastructure. Moreover, it can also lead to a deterioration of social networking within companies, which is necessary to build a cultural identity in the organization.

Maslow's (1976) concept of the hierarchy of needs is well known but it deserves a mention here. He identified four levels of need in human beings: Physiological needs, Safety needs, Love and Belonging, Esteem and Self-actualization. We can probably satisfy the first two levels by working remotely (Physiological and Safety needs). But working from home we are unlikely to fulfil the next three levels. Let´s zoom into this:

1. The need for Love and Belonging includes: friendship, intimacy, family and sense of connection. A space that leads to personal relationships and a connection with the company. Corporate culture, which is generated by the members, generates a sense of belonging or the psychological contract as we used to call in HRM.
2. Esteem includes: respect, self-esteem, status, recognition, strength and freedom. Again in this group of needs, status, recognition and respect are values and needs which can be developed by working with others, in collaborating and being part of a community and projects.
3. Self-Actualization: the work place is one of the most important spaces in which human beings move forward to maximise their potential. Redefining Neffa's concept: working and social experience are inseparable from human life.

Human Resources Managers are facing enormous challenges: In the short term they have to obtain high levels of productivity, innovation, agility and very well connected employees. Regarding the long term they have to prepare their people for the next crisis. According to an article by Harvard Business Review, "Covid-

19 is not a one-off challenge; we should expect additional phases to the current epidemic and additional epidemics in the future... Preparing for the next crisis (or the next phase of the current crisis) now is likely to be much more effective than an ad hoc, reactive response when the crisis actually hits."

Teleworking in Argentina (Pre and post Covid-19)

According to a recent report produced by the ILO (2020), "working from home is a working arrangement in which a worker fulfils the essential responsibilities of his / her job while remaining at home, using ITCs. In response to the uncertainties presented by Covid-19, many companies and universities have asked their employees to work remotely. Before Covid-19, teleworking seemed to be a simple trend rather than an effective business practice. But despite many doubts, fears, and prejudices, teleworking offered the answer to continuing productivity despite global and local lockdowns.

COVID hit the entire world and caused a profound transformation in the world of work; many employees — and their managers — started working away from the office and were separated from each other for the first time. Every company, from multinationals to small local businesses, have been experimenting multidimensional change. Knowledge based businesses that do not involve industrial processes adopted teleworking almost compulsively and quite easily. Before Covid-19, many countries didn't have a legal framework to regulate teleworking because, as mentioned before, it was considered simply a management issue. In Argentina, before the Covid-19 pandemic, there were no government measures to promote teleworking - an issue that could be the subject of further research - but in the middle of the lockdown the current argentine government passed a law to regulate teleworking in companies. This law, as in other countries like Spain and Chile, includes aspects such as working hours, the right to be disconnected, reimbursement of ICT expenses, definition of tasks, controls, to mention but a few. The point is that all those new elements of the legal framework must be taken into account by human resources policies in companies. However, adapting human resources policies to the new legal framework is not difficult compared to the changes and transformations which teleworking brings about. How does working from home affect psychological health? What can employers do to make sure that people remain focused, committed, and happy? What about corporate culture? Can a good culture be created remotely? In every situation, teleworking has advantages and disadvantages for both employees and employers. Here we will try to find some guidance for human resources professionals and leaders to deal with teams working remotely and in a distributed manner. According to HBR and their publication on Leading Teams, "To start, managers need to understand factors that can make remote work especially demanding. Otherwise high-performing employees may experience declines in job performance and engagement when they begin working remotely, especially in the absence of preparation and training." For this reason, according to a survey conducted by University of San Andres and Microsoft, 60% of leaders in Argentina consider that the major challenge for them is to place the focus on emotional support for each team member under their management. Other challenges inherent in remote work include a lack of face-to-face supervision: both managers and their employees often express concerns about the lack of face-to-face interaction. Supervisors worry that employees will not work as hard or

as efficiently (though research indicates otherwise, at least for some types of jobs). Many employees, on the other hand, struggle with reduced access to managerial support and communication. In some cases, employees feel that remote managers are out of touch with their needs. For this reason, it becomes more important than ever to put the emphasis on robust communications. Social isolation is a new factor of concern in the Human Resources manager's agenda. Loneliness is one of the most common complaints about remote work, with employees missing the informal social interaction of an office setting. This makes sense according to Berger and Luckmann´s theory of social construction, in fact, they held that people are the product of socialization and customs and that reality is a social construction. So teleworking is here to stay permanently, this is a fact and a construction of global society, the next step could be to answer the following questions: How will the teleworking experience answer successfully the new challenges we are facing today? How will it build a culture outside the company´s setting?

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Digital trust in business and society

Barbara Wyrzykowska[11]

ABSTRACT

The emergence of new digital technologies creates new challenges in terms of data security. The subject of the article is the issue of digital trust. Using the literature review, attention was paid to the potential of digital technologies and their impact on digitization and data security. The end result is the development of a trust-building model in the digital age.

Keywords: digital trust, digitization, information and communication technologies (ICT), cybersecurity,

Introduction

The pandemic suddenly caused a quarter of the world's population to log onto the internet every morning. Digitization has gained an unprecedented pace. Dynamically developing information and communication technologies cause changes in the systems of organization and performance of work. Remote work, remote work, flexible and mobile work are becoming common, virtual and distributed teams are created. And this means huge challenges for companies that want to give their customers a sense of comfort and security. Nowadays, trust counts more than ever, because people who do not feel confident in it and who need support have been forced to go online. Taking into account the potential of new digital technologies and their importance during COVID-19, the author noticed the role of building trust in information and communication technologies (ICT) offered by various organizations and enterprises, and in data security.

The aim of the article is to present the potential of information and communication technologies (ICT) and to develop a digital trust model. Popularization of knowledge on this subject is important from the point of view of the implementation of modern technologies by enterprises and their innovation.

To achieve the intended purpose, the first part of the article describes the development of digital technologies and presents the levels of digitization. The second part presents a model for building trust in the digital age. The summary formulates conclusions and indicates the directions of further research in this area.

Research method

The following research methods were used to achieve the assumed research goal. First, literature studies were conducted (Webster & Watson 2002). The methodology included: source materials search, selection, analysis, synthesis and logical inference. Articles from such databases as: EBSCO, Google Scholar, CeON were the subject of the critical assessment.

Secondly, the latest data from the Internet, prepared by various companies and experts in the field, as well as the author's own thoughts, were analyzed.

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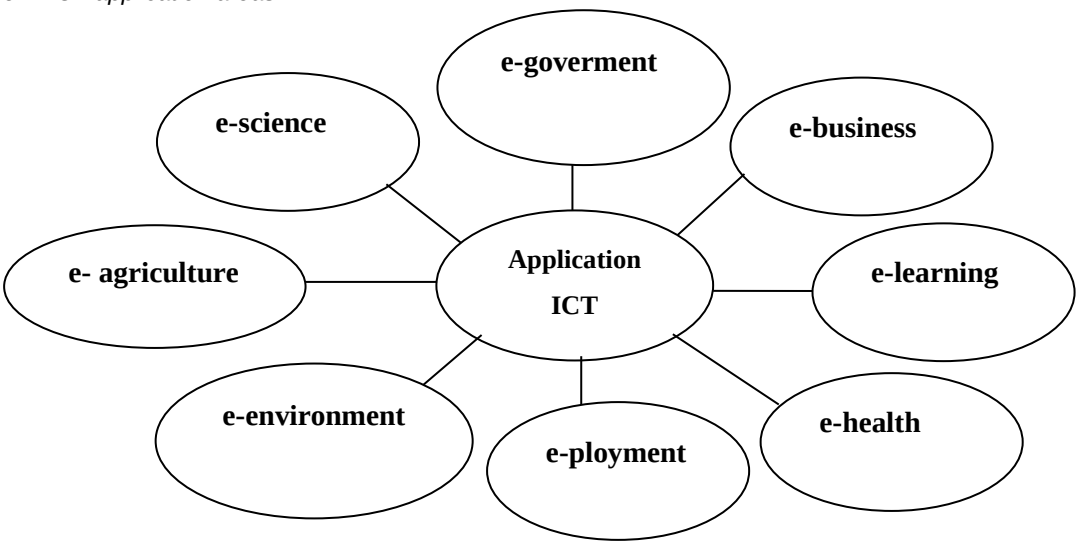
The potential of new digital technologies

The driving force of digital transformation[12] in all areas of socio-economic life are new information and communication technologies (ICT), which process, collect and transmit information in electronic form (fig. 1). In a narrower sense, as digital technologies (using the digital form of information) and the related digital transformation, which means generating and implementing completely new business models for the company's operations based on technology (Gonciarski 2017; Kowalczyk 2018).

Figure 1: ICT application areas



Source: Tunis Agenda for the Information Society, World Summit on the Information Society, Geneva 2003-Tunis 2005, Document WSIS-03/GENEVA/DOC/5-E, 12 December 2003; *World Summit on the Information Society – WSIS+10*, International Telecommunication Union (ITU), Geneva, 10-13 June 2014.

Digital technologies change the way business processes are conducted, create opportunities for new market behaviors, enable the organization to operate in other markets and gain a competitive advantage (Gorustowicz 2019). The process of ICT and Internet development also includes mobile technologies, which constitute one of the distinguished technological possibilities of digital transformation, referred to as transformative technologies. Transformative technologies are digital technologies that use digital technology and information systems. These include (Gonciarki 2017; Gracal & Makowiec 2017; Murawski & Bick 2017; Kowalczyk 2019):

- Social Media - they enable interactive communication, which is based on Web 2.0 technology, consisting in the creation and exchange of content between Internet users, these are: collective cooperation projects, blogs, communities centered around a specific type of content, social networking sites / portals, virtual game worlds and virtual social worlds.

[12] The term digitization is semantically related to computerization, computerization and its interpretation depends on the industry and the environment. Digitization has a strategic dimension and is oriented towards the optimal use of the organization's digital resources thanks to IT solutions. It is one of the many approaches to digitization.

- Virtual Reality (VR) - this is a way of using computer technology to create an interactive three-dimensional world in which objects give the impression of spatial physical presence, and the user can feel present in an electronically simulated environment.
- Agumented Reality (AR) - technology based on integrating the real world with 3D virtual objects using a camera, tablet or smart phone. It combines the real world with virtual reality, allows interaction in real time in three dimensions.
- Big data and cloud computing (big data, cloud computing, cloud computing) - big data is a method consisting in obtaining, collecting and processing (analyzing) large data sets (including unstructured behavioral data obtained from social media, customer service centers) , websites, shopping centers), and drawing conclusions for specific purposes (acquiring new knowledge). This is a service offered by specific software and infrastructure that eliminates the need to purchase hardware and software (contract for the provision of cloud computing services).
- Internet of Things (also the Internet of Things, Internet of Tings, IoT) - is a network of things equipped with appropriate sensors connected electronically or via a computer network enabling monitoring, control, optimization and autonomy of devices (also Internet of Everything, Internet of Everything, IoE - a network of people, processes, data and things connected to the Internet).
- Artificial intelligence, AI (Artificial Intelligence, AL) and machine learning (Machine Learning, ML) - artificial intelligence is a technology focused on increasing human thinking capabilities. Systems or machines that mimic human intelligence when performing tasks and can interactively improve on the basis of information collected. SI is also defined through the prism of the process as the creation of machines (algorithms) capable of performing actions that would require human involvement in intelligence. Technology, a subset of artificial intelligence, is machine learning - it is the ability to learn (modify the principles of its operation), based on data obtained as a result of experience (generalization based on data without human intervention).
- Mobile technologies - are a response to the needs of a mobile person (more broadly - a mobile society) expecting current access to information processing and sending it in any situation without the need for a wired connection to the Internet.

The presented technological solutions do not exhaust the topic of the possibilities of digital technologies that revolutionize the economy and methods of producing products. Phenomena associated with the impact of digital technologies, the Internet and the resulting digital transformation occur at different levels (Kowalczyk 2019):

1. The level of society - results in orientation towards a network society (departure from a hierarchical society), social media, increase in the importance of interpersonal interactions based on internet platforms enabling the building of new business models.
2. Level of the economy - includes economic and social activities constituting a global network of relationships using digital technologies, referred to as the digital economy. Digital transformation at this level means the integration of economic sectors and their participants, creating "new opportunities for

networking and cooperation between entities, which takes the form of the so-called platform economy and cooperation economics.

3. Industry level - means changes in the structure of industry entities oriented on the service model (penetrating the boundaries of various industries and using a comprehensive service instead of buying a product).
4. The level of organization the use of mobile networks, social networks, virtual and augmented reality, artificial intelligence underpinning a completely new approach to clients, creating processes and products.
5. The level of the individual (client) - means a significant diversity of users of new technologies, mainly the Internet, creating communities (connected by common goals), e.g. transactional (purchase, sale), interests (computer games),

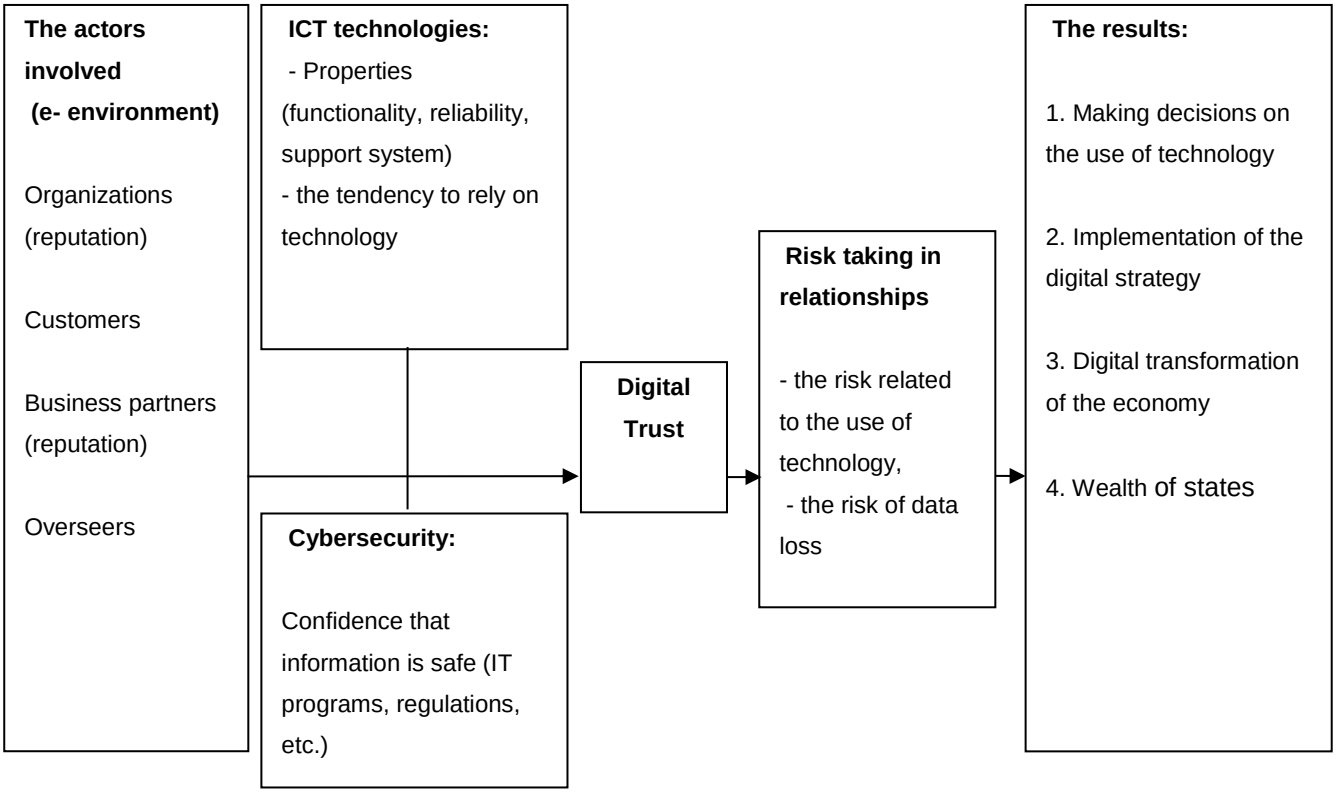
Model of building trust in the digital age

In times of the Cowid-19 pandemic, companies are entering the next stages of digital transformation. The dizzying pace of digitization of all spheres of life means that there was a need to redefine trust, which was traditionally based on trust in family or friends, in politicians and government institutions. Over 50% of the world's population is already online (https://www.cnbc.com/ download: 16.09.2020). Every day, these people entrust information about themselves to dozens of institutions that must be trusted in the field of data security. Moreover, the skilful use of technology is of key importance for the credibility of actions.

In the digital age, trust is closely related to data protection cybersecurity. It enables decisions to be made between two or more entities based on their digital reputation. By focusing on the dimensions of trust in the online world, we can distinguish three categories (https://foreignpolicy.com/ download: 22.09.2020):

1. Trusting individuals, that is us as consumers with whom we interact;
2. Acquiring value from various individuals and entities;
3. Share sensitive information (such as passwords) with these entities and trust them to act in accordance with our intentions;

Figure 1: Conceptual model of digital trust in business and society



Digital trust applies to leaders, organizations, their stakeholders and society. Each of these groups faces completely different concerns. One or more of the following entities are involved in the process of building digital trust (https://przemyslprzyszlosci.gov.pl/ download: 15.10.2020):

- Organizations are the first parties involved in making digital transformation decisions that are interested in the reputation of digital activities that can drive business. Often this reputation is influenced by the assessment of an organization's ICT security as a reflection of its robustness.
- Customers are the other party involved in digital activities. Often, but not always, they are individual consumers with an interest in the privacy of their digital activities.
- Business partners are third parties who support and influence digital business by acting as suppliers, service providers and other entities. They affect the reputation and risk level of an organization or customers. These days, often these are also external companies - for example, service providers that provide resources to external business partners to support organizations and customers.
- Supervisors may exercise regulatory oversight (authorities), make coordinated efforts to influence customer feedback (activists) or publish information (media) by putting pressure on decisions that build digital trust. Especially for regulators, they can have a significant impact on an organization's digital activities.

ICT restricts, replaces or eliminates human participation. The existing human-human relations are replaced with human-technology relations. McKnight (McKnight 2005) indicates that people can trust technology because technology has specific functionalities, works reliably and is helpful to its users. The propensity to rely on technology can be analyzed in the context of three features proposed by Lankton and others (Lankton et al 2014): the functionality of the technology, its reliability and assistance provided to users in achieving their goals and tasks. a certain level of trust in them, conditioning a person to interact with them. The total lack of trust on the part of man in technology would prevent its use in everyday life, and thus its development and the development of entire societies.

Trust in technology can be related to the general level, reflecting the level of social trust, or to the level of a specific technology, a specific solution (Ejdys 2018).

Cybersecurity The rapidly increasing amount of processed information is one of the most important challenges for modern business. Organizations need to prevent data loss while pressure from customers to deliver products and services faster and cheaper. Companies must control data and introduce a number of tools to comprehensively secure it - from hardware solutions to appropriate applications and software, while automating as many processes and procedures as possible. trust in the area of cybersecurity is one of the major challenges facing a global society. Ken Hu identified four main challenges in building trust (https://itreseller.com.pl/ download: 15.10.2020):

- First, rapidly evolving digital technology has brought about many new security challenges. For example, traditional telecommunications networks have evolved from closed networks to internet networks. More and more digital content and services are migrating to cloud data centers. As more and more devices use the Internet and our smartphones become more powerful, networks are more vulnerable than ever before.
- Second, as a global community, we lack a common and unified understanding of cyber security. Governments and business representatives discuss the importance of this issue. The fact is, however, that both the public and private sectors lack a basic common understanding of this issue. As a result, different stakeholders have different expectations and there is no commonality of responsibilities.
- Third, there is no uniform set of technical safety standards as well as verification systems across the industry. This is complicated by the globalization of the value chain. Digital products include components from many different countries, with or without many different standards at all. There is an urgent need to invest in national security standards and verification systems, as well as professional resources and skills.
- The fourth challenge is issues at the level of government regulation. In some countries, cybersecurity management has no legislative support and enforcement of cybersecurity laws is insufficient.

Trust built online makes real-world interactions easier. By combining elements of the digital and real world, a new generation of trust is built. The way we are connected is changing, relationships are changing, and this is transforming the patterns of economic activity around the world.

Pete Lindstrom and Martha Rounds concluded in the report "Digital Trust: The Key Driver for Digital Transformation" how important digital trust is in digital transformation strategies. It enables decisions to be made between different actors. The decision-making process is based on the assessment of digital trust in each entity and the trust that can be ensured by the IT cybersecurity programs introduced by these entities as part of their digital activities (https://www.idc.com/ download: 18.09.2020).

Minimizing cybersecurity risks is essential to executing digital strategies. Neglect at this level may result in a loss of trust in the organization, but also threatens its existence as a consequence of lawsuits, compensation payments or, finally, loss of clients. Reputation management is a very important element both for individual digital activities and for the entire organization. Reputation is often ambiguous and challenging - as is trust itself - because it can be influenced in many ways.

In 1972, Nobel laureate economist Kenneth Arrow noted that “virtually every commercial transaction has an element of trust in it, each stretched over a period of time. So it can be rightly argued that much of the world's economic backwardness is due to a lack of mutual trust." Due to a low level of trust, in a given economy relationships with a low level of risk and value, built ad hoc and tactical in nature, which with difficulty create new economic ties, prevail (Arrow & Bilir & Sorensen 2020).

Conclusions

Although the issue of digital trust has recently become an interesting area of scientific discourse, there is a lack of comprehensive research devoted to this issue. This whitepaper makes a significant contribution to advancing research on trust in the digital age. It explored the potential of ICT and the digitization process in business and society. The result of the research is the concept of the digital trust model. The conducted literature research indicates the need to continue work on digital trust in management.

As future research directions, the author proposes empirical research on digital trust based on the proposed model. The research may be conducted in various groups of entities, both production and service.

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Universities' Sustainable Development Communication – case studies

Anna Losa-Jonczyk[13]

ABSTRACT

Universities of economics as institutions creating future managers, leaders and entrepreneurs exert a significant influence on their sense of responsibility for sustainable development in various aspects of the functioning of the organization. In order to gain students' trust in the knowledge they transfer, universities should themselves be a model and take various actions in the field of sustainable development. The basis for creating trust in the organization is its consistent communication with the environment. The presentation will aim to present an analysis of communication in social media conducted with the environment by three economic universities in different countries: The analysis will focus on identifying the communication strategies adopted by the universities in the context of their sustainable development.

Keywords: Communication strategy, social media, sustainable development, universities' responsibility, trust
CCS CONCEPTS: I23, D83, Q01

Introduction

In response to the educational system's constant evolution, the modern university is forced to seek and redefine its place in the future. A global community based on the interdependence of everything and everyone entails consequences resulting from one subject's multidimensional influence on another. Universities' decisions and the related impact on specific relationships with stakeholder groups, numerous interactions between the university and its environment result in a constant expansion of the university's responsibilities. We can currently observe a visible increase in the stakeholders' requirements concerning public life entities, and universities play a unique role in economic and social development, educating future social elites and participating in building a knowledge-based society and conducting scientific research. The primary tasks of higher education, such as: educating students to prepare them for professional work, educating students in the sense of responsibility for the country, strengthening the principles of democracy and respect for human rights, or conducting scientific research, indicate a clear direction of the university's activities towards the social area. The socially sensitive client and global media information force the universities to adopt a broader social and ecological orientation. While specifying the tasks of a business school in the context of sustainable development, it should be noted that the primary goal of its activity is to educate at different levels of advancement people capable of creating and developing the economic potential of regions and countries (Moratis, Hoff, Reul, and Dual 2006). Modern societies are increasingly aware that the development of this potential must sustainably take place. The stakeholders impact both business organizations and public institutions such as universities (Mori, Fien, and Horne 2019; Bowen, Cradock-Henry, Koch, et al. 2017). Therefore, in particular, business schools should be involved in sustainable development promoting and

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supporting the achievement of the Sustainable Development Goals due to their impact on many spheres of social life.

Sustainable Development

The education sector is one of those sectors that can and should support, promote, and actively engage with sustainable development. The concept of sustainable development in September 2015 was adopted as a strategic document Transforming our world: An Agenda for Sustainable Development - 2030 by the United Nations.The Agenda includes 17 Sustainable Development Goals (Agenda for Sustainable Development 2030). The implementation of the adopted directions of development is to eliminate poverty, reduce inequalities, and preserve or improve the state of the natural environment while ensuring economic growth worldwide.

The Sustainable Development Goals (SDGs), adopted by 193 countries, are a broad vision of a better future for the world but firmly rooted in reality (Sustainable Development Goals). For each goal, tasks have been set with specific indicators to be achieved by the end of 2030. In order to achieve it, joint actions of governments of all countries are needed, which will make real changes in politics and the economy. The universities have great potential to support the achievement of the SDGs in many areas. Firstly, by educating the society and promoting the idea of sustainable development and the SDGs. Secondly, the universities should implement themselves such actions that will support the 17 Sustainable Development Goals. The third way for universities to get involved in the implementation of SDGs is through research, which can solve many social and environmental problems. Goals such as 9 Industry, innovation and infrastructure; 2 Zero hunger; 3 Good health and well-being; 7 Affordable and clean energy; 12 Responsible Consumption or 14 Life below water are the thematic areas currently present in research in the various scientific fields. Objective 4 Quality Education covers the critical area for sustainable university activities (Kestin et al. 2017).

Implementing the Sustainable Development concept in the universities

Universities with an economic profile are in a particular situation. The shock caused by the corporate scandals at the beginning of the 21st century made many business schools think about the validity of the theories that have so far been passed on to students based on lecture programs in management, finance, or economics. According to Sumatra Ghoshal (2005), those theories have been separated from the principles of ethics and social impact that contributed to the strengthening of these practices, which are now so stigmatized (Smith, Lenssen 2009).

Some universities have reacted to this situation by extending their curricula to business ethics and sustainable development. University as an institution responsible for shaping young people's attitudes and bringing them up to live in the community, and in particular business schools preparing young managers to enter the labor market, is obliged to provide students with the sustainable development concept and methods of its implementation in the company. However, the programs' mere extension to include classes in business ethics in response to the corporate scandals Ghoshal (2005) compares to companies that establish departments

responsible for social responsibility policy and undertake corporate social responsibility projects while conducting their business activities completely unchanged. Ghoshal claims that each of these reactions is only a mere pretense for change.

The university managers should be aware that the university, as an institution striving to expand and disseminate knowledge, plays a severe role in developing the economy, and as a participant in social life, it creates this reality itself. This makes it responsible for supporting sustainable development and the SDGs adopted by the UN in its daily activities. Therefore, the sustainable development concept must be integrated into the university's strategy and integrated into its mission.

The strategic approach to sustainable development gives universities many benefits that can influence their market position. The primary assumption for universities' successful operation should be a long-term development based on relationships with stakeholders, both in creating student education programs following the anticipated and current needs of society and in the context of cooperation with internal stakeholders - employees. Positive relations with stakeholders also translate into building the university's image and a good brand, which contributes to the legitimacy of its activities. Social trust is a necessary factor in many research activities. It is also an essential component of the university brand. According to the research conducted by Edelman Trust Barometer in 2020, the academic staff gained a very high social rating (66%) as credible persons (second place in the ranking), and 58% of the respondents trust third sector institutions, to which universities are included (Edelman Trust Barometer 2020). Legitimacy often gains in importance only in the absence of it; the loss of legitimacy for many organizations, including universities, may mean that the right to take specific actions is not apparent, and sometimes the organization loses this right in its entirety (Pettigrew 2009). To avoid situations like those of organizations whose activities have been publicly questioned, the university should treat the building of public trust and legitimacy as essential factors in carrying out its activities. The implementation of sustainable development in the university's strategy determines the growth of stakeholder trust, which is extremely important given that trustworthy institutions are now gaining importance in stakeholders' eyes (Geryk 2011). Disregarding the environment's opinion may bring adverse effects for the university, which may affect the market position of even the most recognized university.

Sustainable Development communication

Trust is created in relations between partners; between the university and its stakeholders. One of the activities that build this trust is open communication and willingness to share information (Paliszkiewicz 2013). Sustainable development communication can be one of the tools to build trust between the university and its stakeholders.

Sustainable development communication is described in the literature in three forms: corporate communication, advocacy, and development communication (Mefalopulos, Grenna 2004). Corporate communication in this context refers to the flow of communication within the organization in order to raise employees' level of awareness and competencies about the SDGs. Corporate communication is also about

creating the image of a responsible organization, aiming at the Sustainable Development, among specific stakeholder groups, e.g., local community, supervisory board, or customers.

- Advocacy - the purpose of this form of communication is to support the Sustainable Development policy and raise the recipients' awareness of specific problems, such as poverty, the effects of climate change, or care for clean energy. Advocacy communication goals are achieved primarily through the activities of journalists and widely understood mass media are the tools used in their implementation.
- Development Communication (also referred to as Communication for Development) is defined in the literature as a process based on dialog communication, which involves a strategic approach to using communication methods and tools to cause social change. It is used to identify and analyze the needs, problems, and risks associated with Sustainable Development. The three key elements characteristic of Development Communication are process, dialogue, and the pursuit of change.

Mefalopulos and Grenna (2004) also analyze in their research the main communication paradigms in the context of Sustainable Development since the last century:

- Modernization paradigm - implemented since the 1950s in communication about global development by emphasizing the role of new technologies and scientific methods in the realization of the idea of maintaining peace and prosperity around the world. Communication took place mainly through mass-media; it was a one-way communication (top-down process).
- The paradigm of dependence - initiated in the 1970s. Communication in this paradigm was understood as a tool for educating society and creating alliances between developing countries. The media should, by definition, be under the supervision of the state, as the state represents the vital interests of society.
- The co-participation paradigm - the third paradigm is based on the idea of public participation in the process of communicating about world development. In this paradigm, the possibility of exchanging opinions, experiences, and knowledge between the sender and the recipient is ensured. Society becomes a co-creator of a world development strategy. The adoption of such a model of communicating about Sustainable Development does not change the traditionally understood role of the mass media. The media continue to inform and promote, but this is no longer their only function in reality, where every recipient of a message can easily express their opinions.

An analysis of the literature shows that the research conducted so far on sustainable development communication and activities undertaken by enterprises in this field has focused on the analysis of information contained in companies' websites or non-financial reports (Jones, Wynn, Hillier, and Comfort 2017). University communication in the literature appears in the research on communicating the concept of sustainable development within organizations - communication with employees (Djordjevic, Cotton 2011) and communication with external stakeholders - communication through sustainable development reports (Adams 2018). The disadvantage of reports as a communication tool, as well as websites, is the unilateral nature of communication. Communication through non-financial reports and websites only serves as an advocacy function to inform the public and raise their awareness of the SDGs. They can also promote the idea of sustainable development and the goals. Such tools, however, make it impossible for the public to get involved

in the discussion about sustainable development and the actions taken by university. Social media seem to be a much more effective tool for sustainable development communication, enabling organizations to conduct a dialogue with their environment. Organizations using social media to communicate about sustainable development adopt different strategies. In the literature, it can find classifications of communication strategies based on the analysis of message content, the number of messages (Drumwright 1996, Kim, Kim, and Sung 2014) about sustainable development, or the level of involvement of message recipients (Sundstrom and Levenshus 2017; Morsing and Schultz 2006). The theoretical basis of the research process was the typology of social media communication adopted by Kim et al. (2014) and Morsing and Schultz (2006). The first typology (Kim, Kim, and Sung 2014) distinguishing three types of strategies:

- corporate ability strategy
- corporate social responsibility strategy
- hybrid strategy.

The aim of the corporate ability strategy is to emphasize the quality of products and services and to build the image of the organization as a specialist on the market. Messages sent to stakeholders as part of the adopted strategy often concern the organization's success on the market, sales growth, leadership in the industry. The social responsibility strategy, on the other hand, serves the purpose of conveying information on the activities undertaken by the organization for the benefit of society and the natural environment. A hybrid strategy is a combination of the assumptions of the quality and social responsibility strategy, under which messages are sent to stakeholders concerning both the quality of services, as well as socially responsible activities.

The level at which organizations engage their stakeholders in the process of communication is a criterion for the division of social responsibility communication strategies in the Morsing and Schultz typology (2006). The researchers defined three types of communication strategies for organizations with their environment:

- information strategy (unilateral),
- asymmetrical communication (bilateral),
- stakeholder involvement (bilateral).

Organizations that implement an information strategy communicate unilaterally, providing their stakeholders with information on social and ecological policy and activities, but not expecting a response to the messages sent. In the case of the second communication strategy - the asymmetric communication strategy - here, the stakeholders do not influence the organization's strategic activities. Although in this kind of communication, the information flow is in both directions, it is asymmetrical. Only the third type of strategy presented by the researchers - the strategy of stakeholder engagement - assumes a dialogue between the organization and its environment.

Methodology

In the literature, the concept of sustainable development, the topic of communicating and activities related to social and environmental responsibility, is addressed by researchers concerning the business. However, it

should be noted that universities' role in promoting the idea of sustainable development among the crucial stakeholders, and that is why the subject of the research was the universities.

Three business schools from three countries were selected for analysis: Great Britain, Poland, and the United States. The universities' choice was dictated by their winning the highest place in national rankings of business schools:

- The Business London School – No.1 in The Financial Times 2020
- The Stanford University – No. 1 in The Best Business School Ranking 2020
- The Warsaw School of Economics (Szkoła Główna Handlowa w Warszawie) - No.1 in The Polish Business School Ranking 2020 by “Perspektywy”.

The research on social media communication carried out in the previous chapter showed that universities' topic of social media communication has not been of broad interest to researchers so far. In the author's opinion, social media should be the primary tool for communicating sustainable development and conducting dialogue with its stakeholders. That is why sustainable development communication through social media was the subject of research.

The research was conducted to find answers to the following research questions:

Q1: Do the surveyed universities communicate about the sustainable development idea?

Q2: Do the surveyed universities use social media to communicate about the sustainable development?

Q3: What types of strategies did the universities adopt in communicating through social media?

In order to answer the research questions and identify the social media communication strategy implemented by the surveyed universities, a text corpus consisting of entries 291 posts on the official university’s Instagram accounts was collected for analysis. Instagram was chosen for analysis because it is now a rapidly gaining medium in popularity with the public. Instagram is becoming immensely popular among young Internet users (Digital 2020 Report), the group with which universities communicate (students, candidates, graduates).

The text corpus was created based on the entries posted in the accounts in the period of one year - from October 2019 to October 2020. Then the content of the collected entries was analyzed according to the coding procedure adopted by the author. From the text corpus, entries concerning sustainable development and the SDGs were separated. The total number of sustainable development posts was 74. When analyzing the content of the entries, coding tags were indicated, which define the thematic areas related to particular SDGs. The entries have been grouped according to the separated SDGs. The list of subject areas and coding tags is presented in Table 1.

Table 1: Subjects of posts concerning SDGs in the surveyed companies' social media

The name of university	SDGs in social media posts (No. of SDGs and title)
The Business London School	4 Quality education 5 Gender equality 9 Industry, innovation and infrastructure 10 Reduced inequalities 12 Responsible consumption and production
The Stanford University	3 Good health and well-being 4 Quality education 5 Gender equality 8 Descent work and economic growth 10 Reduced inequalities 12 Responsible consumption and production
The Warsaw School of Economics	1 No poverty 4 Quality education 5 Gender equality 15 Life on land

The theoretical basis of the research process was the typology of social media communication adopted by Kim, Kim, and Sung (2014) and Morsing and Schultz (2006).

Based on the collected quantitative data (total number of entries and the number of entries concerning Sustainable Development and SDGs), the type of social media communication strategy implemented by companies was determined.

The analysis also included the reactions of recipients to the posts. This analysis showed the involvement of recipients of the messages and universities in the dialogue on sustainable development.

Results and Conclusions

As a result of the quantitative and qualitative analysis of the content of posts posted on the official Instagram accounts of the surveyed universities, it can be concluded that in none of the surveyed cases have the universities adopted a communication strategy based on sustainable development (the number of posts concerning sustainable development on individual accounts does not exceed 50% - Table 2). The adopted strategies are corporate ability communication strategies based on posts about the universities' services.

Table 2: Results of social media messages' analysis

The name of university	The total number of posts	The percentage of posts related to Sustainable Development
The Business London School	132	39%
The Stanford University	97	26%
The Warsaw School of Economics	64	16%

The results of the analysis of the recipients' reactions to the university's postings concerning the sustainable development subject showed that the recipients are interested in the university's activity in the sustainable development area. Recipients "liked" the posts and also commented on individual posts.

However, apart from inserting the posts, the universities did not continue the dialogue with the recipients. There were no responses to any comments from the university.

In communicating sustainable development, universities adopt information strategies; they do not engage in dialogue with their recipients. The universities' lack of response to the posted comments shows that the adopted communication strategy is not a strategy of dialogue, but only one-sided communication of information.

It is worth paying attention to this fact because the recipients to whom the messages on Instagram are addressed are young people: students, candidates, graduates. They are people of the Z generation who are used to two-way communication in social media and expect feedback on their comments and constant contact through social media. Adopting a dialogue communication strategy may strengthen the sense of unity and commitment to the university among its stakeholders. Moreover, in the concept of sustainable development, the dialogue with stakeholders, participation in decision-making on the definition of activities, and stakeholders' involvement in their implementation is embedded. Therefore, it seems reasonable for universities to adopt a dialogue communication strategy, which may also contribute to increasing the level of trust among their stakeholders.

The conducted research was only a pilot study, and the subjects of the study were three the best universities in UK, Poland and USA, which does not give grounds to extend the conclusions to the whole population of the business universities. The topic of sustainable development is more and more critical for young people, and the level of ecological and social awareness of the problems affecting global development is increasing. So there is a growing pressure from society to engage not only business but also such institutions as universities to promote and implement sustainable development objectives. That is why it is worthwhile to devote further research in this area to a more in-depth quantitative analysis of university communication and dialogue with stakeholders in the context of sustainable development. The best business universities in three countries were selected for the study. For the quantitative analysis to meet statistically significant conditions and allow for generalization of results, the number of surveyed entities should be increased. It would be interesting to compare all business universities operating in the whole country.

The benefits resulting from the implementation of sustainable development goals should also become the participation of universities. Creating long-term relations with the external and internal environment, increasing trust, brand building, or efficient use of resources should be considered vital for higher education development.

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Working with artificial intelligence and wisdom

Harald Kitzmann[14], Markus Arthur Launer[15]

ABSTRACT

The fulfilment of the different tasks of Managers and supporting employees request tight cooperating as partners to contribute to the success of the organization. Due to digitalization the mix of their activities will change, as some tasks are taken over by machines or software. In consequence, new occupations will be created, other disappear or the occupational definitions may change and the boundaries between different occupations need to be defined new with overlapping and therefore not clear separable tasks. Taken into account that most occupations will be replaced by digitalization, managers will need to adjust their capabilities to perform their tasks in working with artificial intelligence in digitalized solutions. The paper addresses research questions of which key developments influence the digitalization of decision-making, how will the activities and tasks of managers and supporting employees change in the future, and what additional knowledge, skills and competences will be required for managers in the future.

Keywords: digitalization, artificial intelligence, Quantum Decision Theory, cybernetic management, organisational knowledge systems

Introduction

The fulfilment of the different tasks of Managers (Schumacher, T. & Wimmer, R., 2018) (Vos, E. ; Jia-Yuh Yeh; A. ; Carter, S. ; Tagg, S., 2007, p. 2669) (Rüegg-Stürm, J. ; Grand, S., 2017) and supporting employees request tight cooperating as partners to contribute to the success of the organization (Schäffer, U. & Weber, J., 2015) (Kitzmann H. , 2007). Due to digitalization the mix of their activities will change, as some tasks are taken over by machines or software. In consequence, new occupations will be created, other disappear or the occupational definitions may change and the boundaries between different occupations need to be defined new with overlapping and therefore not clear separable tasks (Manyika, J. , 2017). The characteristics of the new workforces needed is hardly to define, because there are other effects on the labour market impacts like knowledge increasing, globalisation, economic growth, demographical changes, etc. (OECD, Future of work and skills, 2017) (OECD, Job Creation and Local Economic Development 2018: Preparing for the Future of Work, 2018).

As the environment is constantly changing and therefore the information is not always complete and available, management decisions can be made in certain, uncertain and risky conditions. The managers' decision-making process has therefore developed over time not only due to the complexity of the problems they are facing, but also to the contribution of theorists and practitioners in enriching specific literature. Achieving the organization's goals in a complex and volatile environment where managers are forced to make

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faster decisions and to change them as fast, the usage of digitalized decision-making models is useful. Whereas research activities in regard to imitate the human thinking in decision-making started already in the 50th of last century, research areas in the subject of artificial intelligence still exist. Main challenging aspect is that the human brain processes involved in decisions are argued to be principally different from straight-forward computer operations. This means in digitalized decision-making the focus is in overcoming of the causality understanding and therefore the limitation in describing the process of creating knowledge and wisdom, which shows the actual research activities in regard to the dichotomy between intuition und deliberations (Milli, Smitha & Lieder, Falk & L Griffiths, Thomas, 2018) (Gronchi, G.& Giovannelli F., 2018), causality in decision making processes (Cavalcanti, 2010) (Kitzmann H. , 2018) and Quantum Decision Theory (Yukalov, V.I. ;Sornette, D., 2010) (Aerts, D., Broekaert, J., Gabora, L., Sozzo, S., eds., 2016) (Helland, 2018) (Jürgen Eichberger, Hans Jürgen Pirner, 2018).

This complex modelling of decision situations with dualistic considering causal-deterministic static and non-causal dynamic processes requires a different mind-set in solving decision problems. Although main data and information are in good digitalized solutions already implemented as data and information, they are not yet still connected to each other and the decision models need to design and the evaluation of the decision-situations needs to be performed outside the existing organisations' IT-solutions.

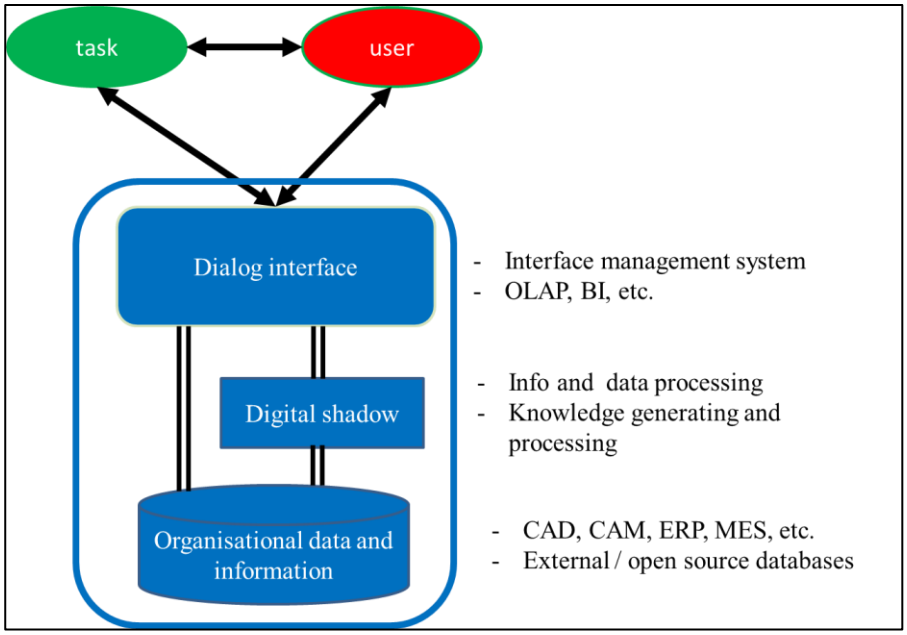
The paper addresses research questions of which key developments influence the digitalization of decision-making, how will the activities and tasks of managers and supporting employees change in the future, and what additional knowledge, skills and competences will be required for managers in the future.

Artificial intelligence in organizational knowledge systems

Whereas research activities in regard to imitate the human thinking started already in the 50th of last century, research areas in the subject of artificial intelligence (AI) still exist and are increasing. Although there is no universally accepted definition of artificial intelligence (OECD, Artificial Intelligence in Society, 2019) the authors of this article focus on artificial intelligence as the digitalized ability to take decisions (Russel, S.; Norvig, P., 2010). Taken into account that most occupations will be replaced by digitalization (Dengler K.,Matthes B., 2018), managers will need to adjust their capabilities to perform their tasks in working with artificial intelligence in digitalized solutions (Felten, E.,Raj, M., Seamans, R., 2018) (Fossen, F., Sorgner, A., 2019) (Frey C. B., Osborne M. A., 2017).

Figure 1 shows the structure of the organizational knowledge system with its part decision task (in green), the decision maker (in red) and the digitalized data, information and knowledge generating and processing system (in blue). Causal information and information proceeding, as well as knowledge generating (inference engine) and info and knowledge preparation (machine learning, deep learning and database engines and training classifiers) characterize the processes in application of digital shadowing especially in industry 4.0 solutions (Schuh, G., Prote, J-P., Dany, S., 2017) (Dölle, Chr., Perau, S., 2020).

Figure 1: Organisational knowledge system, composed by authors



The mangers and supportive employees use failure prevention and safety approaches as well as trial and error philosophy in their daily tasks (Schäffer, U., & Weber, J., 2016) for preparation of the decisions. This shows also the results of an actual international study managed by Marcial and Launer (Marcial, D. ; Launer, M., 2019); as one result managers (on top, middle and 1st level) mainly trust self-made spreadsheet solutions and special reporting solutions for executives and manager, which are mostly used in decision support (Table 1).

Table 1: managers trust in information systems (Launer/Marcial study)

Information system	Rational	Intuitive	Emotional	Predictive	Waiting	Summa
Executive Information Systems	3	2	2	1	1	9
Group Decision Support Systems	0	1	0	0	1	2
Computer Supported Co-operative	2	1	1	2	1	7
Logistics systems	1	0	0	0	0	1
Financial Planning systems	0	1	0	0	0	1
Spreadsheet Models	3	1	3	3	3	13
Management Reporting Systems	1	2	2	3	3	11
Personnel (HRM) systems	0	1	1	0	0	2
Payroll systems	2	2	3	3	3	13
Reservation systems	0	1	0	0	0	1

In these systems, the company-specific and decision-specific information are processed and thus also forms the brain of corporate success. Through a progressive digitalization of the information processing, the

managers are able to invest their capabilities more clearly on the interpretation of the information and increase the strength of the organisational brain.

Activities covering the deliberation type of decisions, like sorting, classification and monitoring decision variables and business processes, their optimizing and forecasting of their outputs, which are predestined for applications of machine learning algorithm, found their way into industrial and commercial applications (Maschler, B., White, D,.Weyrich, M., 2020) (Bosch, J., Holmstrm Olsson, H., Crnkovic, I., 2020) and will take over these tasks from the managers. Solving complex decision situation and combining complex applications into a complete solution is not automated for the near future and still requires considerable human input (Intelligenz", 2019). Main challenges in coming over these limitations are the technological aspects of storage and processing of data, the modelling of decision situations, understandings about the future business processes and organizational structures, and ethical-normative aspects of using artificial intelligence (Intelligenz", 2019) (Insightsarchive, 2020).

Modelling approaches for complex decision situation

Recent researches show three main directions in solving complex decision situations. One direction is focusing on the understandings of the quantum mechanics which shows better results to explain the nature and therefor also the model of human decision making (Wang, Z. ; Busemeyer, J. ; Atmanspacher, H. ; Pothos, E. M., 2013) (Helland, 2018); main focus areas are hereby decision processes, ambiguous perception, semantic networks, probability judgments, order effects of cognitive measurements and memory (Wang, Z. ; Busemeyer, J. ; Atmanspacher, H. ; Pothos, E. M., 2013) (Busemeyer, J.; Bruza, P. D., 2012) (Aerts, D., Broekaert, J., Gabora, L., Sozzo, S., eds., 2016) (Helland, 2018). Researchers around Busemeyer focusing on the Quantum decision model and establish a way of human decision making (Busemeyer, J.; Bruza, P. D., 2012). Yukalov and Sornette are focusing on the analytic part of the model and establish the mathematic requirements for the quantum decision theory (Yukalov, V.I. ;Sornette, D., 2010) and allows quantitative prediction of decision making including quantitative explanations of classical decision-making paradoxes (Yukalov, V.I.; Sornette, D., 2015) (Yukalov, Y. & Sornette, D., 2018). In multi-step decision-models like multi-period optimising (Solomonovich Mazelis, L.; Sergevich Solodukhin, K., 2013), continuous time multi state models, Markov-chains, syntegration model (Malik, 2013) or sensitivity analysis (Vester, 2015) the modelling of Quantum Decision Theory will find it benefits, especially when considering probability matrix approaches in modelling; additional allows these models describing the “hermeneutic” interpretation of mainly qualitative information (Maderthaner, 2008). Implementing the understanding of QDT in daily management activities strengthen the certainty and reliability of decision making, but give also more focus on the decision preparing especially in collecting the needed information for appropriate decision making. Besides ensuring the accuracy of information, the method competency will be in the focus of the Controller’s tasks, whereas the tasks of decision-making and judgement will be replaced by digitalized solutions, and the tasks as an agent for stakeholders will move more in the focus of the Manager’s daily activities.

Besides the describing of the mathematical analytical approaches to solve the dichotomy aspect, existing approaches which focus more on the management aspect. Jiří F. Urbánek uses the relationships between the way and sense of activities of the entities Environment, Processes and Scenarios and built up a Leadership Controlling model (Urbánek J. F., David Král, 2014). He developed the computer assist language Dynamic Vector Logistics of Processes (DYVELOP©), which combine analysis, evaluation, heuristics, modelling, simulation, scenarios and engineering of any entity´s relationships in a scenic meta-model, representing the entities´ roles, semantics and namely their relationships in pictographic mind maps, on a scene. With implementing of DYVELOP into Controlling of SMEs he gave results in explaining and simulating both the quantitative and qualitative aspects of developing activities (David Kral; Jiri F. Urbánek, 2014). Although he developed the approach for managing of crisis, this model is useful for explaining and simulating the dichotomy of quantitative and qualitative aspects (strategic and operative or deliberate and intuitive) of the management in decision making.

Kitzmann developed a management model based on the cybernetic management approach to handle operational and strategical management simultaneously. In the model the focus is on the significant management variables objectives, actuating and control variables and their parameters on the different management levels, which follows the idea of the main management control frameworks (Table 2) (Kitzmann H. , 2018).

Table 2: Management models and control parameters.

Management level	**Viable Systems Model (Beer)**	**Levers of Control (Simons)**	**Model of systemic control (Schwaninger)**	**Key figures**
Normative	System 5	Belief and boundary	Legitimacy	viability
Strategical	System 4	interactive	Effectiveness	Instability, potential
Operative	System 1-3	diagnostic	Efficiency	Success, failure, stability

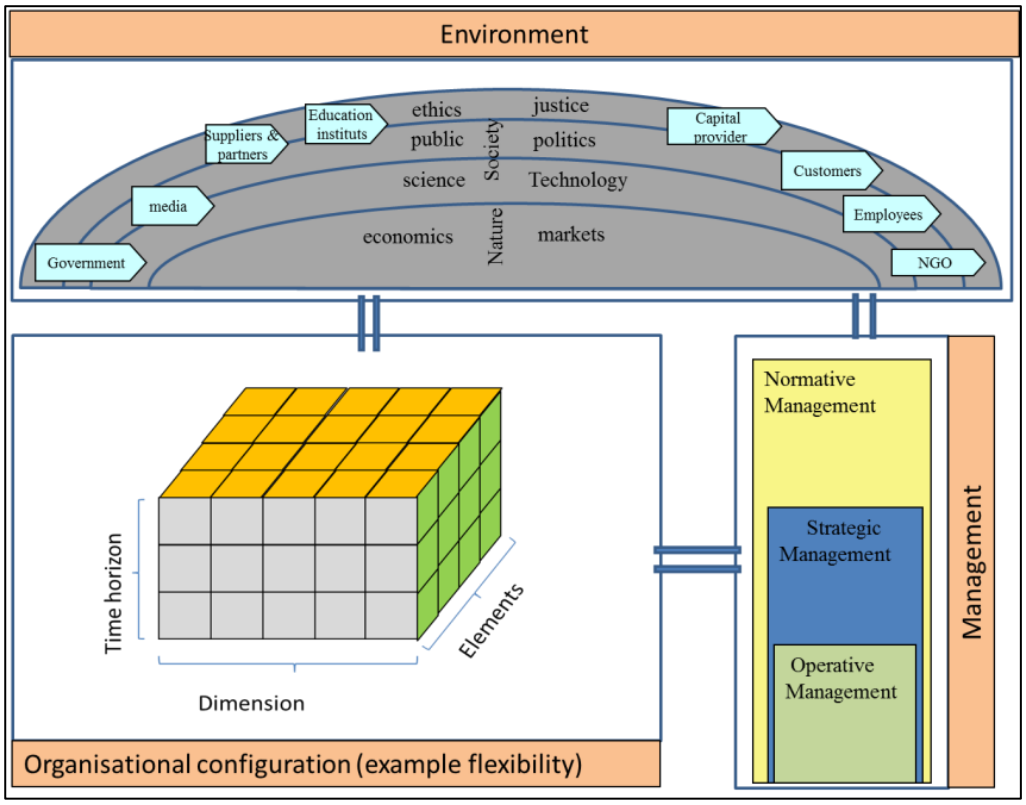
In this understanding depending on the management level, all activities and agreements in the organisation need to be planned and controlled considering organisation's viability, potentials or success and each level demands its certain approach and different managements tasks and directions. Activities started on the operative management level without contributing to the organisation development (without improving the core competencies) will be only on the targets and parameters of the operational level. Sustainable activities therefor start at least on the strategic level with adjustment or creation new potentials in the organisation.

On the operative management level the operationalisation could be done with exact mathematical expression, but on the strategic level the exactness could not be used for defining the target and other methods preferring probabilities and judgements should be used to operationalise the key figures. The core competences and the critical success factors of the organisation has more the characteristic to be useful as actuating or control variable then as objectives.

On the strategical management level, the value of the actuating variable generates the impulse for initiating potential designing on the strategical level and implementing activities on the operational level and connect therefore these two management levels. The objectives on the strategical level are determined based on tri-partite evaluation which follows the nowadays understanding of management. This model is a modification of the classical cause-effect based receptor model (Cisek, R. ; Habicht, C. ; Neise, P., 2002) and consists of 6 different parts: 3 elements and 3 connections (Figure 2). The 3 elements (environment, management and organisational structure) are like the 3 different views in the Gallen Management approach of the 4th generation.

The 3 connection between the elements are tight interdependent connectors and very often shows entangled relationship between the elements. The issues of interactions (norms and values, resources and concerns and interests) in the St. Gallen Management-model describe these types of connectors between the environment and the organisational configuration, the environment and the management and the connection between organisational configuration and management.

Figure 2: organisation – environmental – management model (Kitzmann H. , 2018)



This model implicates the renunciation of generalised solutions, but enable an individual case, organisation and situation-based approach with the timely limited focusing on activities and readiness for frequently changing activities (Solomonovich Mazelis, L.; Sergevich Solodukhin, K., 2013). Although the cybernetic management approach is predestined for implementing into automatized and AI solutions, the multi methods handling of interdisciplinary and cross-functional approaches privilege interactive activities and solutions.

Challenges for education

The characteristic of workforce needed in the future (OECD, Job Creation and Local Economic Development 2018: Preparing for the Future of Work, 2018) and the requested knowledge, skills and competencies are challenging questions national and international bodies (qualification frameworks, qualifications standards), professional bodies (occupational profiles and standards) and educational bodies (curricula and assessment specifications) (CEDEFOP, Application of learning outcomes approaches across Europe: a comparative study, 2016) as the stakeholders in the educational process need to find answers. Beside the implementation of artificial intelligence methods as subject in curricula, the interdisciplinary (especially from biological, chemical and quantum physic science) and cross-functional thinking and modelling, as well as the non-causal dynamic modelling, thinking in complex and fractal structures, dualistic thinking and modelling of combined deterministic and non-causal processes will be in the future subjects found in curricula and training programs. Although the challenge questions exists for all human and juridical persons, each economical area define their own development strategy and agenda which target to reach and the ways to achieve the targets (OECD, Artificial Intelligence in Society, 2019) (Insightsarchive, 2020) (Intelligenz", 2019) (Community, 2018) (CEDEFOP, the importance of being vocational, 2020).

Conclusion

Artificial Intelligence technologies play a special role in digitization. They allow the automation of tasks that previously required human skills of perception, conclusion and interaction. However, the development and dissemination of AI is not separate from other technological developments; it is embedded in the general process of digitalization. In addition to advances in Software and AI, developments in robotics, sensors and additive manufacturing are important drivers of digitalization. In addition, developments in process and storage technology or the increasing networking of Information promote digital change. These drivers are in close interaction and are difficult to separate from each other.

It is estimated that the digitalization will mainly not replace the Managers and supporting employees, but it will be changed the division of labour between humans and machines, and therefore the task profiles, their toolbox, mind-set and qualification profile.

Quantum Decision Theory, cybernetic management and screenplay approaches are promising approaches, but they are in the early stage of development to get a generalized theory for the decision theory and get a complementary to the classical cause-impact based decision theory. With implementation of a higher maturity level of these approaches challenging adjustments in the requirements of future tasks of the Managers and supporting employees are required. As an intermediate step advanced knowledge is required in advanced mathematical approaches based on quantum mechanics solutions, screenplay-based modelling set-up of decisions making situations, cross-functional and interdisciplinary multi methods handling in cybernetic management. Save haven will be the research activities, which have no direct connection to present solutions of customer demands. Further developments find their limitation in the capability of Artificial Intelligence and

the ethical limitations and challenges of digitalization, with implicit demand on research and the therefor the degree on replacement of human activities and actors.

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AI-Empowered Innovation in TVET: Transforming TVET through Skills Forecast, Policy Orientation and Institutional AI Solution in the Context of Industry 4.0

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ABSTRACT

In the context of industry 4.0, the emerging breakthroughs in artificial intelligence (AI) are leading to disruptive changes in the future world of work. The emerging AI-related skills demand drives TVET to innovate and expand access to these skills. In response, international organizations and the Chinese government have proposed AI strategies and policies to prepare TVET for an AI-powered future, which identifies the orientation for TVET institutions to take transformative actions.

The paper investigates how artificial intelligence (AI), as a transformational driver, empowers technical and vocational education and training (TVET) institutions to innovate. Based on the literature analysis of skills demand and AI policies, it displays institutional solutions to TVET innovation for AI-related skills development, which is supported by the case of Shenzhen Polytechnic, one of the leading TVET institutions in China.

Keywords: artificial intelligence (AI), emerging skills and jobs, AI-related strategies and policies, TVET innovation

JEL Codes: I21 (Analysis of Education); J24 (Human Capital • Skills • Occupational Choice • Labor Productivity)

Introduction

This paper will explore how artificial intelligence (AI), as a transformational driver, empowers technical and vocational education and training (TVET) institutions to innovate by means of literature review and case study. Herein, AI is defined in its broad sense as a collective set of research fields that relates to the automation of activities regarding intelligent human behavior with minimal human engagement (Bellman, 1978); TVET covers education, training and skills development associated with various sectors and occupations (UNESCO, 2015). To begin with, this paper will introduce the rapid growth of AI technologies in the context of Industry 4.0, which maps out the background of TVET innovation. Then, it will identify the demand for innovating TVET by analyzing AI's impact on future jobs and forecasting the skills need. It will also illustrate AI-related strategies and policies presented by international organizations and the government to identify the policy orientation of transforming TVET towards an AI-powered future. At last, this paper will recommend the institutional solution to TVET innovation by presenting the practice of Shenzhen Polytechnic, a leading TVET institution in China.

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Background of TVET Innovation: Industry 4.0, digitalization and AI Development

The 21st century is witnessing the transition to the fourth industrial revolution (industry 4.0) with the rapid growth of digital and AI technologies (Ghobakhloo, 2020). UNESCO has pointed out that digitalization is one of three key strengths that significantly transform the world of work and TEVT (Ganter de Otero, 2019). The emerging digital technologies in industry 4.0, such as cyber physical systems, big data, Internet of Things (IoT) and cloud computing, are leading to radical changes in the industries of robotics, machine operation, data processing etc., which are closely associated with AI (Lee et al., 2018). In this context, AI is increasingly capturing attention from key stakeholders of industry 4.0, especially sectors and enterprises that are viewing AI as the key technology to business competitiveness (Ernst & Young LLP, 2018; Deloitte Insights, 2019). This scenario is fostering the development of AI more than ever and facilitating TVET to keep up with the pace of AI advancement, as implicated on UNESCO-UNEVO's 2018 Global Learning Forum on 'Managing skills in a time of disruption' (Ganter de Otero, 2019).

Demand for TVET Innovation: Changes in Future Jobs and AI-related Skills Need

AI technologies are rapidly and significantly changing the landscape of sectors and future jobs. AI technologies are displacing obsolete jobs and creating emerging jobs (Petropoulos, 2018). PwC (2018) estimated in the next 20 years AI would displace 26% of current jobs in Services, Construction, Industry and Agriculture in China, and the estimate for the UK was 20%. The scale of job replacement is much higher in the US as Frey and Osbourne (2013) calculated that 47% of jobs in the US were at high risk of automation in the next two decades. Meanwhile, advances in AI also creates vast new areas of work such as in robotics, AI-enabled analytics, machine learning and virtual personal assistance (Harvard Business Review, 2016). In China, 297 million current jobs, accounting for 38% in the labor market, will be created by or from AI (PwC, 2018). Notably, the development of AI is generating these kinds of changes 10 times faster and at 300 times scale compared to the earlier industrial revolutions, with nearly 3,000 times the impact (Dobbs et al., 2015).

The changing landscape of future jobs necessitates not only upskilling in technologies but also overall development of key competences. Based on the McKinsey Global Institute workforce skills model, ILO predicted a general uplifting in technical skills (Ernst et al., 2018). According to ILO's prediction, the hours worked with technological skills will change from 31 billion in 2016 to 60 billion in 2030 in the US and from 41 to 60 in Western Europe (Ernst et al., 2018). In addition to technological skills, the demand for higher cognitive skills and social & emotional skills is also increasing (Ernst et al., 2018). In line with ILO's prediction, European Commission (2018) indicated that AI capacity building should take consideration of not only specific skills but also other key competences in science & technologies, liberal arts, citizenship etc. The underlying logic is that transversal skills and flexibility will be in need as new applications of AI could happen in yet unknown areas of work (Ernst et al., 2018). Therefore, the changes in future jobs and skills are urgently demanding education and training, including TVET, to reshape an innovative skills provision system responsive to AI technological advances

Orientation for TVET Innovation: AI-related Strategies and Policies

The increasingly sophisticated AI technologies not only "urge" but also "enable" TVET innovation, as AI-related strategies and policies could provide orientation for the innovation. According to Beijing Consensus on Artificial Intelligence and Education, the integration of AI with education shall aims to achieve SDG 4 and governments are recommended to consider AI in education policies, education management, teaching, learning, values and skills development, educational equity, education evaluation etc., (UNESCO, 2019; Svenson et al., 2020). With global consciousness of AI, the executive orders on AI leadership have been high on government agendas (The China Academy of Information and Communications Technology [CAICT] and Artificial Intelligence Industry Alliance, 2019). For example, the Chinese government has issued "the Development Plan of the New Generation Artificial Intelligence" (Government of China, 2017). The government of Germany has begun to implement its national strategy "AI Made in Germany" (German Federal Ministry for Economic Affairs and Energy, 2018). The Canadian government has also fostered the "Pan-Canadian Artificial Intelligence Strategy" (Canadian Institute for Advanced Research, 2018). The Conditions for trust in artificial intelligence are highlighted, for example, in Svenson, Mikuskova and Launer's publication (2020). Similarly, these strategies and polices all provided systematic and contextualized guidance on how to achieve a breakthrough in AI from perspectives of economics, technology, ethics and importantly, education and training, which encouraged an increase in investment in AI skills provision and (Deloitte Insights, 2019).

Specifically in China, the AI development path has been explicitly identified with three steps stated, providing implications for TVET development. The Chinese government has been attaching significant importance to the development of AI, which could be evidenced by the assessment result that China was one of two countries with the largest investment in AI (Deloitte Insights, 2019), Based on the "the Development Plan of the New Generation Artificial Intelligence", China shall keep the overall AI technological level advanced in the globe by 2020, shall gain breakthroughs in both AI-related theories and applied technologies by 2025, and shall achieve AI leadership in terms of AI theories, technologies and applications (Government of China, 2017). With such top-down policy support and orientation, the TVET system could draw some insights and design institutional approaches to capacity building in AI programs development and delivery.

Cases of TVET Innovation: Approaches to and Actions for AI Development in TVET institution in China

With TVET being driven, necessitated and guided by AI to innovate, how to implement TVET innovation stays a question for many TVET institutions yet. As Baker et al. (2019) pointed out, AI in education still lagged too far behind to adapt to the skills needs. To change the status quo, TVET institutions should identify the trends of technological changes and thereupon forecast the AI-related skills needs (Ganter de Otero, 2019). Then based on the skills trends, education and training might transit to a sustainable and systematic skills provision system across disciplines and sectors, so as to provide both work-related skills and transversal skills (Ernst et al., 2018). In addition, European commission recommended that education institutions should create competence platforms to expose students to more opportunities of learning (European Commission, 2018).

The practice of Shenzhen Polytechnic, a leading TVET institution in China, has illustrated what actions could be taken to achieve AI-empowered TVET innovation. The actions it has taken included: (1) developing an institutional AI action plan; (2) establishing the School of AI to offer AI programs; (3) establishing an applied AI research institute to serve the local development demands; (4) upgrading all SZPT education programs by embedding AI technology into curricula; (5) offering common core AI curricula to all students; (6) constructing a 5G model campus to empower teaching and learning; (7) jointly establishing industrial schools with leading enterprises in the emerging industries, for instance, the robotics training school (Shenzhen Polytechnic, 2019). Despite the variety of contexts and conditions for TVET institutions, the practice of Shenzhen Polytechnic is expected to somehow provide reference for international TVET community to take innovating actions and keep up with AI advances.

Conclusion

Overall, the rapid development of AI empowers innovation in TVET through exposing TVET to the changing skills landscape, orienting TVET with AI development strategies and policies, and driving TVET solutions to AI at the institutional level. Industry 4.0 has overwhelmingly brought about digitalization concerning various sectors and boost unprecedented progress in AI technologies. The following changes in jobs and skills needs demand TVET to innovate its skills provision system to provide updated technological skills and transversal skills. Responsive to the AI technological changes, UNESCO and governments in different countries showed consensus on increasing investment in AI, and the policies seeking for AI leadership have mapped out the development orientation of AI in fields including TVET. Based on the skills analysis and policy orientation, TVET institutions are recommended to reshape the programme development and teaching & learning system and build competence platforms. As a reference for the broad TVET community, the institutional solution of Shenzhen Polytechnic to TVET innovation is provided, with specific actions on AI skills development elaborated clearly.

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The case method for teaching about digital trust at work/business

Erich Spencer Ruff[17]

Introduction

The **digital economy** has not only brought multiple innovations and contributions to the world, but also a set of important challenges and questions on what this really means for different groups of people and clearly the area of **education for business** is not exempted from this.

We have witness how **companies** redefine, adapt and incorporate some or all of this new digital technology into their operations and else, and at the same time, an impressive development of new organizations, systems and business models that are often defined and projected as digital.

In **education** it is observed that many faculty members, who have been adopting different degrees of digitization in their doings, have done so, based on some training and/or research in specific areas such as e-business, e-commerce, big data, AI, web based services, etc. as well as the use of internet communication networks, digital platforms, information (formal or informal), etc., and certainly by trial and error.

Putting this two dimensions together (business and education) one of the main concerns in the field actually, is how to effectively incorporate those topics (from the digital world) into **business teaching** (including the Digital Trust at work), allowing a good level of **understanding of the technological** part (a basic start for its use) but above all generating an adequate integration with its essence, this is the **strategic perspective and decision-making** (basic starting point to get returns and to innovate as part of a business model).

So **questions emerge**, as to what extend we are doing well in teaching digital business (and related topics) to secure **meaningful learning goals**? Are there any teaching method available that could potentially be more adequate for generating a good balance between **technical/digital content and business** perspective? How can we organize a course where both theoretical **content and its applications to real world** situations and problems could be met?

This paper aims to briefly explore the case method, being usually utilized for Business Schools, as a valid tool for teaching courses on digital business eventually. Its main characteristics, role of instructors and students, and a synthetic process view of a typical case discussion is examined.

Additionally a real business case (Banco de Santander Chile) is included with important organizational digital transformations (as a response to COVID 19) which generates significant challenges in terms of its strategic, cultural and digital trust consequences for the company.

What can the Case Method (CM) offer for teaching?

From the beginning, it is important to note that Concepts and theories are usually only the first step in learning and that practicing on how to apply knowledge is the crucial second step. Cases are one way to allow students to be closer to practice.

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The case method "aims to introduce students to a range of real-life scenarios and build decision-making skills"[18], as such is based on the application of concepts and the generation of a solid logic in the resolution of real business problems, that is, that participants develop a more systematic, well-founded and coherent decision-making method that can apply to multiple situations.

What is a business case?

In practice, cases often represent detailed descriptions or reports of management problems that are written by observers trained in the subject and who may have been involved in the company and/or had been related to the problem under consideration.

It usually helps to appreciate an important variety of events and phenomena within organizations and therefore allows progress in the cultivation of skills that make it possible to "think like a manager".

It is a real-world simulation that involves multiple senses (read, listen, see), which can be messy and ambiguous as in the real world. This can lead to sometimes being easy to read but difficult to understand.

However, cases takes on meaning through both, reading and discussion and the way they allow students to access practice using their knowledge of new situations.

Undoubtedly varying learning conditions makes it harder for students, but this results in better learning in the long run. Each case is different, even though the field of knowledge (such as marketing, finance, etc.) is the same.

In short, cases allow to enhance the skills around thinking about:

a) Information analysis
b) Troubleshooting
c) Making decisions
d) Action plans

Role of students

They should prepare the material before class and discuss it later in their respective section. After this, to collaborate with each other and with the instructor in giving meaning to the case with the idea that they can also learn from each other.

The idea is to apply concepts, theorical models, working methodologies for a better understanding of the case, and they should review the case by assuming the role of managers or executives, directors, etc.

They must actively participate in the discussion of the case, to give his or her opinion and/or to ask good questions, which are part of managerial learning.

All in all, we may have competing conclusions based on the evidence in the case.

[18] Case method in the digital age: How might new technologies shape experiential learning and real-life story telling? . Tom Clark, https://blogs.lse.ac.uk/impactofsocialsciences/2016/04/22/case-method-teaching-in-the-digital-age/, April 24, 2016.

Role of the Professor[19]

The main role of the instructor is to behave as moderator, motivator and articulator of the discussion in classes (personal or virtual), for which he/she must know the case very well, contribute with good questions that motivate reflection and the deepening of relevant topics that should be attended by the students.

It should also promote participation, manage the times, synthesize ideas, lead to group reflection of the learnings achieved and promote metacognition.

How would a typical DT case discussion look like?

This depends on the case itself, but typically the instructor has a discussion plan, where he contemplates minimum aspects that should be addressed.

Commonly he/she initiates it by asking one or more questions to the group or students in particular on specific topics (it can also be the other way around, asking for questions). Those that arise are registered on the board, highlighting facts and conceptual aspects, indicating counterpoints and sustained opinions, so as to generate a broad and diverse board (many times) of what the particular case entails.

The Professor often question or ask about what students have proposed, in order to explore alternatives and sustainment to what is expressed. He/she should be careful not to become a "killer of ideas" for creative proposals though.

Usually there are no correct answers that are objective. They are expected to be consistent, even though certain findings may be much better than others and are well supported by the case's background.

Do we have material (cases) for Digital Business /Digital trust available so far?

A good way to address this issue is to see what the offer of cases on Digital Trust-related issues is. Reviewing their availability on the Harvard Business Publishing website [20], you can see that nearly 20 relatively new cases are listed when searching for those with digital trust content, including some such as "Managing Online Reviews on TripAdvisor", "Facebook Fake News in the Post-Truth World" and "Luxola to Sephora Online: Opportunities in Beauty".

When you change the selection criterion to Digital Business , the number of feasible cases increases to 880 and the list shows cases such as “Amazon Fresh: Rekindling the Online Grocery Market”, “Digitalization at Siemens”, “Uber Pricing Strategies and Marketing Communications”, among others.

While the availability of material for the Digital Trust theme is significantly lower than that for digital business, the relevant thing is that as it is a rather new topic, it is already considered to be noteworthy through the case method and it is probably a matter of time before the offer increases significantly.

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A case in progress:

Banco de Santander Chile, in the face of the crisis caused by COVID -19

The Problem to Be Addressed

In June 2020 Miguel Mata, (CEO of Banco Santander Chile) and Claudio Melandri (Chairman of the Board and Country Head Banco Santander Chile), met with all the Top Managers of the different areas of the Group's business in Chile, in order to discuss the impact that the "Covid-19" could have from now on and whether to maintain their corporate strategy focused on the face-to-face services system or investing in technology to generate a mostly virtual model.

It is estimated that the decision to invest in technology or not is crucial, since on the one hand it aims to respond to the problem of how to keep the bank operational in the short term (generating certain adaptation problems and leaks, and affecting market share) and on the other hand, that of improving its long-term profitability, making its various processes faster and more efficient. It was also clear that the Covid-19 was not just a " flying bird" that could be underestimated in its effects.

The industry

The competition is divided into different segments, such as; Global Segmentation Banks (entities with business and corporate strategy, multi-products with diversified services in the domestic and foreign market), niche banks (more specialized to the segment where it is intended to develop)

Santander Bank

Present in the country since 1978, Banco Santander Chile is currently a leading financial institution, both in terms of market share and profitability. The reasons for this leadership can be found in the strategy followed since then, based on specialization in the financial business, innovation in products, appropriate risk measurement, quality of service to customer and an active participation in the local market, which is complemented by the international network that Grupo Santander owns worldwide.

Technology and Innovation

Banco Santander is characterized by a business architecture that has managed to provide a comfortable experience for its customers, so it has worked hard in technology and innovation, in order to provide a technological and comfortable experience. In 2019, four major milestones were marked prior to the pandemic. Within them, we highlight:

- **Automation and Process Robotization:** The RPA (Robotic Process Automation) area is created, with state-of-the-art technology and applying process reengineering addressed 52 automated processes, in order to strengthen the business by delivering greater operational security and increase efficiency indicators in a cross-cutting way in thebank's projects, for all its areas.
- **Cybersecurity: Digital transformation and** the increase in the implementation of smart technologies, carries new risks related to the vulnerability of banking systems to possible theft of information by cybercriminals.
- **Cloud Migration:** In 2019 Santander began the migration to the leveraged cloud in the Santander Group's "Cloud First-Cloud Hybrid Multicloud" Strategy, initiating the Bank's first private cloud project

(OHE), which is expected to end Phase 1 by September 2020. Likewise, the Bank has initiated the transformation of processes by adopting the DevOps methodology to expedite the development of new systems, with the aim of having in 3 years 95% of the operation in a cloud environment both private and public

Operational impact on Banco Santander branches by Covid-19 (March/April/May/June):

- April 9, 2020, of the 330 branches, 277 were operational and publicly attended. 53 offices were closed. According to the protocols that had been implemented, branch offices were operating with minimal endowment and a number of customers being allowed to enter maintaining a safe distance inside each office. Following the usual commitment: "to serve customers in an impeccable way, to be available at these complex times for the country and always put the health of employees and customers first on the list".
- The number of virtual operations grew day by day. By Monday, March 30, 6,800 people were enabled to work from home via Citrix, Horizon, or VPN. On the other hand, 99.4% of Santander professionals in Chile have *Office 365 and Teams*, which considerably facilitates remote work.
- On May 07. , it is reported that about 60% of people from mayor cities will be in total quarantine. The latest report notes “in the cumulative we added 41 infections during this juncture, 11 of which have already left the disease behind. In this way, seen in terms of active cases, at the end of this day there are 30 collaborators with Covid 19.
- On May 18, the infected group increased, 66 employees infected, 19 of whom have already recovered, leading to 47 active cases. This has reduced the number of offices open to public care to about 70% of total branches.

About the future

While the group analyzes the complexity of the scenario looking to determine the different edges of the decision to be made, Claudio Melandri receives an unexpected and surprising email in his tray from Madrid, Spain: "Dear Claudio, Chile is a strategic point for the diversification of the business, so I am interested that a decision is taking regarding the strategy to be implemented for the second half of 2020 . Will we continue to invest in workcafes or allocate resources to technological investment? I need a response by tomorrow at 9:00 am. You have all my support; I am attentive to your comments”. Ana Botín, Country Head Global Banco Santander"

At the time, Claudio Melandri and his team found the unsustainable pressure to make a decision: Was it time to think about how to gradually return to a pre-crisis mode of operation or radically change the operating model and aim to revolutionize the way we bank? What criteria should be applied to decide? Is there clarity on what our starting point is?

Theoretical perspective for analysis

It seems that the case allows at least three important theoretical perspectives to be considered: a strategic one, an organizational one and a cultural one (which would include digital trust with the introduction of new technology and to work remotely).

Strategic:

- **Key questions:**
  a) What impact changes from the company's environment (health, legal, political, economic, technological) would have on Banco de Santander
  b) Its effects on the competitive capacity of the company?
  c) Would the massive introduction of digital resources develop a more competitive company in the end? Short term and long-term consequences?
  d) How would your market positioning change especially in view of turning the Bank into a virtual operated organization? Would the consumers resent this?
  e) What key (strategic) resources would become particularly relevant for addressing the contingency?
- **Analytical Perspectives:**
  a) PESTEL
  b) Five forces and value chain of M. Porter
  c) VRIO analysis
  d) Swot

Organizational:

- **Key questions:**
  a) How will the changes in the environment affect the current organizational structure?
  b) Should Santander consider moving towards a flatter, decentralized organization? If so, how would that go with technology?
  c) How effective would the virtualization of the firm be? Its impact on employee's productivity?
  d) What adjustments should be made for better implementation of possible changes to the Bank's strategy against Covid-19?
- **Analytical Perspectives:**
  a) Organizational design
  b) Organizational structure
  c) Process analysis

Culture:

- **Key questions:**
  a) How will changes to a virtual organization affect employees or work with a larger virtualization component?
  b) To what extent do employees rely on digitizing their way of working?
  c) Would this change their level of digital trust? Why or why not?

d) How should the company address these issues?

- **Analytical Perspectives:**
  a) Cultural profile
  b) Organizational climate
  c) Change factors

On the overall, one of the theoretical aspects to be considered and expanded in the case is the digital confidence that comes from the public and employees derived from the digital virtualization measures taken and to be taken by the bank's executives in order to keep the organization operating under Covid-19.

In the latter, it is worth recalling the central purpose of the research on the subject led by Professors Launer and Marcial[21], this is "to assess digital trust among employees and his perspective about his/her own experience as a worker, his or her attitude towards the employing organization, as well as his or her behavior in the society as a whole".

It is also possible to incorporate the concepts related to the adoption of an innovation where the company is probably in a different group known as early adopters, early majority, late majority, laggards, etc.

Conclusions

While the use of the case method would not be the only way to teach digitization in business and digital trust, but all indicate that it is one that offers significant advantages:

a) It is a methodology that allows students to be c**onnected with specific experiences**, where you can link theory and practice on numerous topics, including the digital trust.
b) For the business perspective of digitization, the method facilitates a path of analysis and **decision-making based on sound theoretical foundations**.
c) Promotes the exploration of **comprehensive creative and innovative** solutions both in the assessment of their impact and in the development of implementation plans related with digital technology.
d) It allows the digitization of businesses to be analyzed from a mostly **technical perspective to one of strategic resources.**
e) The case of Banco de Santander shows us that the incorporation of information **technology and the digital trust** are in direct interdependence with the **competitive capabilities of a company.**
f) In addition, this case makes possible to analyze the important **connections between the digitization of businesses** and some key pillars of the bank such as its **strategy, organization and culture (digital trust)**.

Finally, it should be noted that there are also spaces to improve in the way it is taught through cases today. It is advisable that, above all, for the proper and effective inclusion of technological and digital issues, **blended learning systems should be considered and/ or with clear online support.**

[21] "Towards the Measurement of Digital Trust in the Workplace: A Proposed Framework", Dave E. Marcial , Markus A. Launer, International Journal of Scientific Engineering and Science Volume 3, Issue 12, pp. 1-7, 2019.

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Freshmen Courses for Informatics Education Incorporating Blended Learning

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ABSTRACT

University of Electro-Communications (UEC) is a national college located in the suburbs of Tokyo, and is specialized in informatics, science, and engineering. The task of our informatics course for the freshmen year is to smoothly prepare students toward advanced technical curriculum in the sophomore year and further. To accomplish the task with limited class hours, we have designed and implemented a systematic blended learning curriculum and methods using Moodle LMS. In our method, students study class contents using text and videos in advance (flipped classroom), and the majority of class hours are used for exercises (mostly using computers). All learning materials are distributed using Moodle, and students can use them from home as well as in our computer rooms. Students are required to submit a report each week, and those reports are scored by the lecturer and teaching assistants with appropriate feedback. End-term exams are also carried out using Moodle with automatic scoring. Final marks are calculated by 50:50 sum of report score and exam score. As a result, students' satisfaction was high. Further, with our programming course, most students could acquire fundamental programming skills.

Keywords: blended learning, flipped classroom, report-based evaluation, programming exam with automatic scoring

Introduction

University of Electro-Communications (UEC) is a college located in the suburbs of Tokyo, and is specialized in informatics, science, and engineering. In the undergraduate curriculum, we provide three clusters (departments), cluster 1 through 3. Cluster 1 covers informatics, and cluster 3 corresponds to science and engineering. Cluster 2 is the "boundary" or "fusion" cluster, including robotics, sensor & control, and so on. As a result, our students need to be fluent with informatics.

In Japanese colleges and universities, science and engineering (including informatics) 4th (final) grade undergraduate students must experience research activities and write a paper to graduate. Therefore, they have to acquire advanced knowledge and skills needed for research by their 3rd grade, which is not an easy task.

We are designing and implementing the informatics curriculum for the freshmen year, whose task is a smooth entrance of our students into more advanced materials covered in the sophomore year and further.

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Those materials include algorithms & data structures, numerical analysis, computer architecture, operating systems and so on.

However, students also have to take mathematics, physics & chemistry (with experiments), and some other courses in their freshman year. Therefore, we have only two informatics courses of 15 weeks (90 minutes per week) each, namely “computer literacy” in the first semester and “fundamental programming” in the second semester (the former and the latter half of freshmen year).

The above is rather limited hours considering what students have to acquire by the sophomore year. To overcome the problem, we have designed and implemented the above two courses with extensive use of IT (information technology) in blended learning settings, which we explain in this paper.

Rest of this paper is as follows. In Chapter 2, we discuss the general design policy of our courses (our two courses have many design choices in common). In Chapter 3 and 4, we explain our design and experiences on “computer literacy” (“CL” below) and “fundamental programming” (“FP” below), respectively. In Chapter 5, we review related works. In Chapter 6, we present discussions and conclusions.

General design policy for two courses

General course settings

UEC has about 800 students in a grade. However, the number of students registered to CL or FP courses differ from above, because some students pass the subject due to qualified courses in their previous schools (other colleges), and some students who failed in the previous year take the same course again. The number of students showing up to the end-term exam is approximately 770.

There are 13 classes of approximately 60 students each, with one lecturer and two graduate teaching assistants for each class. Two computer rooms are used, so there can be at most two classes at the same time. There are 15 weeks of class hours (90 minutes each).

The 80 minutes end-term exam is also performed in the ordinary class hour in 16th or 17th week. We fully use CBT (computer-based test) to reduce scoring cost. To prevent problem leakage, we provide seven problem sets of similar but not identical problems; classes performing the exam on the same or neighboring hour share the same set of problems.

Problems and solutions

Firstly, we must make clear what problems to attack with our course design; the following is our list.

(1) Limited time — As noted above, 15 weeks with 90 minutes each is allocated for each course, and we have to get along with this.
(2) Need for exercises — Students will have very few experiences on college level informatics materials. For concrete understanding of those materials, experience through exercises is mandatory.
(3) The large difference among students — Some of our students are interested in informatics since their youth, and are fluent with it, while others are just novices. Additionally, although “information study” subject is mandatory in Japanese high school curriculum, actual contents and levels largely differ from school to school, leading to again large differences in even among “novices.”
(4) Novices dropping out — The gap between required skill to pass and students’ actual skills tend to be large in novices, so novices have a tendency to drop out. However, most of our students are novices,

because “information study” is not considered important in Japan (it is rarely used in a college entrance exam, and subject that is not used in college entrance exam often regarded as unimportant).

(5) Skilled students getting bored — For our college, development of skilled students throughout the freshmen year is very important. However, if we make the contents of the course easy to prevent (4), then skilled students will get bored and lose interest in the subject.

(6) Difficulty in programming education — Programming is notorious for its difficulty in teaching; we have seen many students dropping out. The FP curriculum has to deal with this difficulty somehow.

For (1) and (2), flipped classrooms (student study supplied materials in advance to the class hours) can be the solution. For the purpose, we prepared textbooks, which explain all materials in detail, and lecture videos for every week.

In order that those materials to actually be used, we additionally did the followings.

- We have included all materials in a Moodle course, and used them fully in the class hours. Students can log in to the course from their home, and they will see the same materials, leading to a smooth transition from classroom learning to home learning.
- Students have to submit their assignment report every week through the Moodle course. Additionally, they are also required to submit an “activity report” at the end of each class hour. The Forms of these reports are similar, so that they can “practice” report submission in every class hour, and also get used to Moodle operation.
- Video lectures are actually placed on YouTube, so that they can comfortably be viewed with smartphones. They are split into a short movie of around 5 minutes, so that viewing one of the videos does not take long.
- We asked the lecturer to avoid lectures during class hours and proceed to exercise as soon as possible; this urge students need for studying in advance.

To overcome (3), we have prepared many exercise problems for each week, and ordered students to “choose one or more exercises, practice them, and write a report.” There is also a large difference in the difficulty of those exercises. Therefore, students fluent in the topics choose difficult exercises and answer many in their report, while novices will choose easy ones and answer only a few in their report.

The above method seems not fair at first glance, but we believe this scheme is a “must” in our situation. Consider the following: muscular workout requires appropriate weight to be effective; if too heavy, it will cause damage, and if too light, it will be useless.

Likewise, the difficulty of an exercise should be balanced with the students’ ability; if too difficult or too easy, it will be useless. We saw many classrooms in which only one exercise is presented, and all the students must do that; we suspect that that exercise will be too difficult or too easy for most of the students and thus ineffective. We avoid such problems.

People also might suspect: “hey, all students will choose the easiest exercise for their luxuriation.” In our observation, most students choose exercises appropriate for their ability. Perhaps it is because skilled students like informatics and so want to attack difficult exercises, and for novices easy exercise will be appropriate anyway. There do exist lazy students who choose easy exercises in spite of their ability, and they tend to score less in the end-term exam.

Solutions to (4) and (5) are tightly connected to the above scheme (students choose which exercise to solve). As noted previously, students are required to submit a report every week. Contents of these reports

are how they solved the problems, plus findings from the experience of solving the problems; the difficulty of the problems are not accounted for in scoring.

Professors are accustomed to review and grade reports with respect to their quality (sentences, logics, presentations and so on), and we are asking for such grading. Therefore, novices and skilled students in informatics are evaluated on equal foot. Students also know the fact, so novices are not discouraged.

Additionally, our criteria for grading is that, ordinary reports, which is the majority, receives score B, extremely superior (very few) reports receive A, and reports with some clear failure (do not satisfy some stated condition) receive C. These criteria are very coarse and thus reports can be graded rather quickly.

Yet, a class with 60 students and 15 weeks results in 900 reports in total, which is a huge amount. To reduce the burden of opening 60 documents every week, we concatenated 60 reports into a single PDF document and added a watermark with a student ID to every page, changing colors among students. Professors just have to skim through a PDF document of approximately 120 (week of the short report) to 600 (week of the long report) pages, which was manageable enough.

Many students complain that their reports receiving B in spite of their effort, but we repeatedly explain that A is limited to really excellent reports. Instead, we are asking professors to return one-line feedback comments to their reports if possible (along with TA); actual existence or elaboration of feedback comments vary among classes.

We assign 3 points to B report, 4 to A, and 2 to C. There are two “integrated exercise” weeks, in which not many topics are presented, and students attack slightly complex problems (or group works), and those receive double points (b = 6, a = 8, c = 4). The result is that all normal grade (B or b) results in approximately a full score (50 points) for the reports. With A or a, additional points can be earned, up to 59 (one needs 60 points to pass the course). Remaining scores come from the end-term exam, whose full score is also 50. The total of these scores (maximum 100) is used for grading.

With this scoring, one is likely to pass the course if they submit a normal report every week, which is encouraging to novices — solution to (4). Note that there are also good points for skilled students, because a good total score requires good points from the end-term exam, so they will not complain about either — solution to (5).

As for (6), we are going to discuss the topics in Chapter 4, but we are using some of CL hours as preparation for FP. For example, our students experience assembly language simulator in “principles of computers” topic, and simple JavaScript programming in “software development” topic included in CL.

Computer Literacy (CL)

CL course design policy

As we search on the net, there seem to be many colleges having a course named “Computer Literacy.” However, the content of our CL is distinguishing in that it mainly focuses on Unix, LaTeX and HTML (Figure 1), which will be needed in the sophomore year and later.

The difficulty in our CL course design is that large portion of our contents are command line based (Unix, Shell) and markup language based (LaTeX, HTML / CSS), while students are accustomed to GUIs (Windows,

Explorer) and GUI applications (Word, Excel, PowerPoint). If they feel like: “Hey, what the heck are these old fashioned, complex, tedious and seemingly useless tools?” then we will certainly fail.

Solutions of our predecessor (course design used until the school year 2016) were to “treat them as knowledge to be acquired by students.” Students learn that knowledge through lectures, memorize them, dump them onto an exam sheet, and forget — it is seemingly understandable to students, because many school contents were likewise. However, with such experiences, students will never use that those knowledge to actual tasks in their college life, which is undesirable.

Our solution is already described in the previous chapter — lots of experiences through exercises in the class hours, and actual use of that knowledge through weekly report assignment (students have to use command lines or markup languages because exercise problem states as such).

Curriculum for CL2018

Table 1 shows our CL curriculum for the school year 2018. #1 is the guidance, but a difficulty in authentication and issue of safe passwords are noted, and students craft their own “safe and also memorizable” password and change login password. Most students have not heard about touch typing, so we introduce the touch method here. We provide a measurement page, and those reached to 150 or 100 characters / minutes by the end of the semester will receive 3 or 2 bonus points respectively.

Table 1 Weekly curriculum of CL2018

week	topics
#1	What is computers?, Passwords, Touch Typing
#2	Principles and Functionality of Internet
#3	Nexworks and Security
#4	Principle of Computers (assembly programming)
#5	File System, File Manipulation
#6	Text files and Text editors
#7	Computer Systems and OS
#8	Unix Filters, Shell scripts
#9	Markup and text formatters (LaTeX)
#10	Graphics, figures and tables (LaTeX)
#11	Academic Literacy (Integrated Exercise)
#12	HTML / CSS and Web page creation
#13	Web and Information Architecture
#14	Web site design and construction in team (Integrated Exercise)
#15	Software development and Tests (JS programming)

#2 includes the first experience of Unix command line, but major topics is on packet switching, network protocols and Internet; students try ping command to measure packet round-trip time, and paper-based exercise on error recovery protocol (the sender write messages onto multiple memo sheet “packet” and send one by one to the receiver, and intervening “network” occasionally introduce transmission errors — the sender and the receiver have to come up of some error recovery method to attain error free transmission).

#3 includes topics of cryptography and PKI, and students examine PKI certificates on their Web browser (although they must have used Web browsers many thousands of times, scarcely any student has not

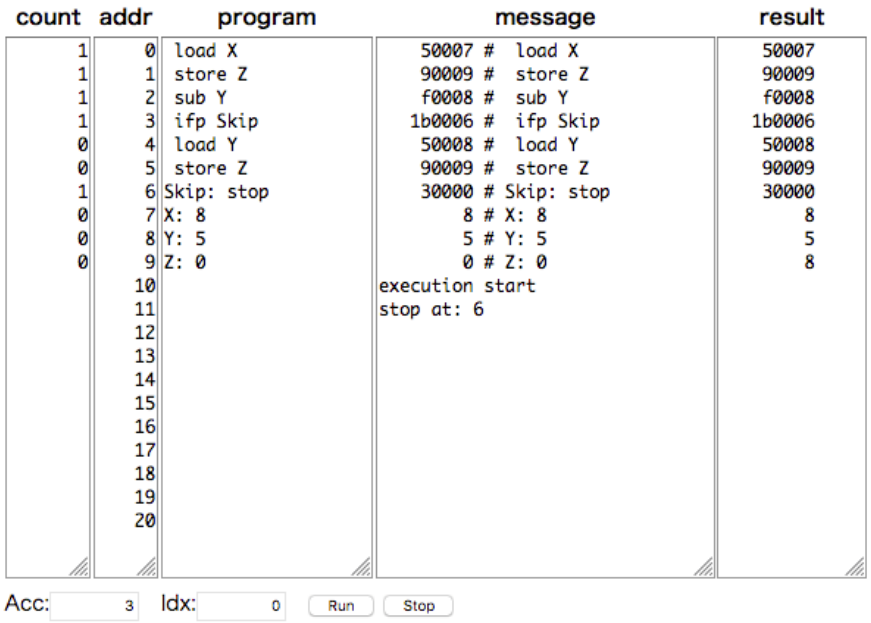
experienced those matters in the browser). Then we set up a college e-mail account on our IMAP mail client (Thunderbird), and view RFC822 format message for their own mail messages (which is also their first experience).

#4 contains the topic “principle of computers.” However, those topics are difficult to be understood with ordinary lectures. Therefore, we use an assembly language programming experience here. We designed and developed a small accumulator (1-register) machine architecture and its simulator running on a Web page. Students experience simple assembly language programming with the simulator. Figure 1 shows a screenshot of the simulator, with the result of “compare X and Y value, then store larger to Z " program shown. Our intent was that students will understand the principles of the computer through the exercise, and the exercise can be a good introduction to programming by itself.

#5-#8 are the various aspects and topics on the Unix system, and students exercise Unix commands and tools.

#9-#11 are focused on LaTeX report writing. Starting from #9, students are required to write their reports with LaTeX and submit resulting PDF. #9 introduces LaTeX, and in #10, basics of graphics (pixel graphics, vector graphics) and various image files are covered, along with LaTeX figures and tables. #11 is an integrated exercise; topics of academic literacy are briefly introduced, then the students are gathered to a group of 3-5 people to discuss an academic literacy-based theme they have chosen.

Figure 1 A small computer simulator



#12-#14 are focused on Web page design and construction with HTML and CSS. #12 introduces HTML / CSS using HTML practice page (Figure 2). The page allows students to type and modify HTML / CSS in the upper area, and the “Run” button immediately shows the result display in the lower area; CSS styling, character entry (for special characters) and link tag can be used as in the ordinary HTML file. Note that we teach both

HTML and CSS from the start, because students have high motivation in decorating their pages; they were interested in a various presentation which can be specified through CSS. #13 covers topics of inline / background images in a page, intra-site links, and structure of Web sites (linear, hierarchy and so on). #14 is again an integrated practice; students form groups and design / develop a site on some specific theme (chosen by themselves) containing multiple pages.

Figure 2 HTML practice page

Finally, #15 is an independent topic of software development; this topic was placed in the middle in the school year 2017 with Web site construction being the last topic, but students complained about heavy integrated exercise just before the exam week, so we moved this topic to the last week. This topic includes a notion of high-level language (compared to assembly language, which is low level), simple JavaScript programming, and concept of software product development (which is quite different from simple programming) along with the notion of software testing. In this week, we use two practice web pages, namely JavaScript execution page and test case execution page. In the former, one can type and execute a simple JavaScript program. In the latter, one enters a JavaScript function plus several simple test cases (set of input parameters and expected return value) and runs them to experience how the unit test looks like.

Experiences of CL2018

Here we report our experience for the school year 2018. Week #1-#3 were relatively easy, and students seem to enjoy them. As for assembly programming in #4, many novice students report that they have enjoyed their programming experiences. As assembly language instructions (corresponding to CPU instructions of “small computer”) are very primitive and simple, students had little difficulty in grasping and using them; some students with previous programming experiences were a bit confused because assembly language does not have nested if or while statements.

However, Unix topics in #5-#8 were dark sides; although students could submit the report as in the other weeks, chosen exercises were relatively easy ones and an only small number of student (perhaps with

previous Unix experiences) became fluent with file / directory hierarchy, Unix commands, process handling, and Emacs editing. We feel these topics are difficult to master in several weeks.

From #9, LaTeX sections start. Perhaps because we have explained that LaTeX is the majority in the science / engineering academic community and convenience LaTeX math formulas, there was a little complaint in learning LaTeX. #10 mainly focuses on exercise on graphics (write PPM image and / or PostScript with a text editor); students were impressed that text can actually be a source for graphics. The focus of #11 is group discussion; many students noted that they have not experienced such discussion before, and it was interesting (apparently this is the weak side of traditional school education in Japan). These reports must be formatted with LaTeX so that students get accustomed to it; by the end of the semester, several students seem to start using LaTeX for reports in other courses.

From #12, HTML / CSS sections start. As students have already learned one markup language (namely LaTeX), learning another seems of little difficulty. Additionally, the practice page is proved to be a powerful tool for learning the topic. In #13, students are requested to construct multiple passes or pages with separate image files referred to within, so practice pages cannot be used. However, as students see that copying HTML source from the practice page input area to text editor results in the correct HTML file, they had little problem in transition. In #14, Web site planning, design and development in teams are the mandatory exercise, and most students enjoyed their original Website construction. They also noted about the difficulty of team development (load bias, communication problems and so on), which we hoped them to experience.

Finally, #15 is mainly focused toward programming in a high-level language (JavaScript in this case), although other topics are also covered. We asked which one of the assembly and JavaScript to prefer in the inquiry, and as a result, some prefer assembly and the other prefer JavaScript. This topic seems to be a good preparation for FP in the second semester.

Evaluation method for CL2018

As noted previously, 50 points come from assignment reports, and the remaining 50 points come from the end-term exam of 80 minutes. For the exam, we used the following types of problems.

- 5-2 problems (34 problems) — Five sentences regarding a chosen topic are provided, and students choose two correct sentences from the list. The score will be 2 if both choices are correct, 1 if one choice is correct, and 0 otherwise.
- Split-Paper (SP) tests (8 problems) — Students are asked to construct correct answers by choosing lines from a choice set and reordering them as necessary. The score will be 2 if the resulting answer is correct, 1 if a single difference from the correct answer is found, and 0 otherwise.

We use 5-2 tests instead of a simple multiple-choice test or YES, NO test, because interference among five statements shows a problem more difficult. As to the SP tests, we explain them in depth in the next chapter; for CL course, various kinds of lines — lines from LaTeX source, HTML source, PPM image text, and program text are used.

As exams are carried out in a normal class setting (in two computer rooms), we prepared seven problem sets to avoid problem leakage. The corresponding problems for each set are similar.

For a total of 42 problems, the full score will be 84 points; we scale them appropriately, and calculate sum with report score (plus typing bonus of at most 3 points) for the final mark.

Results of CL2018

Figure 3 shows accumulated points of report scores (as noted previously scores over 59 are forced to 59 for grading). As expected, frequency around 50 points (all B / b) is highest, meaning that most students submitted the ordinary-level report.

Figure 3 Histogram for CL report score (n=801)

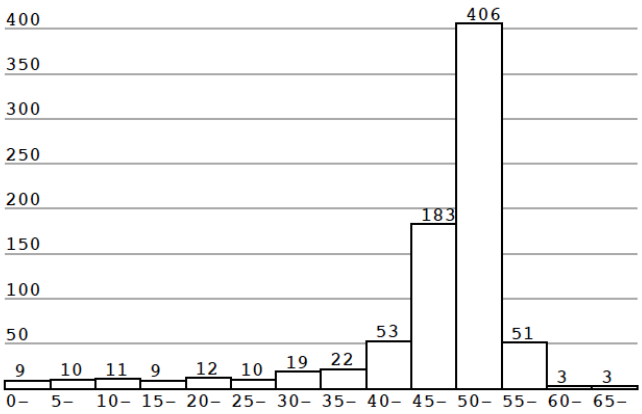


Figure 4 shows a histogram for the exam, with the full score being 84. From the distribution, we consider that the test score appropriately measures students' performance. We also examine students' scores for each problem to investigate where to improve in the course (not shown here due to space limitation).

Figure 4 Histogram for CL exam score (n=769)

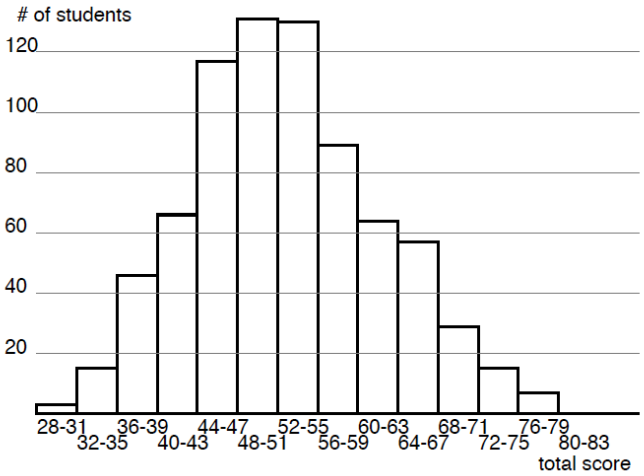


Table 2 and 3 are a summary of inquiry in the last class hour (#15). These results indicate that students recognize the class as useful, and they have learned much from the course.

Table 2 [CL] Q. Was the course useful to you?

Positive	Weak Positive	Neutral	Weak Negative	Negative	No Answer
164	230	191	72	39	9
23.0%	33.5%	26.8%	10.1%	5.5%	1.3%

Table 3 [CL] Q. Have you learned much in the course?

Positive	Weak Positive	Neutral	Weak Negative	Negative	No Answer
405	243	33	18	5	10
56.7%	34.0%	4.6%	2.5%	0.7%	1.4%

Fundamental programming (FP)

FP course design policy

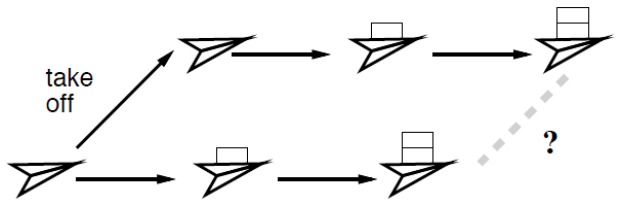
In contrast to CL, the goal of FP is clear and can be agreed upon by most people — just acquire programming skills. However, this simple goal is notoriously difficult, as noted before.

Based on our previous experiences, we choose the following seven policies to overcome the problem (difficulty of programming education). We explain them below.

Policy 1: *Take off first.* The term “take off” means that one can express his / her idea as programming code and run it. It sounds like a final goal and not a policy, but it is not so.

In many programming classes, the teacher first explains not only overviews but also many details (accurate lexical or syntax rules and so on) of the programming language before exercises. It is perhaps because many programming textbooks are written in such a way. With such a method, students get to exercise writing their own program, they get stuck because so much knowledge was already presented, and they cannot know which of this knowledge are important and which are not (the lower route of Figure 5).

Figure 5 Concept of take off



In our scheme, we present a short but complete running program and explain them. Following is the first program in our FP course, a Ruby method to compute the area of a triangle.

```
def triarea(w, h)
  s = (w * h) / 2.0
  return s
end
```

Then we explain the meaning of the code from top to the bottom, but it won't be long because the program is so short (we avoid generalization as much as possible here).

After students actually enter and run the above code, first exercise problems are presented. They are: "sum of two numbers," "volume of corn," " the inverse of a number" and so on. It is not difficult for students to solve those problems, and this means "express his / her idea as programming code and run it." Then, we add new knowledge one by one, always making sure the "took off" status of the students continuing (upper route of Figure 5).

"Take off first" approach has huge benefits, namely: (1) if something goes wrong, computers automatically tell the student as such because the program will not run, so students can be confident with their code, and (2) students are highly motivated because looking at one's own program running is a pleasure.

Policy 2: *Varied levels of exercises.* This is the solution to the problem (3) of section 2.2.

Policy 3: *Take precedence on practice.* To keep the status of "took off," practice is important. To reserve enough class hours for practice, the flipped classroom is employed, as in CL.

Policy 4: *Encourage novices.* This is the solution to the problem (4) of section 2.2.

Policy 5: *Clearly indicate the goal of acquiring programming skills.* Many programming course exams include problems other than writing programs, e.g., test syntax knowledge, program comprehension, and so on. Therefore, many students without actual programming skills pass the programming course thanks to these kinds of problems. However, they will get stuck when they really have to create a program to solve their problems. It is as if a doctor saying:"I got the doctor license thanks to easy problem, but I really do not have the skill to treat patients."

Therefore, in the end-term exam of our FP course, all of the problems are program construction, and we announce our students as such from the start, and students struggle to acquire the skill. Previously, program construction exams were difficult for a large number of students because a skilled person has to grade them. However, we developed Split-Paper (SP) tests for programming performance evaluation, and these tests can be automatically scored. We discuss the issue of evaluation further in section 4.4.

Policy 6: *There is no single "correct" code in programming.* In our experience, high school students have the tendency of believing that there is always "a single, correct answer" to the problem, and they "search" for that single solution. However, in programming, code with the identical outcome can be written in multiple ways, and students should realize the fact.

We repeatedly tell our students the above issue, and presents multiple "correct" sample answers to a problem many times. Additionally, we speak to the student as: "There is multiple correct ways to write the code, so YOU have to decide among those choices yourself; develop your own policy on which way to choose."

Policy 7: *You should produce your code out of your brain.* As in Policy 1(take off policy), students should express their ideas as program code. However, for the first few weeks, those "ideas" are provided as exercise problems, and they code the solution. However, people learn programming best when they are programming their own idea, what they want to do themselves.

Therefore, we include the “free programming” problem stating “create a program which you feel interested” on many occasions. Additionally, we use two “Integrated Exercise” weeks for the creation of pictures (images) and movies (frame animations) of students’ preference. They are appropriate because we can easily come up of our own idea with pictures and movies.

Curriculum for FP2018

Figure 4 shows our FP curriculum for the school year 2018. We use Ruby for 10 weeks, and use C language for the remaining 5 weeks. Ruby was chosen because it is a suitable language for “Take off first” scheme; code can simply contain target method (function or subroutine in Ruby term), no extra declaration, includes or surrounding module necessary.

However, in UEC, the programming curriculum of the sophomore year is based on the C language, so we cannot avoid the C language for our course. In the programming community, it is often said that learning a 2nd language is not so much of a burden but leads to lots of benefits. In our case, C language (in addition to Ruby) can provide (1) experiences in a statically typed language, and (2) knowledge that primitive elements of programming languages (if, while, array, struct) are similar or identical.

Table 4 shows our FP curriculum for the school year 2018. #1 includes a brief guidance which is immediately followed by the explanation of the first example (triarea above), how to use Ruby, and then first exercises explained above. For all exercises we use the irb command (read-eval-print loop in terms of programming language community), so that we can invoke methods by directly specifying input data and automatic printouts of return value; in this way we can postpone tedious, lengthy and difficult input / output altogether.

The latter half of #1 includes topics of numerical error present in floating point calculation (real numbers), and exercise to observe various kinds of numerical errors appearing in computation. Such topics are not usually included in the introductory programming course. However, the topic can be used with simple straight-line code (no loops or branches), so we can include it here. The intention is that skilled students are going to investigate these advanced topics with interests; they will get bored if such topics do not exist. Additionally, we wanted all students to know an important fact that “computation with computer is not at all 100%-accurate,” to which many students expressed surprise.

Table 4 Weekly curriculum of FP2018

week	topics R: Ruby; C: C language
#1R	Introduction to Programming; Numerical Errors
#2R	Control Structures; Numerical Integration
#3R	Control Structures(2); Arrays and its usage
#4R	Procedure and Abstraction; Recursion
#5R	2-Dim Arrays; Records; Image Representation
#6R	Drawing a Picture (Integrated Exercise)
#7R	Sorting Algorithms; Computational Complexity
#8R	Complexity (2); Random Numbers/Algorithms
#9R	Object-Orientation
#10R	Dynamic Data Structures; Encapsulation
#11C	Introduction to C Language; Solving $f(x) = 0$
#12C	Various C Types; Dynamic Programming
#13C	Manipulating Strings; 2-Dim Arrays in C
#14C	Record Types in C; Dynamic Data Structures (2)
#15C	Team Development (Integrated Exercise)

#2 and #3 focus on if statements and loops, and then combine them to construct more complex control structures. Introduction to arrays is also included. #4 focuses on procedures. As noted above, we use Ruby procedure (method) from the beginning, so here we review the concept of the procedure (parameters, return values, variable scopes), and also provide materials on global variables and recursive procedure.

As stated in the “Policy 7” section, we would like to include exercises on drawing pictures (with code), so #5 and #6 is focused on this topic. In #5, we introduce the concept of 2-dim arrays, records, and combine them to represent an image. We construct an arbitrary image on the image data structure in memory, and can use a simple Ruby method to write out as a PPM format image (PPM is a simple image format used on Unix). Followings are the code to create image data structure and writeimage methods.

```
Pixel = Struct.new(:r, :g, :b)
    $img = Array.new(200) do Array.new(300) do Struct.new(255, 255, 255) end end
    def writeimage(filename)
      open(finename, 'wb') do |f|
        f.puts("P6\n300 200\n255")
        $img.each do |a| a.each do |p|
        f.write(p.to_a.pack('ccc')) end end
      end
    end
```

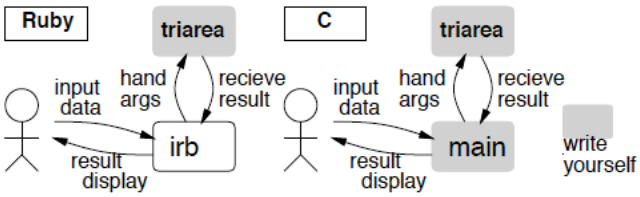
In #5, we introduce the above data structure, with the exercise of drawing a line and filling various shapes of various colors (in prior to the exercise, a sample program to fill two circles is presented and explained). #6 is an integrated exercise, and report assignment is “to create a picture which you feel beautiful.” We also provide a sample method to fill triangle, thick line, oval, and arbitrary convex polygon; students are expected to combine them to construct their code.

#7 through #10 is used to present various CS ideas to students. Those topics are relatively independent, so the difficulty in understanding one of them will not affect the learning of later weeks.

#11 is the initial week for C programming. For a smooth transition, we present Figure 6 to urge similarity among Ruby and C, and again start from the C version of triarea (area of a triangle) example. We prepared many exercise problems identical to the Ruby section, and specified the number of problems to be reported as “ten” (in contrast to “one” in other weeks) to urge sufficient practicing. Additionally, the latter half contains topics on solving the f (x) = 0 equation (with enumeration, binary search, and Newton’s methods). This part is for skilled students, just as in numerical error part of #1. All of the following weeks (except for the integrated exercise week) contains advanced topics for the same purpose.

In #12, major focus is on an array. However, as C language handles array access as pointer operation, concepts of address and pointers are also covered. Exercises are mostly straightforward array manipulation. As an advanced topic, dynamic programming is included.

Figure 6 Roles of irb command and main function in C



In #13, string (array of character) is introduced, and basic string operation (string length, character replacement and the like) are cast as exercises. As an advanced topic, pattern matching with recursive function is included. Handling of 2-dim arrays in C is also included to meet practical needs.

In #14, struct (record) type is introduced with several sample functions manipulating 24bit RGB color data (1 byte for each color). Exercises are also on the same RGB color structure. As advanced topics, dynamic memory allocation and linked list construction are provided.

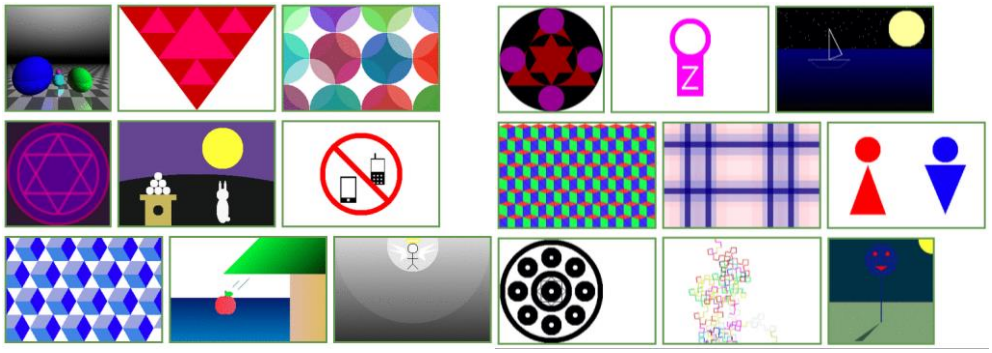
#15 is the final week with integrated exercise. Exercise problem is to generate frame animation (actually a series of PPM files, which can be combined to GIF animation using Unix command). Additionally, the topic of organizing a C program into multiple source files (including header files) is explained, and animation exercise must be carried out by a team of 2 to 3 students. These topics prepare our students toward larger program and team development.

Experiences of FP2018

Here we report experiences for the school year 2018. Week #1- #3 (introduction part) went smoothly. In #4, many students wrote that simple recursion (such as factorial) was easy to understand. However, for more difficult recursion (such as permutation), included as an advanced topic, exercise was attempted by only a small portion of the students.

When the topic was changed to pictures in #5-#6, many students felt it as difficult, but along with the exercises they understood gradually, and could submit many interesting pictures (Figure 7 shows some of them) with integrated exercise reports.

Figure 7 Some pictures in FP2018 report #6



Middle section #7-#10 contains various relatively independent topics, and preferable topics seemed to differ among student by student. In #7 (topics of sorting), many students had difficulties in manipulating arrays; we felt that exercises in array introduction week (#3) were not sufficient, and planning to improve them. In #8 (topics of complexity and random algorithm), many students seemed to enjoy writing simulations such as “coin toss game” or “dice roll game.” Object orientation (#9) is a seemingly difficult topic, but many students have commented that such kind of “packaging” will be useful in practical software development. #10 is the final week for Ruby, and we thought that dynamic data structure (single linked list) will be difficult. However, many students could solve several basic exercises.

From #11, C section starts. Students had little problems with #11 because exercises are generally easy and identical to corresponding Ruby version, except for advanced f (x) = 0 part.

However, in #12, when address and pointer are introduced and array access defined as pointer arithmetic plus dereference, many students had trouble with understanding what is explained. Yet, they could solve easy exercises based on Ruby experience (semantics of a[i] is the same in Ruby and C after all). However, understanding accurate semantics in C is important to deal with more complex C programming.

Another problem is that students are not very fluent with array handling; perhaps exercises on arrays are not enough in earlier weeks (around #3). In #13, students are required to act upon C string, or array of characters, and again lack of skill with array manipulation was the problem. On the other hand, structure in #14 was not much problem because we restricted the topic to simple operation only. On this part (#12-#14), “advanced” topics were not problematic because only skilled students have attempted corresponding exercises.

Finally, #15 is the second integrated exercise of team task to develop an animation generating program. As students are already used to picture generation in #6, what is new was principles of animation plus team development, both of which were not easy but doable. Also, note that the complexity of C programs varies according to what kind of animation to generate. For example, minor modification of supplied sample programs is not very difficult. Therefore, this exercise seemed to adapt well against differences in students’ levels.

Evaluation method for FP2018

As stated in Policy 5 of section 4.1, the goal of the course is program construction skills, so we wanted all of our end-term exam problems to be program construction problems. Additionally, we wanted to use automatic scoring because we use CBT (computer-based test) and the number of students is large.

Many CBT sites use Multiple-Choice (MC) tests, in which a list of choices is presented to the examinee, and he / she chose one of the choices as the answer. Fill-in-the-Hole (FH) tests can be considered as a variant, in which there are several “holes” in the problem sentences and the examinee answer the words appropriate for those holes. MC tests are popular because they can be scored by program easily. However, regarding the evaluation of programming skill, appropriateness of MC tests are doubtful. We have previously experienced the case in which an examinee who passed the MC-type programming skill tests could not actually write a program from the scratch.

Constructed-Response (CR) tests are alternatives to MC tests, and are also widely used. In CR tests, the examinee writes answer essays, math proofs, or program codes in the answering area (or type them in for CBT). CR tests on programming tasks are widely used when one wants to asses examinees’ programming skills accurately, because the task of “writing program down” is identical to the actual programming task. Therefore, we wanted to use the CR test for our end-term test. However, there is a problem — automatic scoring of program code was difficult (there are several attempts, but they are not widely used yet).

As a solution to the problem, we have developed the Split-Paper (SP) test. Figure 8 is a screenshot of the SP practice problem used in our course. Stated problem is: “Construct a Ruby method which accepts x and returns x4 − x as the result,” and the answer is filled halfway. Students drag lines from the choice are (left area) to the code area (right area), to construct the answer program (indentation is applied automatically). The upper area shows the list of symbols (Japanese KATAKANA characters in our case) corresponding to the choice lines; this list is collected by the custom Moodle module and used for scoring. For the students to get accustomed to SP test, we provided two practice SP tests for all the #2-#14 weeks.

Figure 8 A SP test for #1 practice

For the end-term exam, we used an 80-minute CBT on Moodle, with all problems being SP program construction. As in CL, we prepared seven sets with similar problems. The number of problems was 28. We uniformly gave 2 points for a correct answer (the answer that matches one of the correct programs), and 1 point with one difference from either of the correct programs; we used edit distance to compute this difference. Exam scores are scaled and added with report scores for the final mark.

Results of FP2018

Figure 9 shows the accumulated points of report score. As in CL, frequency around 50 points (all B / b) is highest; most students submitted an ordinary report.

Figure 9 Histogram for FP report scores (n=854)

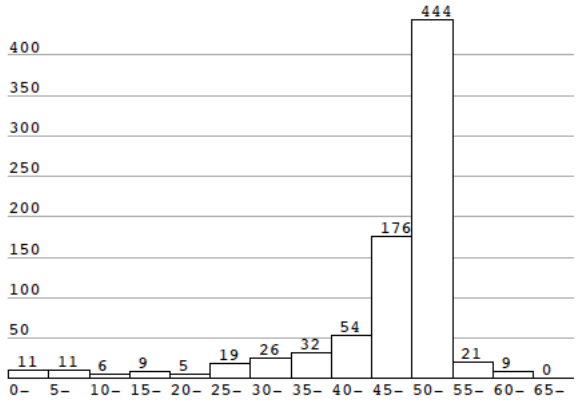
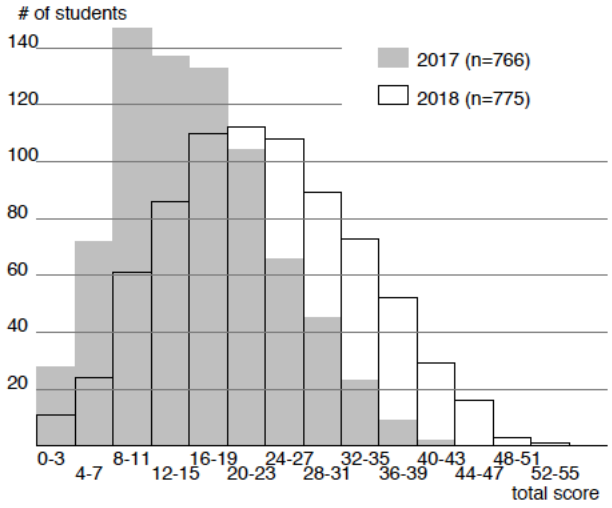


Figure 10 shows the distribution of exam score for the 2017 and 2018 school year. Those distributions, especially the one for the 2018 school year (which is fairly close to normal distribution) suggests that the SP format programming test is an appropriate method for grading students.

Figure 10 Histogram for FP2017 and FP2018 exam scores



Improvement in 2018 was due to (1) improvement of problem set difficulty and (2) improvement of curriculum and teaching materials/methods, as we expected.

In 2018, 95% of the students earned 8 (corresponding to 4 problems) or more points, and 77% earned 16 (corresponding to 8 problems) or more points. As we consider it difficult to obtain SP test scores if one cannot write the corresponding program, we assumed that many students in our classes actually obtained abilities to write simple programs, which is the goal with our FP course.

Table 5 and 6 are a summary of inquiry in the last class hour (#15). As in CL, students seem to recognize the class as useful, and they have learned much from the course.

Table 5 [FP] Q. Was the course useful to you?

Positive	Weak Positive	Neutral	Weak Negative	Negative	No Answer
186	331	145	20	12	15
236.2%	46.7%	20.5%	2.8%	1.7%	2.1%

Table 6 [FP]Q. Have you learned much in the course?

Positive	Weak Positive	Neutral	Weak Negative	Negative	No Answer
279	283	92	26	15	14
39.4%	39.9%	13.0%	3.7%	2.1%	2.0%

Related works

There are many attempts toward effective learning on both computer education (as in CL) and programming education (as in FP).

Among them, those targeted toward self-direction are close to our approach. Isomöttönen et al. (Isömöttonen, V., Tirronen, V., 2013) describe their self-directed approach to basic programming courses. In their course, practice session, independent work days and review session are repeated to enhance self-directed learning. In their approach, the lecturer has to read many lines of code, and review sessions that focus on each students' code; both are not practical in our case of 800 students. Instead of the review session, our FP textbook provides detailed explanations of exercise problems with sample answers at the beginning of next week's chapter, and students study the material by themselves.

Osborne (Osborne, L. J., 2006) reports courses targeted to group work and report writing in advance to technical courses, in order to develop a habit of learning. In our courses, several group works are included, and the student must submit the report every week; the net effect of these designs might be similar to the above case.

Ott et al. (Ott, C., Robins, A., Shephar, K., 2016) state the importance of feedback in computer science education and propose rules toward good feedback practice. Although the volume of direct feedback to individuals is small in our courses (due to large class size), we also provide feedback mechanisms in response to the submitted report.

Automatic evaluation of programming skills plays an important role in our FP design, because only with such measures, we can implement “fully program construction” end-term exam with the least grading cost. However, Multiple-Choice (MC) tests are not suitable for the purpose. Simskin et al. (Simskin, M. G., Kuechler, W. L., 2004) compares MC tests against CR tests in detail and concludes that MC test which measures ability same as CR test (write a program on a paper) can be constructed, yet construction is very difficult. We share the same view. On the other hand, our SP tests problem can be made with a small cost; we just create a correct program, split them line by line, shuffle them and add some extra choice lines.

There are other researchers investigating programming tests of similar format (Parsons, D., Haden, P., 2006); they use the term “Parsons problems” or “code mangler tests.” Denny et al. (Denny, P., Luxton-Reilly A., Simon B., 2008) and Cheng et al. (Cheng, N., Harrington, B., 2017) both investigated correlation of SP-like test score with CR tests, and reported moderate correlation. One of the authors has obtained a similar result (Kuno, Y., Nakayama, Y., Kakuda, H., 2019). Therefore, we consider that our approach of grading FP courses with SP end-term tests is reasonable.

Discussion and conclusion

We described the design and experiences of CL and FP courses for the freshmen year. Both courses have limited class hours (15 weeks of 90 minutes each), and we have to prepare students toward advanced informatics materials in the sophomore year. Contents for the courses are introductory programming for FP, and various informatics-related topics (networks, principles of computers, software development, HTML/CSS and LaTeX) for CL.

There are many contents in both courses, and exercise is mandatory to learn them in spite of limited class hours. Moreover, there is a large difference in students’ background, so we have to avoid novices’ dropping out and experts’ boredom at the same time.

Our solution to the above problems is use of flipped classrooms, many exercise problems from which student choose a few to report (for every week), and grading scheme which covers both novices (all B report results in 50 points for report part) and experts (good final grade requires a good score in the end-term exam). To implement those solutions as a whole, blended learning settings with Moodle LMS are extensively used (distribution of materials, practice pages, report acceptance / returning, fully CBT end-term exams).

That design seems successful, as many students commented that studying not restricted to campus is a good point, and the majority of students earned close to 50 points in report score.

Difficulty in learning programming is also a grave problem to be overcome in the FP course. To attack the problem, we used policies “take off first,” “varying levels of exercises,” “take precedence on practice,” “encourage novices,” “goal as acquiring programming skills,” “no single correct program,” and “code out of your brain.” These also seem successful, and the majority of our students acquired skills to write at least simple programs. Use of SP tests in the end-term exam with automatic scoring was successful and useful at least for our class settings.

As a final remark, lots of feedback from the students (mostly through activity reports and assignment reports in every week) have been valuable for us to continuously improve our course design and contents settings, which is an important benefit of our blended learning design.

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A Proposal for Project-Based Programming Education Using Minimal Instructional Resources at Liberal-Arts Colleges

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ABSTRACT

In Japan, programming education for elementary school started from 2020. In recent years, programming education at k-12 has been focused not only in Japan but also in other countries. However, opportunities to learn to program at Japanese colleges and universities are restricted. If college students have the chance to learn, they will only learn how to write code, not how to utilize what they have learned with actual software development. Due to this background, students have not been able to improve the ability to contribute to software development projects. Although IT-major departments provide advanced classes to learn those topics, non-IT-major students do not have such opportunities. As a solution to this issue, authors used minimal instructional resources and PBL (Project Based Learning) incorporating active learning. Minimal instructional resources mean the authors carefully selected teaching materials. The characteristic of this course is to learn both "introductory programming" and "management of software development" at the same time. In this paper, the authors discuss the policy and design of a programming education curriculum with the above characteristics, and report on the practice of the class.

Keywords: Programming Education, Project-Based Learning, Liberal-Arts Colleges, Minimal Instructional Resources

Introduction

In recent years, with the development of digital society and AI's rapid progress, the way of work in society has changed. By now, such as mobile phones, robots, automated driving of cars, which peoples had dreamed about, have been realized and IT is becoming more and more familiar. According to a survey conducted by the Japanese Ministry of Economy, Trade, and Industry, about 590,000 IT personnel are in demand by the year 2030 (METI 2016). However, the number of information science departments in Japan is not large, and it is impossible to satisfy the demand for IT human resources by graduates of these specialized departments. Thus, the development of IT human resources has become one of the social issues.

In order to supplement these, it is necessary not only to develop human resources in various fields in *rikei* (Engineering and Science) colleges but also to promote IT education widely among students in *bunkei* (Humanities and Social Science) colleges (Hagiya, 2015). Looking at work after graduation, the future society requires the ability to use the software and the knowledge to engage in software development projects, even if the work is not directly related to IT. Thus, as basic education in university, it is necessary to learn to program and acquire such knowledge on IT regardless of the major of *bunkei* or *rikei*.

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The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has revised K-12 curriculum guidelines to start programming education in elementary schools in the year 2020. Moreover, the curriculum in junior high schools and senior high schools is also going to change accordingly. However, the IT curriculum in higher education is up to each university's policies and are not implemented in the same way as curricula changes in primary and secondary education.

Based on these backgrounds, the authors consider it desirable to expand opportunities for learning computer science. Therefore, to do this, it is necessary to develop a curriculum that can be taught well even in *bunkei* university or non-IT significant courses.

The authors' idea is that, given the post-hiring activities, what should be learned through programming learning is to write codes and essential elements in a system development cycle (such as requirement specifications, involvement in projects). In software development, it is necessary to accurately judge what type of system is to be created before proceeding with construction. To overcome these problems and realize both "introductory programming" and "management of software development," the authors designed a new lesson curriculum that combines these two. Also, instead of learning according to the textbook, authors utilized visual representation using figures (i.e., line, circle, triangle, rectangle, and so on) and students' thought on their own. This idea allows for controlling the various processes that impede programming learning, and the authors could lower the walls that beginners hit.

In this paper, the authors discuss the principles and design of the new curriculum and experiences. In Chapter 2, the authors analyze the situation in higher education in Japan. In Chapter 3 and Chapter 4, the authors propose the course design and class experiences. In Chapter 5 and Chapter 6, the authors present discussions and conclusions.

Situations for higher education in Japan

Information Education and Programming Education in Colleges

One of the challenges is to realize information education and programming education in colleges by itself. As mentioned above, in Japan, K-12 education is provided under the curriculum guidelines established by MEXT. However, in higher education, such guidelines do not exist, and colleges operate by their own curriculum.

According to a survey of 750 universities in Japan by MEXT conducted in November and December 2016 (Takahashi, 2017), many undergraduate departments do not teach "Algorithm and programming." Instead, most of them only taught "computer literacy" and "information ethics and security."

Many students learn information literacy as an elective subject, and these courses are how to operate specific applications (ex. MS-Office). Therefore, most non-IT students do not have basic knowledge of computer science (CS) or programming. Consequently, they will enter the real world without understanding that knowledge.

Despite this situation, on March 29, 2019, the government in Japan requested all universities to provide artificial intelligence (AI) primary education to develop AI human resources. Authors agree that everyone

should have a basic knowledge of programming to adapt to the AI era. Furthermore, the authors believe it essential to develop a curriculum in which everyone can learn programming.

However, the traditional programming education style heavily relied on textbooks and lectures and postponed practices to later hours. Such a method will give learners many hurdles, as they must obtain much knowledge; many learners will overflow or drop out. Even if everything is packed and learned, it is challenging for a novice or non-IT student to write a program that uses a necessary portion of them. Thus, the authors propose carefully selecting and restricting what is necessary, thus encouraging them to write their code from the beginning.

The authors think that learning programming is the program's writing, and the requirements specification and involvement in the project are essential elements from the viewpoint of post-employment activities. Because in software development, it is necessary to make appropriate decisions on what kind of system to build, proceed with development according to schedule, and complete the order.

Students majoring in information systems can learn and practice systems development thinking through various subjects after an introductory programming course. However, students of non-IT majors will not be able to do serious software development from an entry-level level and will not have the opportunity to learn the key points above.

The authors surveyed papers published by the Information Processing Society of Japan since 2000 on programming education in liberal arts universities and found 11 peer-reviewed papers, study groups, and symposium presentations. These fall into two categories: three of the article were on educational support systems (Kawamura et al. 2001, Kato et al. 2015, Kato et al. 2017), and seven of the papers were of actual examples conducted in information education subjects (Yoshida T. 2008, Cho 2009, Matsumoto and Yoshida T. 2011, Ishiyama and Kusunoki 2012, Matsuzawa and Sakai 2013, Ishikawa 2003, Yoshida A. et al. 2015). However, they mainly focus on tools and languages, and few articles described methods for programming education itself.

Kawamura presents several points to keep in mind and examples of education using JavaScript in general information education at liberal arts universities (Kawamura 2011). Nishida et al. describe the effects of courseware on learning, and in it, he mentions the impact of using graphics drawing type teaching materials (Nishida et al. 2017). Yoshida T. also suggests introducing programming in 4 of 15 lessons using PEN (Yoshida T. 2008). Yoshida A. et al. describe how to teach minimum knowledge in 3 learning phases (Yoshida A. et al. 2015).

The critical point is how well teachers design a course for limited class hours.

Active Learning and PBL

Another recent trend in the educational domain is Active Learning (AL). Today’s central idea of learning is not passively accepting knowledge, but actively incorporating the experience into subjects, and it is done by associating the existing skills of the learner with the new one acquired (National Research Council and Division of Behavioral and Social Sciences and Education 1999, Papert 1980). The way of learning incorporates this

idea is called active learning. Active learning is not learning passively by listening to the teacher's explanation; instead, learners should take various kinds of initiative with their problems.

The report of the Japanese Central Council for Education, "Improving Connectivity between Primary and Secondary Education and Higher Education," in 1999, was focused on career education in universities. Following that, MEXT recommended AL at universities in August 2012. MEXT's 2016 college entrance reforms reviewed traditional (knowledge-based) learning methods and suggested that future school education should focus on AL (NEXT 2016). In response to this, the following curriculum guidelines of primary school, junior high school, and senior high school publicly announced by MEXT from 2017 to 2018 emphasizes AL.

There are many options for how to proceed in active learning. One of them is PBL (Problem/Project-Based Learning, problem-solving type learning). PBL is initiated by American medical science education in the 1960s and 1970s with the Problem-Based as the axis, and in engineering education, there are many things done under the name of Project-Based (Sometimes "Problem" and "Project" are not distinguished).

Since its inception in medical science and engineering, PBL has been practiced not only in these fields but also in many other disciplines, and its purposes vary, including the development of competencies, the development of problem-solving skills, and regional development/ improvement (Nakayama 2013, Ikemoto et al. 2014, Uchida Y. 2015).

Concerning software development education, it is easy to include PBL as the framework. The reason is that there is an apparent "PROBLEM" toward which software is created, and group development is essential depending on the size of the software. MEXT has implemented an enPiT (http://www.enpit.jp/) project, which aims to develop human resources to add knowledge and develop practical abilities to discover and solve problems in 4 fields (cloud computing, security, embedded systems, business applications) through the cooperation of multiple organizations.

Education with AL/PBL is challenging in various respects. Firstly, these teaching methods take much time, and some teachers and students are burdened and exhausted. Therefore, it is challenging to design a course in which everyone can work efficiently and meaningfully with the PBL framework.

Connections to Society

In recent years, the abilities required in society include the following.

- Ability to solve difficult problems that might have multiple solutions or the existence of a solution is unclear
- Move autonomously
- Achieve results with a team of multiple people

Authors believe that AL at universities requires not only active learning but also a deeper level of education. Is learning genuinely equal to learning a lot? In the next AI era, in addition to these abilities, programming skills are required; however, how can you introduce them to all students?

Even before the term PBL became standard, in the college of information technology, practical training classes for software development have been conducted on a project basis. Also, in recent years, there have emerged practices that provide software development education with an awareness of the characteristics of

PBL. (Matsuzawa and Oiwa 2007, Matsuzawa et al. 2008, Inoue and Kaneda 2008). However, at *bunkei* colleges, there are tight opportunities to learn due to time constraints or restrictions with teachers, misunderstanding of the need for information technology skills, and so on. Authors consider that it is possible to facilitate the connection to society by combining the two, programming and PBL above、 and investigating comprehensively.

In the following chapter, the Authors propose a PBL curriculum that overcomes the problems described so far and learns programming effectively in a restricted time.

Course design

Purpose of the Curriculum

The purpose of the curriculum is to enable learning what is useful after students start to work. Therefore, authors have targeted the curriculum both toward "introductory programming" and "management of software development." To achieve these goals, authors first considered what abilities are required explicitly in both "software development project" and "programming."

The Authors referred to the paper of Komaya (Komaya 2009), and IT human resources white paper 2013 version (IPA IT Human Resource Development Headquarters 2013) concerning the abilities involved in "software development project."

Komaya says that PBL effectively raises practical, independent, and problem-solving skills and develops human resources required by industry. Additionally, this educational method is expected to fill the gap between a company's request and college education. In the latter white paper, authors focused on what the industry (IT company) wanted to emphasize differently than educational institutions.

The authors summarize the top items which the industries and educational institutions emphasize in Table 1.

Table 1 summarizes responses from 564 companies and 239 educational institutions. The first to fourth in the list are general-purpose skills, which both institutions rate high. However, in comparison to the fifth and below place, requirements analysis and project management, which rank sixth and seventh in the industry, scores far lower in educational institutions. These data have shown that corresponds to the divergence of industry-academic awareness pointed out by Komaya (Komaya 2009). Considering social needs, the authors have selected seven items listed in Table 1 and "software development process" skills. Note that four out of those eight items are related to software development.

As for the ability related to "programming," it is unsatisfactory if "Simply learning the grammar of the language" or "Just copy the example code and run it" is the actual learning contents; in addition to these, learners need knowledge of software development. However, in many colleges (especially in *bunkei* majors), students tend to have low interest in those technical topics, and lesson times are short. Therefore, it is challenging to have students experience full-fledged system development.

Table 1 Comparison of Important Education Items

Rank	Item Name	Company	Educational Institutions
1	Communication Skill	61.2%	59.4%
2	Problem Solving Ability	42.6%	29.3%
3	Writing Skill	30.7%	20.1%
4	Teamwork/Cooperativeness	25.5%	24.7%
5	Programming Skill	22.2%	19.2%
6	Request Analysis	12.1%	3.3%
7	Project Management	11.7%	8.8%

Thus, authors have decided to allocate minimum hours to programming languages and algorithms and assign remaining hours to "making things" within Project-Based setups.

Based on the above policies, the authors set the following four goals:

(1) Programming:

Programming should realize what you thought as a code, not just the experience of driving an example

(2) Project management (PM):

Students learn how to proceed with projects through group work. Besides, they should gain skills in effective communication, hands-on reporting, and presentation

(3) Requirement Analysis:

For purposeful development, students should experience analysis on "what is important" and "what type of function is implemented."

(4) IT skills:

Students should utilize various IT tools for editing and de bugging code, sharing information for group work, creating a deliverable, etc.

Curriculum Structure

Goals (2) through (4) mentioned in the previous section will not be cultivated through individual learning but nourished by group work.

However, since novice students do not know programming well, writing codes in groups from the first lesson is challenging. Therefore, the authors allocated traditional lecture-practice-style programming lessons in the first half of the classes. Afterward, the authors have configured students into multiple teams and implement the group work of software development in the second half (Uchida N. et al. 2017, Uchida N. 2018).

By doing this, even students with no prior programming experience and no software development background could help each other in group work and could experience development tasks. Additionally, those types of knowledge and skills acquired through repetitive practice could be learned experientially while repeatedly practicing in the project.

Table 2 shows the course contents for 15 class hours (1 class hour corresponds to 90 minutes).

Table 2 Course Contents

Lesson	Contents
1	Introduction
2	Selection and Repetition
3	Control Structure and Arrays
4	Procedure and Abstraction
5	2-Dimensional Arrays and Images
6	Summary of programming part
7	Group creation / Assignment and goal setting
8	Brainstorming and Specifications
9	Design / Decide share / Production
10	Prototype / Intermediate document creation
11	Intermediate presentation / Review of specifications
12	Production / Unit test
13	Code review
14	Production / Integration test
15	Final presentation (summary)

Programming Part

This course is for non-IT course students who are studying programming for the first time. Students need to develop the skill to "write code as they think," which will be required in the latter part of the class. The authors used the guidelines of Kuno for learning programming (Kuno 2016).

The authors think that the following should be avoided in programming education.

- Requirement to "just memorize" lots of knowledge written in textbooks.
- Repeated practices with drills and other materials targeted toward memorization, e.g., "what code pattern appears most in the examination" and so on.
- In testing, asking students to solve many problems in a short time in a "remembered" way.

Instead, the authors think that the following points should be pursued in effective programming education.

- Students should understand "minimum rules for programming" and make those rules repeatedly in various ways. Thereby they should practice "how to think like a programmer."
- Students should choose the problem they solve according to their skills and interests, which results in better learning experiences and better motivation.
- Students should understand that there are large varieties in writing "correct" programs, and there is no "single correct solution."

Moreover, the conventional textbook has the following undesirable features.

- Rules (syntax and functionalities) of the programming language are explained one by one in the

textbook, and students are expected to learn (or memorize) them one by one.

- Many of the problems are not about "writing a program," but about recalling rote knowledge of the explained contents.
- There are only a few examples of the program with through (or detailed) explanations, suggesting bare memorization of those examples.

Alternatively, authors have adapted the text with following features.

- Minimum rule of thumb is explained, and students are encouraged to apply those rules through various exercises.
- Many numbers of exercises are provided with various difficulty; students choose their exercise to solve according to their levels and interests.
- Many topics and example code are provided, and students choose whichever topic to attract their interests.

Each lesson consists of "Explanation → Exercise → Assignment in the classroom (Assignment A) → Homework until the next lesson (Assignment B)." Authors prepared exercises from straightforward ones (Students can submit if they modify the example a little) to sophisticated ones. Students choose a problem according to their level from among those exercises. In this way, each student can obtain their learning according to their level, and it is possible to write "one's code" instead of "copying and running the example or someone else's answer."

As mentioned earlier, when learning programming, novices must learn much from the first lesson. However, there are too many challenging things for them. Hence authors designed the minimal instructional resources, which utilize code for drawing diagrams (round, triangle, squares, and line). Using these, students learn the necessary programming items (selection, repetition, function, arrays), just as in standard methods.

In this part, although the contents are minimal, the goal is to write one's code and to acquire the minimum programming skills necessary for the project.

Project Part

In the second half (starting from the 7th class), four to five students form a group. This part aims to acquire practical skills of programming by experiencing the project and gaining the ability to operate the project.

Based on the programming skills acquired in the first half, they set up for more practical tasks and experience request analysis (corresponding to target (3) in section 3.1) to decide what type of work to do. Although it is difficult to learn everything in one project, we have prepared an environment in which practical learning occurs in this curriculum. Therefore, the project can be completed within the planned timeline and with the consciousness of project management.

As a failure of PBL, several prior research (Inoue and Kaneda 2008, Uchida Y. 2015) mentioned the following two.

- One person works in group work, and the other members do nothing
- The quality of output varies depending on the ability and skill of members

For these problems, the authors thought it would be beneficial to clarify the group's role and share information. As one of the tools for that purpose, the authors use a worksheet to record the sharing and progress each time.

Another idea is to set up multiple opportunities for all the students to share how each group is working and to have a place to exchange ideas among the groups, not just in the group discussion. (Corresponds to the 11th week's interim announcement and the 13th week's code review in Table 1).

In this course design, as an essential assignment task is identical throughout the groups (only differ with what to make as the output), all students of all teams are sharing the same goal. Therefore, they could discuss the same viewpoint. In each group, spirals of "production (creation)" → "sharing" → "reflection" are formed, and in the classroom, the flow of "sharing" → "empathy" → "competition" is created. In this design, students could brush up their programming skills through compensation within each group, and those skills could further be expanded through the sharing of information within and among the groups. Also, students' motivation could be kept high due to the awareness of competition among the groups.

There are four expectations for these processes' learning effects (to organize one's thoughts — make a trial — complete one's work) will provide.

- Supplementing programming skills that were insufficient in the first half.
- Expand your scope by sharing information among groups.
- Motivates you by creating a sense of competition among groups.
- Experientially learn how to communicate accurately.

Classes Experiences

Class Outline

Here authors describe the class experiences at Ferris University during the second semester of the school year 2017 and 2018. Ferris University is one of the oldest women's school in Japan. The course was in the Faculty of Global and Intercultural Studies. It was an elective subject for first through fourth-grade students and was also open to other undergraduate departments (Faculty of letters and College of Music).

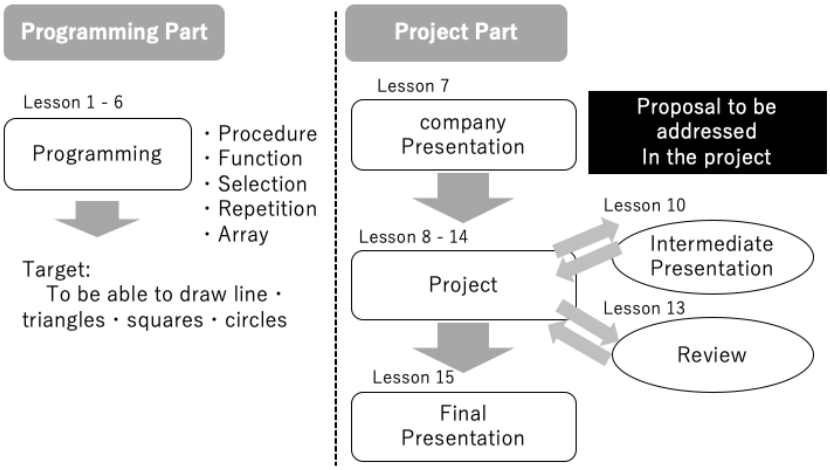
Classes were conducted once a week in 90 minutes. As described before, introduction to programming occupies weeks 1 through 6, and the remaining weeks project activities (Table 1). The authors' conducted a competency evaluation test in the second and final week.

The authors used the Ruby programming language due to simple syntax and suitable execution environment. As the author could not hire an assistant in this course, the author recommended pair programming to get by with only one teacher (one of the authors). The classroom environment is Windows 10, and it is a simple setup just installing Ruby language and ImageMagick (image display software). As an editor, initially, the authors used the Windows standard Notepad. The authors changed it to Atom as of issues with Japanese code and consideration for Mac users. The programming part's goal was to draw figures (lines, triangles, squares, circles) necessary for the project part, focusing on basic control structures such as selection and repetition. Using a graphic has the advantage of being able to output an execution result visually. In the

project part, every group consisted of four members. Authors have determined the grouping based on the submission, individual students' understanding level (as observed in previous lessons), and intermediate questionnaire. The intermediate questionnaire consisted of self-evaluating questions about programming understanding, group work skills, and other generic skills.

In the 11th and 13th week, authors have set up an interim presentation by each group, sharing proposals, and each group's progress. Additionally, in the 15th (final) week, the lesson was held in the cooperating company's conference room. Figure 1 shows a schematic representation of the course.

Figure 1 Overall Flow of the Course



Submitted Issue

Many of the precedent cases of PBL used real-world system development as the class material. However, it is too much of a challenge to tackle such issues in beginners' programming subjects. Therefore, the authors have asked the cooperating company to provide a practical but simplistic task for the student projects.

Authors strived hard to assimilate real-world processes and devised a process not so difficult for students. There are many examples of programming using graphics. However, there are no examples of connecting the task to manufacturing. Many of the cases are the ones that individuals tackle. Authors thought that students could work on drawing in a process similar to system development, with themes and materials they were interested in independently. Additionally, the authors have asked the cooperating company to provide a straightforward task for students' projects.

The specific assignment was to create a design toward specific targets (each group decides their goal) and a GIF animation for advertising. The materials are nail stickers (2017) and plastic files (2018).

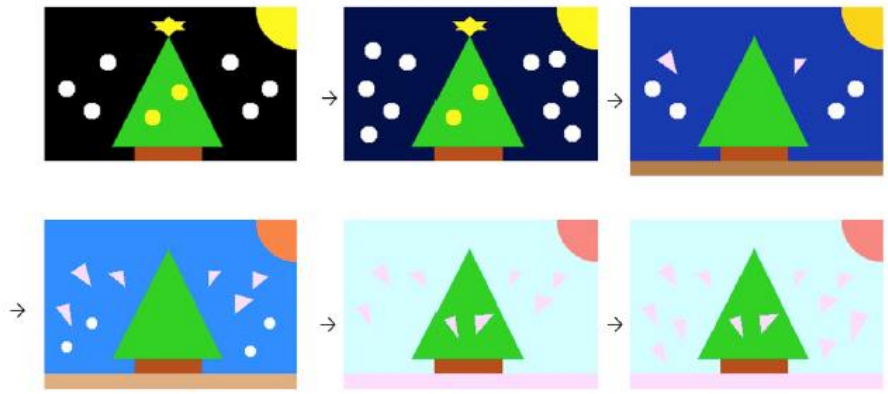
Case in 2017

The assignment was to design a nail sticker that a female student is interested in. Students created a design for a nail sticker toward some specific target (each group decides their target of person) and a GIF animation for advertisement. Instead of working individually on each task, students share design and work together

among team members. Figure 2 shows part of the created nail sticker. Figure 3 shows the development of part of the animation.

Figure 2 Outcome: Nail Sticker

Figure 3 Outcome: gif Animation



Case in 2018

Using the reflection in 2017, authors changed the way the programming part goes and the text. The authors decided to draw pictures aggressively from the first lesson, excluding mathematical elements as much as possible. The authors also developed the intermediate evaluation (end of the programming part) into the design of the toilet roll wrapping. Figure 4 is a part of the works.

Figure 4 Outcome: Toilet Roll Wrapping

In the project part, the authors changed the nail sticker into a clear file folder and worked by the same process as in 2017. The theme was to combine three keywords: Yokohama, ZOORASIA (zoo), and Rose. Figure 5 shows the design of the created clear file folders.

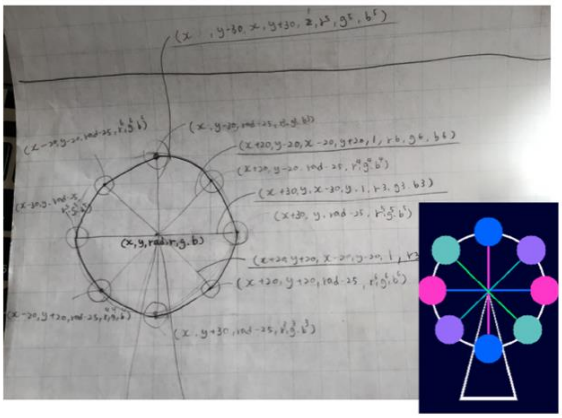
Figure 5 Outcome: clear file folder

Discussion

In this research, the authors focused on the knowledge necessary for connecting from university to society and examined how to introduce programming education meaningfully in a restricted environment. As in previous research (Yoshida, T. 2008, Matsumoto 2011, Nishida 2017), the authors used graphic drawings as teaching materials. Besides, the authors prepared to teach using minimal instructional resources and project-based settings in this course. The purpose is to enable students to confirm their thoughts through programming.

The students drew the sketches they had considered, wrote and executed the program, and output the pictures (Example: Figure 6). These course ideas foster the logical thinking skills needed to get the computer to do the intended processing.

Figure 6 Students' Rough Idea and the Resulting Output



In classes that involve practice require a teaching assistant (TA). However, preparation for the TA is difficult for courses in non-IT colleges. Therefore, the authors adopted the pair programming method in the programming part so that even one teacher can manage the class. Moreover, in the project part, students gained skills with team members when they found a wrong part and a solution with each other. Matsuura et al. and Hirai et al. state that pair programming among novices does not necessarily lead to good results (Matsuura et al. 2003, Hirai et al. 2012). However, the authors got the opposite effect from the feedback of pair programming in the programming part. The responses from the two students show the effect:

- "Today, the first grader who is paired with me succeeded to run the program well for the first time. I saw that she could get to grasping a knack."
- "Since this class was a pair work, I could find solutions and mistakes in teaching the pairs and thinking together when I got an error. With this experience I feel that I could get to gain the skill."

Selection or repetition is one of the things the authors want students to learn as they learn programming. The problem of programming learning using figures is that learners plot just the figure without using these. The authors had the same situation in the class. Furthermore, because the task was easy for the students, they often wrote code without making blueprints. The reasons are in the teaching materials. The drawing figure was uncomplicated, so most concentrated on putting figures (such as lines, circles, triangles). Thus, it was challenging for them to use the kind of selection and repetition.

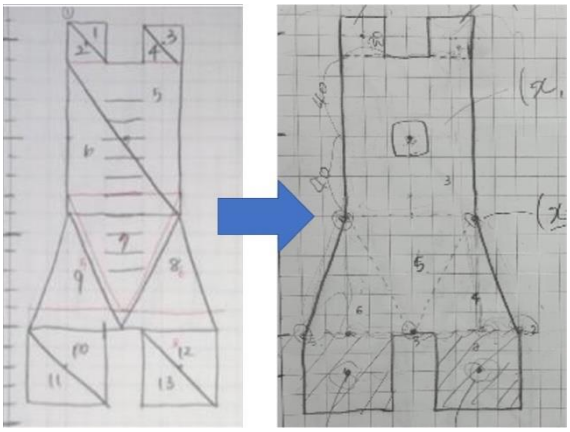
In the class, authors have taught students about the importance of learning programming languages and learning how to use the programming language in software development. For this is an introductory-level activity at the University of the liberal arts, the quality is different; however, this learning becomes understandable by simplifying the teaching materials, and students have been able to solidify the basics knowledge.

In many programming educations courses and manufacturing PBLs, it is not easy for students to rethink and reinvent various solutions after their work. However, using the minimal method makes it easier for students to understand visually and secure time. Therefore, they can develop the power "to work on what you do not

know the correct answer," required in the real world by examining the ideas in the mid-term presentation and code reviews.

Thus, the authors could set up an opportunity to learn empirically. Figure 7 shows the student practice. At first, she thought to use only triangles. She thought this way is simple. However, after a code review, she noticed that triangles and rectangles simplified the structure.

Figure 7 Rethinking the Configuration



However, on the other hand, there is a difference in the quantity of activity to assign tasks and quality of the output as a drawback of PBL. In primary and secondary education, students study the same content (goal). However, when they work in society, they do different work with each other, not do the same thing simultaneously; they distribute the roles. Therefore, it is essential to be conscious of what kind of work they have in class, share it, and complete it by the deadline. The authors did not have a problem because clarifying the purpose of the students is to divide the task's role and work on the worksheet in every lesson.

The authors consider that authors could overcome "differences of output quality between students" and "quantity of burdens of students and teachers" by applying constraints without imposing too many tasks (minimum program knowledge, easy-to-understand goal settings). The authors simplified the idea of this course with small skills. However, the motivation and the effects of learning of learners have become a lot.

Conclusions

In this paper, the authors described the design of a new course curriculum based on PBL, which achieves both "introductory programming" and "management of software development" with the minimum number of hours. They have only acquired entry-level knowledge, but this proposed curriculum was very successful as an entry-level subject.

Many *bunkei* university classes are centered on traditional lecture-style and have little practical or learning experiences. In such an environment, it is not easy to expand the situation to learn actual (usable) programming. Therefore, the hurdle for students to learn programming is high. Our curriculum design might lower those hurdles.

In project-based learning, the burden on teachers is also an issue. Further, a teaching assistant is a "must" in programming practice classes, which is difficult in *bunkei* university. In such cases, the burden on teachers will become doubled or tripled. However, after the projects are successfully launched in our curriculum design, students start to learn by themselves / among themselves toward their goals, lowering the burden noted above.

From this study's practice, the authors got good results on the learning effect of utilizing a real project even on a small scale. The student's learning impact in the project part is high; authors guess that the appropriate goal setting realized engagement (MEXT 2015), which improves the students' motivation and satisfaction after the class.

Overall, our curriculum design of "programming and project in one subject" could easily be transferred to many environments and will contribute to better class experiences both for students and for teachers.

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Short papers

Digital elections in Kenya

George Katete[30]

ABSTRACT

This article is inspired by studies on digital trust at the workplace. The article seeks to bridge the gap on lack of explanations of sound academic studies and theorizing on why, even though elections can be held in African countries using technology and digital tools, the contestation of the outcome mirror the past happenings where blame is pointed on the electoral institutions as equally on people running the institutions and technology. In giving specific context of Kenyan situation, the study benefits from a wide theorization and generalizations from literature on trust in the functions of institutions, people and technology as well as linking the three in broader framework literature of the project digital trust in workplace. It concludes that holding of elections using digital technology did not yield to the desired expectations of solidifying trust in Kenyan electoral process and in the entire political domain. The institutions are from a liquid trust background and much frustration that enable making decisions on use of technology does not necessarily lead to better results.

Introduction

The stakes in conduct and management of elections in Kenya have led to (dis)trusts on whether the human led management of elections by the Kenyan management body - the Independent Electoral and Boundary Commission (IEBC) can deliver a transparent, accountable and variable results. Utility of digital instruments mean that human physical touch with election materials and data storage which is the norm in conduct of elections and processing the results are no-longer at the center of the data administration of votes but technologically aided which involves recording of the votes cast at the polling centers, tallying of votes at the grassroots levels in constituencies and county centers spread across the country, and transmission of the same to the national tallying center in Nairobi. All data of votes cast to various contenders by way of digital voting are stored in servers by the technology provider, which for the case of the 2017 election - being French based company, OT Morpho. In using technology led election process and during voting, understanding the system is not within the interest of the voter, but the management organ responsible for the process, the involvement of data storage service provider and the candidates that are competing for various posts and their close aides.

The procedure and process for taking part in digital election and voting involves procuring the digital electronic tools, testing the same and then getting the Kenyan citizens to become digital voters. The IEBC procured technology from the west. This involves purchasing and mounting of digital gadgets and utilization of the same at the polling stations spread across the country in the Election Day. These technology enhanced

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tools and system included the Electronic voting Identification system (EVID), Candidates Registration System (CRS), Result Transmission and Presentation System (RTP) and Biometric Voter Registration System (BVR).[31] Data from BVR machines are then stored in a centralized storage server.

According to the political class in Kenya, the cure to the highly contested election disputes and distrusts on Independent Electoral and Boundary Commission (IEBC) – the institution charged with management and conduct of elections in Kenya required a shift from a human led process to technologically led election process, known as digital election. Over the past three consecutive election cycles, given the huge following the opposition leaders amass on the one hand, and the power held by the incumbency, on the other hand, electoral disputes and violence have escalated every election day and in the aftermath. Following the adoption of new constitution and creation of county governments, election disputes heightened following the political positions that include Governor, Senator, Members of Parliament, Women representatives and Member of county assembly.

The decision to hold the 2017 election in Kenya using digital tools was arrived at to respond to calls from frustrated Kenyans from various quarters, particularly from the political class within the country to adopt the use of technology with a belief that it can improve the trust needed to contain disputes arising from contested outcomes.

The realm that this paper explores is the implications of utility of digital technology in enabling trust among people, technology and institutions in Kenya. Are the Kenyan citizens confident that their governments protect their personal information and thus their electoral choices? What is the nature of the current trust in digital instruments to conduct and manage Kenyan election by the electoral body and why?

Conceptualization of the Digital Kenyan Citizen and Dimensions of Trust

Writings on the subject of 'citizen' (traditional), 'digital citizen', 'trust', and 'digital trust' have developed over the year (e.g. F. Svenson et.al 2020; Baseer et.al. etc.). Yet, their meanings have remained fluid, dynamic and changing in reference to the subject under study and practice. Conceptualization of these terms in this particular paper is necessary with a view of operationalizing digital trust in the Kenyan context. In the understanding of citizens' transition into perceived or real digital citizens, the conceptual meaning of the assumed transition is hinged on the concept 'trust'. Thus, digital citizen is bound by an element of trusting in

[31] The EVID is a poll book. It is a laptop finger print reader or a hand held device connected to an inbuilt finger print reader. It is used for identification of real voters to avoid impersonation.
The CRS is a register consisting of candidates vying for various seats in the election. It is a technologically enhanced candidate's book containing their details and their political parties affiliations. It consists of over 12,000 candidates vying for 6 distinct political positions. These positions are president, senator, Governor, Member of Parliament, Women reps and county assembly ward representatives.
The third component is the Results Transmission and Presentation System (RTPS), transmission of results is done via mobile phone which is configured with signed results sheet known as form 35. After provisional results are tallied at the polling stations, they are transmitted at the constituency tallying centers, then the county tallying center before transmission to the national tallying center in Nairobi where the results are confirmed then announced to the citizens.
BVR – Biometric Voter Registration System which is a system for registering voters and consists of a laptop, a finger print scanner and a camera. An individual goes to register in a center where he/she will ultimately go to vote during the election day. BVR stores physical details of the voter which include facial image of the voter, finger prints and personal identifiable information (PII) data - name, gender, telephone number, ID no./passport number, street address etc.

technology given the influence that the later creates in the fulfillment of their being and life. The meanings can be derived from combining the two terms ‘digital’ or ‘trust’ to have a holistic understanding of conceptualization of digital trust.

Digitalization shapes the dimension of citizenship in Kenya, and thus its conceptualization and its practices (e.g. Ndemo and Weiss 2017, G.O.K report 2020). Similar to the general observation by Louise et.al, more and more people are turning to internet to get informed to communicate with others about policies to contact politicians, to sign petitions and to form social movements with like-minded peers. This is increasingly experienced in Kenya today. More so, the conceptualization of digital citizen for its use can be premised in the work of which is relevant for studying meaning of Kenyan digital citizen. Digital citizenship can be categorized according to different definitions and empirical approaches to digital citizenship in terms of ethics, media and information literacy, participation/engagement and critical resistance. Synonyms include internet citizenship, cyber citizenship, online citizenship and media citizenship. This understanding can further be informed by three strands of normative digital citizenship, conditional and contextual. In normative strand, digital citizenship is understood as the ideal way to act online (Louise et.al). The normative strand defines digital citizenship as the norms of appropriate behavior concerning use of technology. Conditional strand understand access to the internet to be a necessity or even a right as it allows individuals to be politically informed, perform their civic duties and acquire economic gains. Contextually, digital citizenship is seen as a content dependent concept interwoven with offline citizenship and shaped with political, cultural and socio-economic relations. Digital citizenship is marked by control and power struggles. The three strands can juxtaposed to give a clarification for a Kenyan digital citizen. Appropriate behavior online is experienced when Kenyan digital citizens are able to apply ethics in their conduct and practices of communication and the information exchanged are credible and can be verified. This applies to how citizens’ identities can be reliable and decency upheld in interactions in the internet. Kenyan citizens are conditioned to access information and to communicate using to the new modes of communications as dictated by the existing technology, which become part and parcel of their daily lives. Moreover, there is a significant role which dominant communication content plays in influencing the reasoning of Kenyan digital citizens. In the day to day life, news from social media pages that dominate the social networks spread and become part of the content that sway or shape public opinion which sometimes remain uncontested. This is where the boundary of credible, accurate and true news on the one hand and fake news on the other is thin, fuzzy and unclear.

The definition of digital trust to refer to the confidence that a digital society attains in terms of data protection and privacy protection - as rightly pointed out in Hintz et. al (2018) and also applied by Svenson et.al. (2020) conforms to the Kenyan context in that in Kenya a digital society slowly transforms the citizens lifestyle. Digital society refers to that society which has literacy in utility of digital processes within a social set up. Hence, digital literacy is a determinant of trusting in digital values. Further taking into account the principles of lawfulness, fairness and transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity and confidentiality, and accountability Svenson (2020) (cited in Gonzales/ de Hert 2019). Launer points out that technological innovation disrupt lives, changing the way people believe in ability, reliability and power of

something. Digital trust from a consumer point of view is an outcome that you can influence but not control and refers to the level of confidence in people, processes and technology. Drivers to digital trust are safety, security, reliability, privacy and data ethics.

A digital citizen finds himself or herself within a society consists of digital citizens or netizens. They are those who have access to digital material resources and are skilled to take part in societal institutions. Trust in data protection is an important determinant in a digital society. Imaginaries of information use, responsibility and citizenship are variables of digital society and digital citizenship. The concept trust has been well conceptualized in psychology literature and its meaning go beyond fondness and attachment about something as being of positivity.

Trust can be liquid or solid in dimension; this is according to Bauman (2016). It is likely to be more short-lived, when it is liquid – that is temporal and shallow, and durable when trust is deep and permanent or long-term. Thus it is solid trust when people, processes and institutions can have normal exchange and reliable as well as confidence in relating the people, technology and institutions. Whenever trust is shallow in any of the three elements, then a triple trust crisis results. Trust in self, in others and in jointly built durable institutions lead to solid trust. Thus, lack of trust in institution causes others trusts to dwindle. However, search for a new reason based democratic institution which is ICT based which is thought to further a democratic system brings totalitarianism breeding anxiety, fear and trustlessness making it liquid. Liquid trust is defined as ephemeral, access based and dematerialized while solid trust is defined as enduring and materialized. The modern liquid trust generated its other – the digital non trustworthy or ethics-less design of a digital world. Whereby we do not trust anybody. In addition, any misunderstanding on individual digital confidence could result in overinvestment.

Traditional citizenship refers to belonging to a nation and revolves around different lists of expectations framed as rights and responsibilities of the citizen. Citizenship is a concept that is affected by societal and historical events, which are under constant change.

The Problem of Liquid Trust In Elections: Possible Theoretical Explanations

Since 2005, a growing number of Kenyans have trusted the use of technology. Communication exchanges of social, economic and political nature occur via mobile phones. Kenyans became digital citizens given their contact with technology and its utility evidenced by how they rely on new communication technology. Communication is transforming and nowadays held in social media platforms such as WhatsApp, face-book, YouTube using smartphones owned by a number of the urban working class, students, and businesspersons, workers in the informal sectors of the economy and even youth in informal settlements. Thus, owning phones, which can connect to internet, have become a necessity in life and no longer luxury among the Kenyan population (Ndemo and Weiss 2017). However, with proliferation of communication platforms, Kenyan society has been faced with trust crisis on what to consume as credible information. This is regarded as fake news dilemma. Fake news undermines the informing function of the press by eroding the legitimacy and credibility of traditional reliable news outlets creating uniformed public unable to participate effectively in democracy.

Today, in Kenya, as elsewhere, Fake news impact on political space since it hinders the prospects of Trust building. The society become divided more so, leading into questioning whether technology is an enabler of trust or destructive.

To many, digital life is a good thing and enables people to conduct their daily activities with speed and saves them time. This change brought by technology is also confirmed by the existence of mobile money transactions in Kenya as provided by safaricom.ke, a dominant mobile network provider in Kenya (Government of Kenya Report 2020). For over two decades transacting money via mobile phone has shaped economic dimensions of Kenyans lives and possibilities of transferring cash without involving banks, which many people perceive as slow and bureaucratic but there have been worrying trends on safety of personal private information (Makulilo 2015). To many, trusting a bureaucratic organization which requires a lot of personal information, physical presence and probing caused a shift in trusting mobile banking, thanks to liberalization of financial transactions in Kenya and the faith in technology.

In the political domain, use of the digital has grown exponentially but with mixed outcomes in Kenya. Kenyan political class put a lot of confidence that technology was required to deal with consistent disputes arising from contested elections. But there are also flaws in technology, either inherent within the device or human generated blunders, so technology can stall during election leading to unexpected outcomes. There were a number of cases recorded where Biometric voter devices such as thumb or facial sensor failed to verify voter identity in the presidential poll according to various election observer groups such as from the AU and the E.U. observers. Thus seeing the world through this lens of technology is deeply problematic because placing too much confidence in new scientific discoveries means that the potential flaws in technology are not detected leading to disasters. Further it was also clear that Biometric technology could not fully prevent multiple registrations. Data on those who were registered as voters require performing an audit which should be taken care of by personnel and not by way of using technology which exposes the system into duplication. Moreover, technology was used to manipulate voters' data and were set to break down, yet not publicly admitted by the IEBC as well as by the companies who seek to promote their use. The digital equipment in many occasions did not function as intended during election period. This was a dilemma, which has been referred to from various quarters as the dilemma of modern liquid trust, which generates the digital non trustworthy given that we do not trust anybody (Baumann 2016). Given that there were distrusts on human led process as well as on the institutions charged with elections Kenyan political elite wish to trust on new technology was expected to change the distrust held on how election was conducted in the past to trusting the outcome based on the new technology that was utilized during the Election Day.

Cheeseman (2018) writing on the same topic demonstrates the complexities that underpin digital processes that can render elections less transparent. In Kenya, attention which should be paid to political factors within which technology is introduced was overlooked by the management body. By introducing new technology where it is least effective, the electoral body was investing on improving the quality of democracy by entrusting the digital equipment whereas the institution had not dealt with weaknesses involving distrusts that Kenyans held on its capacity to deliver credible results. Although technology was a new thing, it had damaging effects

on the process of management and conduct in Kenyan election after a number of failures directed on the devices used and the personnel charged with the duty of overseeing their functionalities became pronounced and observed by the public. This undermined the domestic confidence in electoral outcomes. As voting continued, so did trust in digital tools decreased with several experiences of the gadgets failures, where personal data stored in EVID, whose safety, protection and confidentiality were not guaranteed.

Even though the IEBC is the institution charged with conduct and management of elections in Kenya, it is an institution which comes from a liquid trust background. Although put in place to spearhead democracy, trust in the institution have been at its lowest. Kenyan election contestation is embedded on particular problems which Commonwealth observer group identify as bribery, voter intimidation and corruption and these vices cannot be prevented by digitization. While it resorted to utilizing the digital equipment to enable it redeem its image, this move did not result into confidence but instead generated dictatorship, which turned out as an inevitable outcome similar to its past conduct and public image. When the courts annulled the election it came out that there were problems of reliability on the institution because of its inability to promote an important principle of digital trust - data ethics.

Another liquid trust problem is in regard to resource wastage and overinvestment in technology which is not in tandem to the Kenyan economic demand. Kenyan government through the electoral body over invested in technology. By way of procuring and purchasing digital tools including servers for storage of election data from Europe, using huge sums of money, the entire venture turned out as an expensive investment. This means that the lack of institutional and individual digital confidence ultimately results into over-investment in technology. In the Kenyan case, it was clear that the government through the IEBC invested to improve efficiency against electoral process, leaving other important concerns including voter bribery, voter intimidation, double registration of voter – all of which were unaddressed. As rightly observed by Cheeseman, digital technology can encourage narrow focus on parts of electoral process to the neglect of broader political environment and campaigns. The pitfall of digital technology utilized by the Kenyan election organization was mainly focused on improving the efficiency other than transparency and accountability which are the core issues of concerns required in measuring acceptability of the outcomes. That attempts to buy trust turns to be very costly as evidenced by a huge capital by the government to procure technology from the west by the end of accessing the gadgets which were still not within their reach, the economy suffered. Trust cannot be cheap, but it cannot be placed on equipment alone. Ryan points out that trust, is indeed a prime requisite for success including in societies that have been culturally deprived for many years. But trusting too much in technology without putting trust on people inevitably creates a circle of distrust. Ryan calls this the modern trust crisis. There has been erosion of Trust in institutions including government and politicians, banks and financial service providers and journalists and news services. This is compounded with dissatisfaction and lack of confidence in the functioning of institutions of democratic government, which has become widespread.

Conclusion

The background of liquid trust in Kenya is hinged on drawing from entire election that was held in 2017. There is lack of individual trust among the political class and population, there is also lack of trust on the institutions that are responsible for election and the personnel, and ultimately this multiple form of distrusts accumulated to affect digital trust. Trust in a combination of other aspects of life causes trust to technology, and the reverse is the case if there is no transformation of distrust and thus relying on digital tools only leads to a pronouncement of further distrust. This argument holds on the actual events that occurred in election in Kenya from procurement stages to voting and tallying of election results. In procuring digital tools for elections, there were misunderstandings from political class on which instruments would meet the societal needs. This sense of distrust had a spill over into other institutions concerned with election resolving election disputes such as judiciary. Disputes were raised on credibility and procedure resulted into nullification of presidential results. There were challenges on logistics that undermined the citizens' trust in the procedures to be met by the IEBC in order to distribute the equipment across the nation. Authors emphasize on organizational and logistical challenges that digital technology can generate, given the heavy dependence of electoral commission on support and expertise provided by international community who fund and provide technology or digital equipment. Broader management structure was given little attention but more emphasis was placed on availing the digital equipment to Kenya and this disconnect was portrayed in the manner by which gadgets were breaking down and not properly functioning in the Election Day across the constituencies in Kenya. Further, technological failure was linked to the insufficient attention paid to the broader management structure needed for it to function.

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Addressing the Gender Data Gap in the Market for Smartphones: Sustainability-orientation and consumption

Frithiof Svenson[32]

ABSTRACT

A robust 'gender effect' has been established in research on sustainable consumption: women are more likely than men to express concern about sustainability. Gender remains a key feature of many consumer identities. Understanding which consumers are more likely to respond positively to different sorts of product innovations and appeals, and which are not, is clearly important to meet consumers at their needs and wants to support sustainable consumption.

In the market for smartphones, the need for sustainable measures is great. The results of a survey within the Fairphone online brand community show that the phenomenon of a 'gender effect' is present, but not straightforward. An outlook for further research in this industry is provided.

Keywords: smartphone; gender and environment; sustainable consumption and production; brand; sustainable marketing; consumer research;

Introduction

The current hyper consumption in the sphere of mobile information and communication technology (ICT) devices constitutes the question if and how the consumption of smartphones should be designed differently, putting perspectives of product design and consumption patterns at center stage. To enhance sustainability in the smartphone market it is crucial to understand the social and cultural values, beliefs and practices embodied by consumers. In this context gender is an often neglected sociocultural dimension even though it remains a core tenet of identity (Schroeder 2003). We focus on the socio-cultural context of consumption, in which communities, peer groups, and social networks provide guidance for consumer choices and practices.

Theoretical Background on Gender and Sustainability

Our conception of the link between sustainability and gender builds on the approach of earlier studies in the German context (Vinz 2009, Hofmeister and Mölders 2006, Jaeger-Erben et al. 2012). Here the position of cultural feminism is favored, which means that we acknowledge gender to be a social construction. This value-based decision entails that we opt to focus on the recognition of gender in sustainability research rather than a deconstruction of gender per se (Fraser 1998).

'Gender is cultural… referring to women and men as social groups. Sex is biological; [used] when the biological distinction is predominant' (APA 2010, 71, Gentile 1993, Wood and Eagly 2010).

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Gender is understood as something that is socially embedded and continually adopted into human action, consisting of institutions, bodies, artefacts and knowledge (West and Zimmerman 1987). The social construction of gender may be grasped along three dimensions (Harding 1986).

- The individual dimension: Are there gender differences vis-à-vis individual concerns, attitudes and behavior?
- The structural dimension: Is there a gendered division of labor? What are the social practices emanating from this constellation?
- The symbolic dimension: How do systems of meaning and the values assigned to artefacts differ?

Both, consumer psychology and sustainability marketing (McDonagh and Prothero 2014) focus on the individual dimension of the above named. Research in consumer psychology has established that when it comes to sustainable consumption women are in general more concerned about environmental values (Koos 2011, Zelezny, Chua, and Aldrich 2000). After several decades of research in sustainability, a large gap remains between the attitude consumers report toward sustainability and the effective action. The methodological level of analysis shows 'a micro-orientation [that] has led to a hyper focus on individual consumers and failed to address larger societal concerns' (Dobscha and Prothero 2012). By contrast, a perspective on gender and sustainability ought to integrate sociocultural dimensions into the picture (Gopaldas 2014). Such a focus directs research attention towards consumer groups, which coalesce around sustainability-oriented practices (Kraemer 2014).

We anchor our inquiry within the individual dimension and enrich it with the symbolic dimension of consumption (Schouten, Martin, and McAlexander 2007, McCracken 1990). For the purpose of this paper the structural dimension of consumption in the global north (Vinz 2009) is set aside. The methodological struggle involved in this paper acknowledges two approaches that remain widely spread 'to value traditional femininity or to deny differences between men and women' (Cassell 2002, 411). Research on sustainability and consumption is oriented to future choices of consumers; this is why gender specific recommendations should be included in this research (Hofmeister and Mölders 2006). Marketplace communities that gather around newly created sustainability-focused brands (Lehner and Halliday 2014; Svenson 2018, 2019) provide a window into the status of gender effects in combination with the larger societal concerns.

The Gender Effect in Sustainable Consumption

Earlier studies have established that measures directed at furthering sustainability often neglect the separate consequences for men and for women (Jaeger-Erben et al. 2012). Through practicing 'recognition' (Fraser 1998) work in this domain aligns with liberal feminist traditions. Unlike non-feminist mainstream research (Hearn and Hein 2015) we endeavor to take separate consequences of consumption choices and practices for women and men into account.

In a recent consumer psychology study that adds to a grown literature the interpersonal tendencies of consumers have been linked to environmental concerns to explain a gender effect in sustainable consumption (Luchs and Mooradian 2012). Humans can be 'sympathetic to others and eager to help them, and believe[s]

that others will be equally helpful in return' (Costa and McCrae 1992, 15, Graziano 1994, Graziano and Eisenberg 1997). This value is termed 'agreeableness' and has been found to exist in both women and men. We build on this variant of femininity which is supportive of environmental concerns (Luchs and Mooradian 2012, 141). In this sense, cultural feminism bears the potential to foster sustainable consumption.

The market for smartphones is a space, which is laden with controversies about issues of distributive justice and fairness. Extending agreeableness, for example through favoring fair working conditions for laborers involved in the production of smartphones and respect for ecosystems is a viable way to foster sustainable production and consumption in this market. Increasingly, growing consumer awareness allows for entrepreneurs and marketers to start building products that have the social and ecological dimensions of sustainability as a focal point (Pousa and Nuñez 2014).

We focus on the differences across gender in the consumer domain of smartphones. The mechanisms in online consumption communities might facilitate that 'gender becomes invisible' (Hearn and Hein 2015) and develop into a blind spot. Earlier work draws on the case of the Fairphone (FP) for an empirical investigation of gender and sustainability-orientation (Svenson and Haucke 2016).

The 2016 study

The FP was the first newly created sustainability-focused brand in the smartphone product category. It has been on the market for 2 years and was far from bug free. The problems were openly discussed in the Fairphone Community (FPC)-forum, the site analyzed through netnography (Svenson 2018, 2019).

The FPC is made up of adopters with diverse conceptions of sustainability. The core of this brand is to foster the agreeableness in the supply chain during the different production steps of the device. Within this sustainability-oriented community, a relatively strong group is interested in open source software as an alternative to the conventional mass-market providers of operating system. Most users in the FPC hold the position that in order to bring more sustainability into this market the life-cycle of smartphones has to be extended. Currently, smartphones are used for 2,5 years (Manhart et al. 2012), until they are discarded off. Devices should be used for a longer period of time and the desire for novelties has to be moderated. This is considered necessary in order to save natural resources and reduce electronic waste. The FPC is also a multi-actor contact point of ethical consumerism in this industry (Gopaldas 2014) open to activist interests (Kozinets and Handelman 2004) and therefore a polit-brand (O'Guinn and Muniz Jr 2005). It fosters business interests and is therefore a marketplace (Thompson and Coskuner-Balli 2007) and also consumer interests and is therefore an identity project (Dobscha and Ozanne 2001).

Data from an online survey among this very sustainability oriented brand community was analyzed with regard to a possible gender-effect (Svenson and Haucke 2016). The survey generally generated data on attitudes towards the brand and especially focused on sustainability-oriented consumption practices. Earlier research that was conducted under the auspices of the brand in 2012 revealed that there was a distinguished prevalence of male users, consisting of a 70% male and 30% female gender balance (published company user profile).

Consumer Decision-making

In order to reach our objectives of learning about sustainability-oriented consumers, our empirical design follows a three-fold purpose (Willmott 1997), inspired by the concept of human interests (Habermas 1987) from the philosophy of science. At first, we want to understand consumption of ICT, therewith improving mutual understanding among consumers, businesses and society. Secondly, we want to enhance prediction and control concerning the positive and interactive functions of the device. The pursuit of this objective would provide hard and software engineers with guide boards that help them to develop more sustainable product offerings with adjusted fit for the ICT consumption market. Thirdly, through advocating a consumer research that takes into account gender, we strive to realize the enlightenment project through developing more rational social relations.

Consumer psychology holds that women are more active in sustainable consumption (Luchs and Mooradian 2012). Research on technology acceptance considers men to have a greater affinity towards technology (Venkatesh and Morris 2000, Venkatesh, Morris, and Ackerman 2000). We want to find out whether this gender effect also holds in the context of a sustainability-oriented brand community. We base this question on two assumptions, women are more concerned with sustainable consumption, and men are more concerned with technology:

Results and Discussion

Individuals process information differently according to gender, in particular when it comes to technology (Venkatesh and Morris 2000, Venkatesh, Morris, and Ackerman 2000, Yeh, Wang, and Yieh 2016). For example, men are considered as independent and self-oriented whereas women are relationship-oriented and dependent (Yeh, Wang, and Yieh 2016). Arguing for women to be more dependent in their constructed self, one could assume that the action of selling a mobile phone is an expression of the independence of men. Accordingly, women are more likely to dispense this action to a male individual within their family or circle of friends. Similarly, the community environment for support is more important for women than for men. This not only points towards the relationship-orientation of women but also to different behavioral patterns occurring through the difference of process information within gender. Venkatesh and Morris (2000) found that women more likely suffer from IT anxiety. This might be due to the attitude towards the usage of technology and the role of early behavior in dictating future behavior (Venkatesh, Morris, and Ackerman 2000). While for men the constant usage of technology facilitates the usage of these the contrary effect was found for women (Venkatesh and Morris 2000). As a consequence, more women of the FPC rely on the supportive character of the brand community inasmuch as this is predicted by self-construal causes of gender (Yeh, Wang, and Yieh 2016).

Furthermore, it appears that men are more strongly oriented towards technical novelties. In opposite to Yeh, Wang, and Yieh (2016) who did not find a gender effect in smartphone usage of Taiwanese, we do find a difference between women and men in regard to technological innovation. This confirms the findings of Venkatesh and Morris (2000) regarding computer usage at the workplace. One reason for these findings might

be that in opposite to Yeh, Wang, and Yieh (2016), Venkatesh and Morris (2000) also investigated the adoption of new technology. Inasmuch as men are more task-oriented, they might be interested in product innovation. Another reason for the ambiguousness of earlier findings might be the different cultural context in which the studies are embedded. Similar to Yeh, Wang, and Yieh (2016) we would argue and refer to Hofstede (1991) that gender inequalities are espoused by society due to a more likely tendency towards masculinity or femininity, which complicates comparisons across nations. Hence, this is a promising avenue for future research. However, women are more interested in sustainability in terms of apps, but not based on technical devices. When it comes to the technical aspects of sustainability men, according to the 2016 sample, show greater approval. For instance, more men than women acknowledged their smartphone as sustainable in regard of the combination of a phone, camera and mp3-player, inasmuch as they could replace these other electronic devices.

A gender effect is evened out, since it is a brand strongly associated with sustainability and technology. Slightly more men than women embrace the underlying idea of FP (more sustainability within the smartphone industry). Hence, our findings contribute to the understanding of factors influencing consumption and especially sustainable consumption.

Since we consider gender to be socially constructed, the survey data helped us to see salient cultural themes. The indications we may draw from the survey speak towards sustainability-oriented masculinities in this brand community. The men in this sample display a greater approval of sustainability in this high-technology market. Since the women in this sample are generally interested in sustainability, but not overly enthusiastic, different ways of opening up to sustainability-oriented femininities in brand communities remain to be solved.

Conclusion

The demand for smartphones is likely to increase over the years to come. The FP has managed to attract a diverse crowd interested in sustainability in this industry. More sustainability-oriented market offerings could help to transform the smartphone industry currently notorious for a short product life cycle, poor working conditions during the production process as well as sourcing of raw materials from conflict zones.

Our first goal was to find out whether a gender effect could be discerned in the consumption of a sustainability-oriented smartphone brand. A survey yielded a gendered output of themes. We found that a gender effect is reversed, as it stands the men in this sample show a stronger approval of sustainability-oriented electronics than the women. A gender effect is evened out, since it is a brand strongly associated with sustainability and technology. The gendered themes are understood as cultural data, which were then situated in the context of the FP brand community. This article started with the corroborated finding in consumer psychology that women are more active in sustainable consumption due to the way they realize the persistent personality trait agreeableness. The idea that brands could eventually be a practical and effective way to develop the market for sustainable products may be supported through our findings. It turns out that brands work towards diminishing gender effects within a brand community.

Future ventures are advised to examine how the approval of women may be elicited to an even greater degree by their product. In order to achieve this, a greater diversity of sustainability-oriented applications and devices is needed. Females and non-binary users are often marginalized when designing systems to facilitate digital trust. Understanding how gender impacts upon consumption of ICTs and adoption of sustainability-oriented practices is of increasing importance for the electronic industry. By calling attention to differences in reported sustainability-oriented practices our insights demand a stronger consideration of gender. However, femininities and masculinities are not reserved for one sex or the other. Practitioners are well versed in developing messages that are appealing to both men and women. Recognizing differences between socially constructed gender roles implies to set apart barriers of access. An under-determination of gender through diversity in marketing might bring about equal access to sustainability and technology.

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Reflections on Good Thinking or Gut Feeling in the Decision-making of Bankers

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Do people at the workplace use good thinking or gut feeling to make decisions (Thoma et al. 2015)? Certain professional groups make quick decisions in complex situations. Launer, Svenson, Ohler and Meyer (2020) have highlighted differences in decision-making style between employees of businesses and people working in the public sector. People have different tendencies to rely on a fast, intuitive decision-making mode and a conscious, rational, planning-based decision-making mode. Humans have a repertoire of different strategies at their disposal. The use of intuition is based on domain-specific knowledge that occupational groups accumulate during working life. The context of decisions is routinely taken into account. For example, Svenson Ballová Mikušková and Launer (2020), include factors such as industry affiliation and use of computers in the workplace to draw conclusions about IT know-how, which in turn are related to the use of intuition with regard to digital literacy. An important factor seems to be the frequency with which one makes decisions in the respective area - and with it the possibility to learn and improve one's intuition. This frequency, along with other factors, should be taken into account in future analyzes. This short contribution reflects on the context for the use of intuition in decision-making in the banking industry. Drawing on firsthand experience of the first author.

Information processing style used by staff/team while making decisions in the banking or financial industry

In understanding the information processing style used in the banking sector, it is imperative to segment banking operations into two, the core operations and the business development operations. The core operations are strategic decision making regarding day-to-day activities, growth activities and other activities that require research, careful planning and compliance with regulatory provisions. The business development spectrum of banking activities is usually channelled towards relationship management, marketing and brand equity development. Both operations require some distinct approach to information processing.

The nature of activities carried out under operations requires good thinking which is a function of analytic information processing style. This is because day-to-day operations result in the generation of evidence-based data, which forms the basis for studying past performance outcomes and leveraging on the trend to develop strategies to improve current and future outcomes. In this regard, previous performance records form the basis for benchmarking and the task before the decision-maker revolves around intelligence-driven decision-making. The business development section of operations ensures that the bank grows and this requires a blend of gut

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feeling and good thinking. To arrive at effective decisions that will be beneficial to the organisation in the short, medium and long term period both good thinking and gut feeling are necessary.

The management of banks also supports the use of both information-processing styles because it has to comply with regulation and it has to run the business profitably. Therefore, the staff of the banking sector working independently as freelance marketers or groups in different departments have the luxury of choosing the option that best suits them. It could also be said that a statutory part of bank employee work requires that they leverage good thinking or analytical information processing especially where their weekly work report is expected to carry strategic recommendations for the next week but they are free to leverage intuitive decision making when executing their plan because achieving the best outcome is of paramount importance.

Another factor that may be influencing the blend of both decision-making or information processing styles in the banking sector is the risk involved in wrong decision making. Over time, Nigerian banks like Diamond Bank, Platinium Habib Bank and others have been forced to shut down for relying strictly on gut feelings i.e. giving loans based on trust and not based on credit history. With such a high stake, no banker can walk up to management with a proposal based on gut feelings. It has to be backed by sufficient market research, feasibility studies and evidence. Though it cannot be said that one information processing style is superior to the other, both of them work pari-pasu, depending on the disposition of the decision-maker at the time.

As explained above, information processing lies at the centre of decision making in the banking sector. Whether at an individual level or team level, people are guided by the environmental factors and the task characteristics to either leverage good thinking or gut feeling to achieve their goals. In the end, the quality of outcome achieve becomes the deciding factor for what is right or wrong.

When is it important to use analytic information processing? What decisions require analytic information processing?

Analytic information processing becomes very important where there is a need to reach objective decision especially where the members involved have a conflict of interest. For instance, a digital marketer wants the bank to invest in a social media campaign to boost the sales of the brand whereas the traditional marketer wants an organic marketing campaign to drive up foot traffic. The simple way to go is to check statistics of what has worked in the bank over the years and the fact is, digital marketing has many potentials but it has not worked for the banks. By drawing on the historical record, studying trends and identifying patterns, the bank is able to process a huge volume of information to reach an objective decision that is best for the bank.

In addition, analytic information processing is important where records exist or where data can be collected (Emma et al, 2014). This is where banks use analytic processing in product development because previous records can be analysed to determine what customers prefer. Where records do not exist, the bank can revert to researching to collect information. However, there are times where decisions regarding product development cannot be processed using analytic information because no previous records exist and the customer has no idea of the product. Therefore, the bank has to work from the unknown to the known, resulting in the development of highly impactful and competitive products.

Analytical information processing also forms the backbone of dealing with issues of regulation and compliance, which is an ever-evolving landscape in the financial industry of Nigeria (Stears Business, 2020). Law mandates banks to give reports; hence, the need to ensure that today's operation does not result in sanctions tomorrow. The best way to avoid this is to understand the pieces of legislation that exist and find a way to distil it into current operations to prevent any form of mistakes, errors or drawback that could negatively affect the reputation of the bank. Such reputation is fragile and any attempt to fall out of the good books of market players could negatively affect the brand, resulting in slow sales, poor competitiveness and lack of market advancement.

More so, growth of banks has become complex due to globalisation, intense competition and advanced customer instincts, a factor that triggers the switch from one brand to another. In such context, the growth of banks is highly volatile and some banks prefer to maintain statuesque to avoid market backlash. The key to making strategic wins in the financial market is good thinking, which leverages information on business trends, market factors, PESTEL analysis, SWOT evaluation and other strategic approaches to improving business outcomes through quality decision making.

As explained, analytical information processing is one aspect of a strategic decision in the banking sector and thanks to the increasing integration of information technology in banking sector operations, most banks now understand the need to make a quality decision through the array of data and supportive software that they can leverage to make decisions, thereby enhancing individual and team efficiency.

Intuitive information processing; when is it important to use intuitive information processing? What decisions require intuitive information processing?

Often, judgmental decision-making or intuitive information processing comes in handy in the banking sector. Despite the huge resources and information analytic tools available to the banks, there are times where certain information cannot be effectively analysed through statistics (Ayal, 2015). For instance, the decision regarding whether the customer will be satisfied with a resolution or with a customer service executive to be employed. This is complex because the resolution may be highly effective and the customer service staff employed could be very experienced but there is no way of determining the outcome because of the psychology of the customer. Therefore, the gut feeling becomes important and in such context, the decision-maker feels that whatever he/she has decided is right and will be for the betterment of all.

Gut feeling also comes in handy where data are available for analysis and analytic decision-making but the data are not sufficient to make a decision. For instance, after launching a new saving product for students, it was observed within one week that despite the multimillion-naira investment in the product, it is not performing as expected in the first month even though the bank plans to run at break-even point until the fifth month. Now, the organisation is pressed by the board of directors to decide on whether to continue with the product rollout or count its losses. This decision requires gut feeling or intuition because the one month-data is not sufficient to take an appropriate analytical decision for a product that should begin to pay-off after 5 years of deployment. Such decisions are taken in the banks regularly and intuitive decision-making becomes very essential.

In addition to the foregoing, a gut feeling cannot be overemphasised during the period of crises such as the huge crises created by the coronavirus pandemic where it was important for the bank to react to the situation as they present rather than react on the basis of the historical record, data or trends. As such, banking operations were highly flexible and subject to any new announcement of the government irrespective of whether it was beneficial to the bank or not. Some banks could have shut down operations while awaiting the end of the pandemic to resume operations with the risk of losing their customers to the competition. To avoid this, the banks rather leveraged judgemental thinking to continue to sustain operation and keep the business afloat.

Whether people will be excited about taking an intuitive decision as individual or teams working in the bank is a function of a number of factors including the leadership support, the consequence of poor decision making and the confidence of the individual because there is a thin line of difference between gut feeling kind of conviction and guesswork. Where these factors are positive, the individual will be motivated to trust his or her gut feeling but again, the personality profile of the person is very important since some persons are analytical in nature.

Contextualization of the banking industry in Nigeria= its importance to the economy = how internationalized is it = workforce composition i.e. gender ratio, level of education

The Nigerian banking sector forms the core of the countries financial system that has evolved through years of bank consolidation, resulting in a banking sector that is strategically positioned to compete with counterparts around the world. Globalnewswire (2020) rated the Nigerian banking sector as the second largest in Africa with a significant sectoral value of N39.6 trillion next to South Africa. The banking sector drives economic growth, development, competitiveness and provides the pivot that drives international trade between Nigeria and other countries of the world.

Amugo and Buck (2017) found that Nigerian banks are increasingly going international and the internationalisation of erstwhile local banks cannot be disconnected to the increased linkage of the country's financial system with the International Financial Accounting System. Over the last decade, banks such as United Bank for Africa, ECOBANK, First Bank and Stanbic IBTC Banks have expanded to other parts of Africa. Thanks to the role of international switching companies such as Interswitch, MoneyGram and other similar solution, Nigerian banks are increasingly connecting with their counterpart around the world. With reference to workforce composition, the banking sector employs about 104,000 employees out of which 17.3% were senior staff and 39.3% were officers; contract staff took up 43.2% of the total staff of the bank and the sector has a balance of male and female staff engagement (Samuel, 2019). A good proportion of the banking sector employees have at least a Higher National Diploma with a relatively large segment having a Bachelors Degree in financial and nonfinancial disciplines.

Despite the relative balance in the gender composition of the banking sector, the same cannot be said of the financial sector as a whole. This further suggests that the bank has done a lot to improve the gender imbalance in the workplace. This may have been influenced by the global agitation for better representation of

women as confirmed by Ruth (2020). A recent report published on Nairametrics, however, contradicts the earlier claims because some banks have very alarming statistics regarding gender composition. For instance, Zenith Bank has 7.7% of her staff as female while 92.3% of the staff are male and in the same light, 90% of FCMB bank are male while 10% of the staff of the bank are female (Ruth, 2020). The only banks that have made appreciable progress in this regard include Access Bank, Wema Bank, Stanbic IBTC Bank and First Bank.

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What should we learn about Trust in Chatbots?

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ABSTRACT

Nowadays, in the era of distrust, researching trust is even more important than ever. It is exceptionally significant in terms of using a new type of technology. One of them being chatbots that can help in building a better relationship with clients. However, trust in chatbots is still an unexplored topic. Based on the research done so far, author decided on providing the list of research questions, which should be further discussed in terms of trust in chatbots (demographics of those who trust, employees' trust in chatbots, digital trust, and more). Hoping, that answering those questions might help in better-developing chatbots.

Keywords: chatbots, customers' trust, trust in chatbots, technology trust

JEL codes: D83, L63, M15

Introduction

Nowadays, technology is developing faster than ever, making society experience a feeling of unsteadiness (Edelman Trust Barometer 2020) which impedes to put trust in anything and anyone (Sztompka, 2007). Due to this fact, focusing on digital trust and technology trust is even more relevant than it was before. One type of technology, which is developing rapidly (and will be in the following years), is chatbots[37]. Researchers see a lot of the potential in exploring them, yet still, there are many knowledge gaps in terms of trust in chatbots (which is a key value in terms of encouraging people to use this kind of communication technology). In the following paper, the author did an analysis of research on trust in chatbots to find mentioned knowledge gaps. They were presented as a list of topics that should be further discussed in the nearby future in order to better develop chatbots.

Chatbots as an Improvement of Communicating with the Organization

The term chatbot originates from two words: 'chat' and 'robot', meaning the computer program, which simulates human language with the aid of a text-based, dialogue system (Zumstein, Hundertmark, 2017). This technology was invented in the 1960s[38] to fool people by letting them believe that chatbots were real humans. During the following years, reasons for using chatbots have changed. Nowadays, they are used in the following services: business (selling products, promoting a company and its' products, building a relationship with a customer), administration (acceptance and processing of documents), medicine (giving medical advice), education (teaching), entertainment (small talk, computer games), and more (Filipczyk, 2018).

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37 L. Goasduff, *Chatbots Will Appeal to Modern Workers*, https://www.gartner.com/smarterwithgartner/chatbots-will-appeal-to-modern-workers/ [19.07.2020].

38 The first chatbot created was named ELIZA and was invented in 1966 (M. Dagli 2018, p. 31).

This type of technology is getting more recognition for providing effective communication with clients and will be used more often in the future (Carter, Knol, 2019, p. 113). In 2019, the value of the market of chatbots was 2.6 billion dollars, but it is assumed that in 2024, it will be worth even 9.4 billion dollars[39]. What is more, it was noted that in 2018 interest in chatbots implementation grew by 160% compared to the year before[40].

Chatbots are getting a considerable amount of attention because they are an easy way of influencing customers' behaviour; lowering the costs of customer service; busting the amount of the sells made via the Internet; building more personal relationship between the client and the organization (Budzanowska-Drzewicka, 2018, p. 326); communicating with clients 24 hours per day, seven days a week, and more (Zumstein, Hundertmark 2017, p. 101-103). On the other hand, some issues can be considered a threat. For example, a chatbot can provide unclear information, be unable to help a user (Budzanowska-Drzewicka, 2018, p. 331), clients can be inexperienced in terms of using a chatbot, and be afraid about their data safety (Zumstein, Hundertmark, 2017, p. 103). Yet still, comparing the pros and cons, it is noticeable that chatbots can provide more benefits than losses.

However, for chatbots to generate profit there is a need for detailed implementation of them, providing high-quality data protection, and probably the most important, there is a need for users to put trust in chatbots.

Trust in the Era of the Rapid Technological Growth

Trust is needed where the unsureness of the result shows (Sztompka, 2007). It is called "the most important capital" of the business as it, e.g., simplifies the process of managing the company (Paliszkiewicz, 2014). However, what exactly is trust? It is understood as the belief that another party will not act in a way that is harmful to the trusting firm; will act in such a way that it is beneficial to the trusting firm; will act reliably, and will behave or respond in a predictable and mutually acceptable manner (Paliszkiewicz, 2013, p. 118).

Among many types of trust, there is a technology trust, which is a tendency to rely on technology (resulting from its' functionality, reliability, and support system), mainly in the situation of potential risk connected to using technology, determining intentions in terms of future usage of technology (Ejdys, 2018).

It is of note that the level of technology trust is decreasing (Edelman Trust Barometer 2020); hence, it should be considered a priority topic of scientific research. Particularly when a new type of technology is introduced to the market – one of them being chatbots. Therefore, the following part of this article will focus on trust in chatbots.

Previous Research on Trust in Chatbots

The number of research papers on chatbots is growing every year, as researchers see the importance of that topic. However, most of them might be considered exploratory. Second of all, most of the research on trust in chatbots focuses on Natural Language Processing and presentation of chatbots (e.g.. whether there

39 M. Ngyuen, *The latest market research, trends and landscape in the growing AI chatbot industry*, https://www.businessinsider.com/chatbot-market-stats-trends?IR=T [19.07.2020].
40 L. Goasduff, *op. cit*..

should be an avatar, how humanlike should chatbot be etc.). Hence, there is some information on how chatbot should look like to appear more trustworthy (e.g., using a Turing test on them)[41], or what kind of language should it use (e.g., should it be more feminine or masculine? should it be more official?) (Folstad, Bjorkli, 2018). The most crucial researchers in terms of trust in chatbots are M. Dagli, A. Przegalińska, C. B. Nordheim. However, despite their work, there is still a lot of unanswered questions about trust in chatbots that shall be further discussed in this paper.

Research Questions on Trust in Chatbots

When looking through research on trust in chatbots, one can notice that some aspects of it have been omitted or not explored deeply enough. Thus, there are five topics presented to further study in terms of better-understanding trust in chatbots. They were collected using search engines (e.g., Google Scholar), databases (e.g., Research Gate, Science Direct), and companies specializing in conducting research (e.g., HSBC, Accenture). Research has been done between the 1st of August 2020 and the 20th of October 2020.

It is important to remember that those five topics are only a part of the research that should be done on trust in chatbots.

Research questions about trust in chatbots found crucial by the author are:

1. **Understanding chatbots** – based on the research conducted by HSBC, 23% of respondents have not heard about chatbots, and even more (41%) say they do not know what advisors based on AI are (HSBC, 2018, p. 6). What is more, some people do not know where to look for chatbots as they are 'hidden' on the websites (K2, 2018, p. 72, 74). Therefore, if people do not know what given thing is, how can they trust it? There is a strong need to research how to inform society about chatbots and, in so doing, build peoples' trust.
2. **Trust begins at home** – if the company wants to function correctly, there is a need for employees to trust in each other and their managers (Paliszkiewicz, 2011). If we think about chatbots as employees of the company, there is a question emerging do human-employees trust chatbots? There is a need to analyze a potential correlation between employees' (and employers') trust in chatbots and customers' trust in chatbots. There is a possibility of finding out that employees' distrust might lead to customers distrust as well.
3. **Data protection** – one of the problems when trusting technology is the amount of cybercrime happening in the world. The number of DDoS[42] attacks (which can be used against a website using chatbots[43]) is growing every year[44]. Not to mention situations in which malicious chatbots will be used

41 B. Pleban, *Chatboty jako realizacja testu Turinga a zastosowania w biznesie*, http://www.ptzp.org.pl/files/konferencje/kzz/artyk_pdf_2010/127_Pleban_B.pdf [26.10.2020].
42 Distributed denial of service.
43 Inform communications, *Chatbot Security – What You Need To Know*, https://inform-comms.com/chatbot-security-what-you-need-to-know/ [20.10.2020].
44 S. Cook, *DDoS attack statistics and facts for 2018-2020*, https://www.comparitech.com/blog/information-security/ddos-statistics-facts/ [20.10.2020].

to steal customers' data[45]. So far, researchers established that data security might be crucial when trusting chatbots (Folstad, Bjorkli, 2018). Thus, investigating how to provide digital trust when using chatbots is needed.

4. **Who does trust chatbots?** – Surprisingly enough, there is little research dedicated to understanding which social groups trust chatbots (which age group, which gender, which countries). Some researchers (Nordheim, 2018, p. 27) mention this in-between of the main topic of their research, but conclusions are rather vague. There is an open field for discussion, who is more trusting, who needs more education in terms of using chatbots, and to whom should companies propose using chatbots.
5. **Where does the distrust in chatbots come from?** – The most researched element in terms of chatbots is Natural Language Processing (i.e., how chatbots should talk to people) (Valtolina, Barricelli, 2018). One can wonder if the only reason people do not trust chatbot is its fast development (Valtolina, Barricelli, 2018, p. 56) and problems with having a satisfying conversation. One of the questions to answer is: where does the distrust in chatbots originate? Researching this will tell on what elements of chatbots companies should focus on in terms of changing users' experiences.

To conclude, based on the research done, there were found gaps in knowledge which should be further analyzed. Doing so might lead to a better understanding of trust in chatbots and better usage of that technology.

Summary

To sum up, the technology of chatbots is and will be developing. Due to this fact, there is a need to build trust in chatbots. Thus, researchers should put more time and effort into developing ways of creating customers' trust in chatbots. Based on the research done it seems like there is a lack of knowledge in the following terms: peoples' knowledge of chatbots' existence, understanding the correlation between employees' and customers' trust in chatbots, digital trust in terms of chatbots, the demography of those who trust chatbots, reasons for not trusting chatbots. Filling in those gaps in knowledge might help to develop a better understanding of trust in chatbots. Only by investigating the mentioned aspects (and probably more of them which were not listed here), one can use this technology with its full potential.

Therefore, there is a need of discussing presented topics and studying if there is a need for other issues on trust in chatbots to explore.

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Digital Culture: A Systematic Literature Review

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ABSTRACT

Nowadays, digital technologies (e.g., email, file sharing, mobile phones, online gaming, ecommerce, and GPS systems) are changing many aspects of political, economic, and social lives of people around the globe. The majority of research remains largely silent on the specifics of culture change in the context of digital transformation and its management. The aim of this article is to provide insights regarding the state of the art of digital culture, and to propose avenues for future research. Using a systematic literature review of 955 peer-reviewed articles, this paper identifies and synthesis the existing body of knowledge.

CCS CONCEPTS: • General and reference • Document types • General literature

Keywords: Digital technologies, culture, digital culture, systematic literature review

Introduction

Digital technologies are powerful catalysts of cultural change (Karaganis, 2007). The past two decades have seen cultural innovation on an enormous scale, from the virtualization of group networks and social identities to the digital convergence of text and audiovisual media. The extent of the changes in our present society is reflected in the claims about the information "revolution". The terms "information society", "networked society" or "knowledge society" have entered the common language permanently (Cardoso 2006; Webster, 2014; Gallardo-Echenique et. al., 2015).

Gere (2002) suggests that the sheer extent of the presence of digital technology in our lives indicates the existence of a digital culture. He states that digitization can be considered a marker of culture because it includes artifacts and systems of meaning and communication, which clearly demarcate contemporary lifestyles (Uzelac, 2010).

The prevalence of conceptual and illustrative case studies clearly shows the lack of maturity of the phenomenon of digital culture. Reis, Amorim, Melão, and Matos (2018) emphasize that future research should focus more on setting the theoretical basis for this issue. Thus, this article reviews the definition of "digital culture". Furthermore, the article delivers a general overview of the literature, along with some suggestions for future research. To this end, the next section provides a brief description of the methodological approach and is followed by the literature review. The article ends with some concluding remarks.

Research Method

This paper follows a systematic literature review method. It is a rigorous and transparent form of literature review (Tranfield, Denyer, and Smart, 2003, p. 209). Described by Petrosino, Boruch, Soydan, Duggan, and Sanchez-Meca (2001, p. 20) as 'the most reliable and comprehensive statement about what works', systematic

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review involves identifying, synthesising and assessing all available evidence, quantitative and/or qualitative, in order to generate a robust, empirically derived answer to a focused research question (Mallett, Hagen-Zankerb, Slaterc, R., and Duvendackd, 2012). Originally used in the medical sciences in the 1970s to examine the effectiveness of health-care interventions and, more broadly, to support the practice of evidence-based medicine, systematic review has since permeated into a wide range of disciplinary fields, from 'astronomy to zoology' (Petticrew 2001). A systematic review has the following characteristics: (a) a clearly stated set of objectives with predefined eligibility criteria for studies; (b) an explicit, reproducible methodology; (c) a systematic search that attempts to identify all studies that would meet the eligibility criteria; (d) an assessment of the validity of the findings of the included studies, for example, through the assessment of risk of bias, and (e) a systematic presentation, and synthesis, of the characteristics and findings of the included studies (Higgins, and Green, 2008). Despite all of the blessings of this method, its use has not been overly prevalent in business research, but it is increasing (e.g. Coombes, and Nicholson, 2013; Truong, 2014; Håkansson, and Witmer, 2015; Kim, 2016; Xie, 2019).

To reduce potential bias, in the chapter two different approaches were adopted: a) a qualitative approach based on a bibliometric analysis and b) a qualitative approach centered on a content analysis of the literature (Reis, Amorim, Melão, and Matos, 2018). It ought to be noted that this two approaches should be seen as being "complementary" in acknowledging the structure of the field of study (Acedo, and Casillas, 2005). Table 1 summarizes the research methodology.

Table 1: Research methodology.

Approach	Description	Content
Quantitative approach	A quantitative characterization of the selected publications	• Publications distribution • Distribution per higher education institution, country, author and journal • Major research approaches
Qualitative approach	Content analysis of the selected articles	• "Digital culture" definitions

The data search was conducted on September 30th, 2020, and the selected peer-reviewed database was the Institute for Scientific Information – Web of Science (ISI). The author started with the inclusion criteria by using the "digital culture" term in the topic (title, abstract and keywords). The "topic" rather than "text" category was selected to narrow down the search results only to the articles focusing on studying culture directly rather than other aspects of e-commerce.

The search for articles was conducted notwithstanding the time impediments, but constrained to journal papers and conference proceedings. To avoid wrong interpretations, the selected documents had to be written only in English (Table 2.). The exclusion process resulted in a total of 953 academic articles from the ISI database.

Table 2: Systematic literature review process.

Criteria	Filters	Documents
Restriction	Topic (title, abstract, author keywords)	1,149
Document type	Articles and conference proceedings	955
Language	English	955

Results and Discussion

Quantitative Analysis

The number of papers on "digital culture" evolved over time, it was only after 2015 that their numbers increased significantly. In 2019, 86% of the total number of papers are journal articles, and 14% are conference proceedings. The emergence of the field is demonstrated by the graph (Figure 1.) that illustrates the 955 papers published over the years.

The higher education institutions (HEI's) that most contributed to these publications are: (1) University of London, (2) University of California System, (3) Complutense University of Madrid, and (4) Queensland University of Technology with 3.14%, 1.26%, 1.15% and 1.05% of the 955 articles and conference proceedings respectively.

Besides, a classification of the countries that most contributed to the field have been made (Table 3.). It has been noted that the countries that have contributed the most are: the United States of America, United Kingdom, and Brazil with 15.18%, 11.31%, and 10.58% of the 955 articles and conference proceedings respectively. Unsurprisingly, the United States and United Kingdom are at the top of the ranking. Influenced mainly by the size of their markets, these countries also have a strong education and research system as well as a business-friendly environment (Reis, Amorim, Melão, and Matos, 2018).

Figure 1: The occurrence of papers per publication year (n = 955)

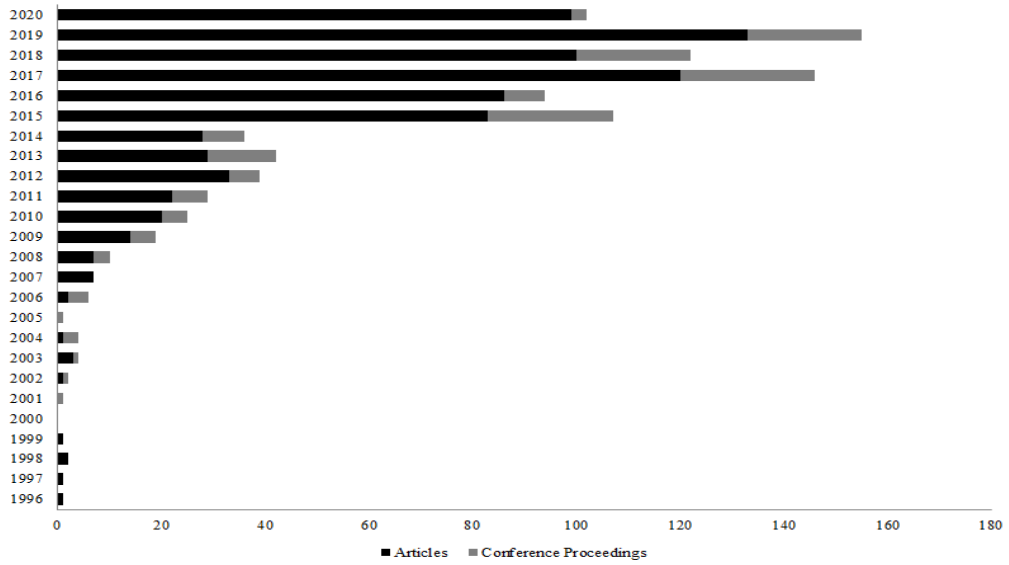

Table 3: Article distribution per country.

Top 5 countries	Count	% of 955
USA	145	15.18
UK	108	11.31
Brazil	101	10.58
Spain	86	9.01
Australia	53	5.55

Table 4. presents the most frequently cited papers. They focus on new internet “users”. Van Dijck (2009) stresses that they are not only participants but also producers, consumers and data providers. In addition, several papers describe the “meme” concept as an analytic tool (Shifman, 2012; Shifman, 2013). After all, some of them review the main features of Web 2.0 through major dimensions: as a universal library, global market, as a giant hypertext jigsaw puzzle, a public space for social communities, a territory for multimedia and audiovisual expression, and as a space for multiple virtual interactive environments (Area-Moreira, and Ribeiro-Pessoa, 2012).

Table 4: Article distribution per author

Top 10 author(s)	Journal	Year of publication	Total number of citations	Average citations per year
van Dijck	Media Culture & Society	2009	460	38.33
Lewis	Information Communication & Society	2012	322	35.78
Deuze	Information Society	2006	215	14.33
Shifman	New Media & Society	2012	146	16.22
Beer	Journal of Computer-Mediated Communication	2008	146	11.23
Shifman	Journal of Computer-Mediated Communication	2013	136	17.00
van Dijck, and Nieborg	New Media & Society	2009	133	11.08
Area-Moreira, and Ribeiro-Pessoa	Comunicar	2012	106	11.78
Duffy	International Journal of Cultural Studies	2016	95	19.00
Nakamura	Critical Studies in Media Communication	2009	80	6.67

The journals that had the largest number of publications in “digital culture” were: “New Media Society”, “Convergence the International Journal of Research into New Media Technologies”, “International Journal of Communication”, “Information Communication Society”, “Museum and Digital Culture New Perspective and Research”, “Social Media Society”, and “Springer Series on Cultural Computing” – Table 5.

Table 5: Article distribution per journal

Top 7 publication journals	Count	% of 955
New Media Society	20	2.09
Convergence the International Journal of Research into New Media Technologies	14	1.47
International Journal of Communication	14	1.47
Information Communication Society	11	1.15
Museum and Digital Culture New Perspective and Research	11	1.15
Social Media Society	11	1.15
Springer Series on Cultural Computing	11	1.15

Qualitative Analysis

“The claim that technology impacts different aspects of our culture is over-simplified and too deterministic, but it is not completely wrong” (Uzelac, 2008, p. 10). People are aware of the changes that happened in present-day societies that are related to introducing ICT into our lives in the same way as electricity did in the past. That is why, more and more often in the literature on the subject there appears the term “cyberculture” (e.g. Matei, 2005; Bell, 2006; Turner, 2010), computer culture (e.g. Vatrapu, and Suthers, 2007), virtual culture (e.g. Robins, and Webster, 2002; Eliseev, 2018), e-culture (e.g. Drigas, and Pouliou, 2013) or digital culture (e.g. Capgemini, 2017; D’Ambrosio, 2018; Ferreira, 2019).

It is obvious, that digital culture constitutes one of the prevalent terms around the World Wide Web; because of its importance, many authors attempt to discuss the exact notion of it. Table 6 illustrates typical definitions taken from the literature. However, it should be noted that there is no single official definition of digital culture.

Table 6: Digital culture definitions (Note: The definitions are presented in chronological order)

Author(s) (year)	Definition(s)
Gere (2002)	"Digital culture has been produced out of the complex interactions and dialectical engagements between (…) abstraction, codification, self-regulation, and virtualization".
Deuze (2006)	"Digital culture is both a social phenomenon and a set of values and activities observable online, but also having distinct offline properties and expressions".
Uzelac (2008)	"Digital culture is described as a participatory culture where users do not only consume information but also contribute in a variety of ways".
Uzelac (2010)	"Digital culture is a participatory culture in which users not only consume information but also contribute information in different ways".
Gómez-Diago (2012)	Digital culture "comprises a set of technologies, material and intellectual, practices, attitudes, modes of thought and values developed along with the growth of cyberspace".
Sadiku, Tembely, Musa, and Momoh (2017)	"Digital culture is the several ways people engage in digital media and technologies in their daily lives".
Çöteli (2019)	"Digital culture is the production culture of software developers and the internet".

Summarizing the Table 6, the first focused definition was presented by Gere (2002), who considered digital culture as a product of the complex interactions and dialectical engagements between abstraction, codification, self-regulation, and virtualization. Whereas Deuze (2006) described digital culture in a broader way, characterizing it as a social phenomenon and a set of values and activities observable online.

It is not possible to understand digital culture unless one can recognize the heterogeneous elements out of which it is composed (Gere, 2002). Rab (2015) draws attention to the following characteristics:

- Copiability: digital information is straightforward to copy, and once joined into a network the possibilities for this are infinite.
- Digital literacy: this involves using the new communication media to evaluate and sort out information.
- Insecurity: this means that, the information society idea and the concept of risk society are similar to each other.
- Instantaneousness: in the digital environment, we send information and read emails instantly.
- Interconnectivity: this creates the opportunity for constant access and contact.
- Multitasking: this means that several tasks are (can be) managed at the same time. Media consumption and entertainment are typical examples.
- Permanence: everything we do in our digital world leaves a trace.

The multidimensionality of digital culture has also made it the subject of philosophical considerations. For example, Galkin (2012) identified three methodological levels of its perception: material, functional, and spiritual (or mental).

The material level determines its technological imperative, the other two – functional, and spiritual – predetermine the inevitability of philosophical reflection and the selection of new levels of perception (Golovko, Kokhanova, and Chereshneva, 2019). These levels raise questions about the ideological determination of the further development of digital technologies.

Concluding Remarks

This paper contributes to the digital culture literature, by providing a clear understanding of its foundations concerning the advancements achieved in the last two decades. To strengthen the aforementioned argument, several authors have concluded that additional debate on the digital culture agenda is needed.

This article has some limitations. Firstly, as this literature review is restricted to one term, it is possible that some relevant articles are missing. Secondly, only articles in English were included, all works in other languages were excluded. Thirdly, a very comprehensive approach to produce a scientific literature review also requires the use of more than one digital repository; therefore, by analyzing other repositories besides ISI, the results obtained might be different. However, for this article, the author decided to prioritize transparency and easy reproducibility of results. Finally, it should be noted that due to space limitations, this article does not list all the references. References may be provided on request by contacting the author.

Future research should aim at a broader understanding of the digital culture phenomenon; therefore, this research can be enriched by the analysis of related topics, such as “digital divide”, or “digital convergence”. Such attempts may focus on showing a clear definition of the conceptual field, as well as a brief bibliometric examination of each term. Researchers ought to moreover draw on the theoretical foundations of the field of digital culture, identifying existing theories or developing new ones in order to theoretically support novel empirical research.

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Digital Trust & Intuition in Career Guidance Services
– Experiences from Distance (and Digital) Coaching –

Torild Carlsson[47]

ABSTRACT

The ongoing pandemic has accentuated the use of technology in career guidance. However, also before the pandemic, hundreds of initiatives were taken every year, to advance the use of technology in career guidance. Most of them ending up as well-intended failures since they lack the domain knowledge required for the solutions to be effective as well as efficient.

The empirical source used in this paper is the experience of professionals working with the development of career guidance service at Ibility Institute. Two domain-related tools are identified as being particularly important to study – "freedom of gaze" and overlooking shared understanding. The two tools are then compared in the context of three meeting technologies – in-person meeting, telephone meeting and video meeting.

Keywords: career guidance, freedom of gaze, telephone meeting, video meeting

Digital and Distance

A distinction that has proven valuable in professional discussions regarding career guidance meetings has been that between Digital and Distance. Digital refers to the tools used in the meeting – the opposite being Analogue. Distance refers to the distance between coach and client – the opposite being In-person. A distance meeting can use analogue tools. And an In-person meeting can use digital tools. This paper focuses on individual distance meetings, but the findings are likely to be of relevance also in distance group meetings and in digital tools.

Career Guidance

Career guidance typically consists of a series of primarily guiding meetings where the client's decision process is more central to the results than the decision process of the coach. A typification of meetings may clarify: Guiding meetings (a coach guides the client through an exploratory process that enables the client to make informed decisions). Advising meetings (an advisor collects information from the client and gives advice based on the advisor's expertise). Informing meetings (an educator informs the client without specific knowledge of the client). Though this paper focuses on guiding meetings, in reality, career guidance involves a spectrum of variations and combinations of these typified meetings.

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Trust and Intuition

In career guidance, trust is a precondition for the well-founded intuition that can uncover new and better solutions than those available to the client or the coach at the outset. Typically, the coach uses a series of tools to gain the client's trust and to grow the client's problem-solving ability, in tandem with, the client's trust in this ability. This paper will focus on two tools that career guidance professionals consider critical in enabling intuition and judgement when expanding and improving the client's solution set.

Reflection: The coach supports the client in uncovering resources and preferences that the client and the coach initially are unaware of. Trust is central to the courage and perseverance needed to enable a mutual exploration of unknown unknowns.

Overview: The coach supports the client in summarizing parts, or the whole, of the shared understanding so far in the process. Again, trust is central to courage and perseverance.

A space for reflection

"How would you rank the following work-life values in order of importance at this stage of your career?"

In strengthening the individual's problem-solving capacities, a trusted mental space should be supported by a physical space for the client's reflective thinking. To create this space, in-person meetings have a well-established model for sittings arrangements. The coach should not face the client straight on but instead sit at an angle, thus enabling the client a distraction-free "freedom of gaze" – not feeling forced to look into the face of the coach. A commonplace version of this is talking to someone during a walk or a car-ride.

Telephone meeting | The professional experience indicates that a telephone meeting is a suitable environment for the client's reflective process. Many professionals even report that a telephone meeting, on average, seems to be a better environment for the client's reflective process than an in-person meeting.

Video meeting | The professional experience indicates that a video meeting, on average, is less beneficial for the client's reflective process than an in-person meeting or a telephone meeting. Both professionals and clients seem to experience less "freedom of gaze" than in in-person meetings.

Preliminary results thus indicate that a telephone meeting, in this aspect, is the better distance solution. The results may even suggest that the quality of the reflective space, is more important than the possibility of reading body language, facial expressions etcetera in a video meeting. The time delay associated with a video meeting is also reported to distract from the client's reflective process.

Telephone and video meetings may enable the client to sit in a familiar environment. Depending on individual circumstances, this can be an advantage or a disadvantage to the client's reflective process. Furthermore, the client's reflective process may be disturbed if the telephone or computer screen is associated with the career issues at hand. In the worst cases, the meeting technology is a space with built-in disruptions like e-mail or reminders.

A space for an overview

"What ideas about your continued career do you get, now that we have a clear overview of your capabilities and preferences?"

An in-person meeting frequently uses analogue materials like written exercises or a whiteboard to supplement the overview that can be created using spoken words.

Telephone meeting | A telephone meeting is limited in terms of overlooking shared working material. However, the professionals also report an advantage to an in-person or video meeting in that client and coach both can use working material to support their thought process without signalling disinterest in the other or the process.

Video meeting | The professionals consider a video meeting to be better than a telephone meeting when it comes to overviewing shared understanding, though not as good as an in-person meeting. The key is not seeing the other persons face but seeing shared work material – for instance, by pointing the camera at analogue work material or a whiteboard. Furthermore, professionals report that readily available technologies for shared screens and writing surfaces are still too onerous and thus distract from the shared reasoning.

Individual preferences

The professional experience is that individual preferences should be allowed to influence the choice of meeting technology. However, the experience is also that a-priori client requests frequently are based on false assumptions, as when a client instinctively prefers a video to a phone meeting – only considering communicative and not reflective meeting aspects.

Individual preferences thus have to be balanced against the professional understanding of the guidance process, an understanding that may also be used to switch between meeting technologies in different parts of the process. For instance, an initial video meeting, followed by a series of telephone meetings and then returning to a video meeting for summarizing.

Digital tools

The professional experience regarding digital tools so far confirms the importance of empirical exploration founded in domain knowledge. A career guidance process requires three types of professional knowledge: Episteme (what-knowledge) which appears relatively easy to digitalize, Techne (how-to-knowledge) which appears to have digital advantages, as well as disadvantages, and Phronesis (when-knowledge) which currently appears difficult to digitalize.

Summary

There seems to be great potential in using distance and digital technology in career guidance services. Those looking for answers to effectively use technology in the area should look closely at the empirically proven solutions for in-person meetings – in particular focusing on tools that give priority to the quality of the client's decision process.

Digital inequity survey to the teachers of St. Aloysius Academy of DASMARIÑAS: A basis for digital trust and intuition

Crisanto E. Avila[48]

ABSTRACT

In the field of education, teachers must be technologically abreast especially in time of the COVID-19 Pandemic addressing the demand of the New Normal. To build confidence and capacity in digital teaching-learning, teachers must consider developing their skills in using digital technologies in education and they must also embed the use of digital devices in the teaching-learning practice.

In this premise, this research article explains the digital inequality that the teachers are experiencing and its effect on their teaching profession and on establishing among themselves the digital trust and intuition. This study also aimed to answer, "What are the digital equalities do teachers encounter?" The teachers' decision for digital trust and intuition is affected by the digital inequalities they are experiencing.

This study draws insights from a one-page survey questionnaire 20 selected teachers of St. Aloysius Academy of Dasmariñas representing the faculty from the 3 departments such as preschool, grade school and high school. The results of this study indicate that teachers of St. Aloysius Academy of Dasmariñas are digitally inclined as manifested by their subscriptions to various digital devices and services. The impact of the digital technology to them in terms of social, economic, political and cultural affects their decision in digital trust and intuition.

Overcoming issues on digital inequality among teachers will lead to digital trust and intuition. The school, from where the teachers are employed must address the digital inequality by ensuring that all teachers have equal chances in accessing the technology based teaching devices and by providing them capacity building trainings which are imperative for the demand of the new normal. Teachers must embrace the digital technology in the community and in their workplace and imbibe the digital trust and intuition in education.

Keywords: Digital Inequalities, Digital Learning Tools, Digital Trust, Digital Intuition, Digitalization

Introduction

With the challenges brought by COVID-19 Pandemic, digital technology is very instrumental in avoiding the spread of the virus and making the peoples' activities possible to the standard of the new normal. As part of the Science and Technology aspects of human lives on earth, digital technology has transformed modern life, bringing life comfort and many advantages. (quora.com)

Goodman (2020) emphasized that digital devices revolutionized every aspect of modern life in travel, work, shopping, entertainment and communication. Almost all electronic devices have been digitized incorporate digital technology.

[48] University of the Philippines Open University

Further, Goodman explained that in digital technology devices can be more compact, faster, lighter, and more versatile that huge amounts of information can be stored locally or remotely and moved around virtually instantaneously. Even the term "information" has expanded to include media such as photos, audio, and video, and no longer refers to just words and numbers.

Digital devices are products of advanced technology. In all fields today, technology plays a key role in the process and its development. Technology dictates the parameter of development in every field. For whatever development each one to take, all are anchored on technological advancement.

In the field of education, teachers use digital technology-based learning devices. It happens across all curriculum learning areas especially in time of the pandemic ensuring the implementation of the School Learning Continuity Plan under the new normal. But, it is just normal that we don't have equal opportunities of enjoying the benefits of digital devices because of social inequality, the uneven distribution of opportunity, and the chances of other factors. It is enviable to every individual, accept it or not. Teachers' decision for digital trust and intuition is affected by the digital inequalities they are experiencing.

Teachers must be technologically abreast. To build their confidence and full capacities in digital learning, teachers must consider developing their skills in using digital technology based learning devices and they must embed the use of these modern learning devices in their teaching practice.

In the business world, Slaymaker (2020) argued that traditional approaches in the business of creating a reputation for trustworthiness through branding, advertising and physical presence are shifting to the trustworthiness customers perceive as they experience millions of digital interactions across their entire customer journey.

While in digital trust in education, Lee (2016) advocated for the use of digital technology in teaching. He believed that the ICT experts and the school personnel that includes principals must collaborate for digital evolution of the schools.

Lee in his paper said that in schools, the students have to use the prescribed device, the specified software, and have every keystroke monitored. Students cannot be trusted with their own digital technologies within the classroom without a teacher supervising. This is one issue of digital mistrust in the schools that has to be overcome.

For digital intuition, Waks (2006) said that experienced teachers have a rich body of experience that guides them in scanning their immediate circumstances for opportunities and then rapidly and flexibly responding without the explicit mediation of consciousness to generate educational value. When they are relatively free of institutional constraint, their work can exhibit intuition.

But, it is sad to note that due to the mediocre salary of teachers and budget in schools, they became victims of digital inequalities that their capacities as teachers are affected and the quality of their instructions suffers. This needs acceptance: digital inequality is a common phenomenon for everyone. There are differences in accessing and having the use of digital technologies today even in education.

In order to fill this gap the researcher undertook a quantitative study to identify the inequalities in accessing the digital devices among the teachers of St. Aloysius Academy of Dasmariñas. In this manuscript, the researcher examines the inequalities, impact, challenges, and adherence to digital technology that impede, shape or mold teachers' trust and intuition towards digital technology in education.

The inequalities of digital technology to the teachers and the challenges of Covid-19 Pandemic

It was found out in this study that 100% of the teachers of St. Aloysius Academy of Dasmariñas own smartphones with internet connectivity which are being used in communication, gathering communication, taking photos and videos, banking, booking, and other comforts. But only 75% of them are equipped with laptops and desktops in their home. In school a ratio of 1:2 desktop computer per 2 teachers. The use of scanners, video cameras, and audio recorders can be accessed through the reservation.

Only 57% has knowledge and skills on the photo, audio and video editing and 80% of them may conduct online instructions. In general, all teachers are inclined with digital devices such as desktop computers, laptop computers, mobile phones, tablet computers, e-readers, storage devices, such as flash drives, input devices, such as keyboards, mice, and scanners and output devices such as printers and speakers.

These manifestations of digital inequalities among teachers of the school is a big challenge of embracing the digital platform in education under the new normal.

Due to the spread of Corona Virus in the country, the Philippine government ordered the abrupt suspension of classes last March 8, 2020, and to give considerations for the completion of all academic requirements for School Year 2019-2020.

In preparation for the S.Y. 2020-2021, all schools were required by the Department of Education to prepare School Learning Continuity Plan (SLCP) utilizing distant learning modalities such as online, printed modules, radio, and television. Face to face classes' instructions was ceased until a vaccine for Corona Virus is available.

For this government mandate, teachers were forced to migrate from traditional pedagogy to digitized instructions as there is no other way to continue the education of the youth. In this situation, challenges in e-learning came in, one is the inequality to digital technology.

Scheerder et.al (2019) explains that the focal point of digital inequality research has been the identification of the determinants of internet access. While discussions have moved away from binary distinctions between those who have and do not have an Internet connection to motivation, material access, skills, usage, and outcomes, digital inequality research is still heavily dependent on quantitative approaches and remains at a descriptive level.

Thus, this study focuses on the assessment of digital inequality among the teachers of St. Aloysius Academy of Dasmariñas. This study aims to answer, "What are the digital equalities that teachers encounter?" This study identified the impact of digital devices to the respondents in terms of social, economic, political, and cultural also challenges faced in using the digital devices that affect digital trust and intuition. This

manuscript also intended to assess the adherence or subscription of the respondents to various digital technology devices and facilities.

The results served as a reference to the school administrations on how they can be of assistance to the teachers when it comes to digital accessibility and capacity that would enhance the delivery of online instructions through the digitalization of learning materials. The results are used as a springboard in capacitating the teachers on digital instructions and establishing digital trust and intuition.

The digital trust and intuition in education under the new normal

WhatsIs.com defines digital trust as the confidence users have in the ability of people, technology, and processes to create a secure digital world. Digital trust is given to companies who have shown their users they can provide safety, privacy, security, reliability, and data ethics with their online programs or devices. When a person decides to use a company's product, they are confirming their digital trust in the business.

In the issue of digital trust, teachers might not yet ready and confident in the digitalization of their teaching-learning materials due to sabotage, theft, and hacking incidents on the internet. They are also protecting the data of the students such as personal data, grades, and other assessment results. Teachers are also conscious of the legitimacy of the information on the internet.

With the demand for the new normal in education, teachers have no option but to subscribe to the digitized system in processing submission and retrieval of data. Their digital trust is motivated by the data protection policy of the government.

WhatsIt.com further explained that digital trust is used by both digital service companies and their consumers. Users apply digital trust to the search process for a service or device. Consumers are more likely to use a company that is trustworthy than one that is unreliable. Companies aim to gain digital trust from consumers and use this goal to digitally transform themselves and create greater confidence in security, safety, privacy, and reliability among consumers.

On the other hand, as shared by Matthee (2020) intuitive people listen out for their inner voice. Before you can even conceive the notion of intuition you need to be able to recognize it. Intuition is not as clear as body language or tone of voice. It’s a deep seeded awareness that makes your gut feeling sway towards positive or negative associations. This takes some time, especially in today’s fast paced life where we rush to do absolutely everything. You need to stop, steer and observe in order to hear your inner voice. Let it shine through and guide you towards your desired goals.

Leonard Waks (2016) sees intuition in education by providing opportunities for achieving intellectual and practical mastery through the acquisition of general problem-solving heuristics and traits of intellectual and moral character.

Svenson, et.al (2020) shares that modern (liquid) trust generates its other--the digital nontrustworthy or the ethicless design of a digital world (we do not generally trust anybody). While exploring trust through empirical study, indicators are collected to find out, whether decision-makers prefer rational-analytic thinking (slow) or intuitive and automatic (rapid) thinking.

Due to the limiting and controlling effects of the pandemic to humanity there is no other safe way to connect and communicate with other people but through the internet platforms. That, resorting to digital technology became an instinct- an act of intuition. In this scenario, teachers are intuitive to digital technology in order for them to sustain the functionality of their profession

Conclusion

The detrimental effect of COVID-19 pandemic not only to health and economy but to its challenges to education is something that cannot just be neglected by the teachers and the government. The continuation of education of the youth has to be championed under the new normal.

Teachers as agent and facilitator of information and knowledge must utilize digital technology in the delivery of distance education as a requirement of the new normal.

Access to digital devices is imperative to the lives of the teachers. Hence, the issues on digital inequality in the school must be addressed by the school managers and authorities by ensuring that all teachers have equal chances in accessing the digital technology-based teaching tools and by providing them skills in the manipulation of advanced technologies.

The fact that teachers have been required to use computers for e-learning and for the submission and retrieval of records, they are compelled to subscribe with the digital trust and to make a decision of digitizing instructions. With this, teachers in the new normal must adhere with digital trust and intuition in order to assure the successful implementation of Schools Learning Continuity Plan (SLCP) as demanded by the new normal.

As the teachers overcome digital iniquities, they are ready to imbibe digital trust and intuition that would bring the parameter of digital education to a different level.

Recommendation

In conformity with the government mandates for no face to face education in the country, St. Aloysius Academy of Dasmariñas (SAAD) has been fully digitalized. In fact, for this school year enrollment and payment systems have been online. Graduation, meetings, and seminars were undertaken using various platforms on the internet.

SAAD is having continuous training for teachers about the creation of videos, podcast, and other digital learning materials. The school is also improving its infrastructure for online education. A Learning Management System (LMS) has been established which facilitates the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.

As to the recommendation of this research, future studies must focus on the impact of Digital Technology to the teachers—Psychologically, Socially, Politically, Economically and Culturally. It is also recommended to encourage school leaders to lobby with the government for the possible financial allocations to the students and teachers for the procurement of digital tools.

This research also recommends the capacitation the teachers on the use of the digital learning devices and develop among themselves digital trust and intuition that would assure full implementation of the Schools Learning Continuity Plans in time of Covid-19 Pandemic.

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Conference Presentation Slides

The contribution of mental simulation to the development of infuition

Bianca Steffen, Christian Harteis

Digital Trust in the Workplace: Preliminary Results

Dave E. Marcial

Digital Trust and foreigners in Korea: Data privacy and protection perspectives

Joeffrey Maddatu Calimag

Understanding Digital Trust in the Workplace: The Case of the Philippines

Joane V. Serrano, Markus Launer, Janele Belegal

Digital Trust in the Workplace

Kandappan Balasubramanian

Digital Trust of Young Poles in online shopping

Anna Jasiulewicz

Young Female Entrepreneur surviving Covid19-Pandemic

Mary May G. Sestoso

Measuring Trust in information technology in the workplace

Dave E. Marcial, Joy M. Dy, Alfie Arcelo, Markus Launer

Welcome! Sustainability and Digitalization in schools

Stefan Nowatschin

Intuition & Digitalität, Digitalisierung

Wendelin Küpers

Quantenphysik und Religion

Dirk Schneider

Anwendungen von künstlicher Intelligenz in der Praxis

Julia Lehmann

IT-Sicherheitsvorfälle forensisch aufklären

Svenja Mischur, Adrian Klick-Strehl

When presents meets past

Thorben Stemme, Simon Zalimben

Deine Intuition und Du ein unschlagbares Team

Sabine Hoffmann

Research at Ostfalia

Kai Hillebrecht

Forschung an der Ostfalia

Kai Hillebrecht

PADERBORN UNIVERSITY

THE CONTRIBUTION OF MENTAL SIMULATION TO THE DEVELOPMENT OF INTUITION

BIANCA STEFFEN & CHRISTIAN HARTEIS

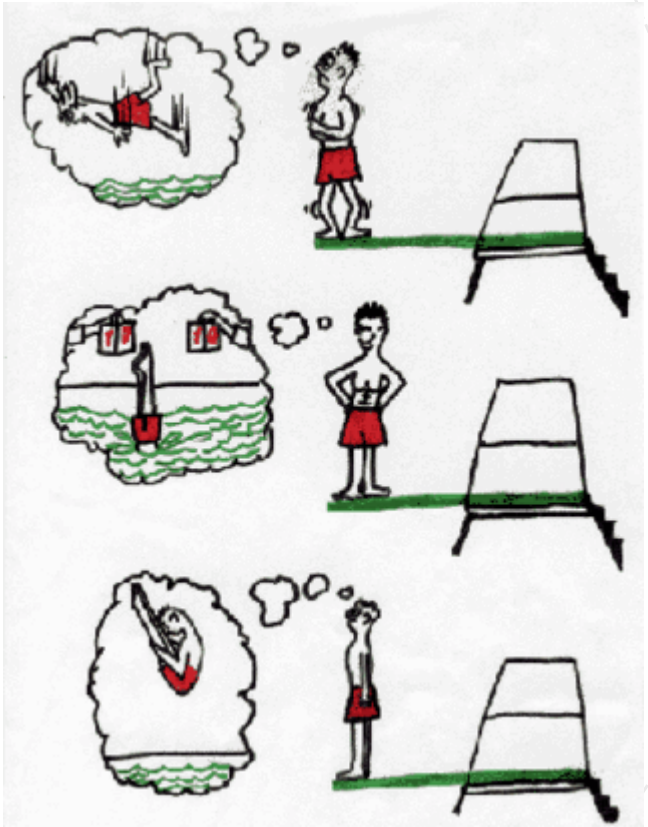
4. Service Management Congress
Digital Trust & Intuition @ the Workplace

Agenda

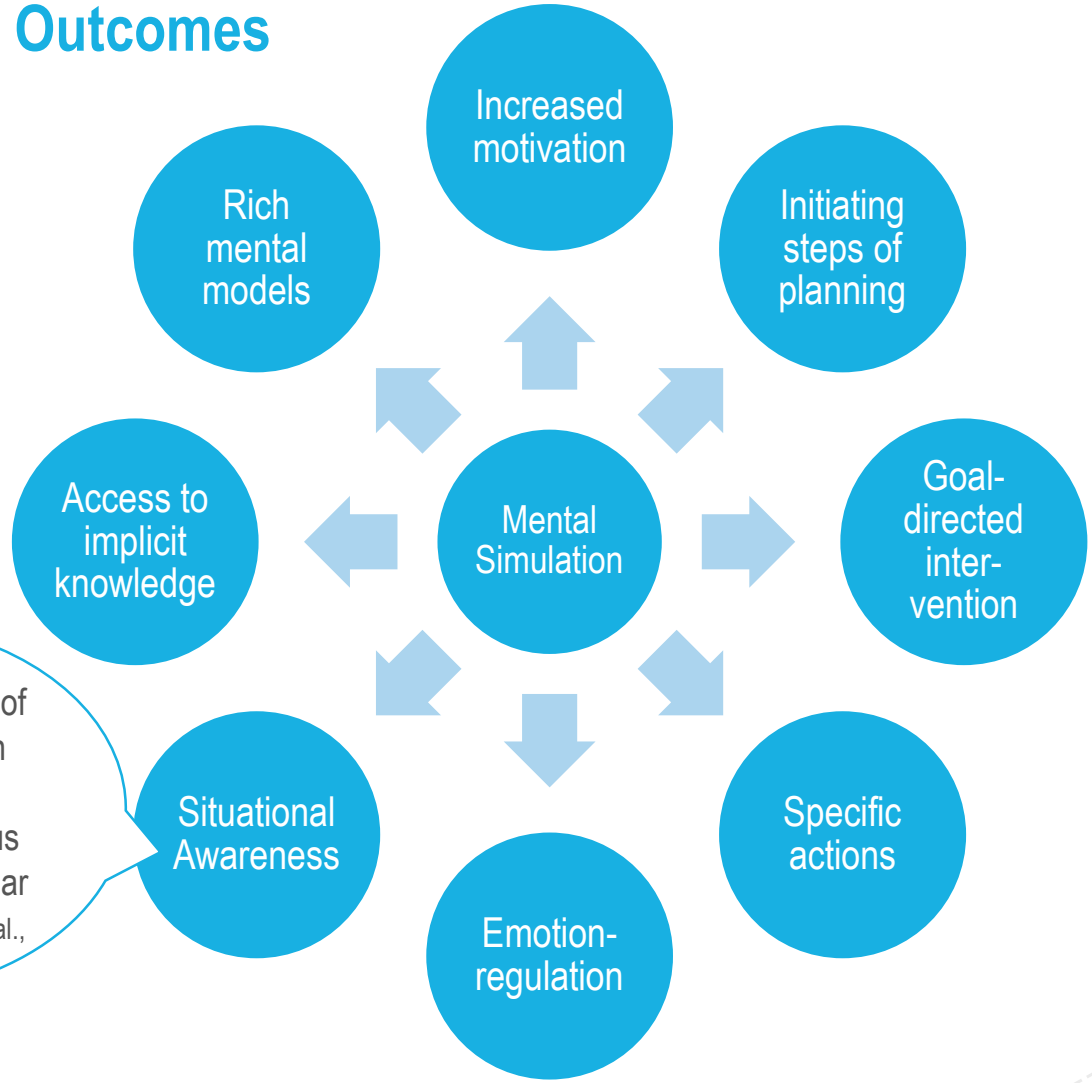
- Mental Simulation
- Intuition
- Research Question
- Interviews
- Results
- Stage Model of Mental Simulation
- Discussion

Mental Simulation

- Cognitive strategies to process hypothetic experiences
- Process simulation / process-oriented thinking
  - Elaboration on the step-by-step process leading to a desired outcome (Thompson et al., 2009)
- Creating difficult scenarios and solutions
- Evaluating courses of action (Klein, 1997)



(Supposed) Outcomes

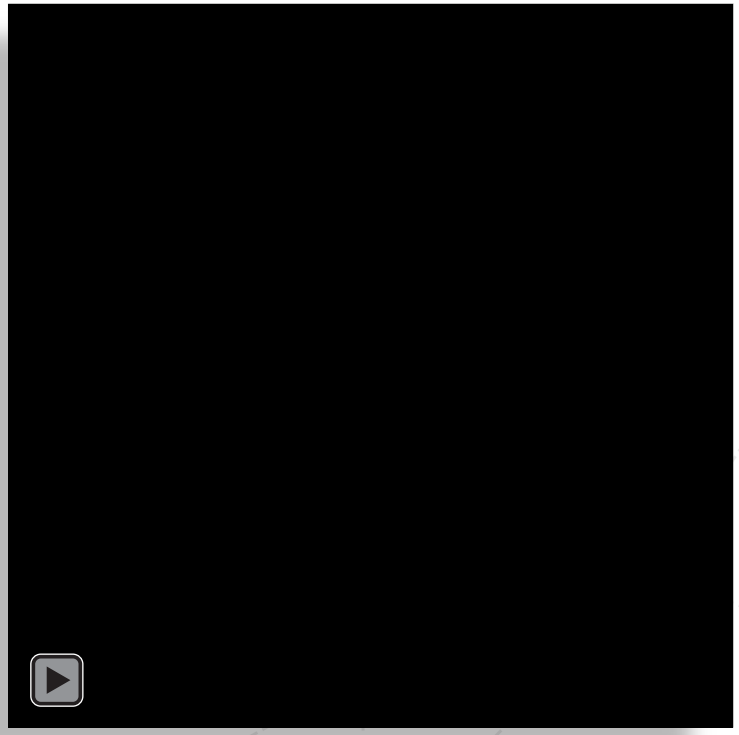


Awareness on situations, recognition of structures in situation allows access to knowledge basis; focus "What do I pay particular attention to?" (Busby et al., 2011)

Intuition

- Knowledge that influences…
  - Decision-making under conditions of uncertainty (e.g. missing or contradicting information)
  - Pattern recognition within complex stimuli (Chase & Simon, 1972; Harteis, 2017; Kahnemann & Klein, 2009)

- Intuitive decisions … (Kahnemann et al., 2009)
  - Emerge on their own
  - Without explicit awareness (of the evoking cues)
  - Without evaluation (of cues)
  - Produced by system 1 operations: automatic, involuntary, effortless



Crisis Response Work (CRW)

- Trained volunteers: “First Aide for the Soul”
- Called to emergencies (e.g. sudden deaths, severe accidents)
- On-site spiritual support, counsel and help
- Short time intervention to overcome first emotional reactions

Acting in new, challenging situations under time pressure

Research Question

How does mental simulation support crisis response workers in decisicion making within complex situations?

Method

- Modified critical incident interview approach (Klein et al., 2010) using a semi-structured interview guideline

- 11 interviews with CRW (5 female, 6 male)
  - <3 years of experience (novices): 4 IVs
  - 8-10 years of experience (intermediates): 3 IVs
  - >20 years of experience (experts): 3 IVs
  - 1 interview without information about experience

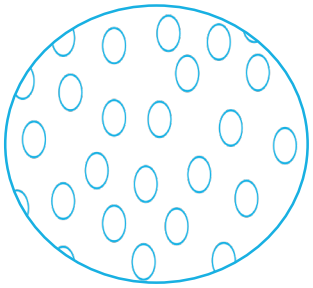
- Analysis: qualitative content analysis (Braun & Clarke, 2006, Mayring, 2008, and Schreier, 2013) with deductive and inductive coding (using MAXQDA v18 software)

Results

- The results show that mental simulation strongly contributes to the professional development and the development of intuition, especially because deliberate practices and means to professional development are missing (e.g. receiving feedback).

The pastor, responsible for the funeral, was able to give feedback. I mean he had spoken with the family again. That was where the feedback was from: „That was very nice, it helped a lot.“ Only in the minority of cases, we get feedback about operations (laughs).

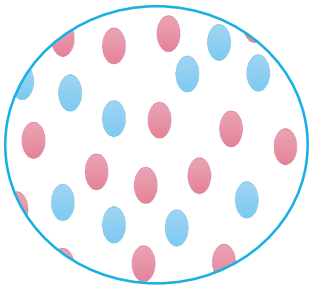
Stage Model – Stage 1



Questions guiding situational awareness

The first operation was this motorcycle accident. […] I was always thinking: „What do you do next? Will you go to the other motorcyclist? Or will you go to the driver first, whose car the motorcyclist got stuck underneath?

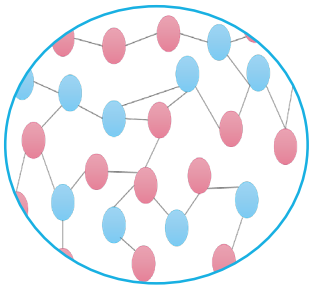
Stage Model – Stage 2



Questions that formulate hypothetical answers

One thing is to check medically, if there is a person staying behind after a fatality „Is the person medically stable?“ That‘s why I […] try to find out whether the person I go to is healthy. Are there any records of depression, suicide risk? Or do they have to take medicine at specific times? ‚Herzkasper‘ (heart attack) they say in Bavarian. Can they get a shock by something special like that?

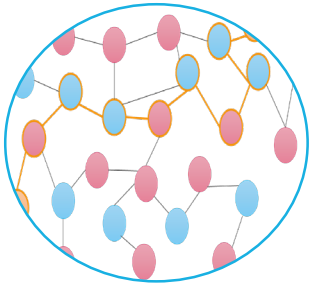
Stage Model – Stage 3



Hypothesis about a potential situation and its influence on decisions

That is the imagination. This „If this comes, then …“ If a neighbor comes by, could she be helpful? Yes, then include her. If the neighbor comes around and she is not helpful, then send her to the street and tell her to watch for an ambulance, grandchild or someone else arriving. To keep in mind: „What to do, if this, this and this happens?

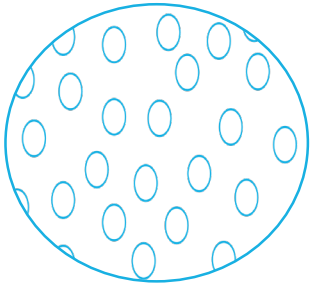
Stage Model – Stage 4



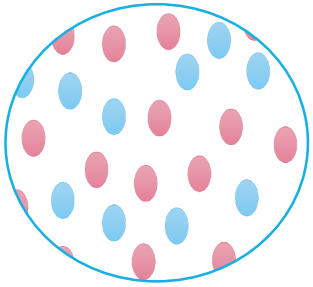
Hypotheses for several steps ahead, the possible decisions, and the influence of those decisions on a situation

On site it is possible, that there is a passenger train, commuter train, occupied by a third, with people unevenly distributed. […] „Is there already someone at the scene?“ The Deutsche Bahn has own staff for support. Private railways don‘t. „Who is the owner of the train?“ The ambulance service takes care of the engine driver. […] „Who else is at the scene?“ […] „Are there any witnesses? Are there any children at the scene, too?“ Children have to be cared for differently. There is a difference between direct witnesses and people who only realised the emergency stop and heared the announcement „The train does not go on“.

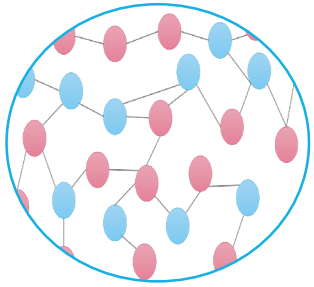
Stage Model



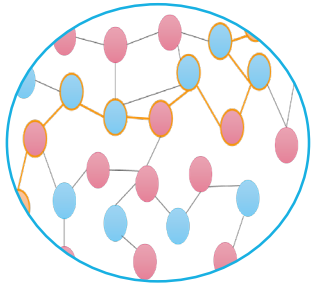
Questions guiding situational awareness



Questions that formulate hypothetical answers



Hypothesis about a potential situation and its influence on decisions



Hypotheses for several steps ahead, the possible decisions, and the influence of those decisions on a situation

Professional Development

Discussion

- Further development of the stage model
  - How do the stages of mental simulation develop along with the stages of professional development?
  - What are the learning outcomes from different stages?
  - What is the contribution from the different stages to the development of intution?

- Limitations
  - Small sample size and only self-description of performance quality.
  - Need of replication through other measures of intuitive decision-making (e.g. skin conductance analysis or eye-tracking methods).

Publication

Steffen, B., Goller, M., & Harteis, C. (2020). The contribution of mental simulation to the development of intuition. In M. Sinclair (Ed.), Handbook of Intuition Research as Practice (pp. 241–254). Cheltenham: Edgar Elgar.
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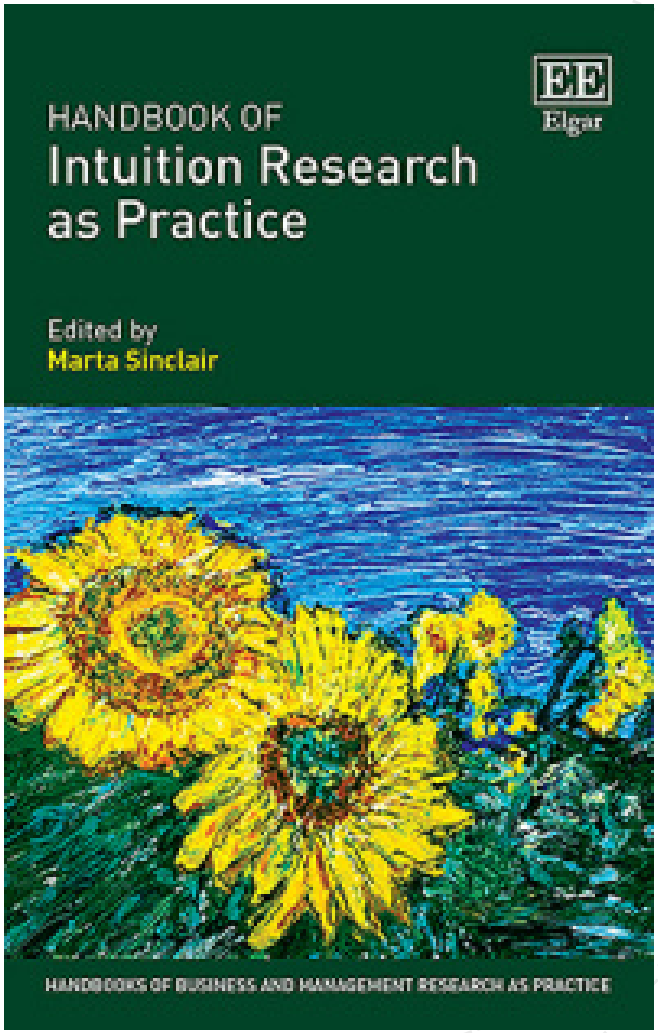

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Thank you for listening!

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Educational Management and Research In Further Education

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Digital Trust in the Workplace:

Preliminary Results

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trust

https://www.merriam-webster.com/dictionary/trust

assured reliance on the character, ability, strength, or truth of someone or something

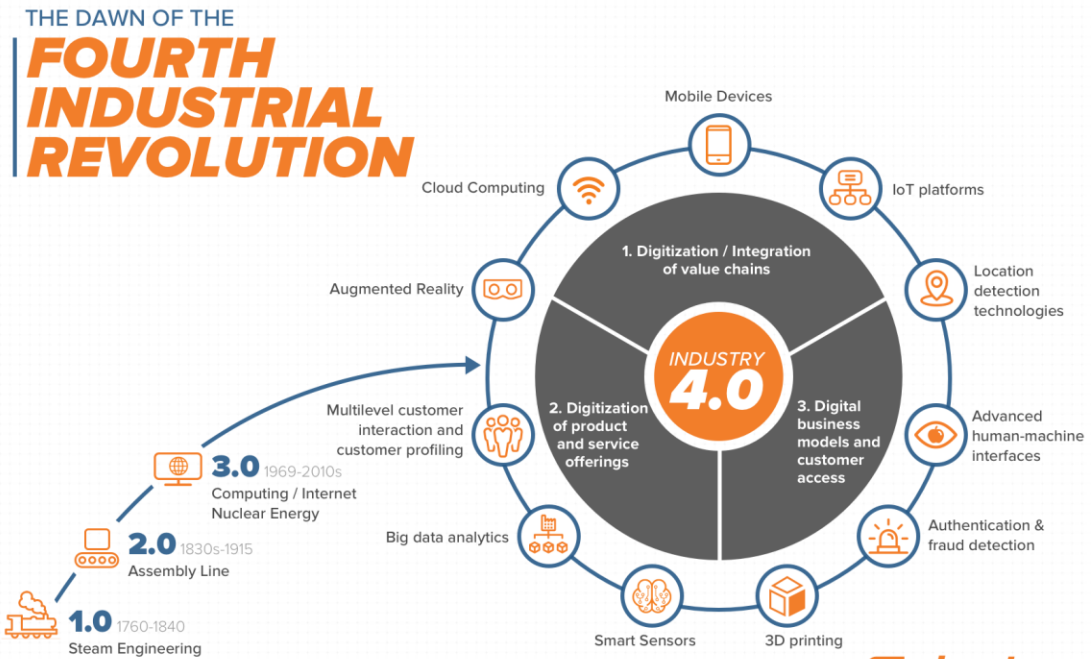
trust affects

- responsibility norms and organizational outcomes (Salamon & Robinson, 2008)
- workplace safety climate (Mosher, 2013)
- employee's decision-making Mosher (2013)
- organizational performance (NICULESCU, 2015).

Legitimacy, effectiveness and transparency, and technological drivers for transformation

(Norbert, 2015).

building a long-lasting trust



National laws,
Ethical,
Data privacy act,
social norms, laws,
practices,
experiences,
education,
Behaviors,

The ever-changing technological innovations *disrupts lives.*

It influences our feelings and emotions.

It changes the way we believe in the ability, reliability and power of something or someone.

It affects *how we trust with people or things.*

Digital trust "underpins every digital interaction by **measuring and quantifying** the expectation that an entity is *who or what* it claims to be and that it will behave in an expected manner" (Gartner, Inc, 2017).

Digital trust

It refers to the “level of confidence in people, processes, and technology to build a secure digital world” (Sean, 2018).

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The Research

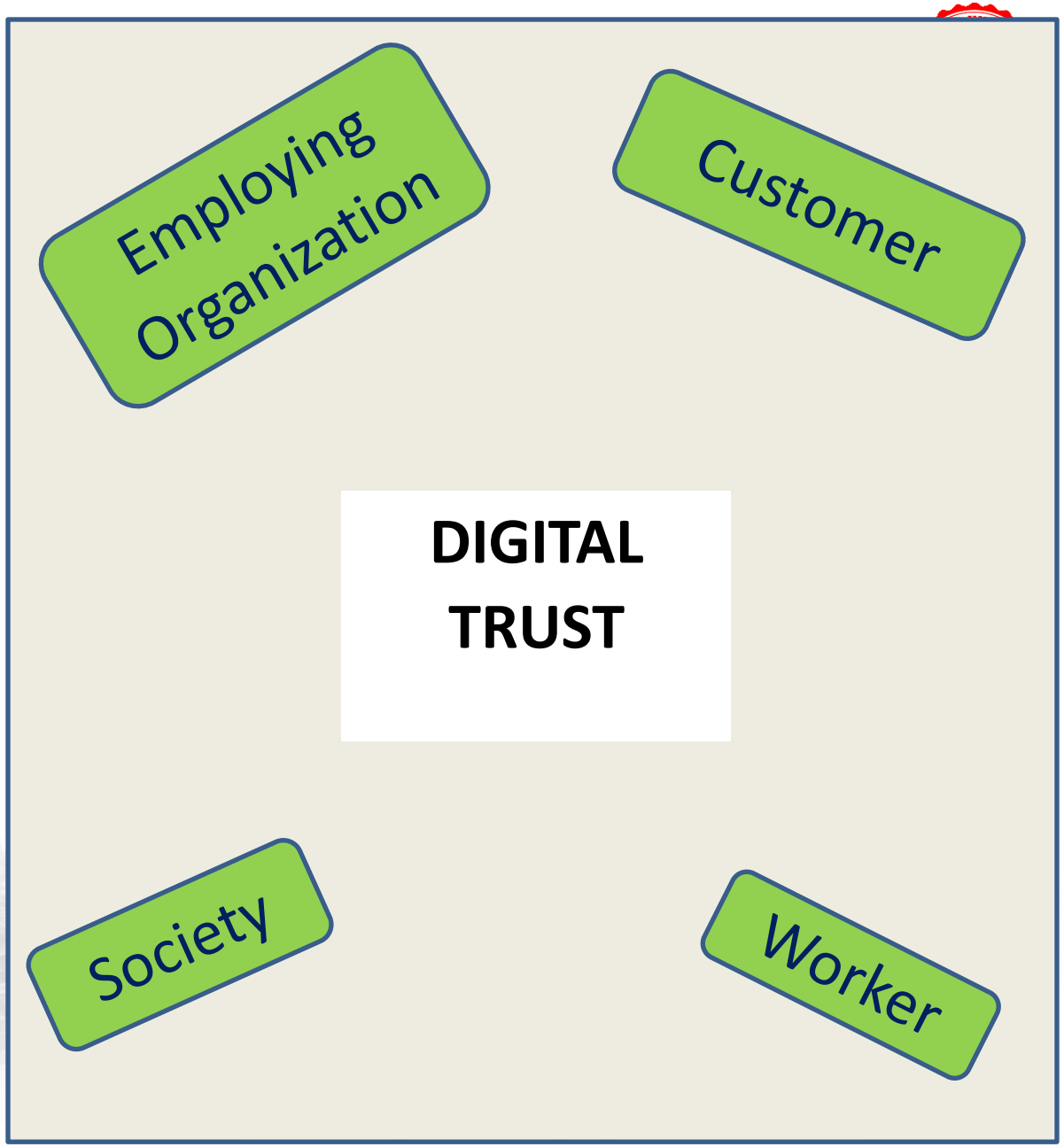
Digital Trust IN THE WORKPLACE

"a central concept for several entities"

(Jackson & Suomi, 2004)

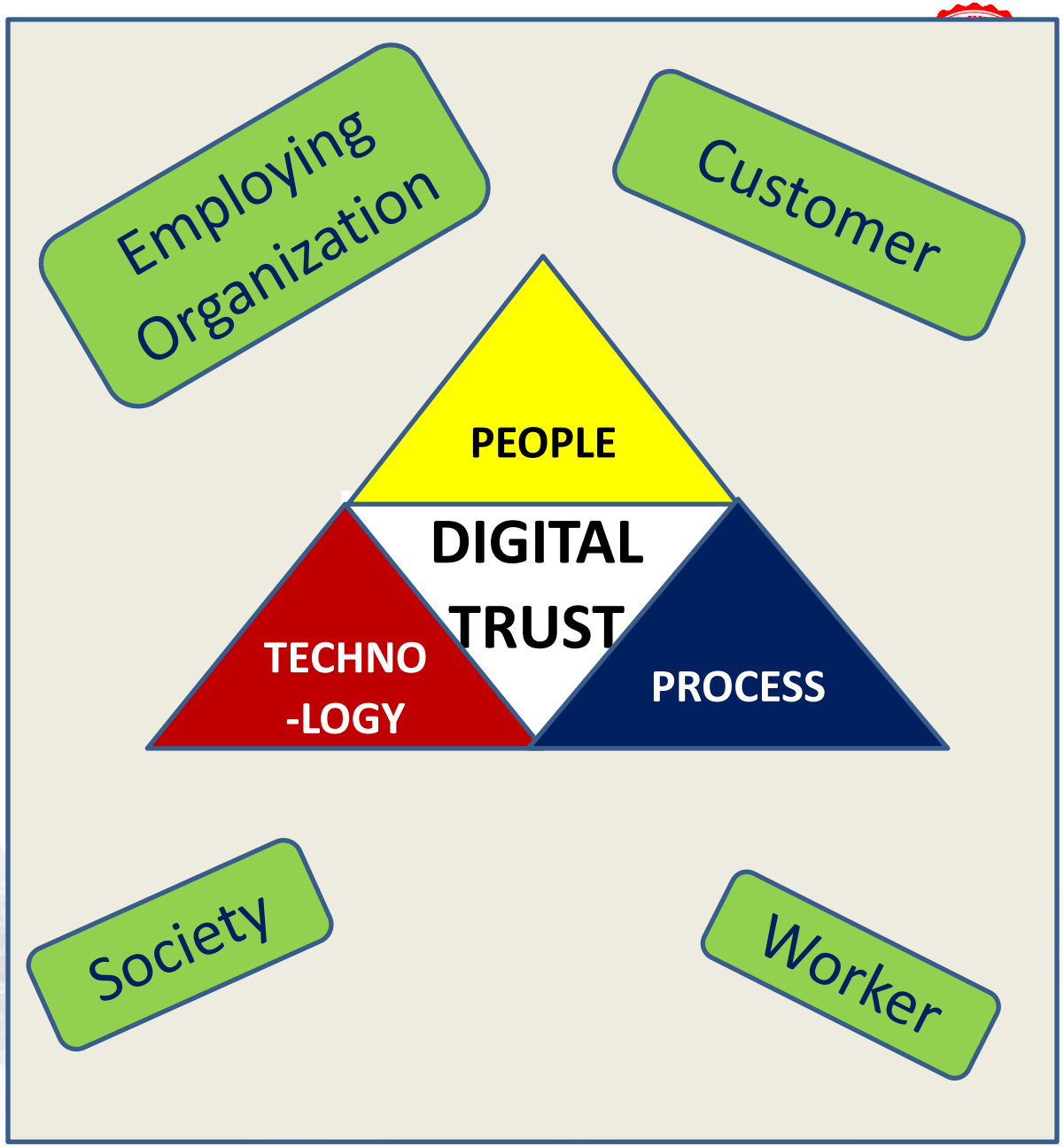
The Research
measured the digital trust **among employees** and

- his/her *perspective* about his/her **own experience** as a worker,
- his/her *attitude* towards the **employing organization** and the customers, as well as
- his/her *behaviour* in the **society** as a whole.



The Research

primarily aimed at measuring the digital trust in the workplace with emphasis on people, technology and process.

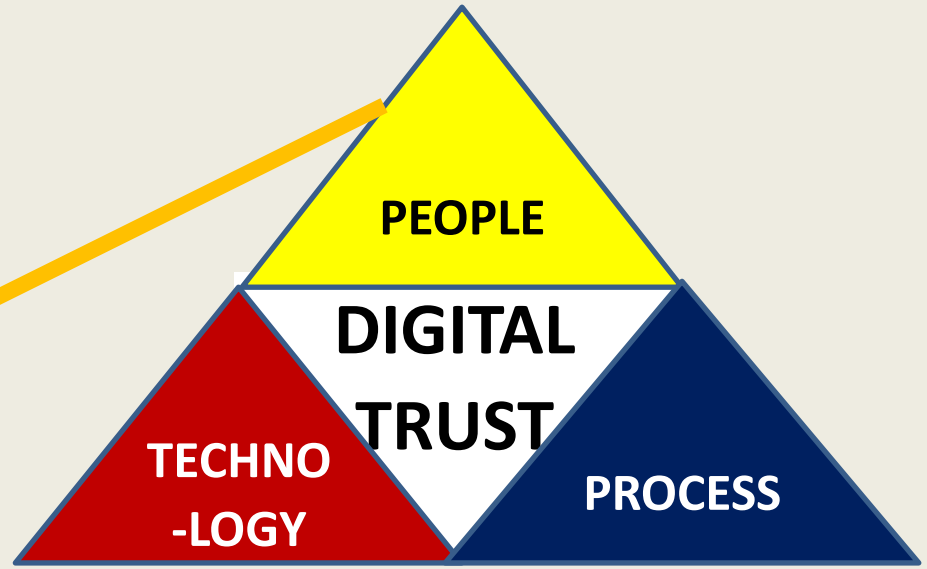


IT Management Theory

Management & Other Internal Entities

IT & Data Support

External Entities



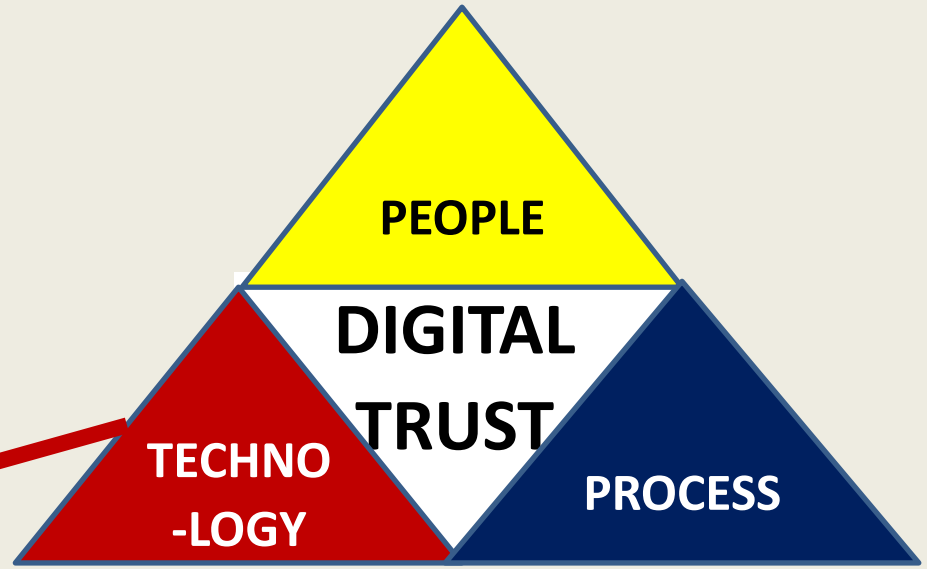
Diffusion of Innovation Theory

MIS Theory

Electronic Devices

Hardware & Software Systems

Information Systems



Supply Chain

FURPS & PIECES Models

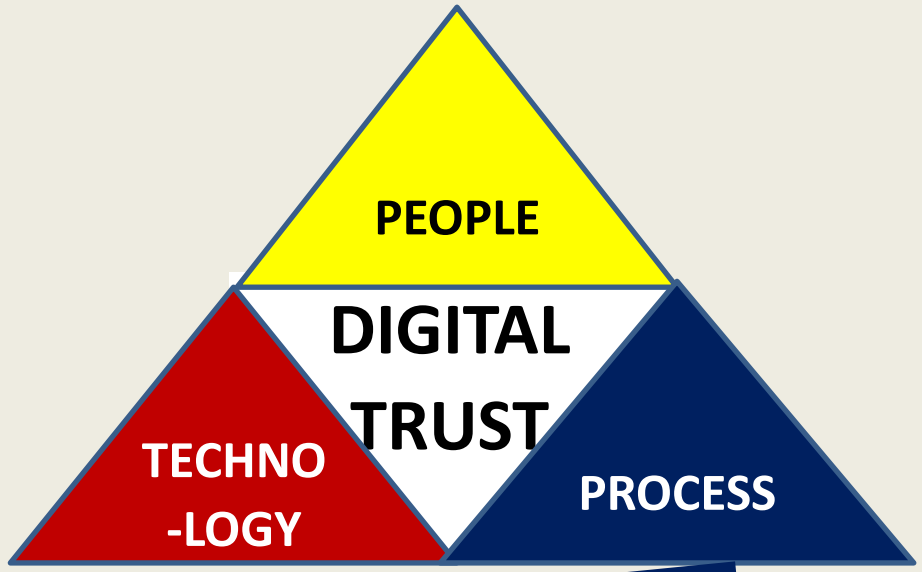
GDPR Principles

Information System Operations

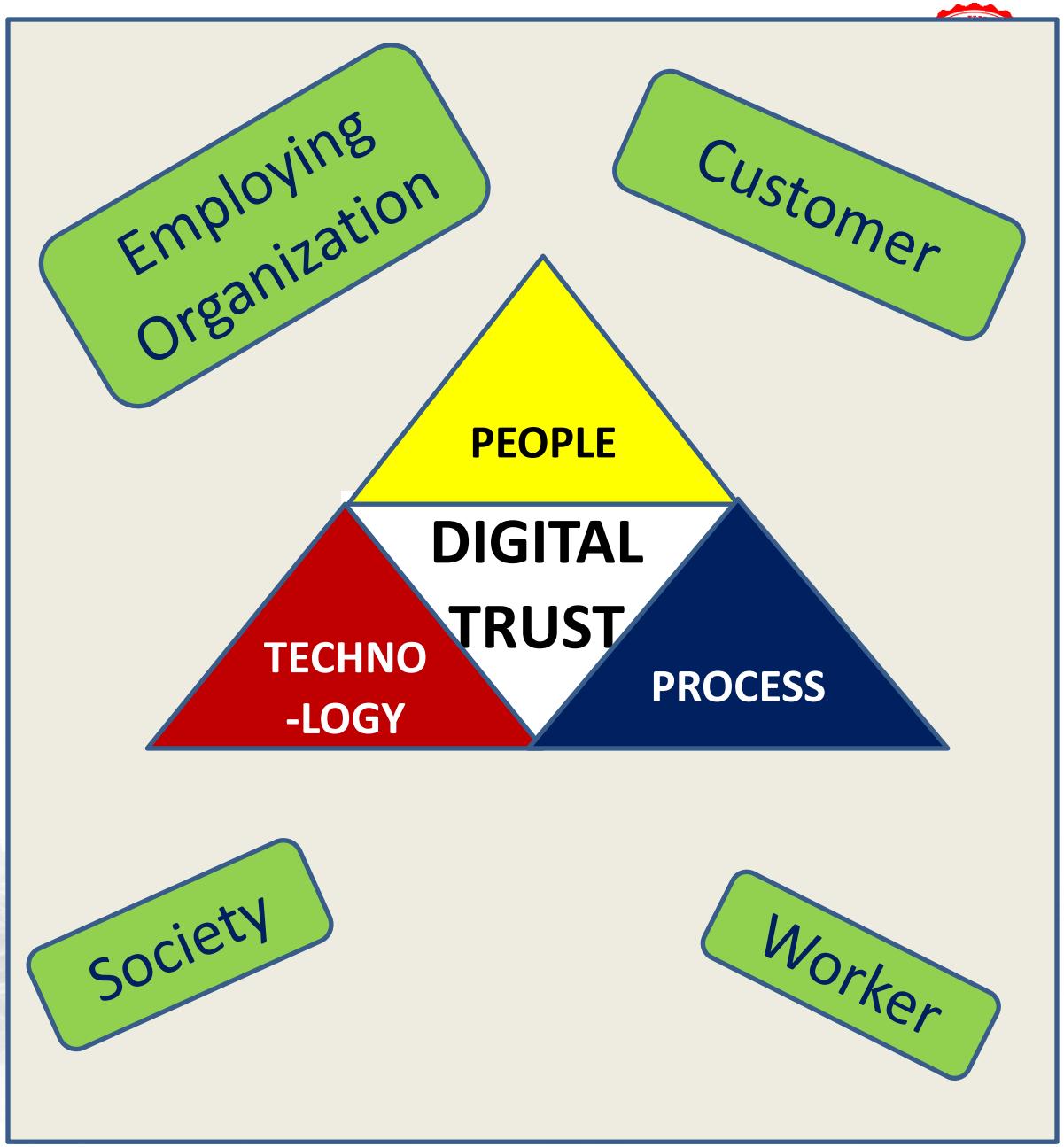
Data Protection & Privacy

Internet & Social Media Use

Responsible Citizenship & Caldicott Principles



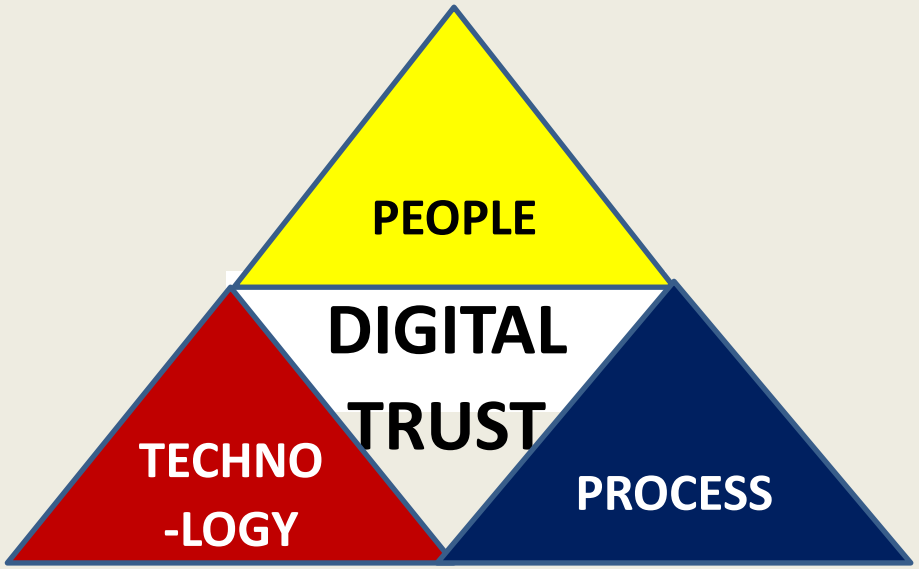
Factors


Employing Organization
Customer
PEOPLE
DIGITAL TRUST
TECHNO -LOGY
PROCESS
Society
Worker

Factors

DEMOGRAPHICS

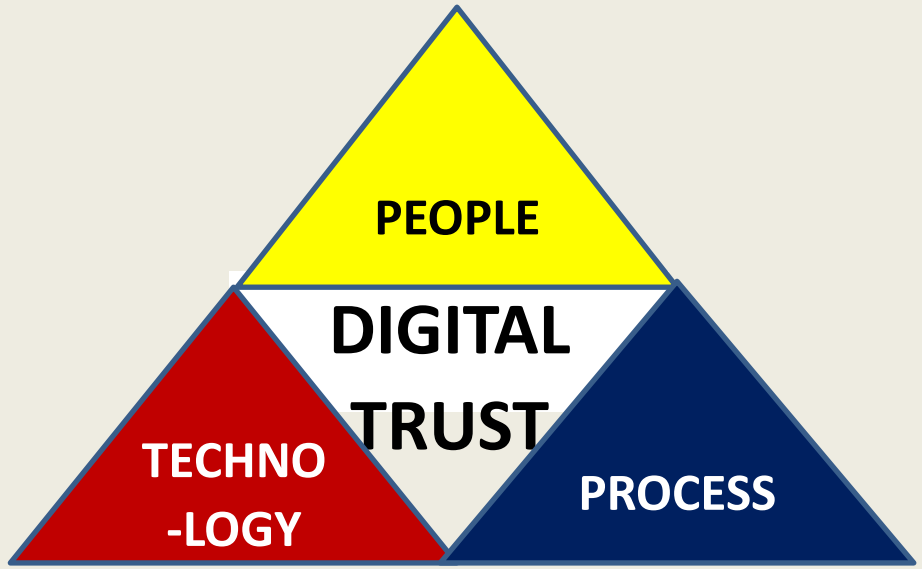
Age, gender, status, education



Factors

TECHNOLOGIC

Ownership,
Social technologic,
satisfaction

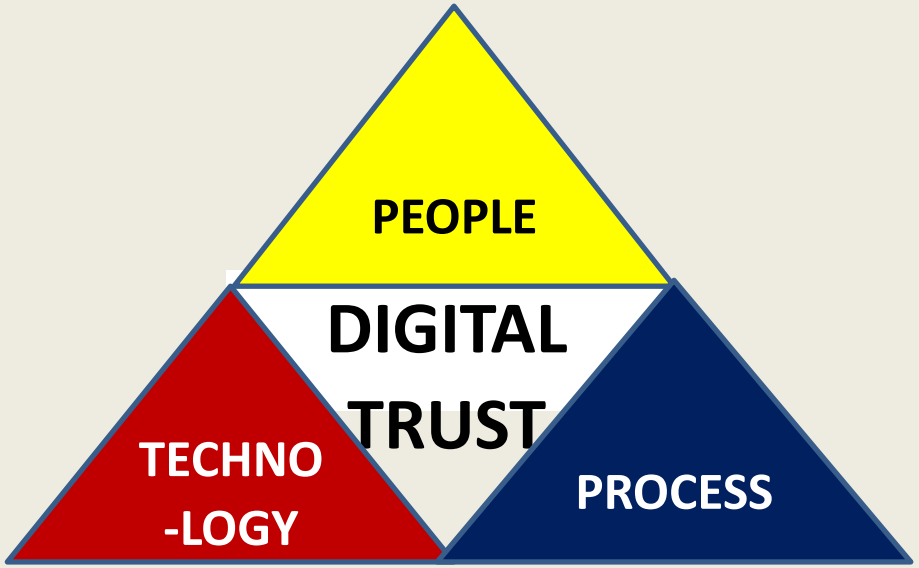


Factors

Management Theory

EMPLOYMENT

Company type, industry sector, customer group, employment status, position

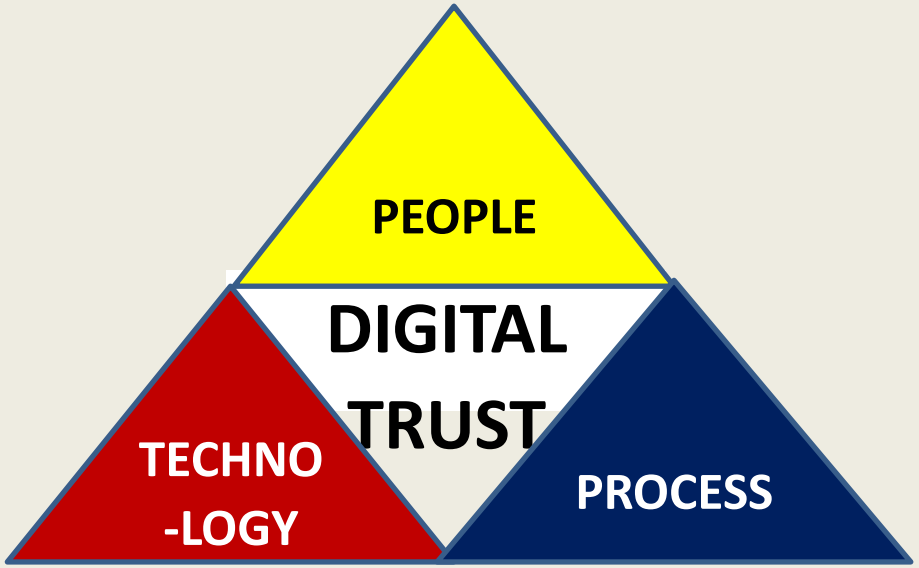


Factors

Adoption Theory

Technology Integration

Connectivity, platform, means of communication

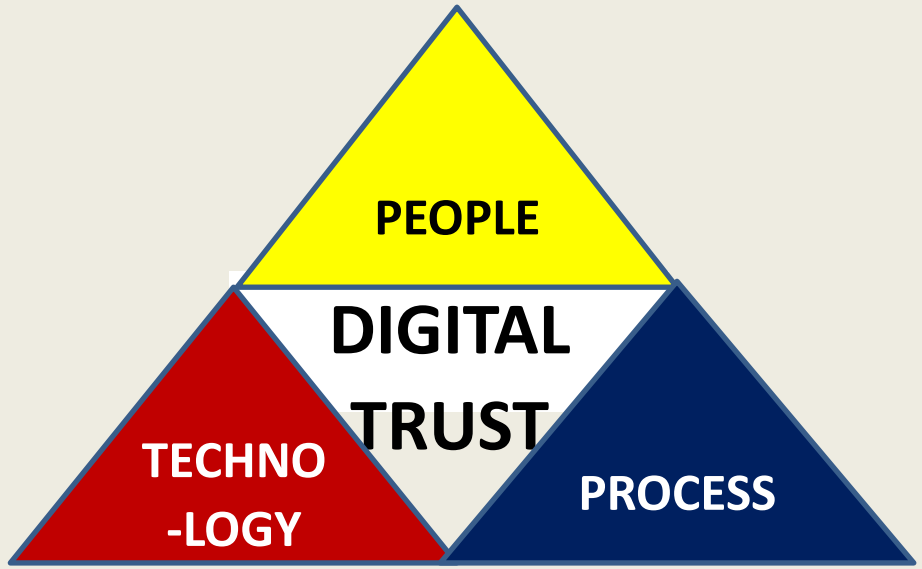


Factors

Intuition Theory

Decision-making skills

Rational, intuitive, subconscious, heuristics, anticipation

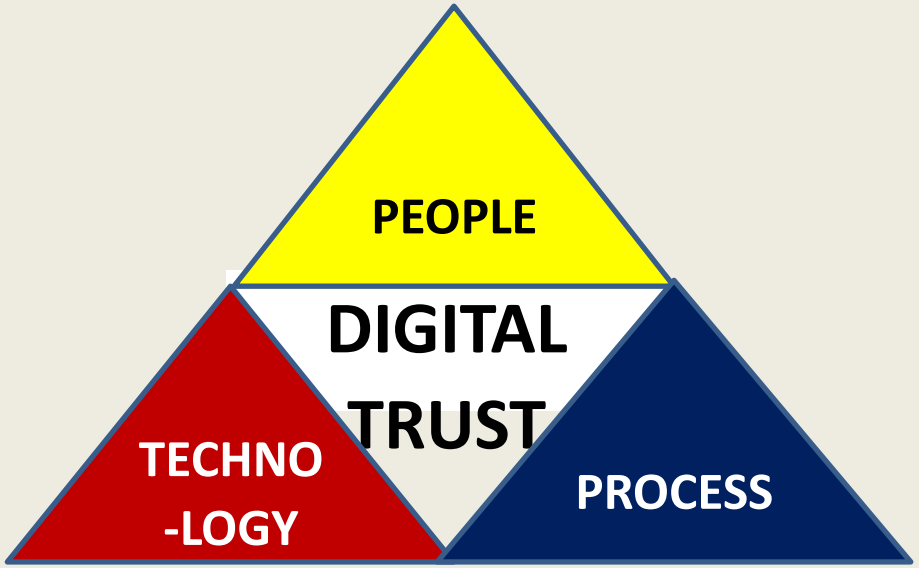


Factors

Big Five Model

Personality

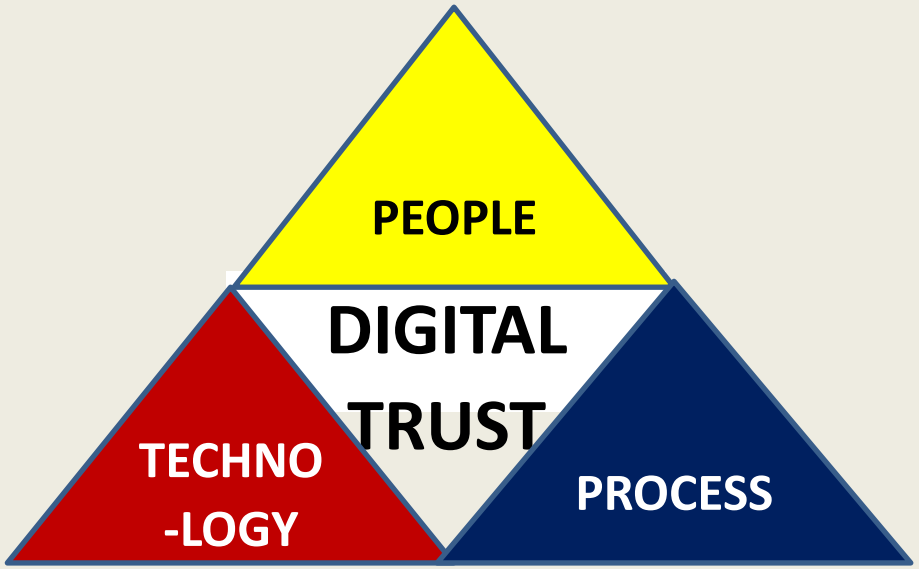
Openness, Conscientiousness, Agreeableness, Extraversion, and Neuroticism



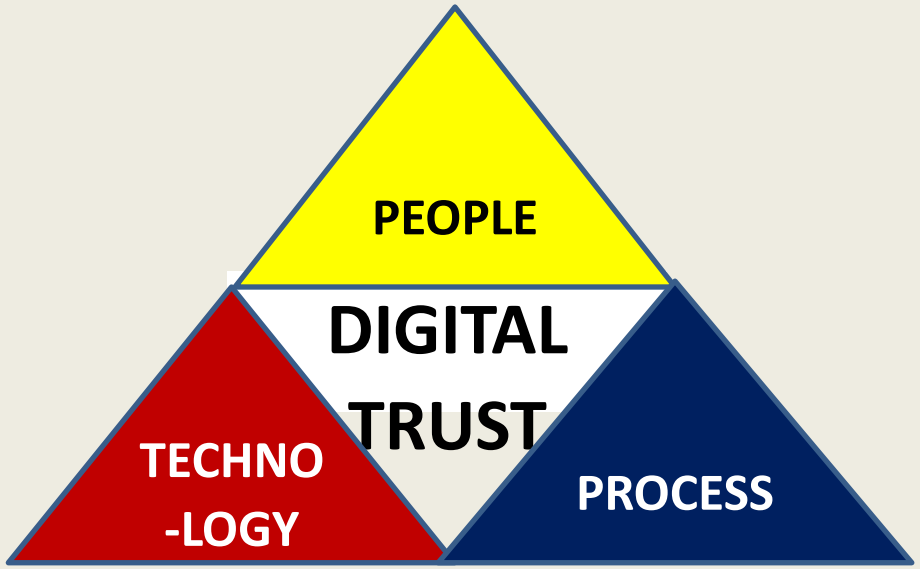
Factors

Technology & Information System Features

Performance, Information, Security, Reliability, etc.



The Research



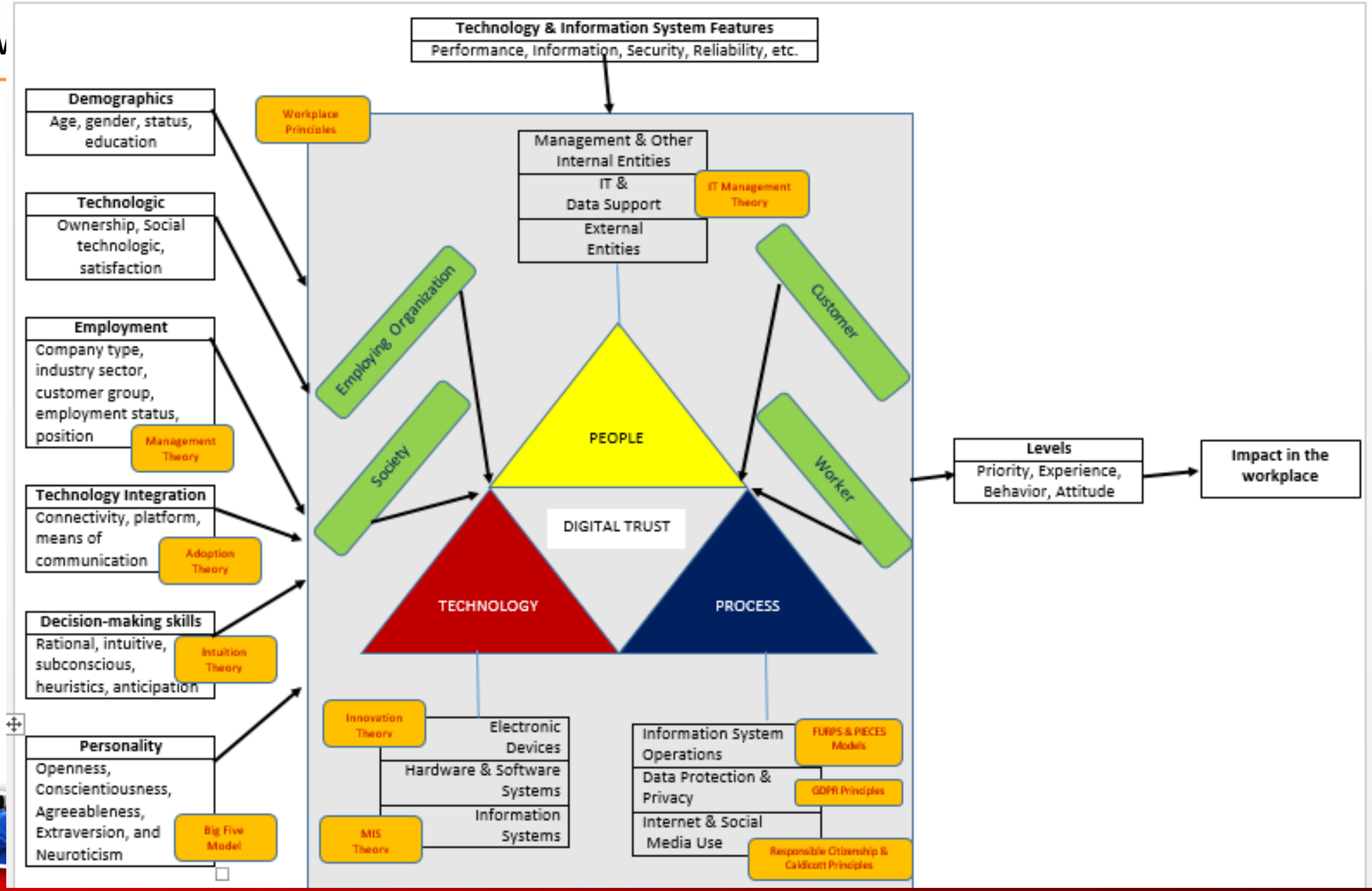
Levels

Priority, Experience, Behavior, Attitude

Impact in the workplace

- responsibility norms and organizational outcomes (Salamon & Robinson, 2008)
- workplace safety climate (Mosher, 2013)
- organizational performance (NICULESCU, 2015).
- employee's decision-making Mosher (2013)

Digital Trust in the V



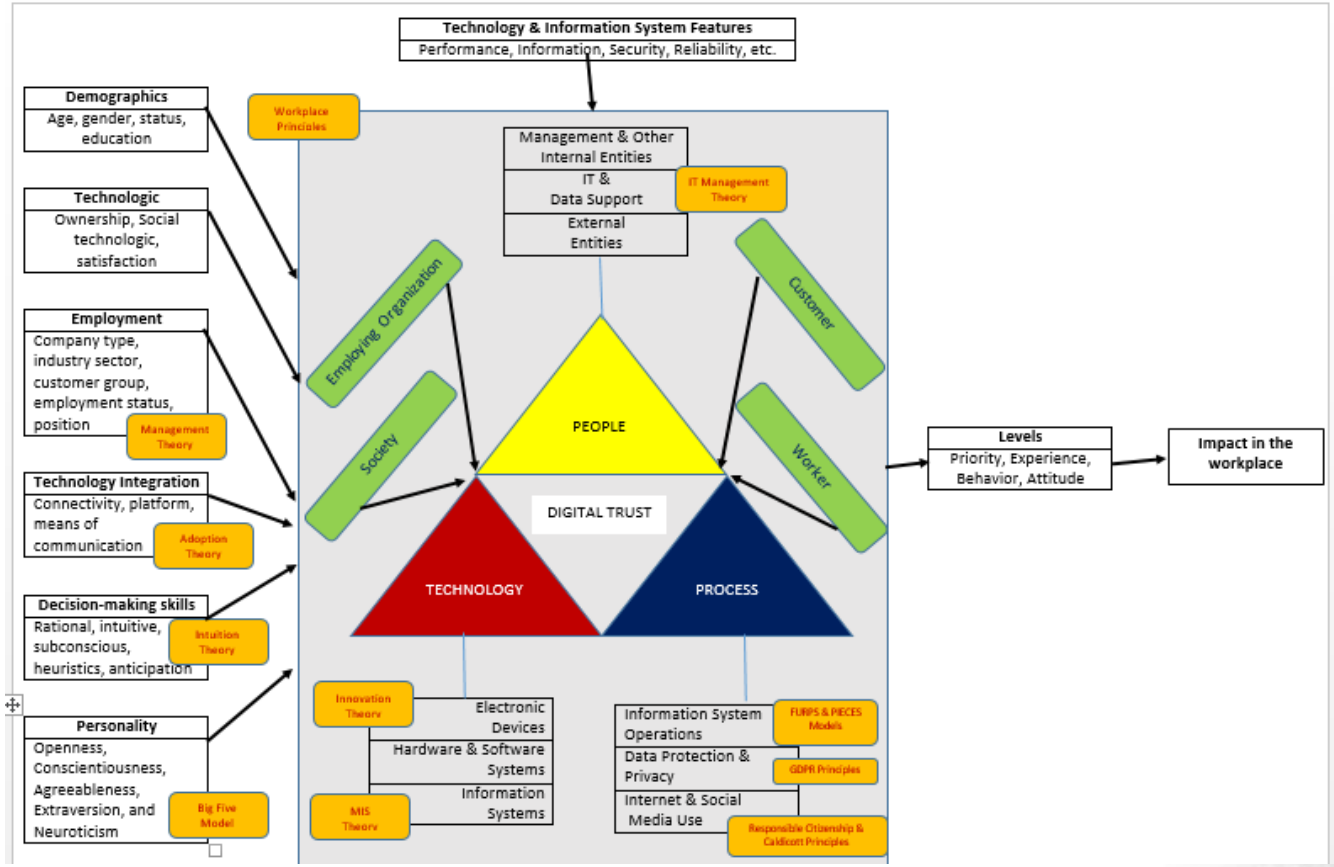
METHODS

Respondents

- employees/workers
  - –Fulltime or part-time
  - –Regular or probationary
  - –Private, public, or NGO
  - –SMEs, LSEs

METHODS

The Survey Questionnaire



- the measurement of the digital trust level is based on six components.
  - a) Technology and Information System Features,
  - b) Hardware and Software Technologies,
  - c) People,
  - d) Information Systems Operations,
  - e) Data protection and Privacy, and
  - f) Digital Citizenship.
- Likewise, Survey eTrust comprises four profiling, such as
  - demographics,
  - employment,
  - technologic and
  - technology integration.

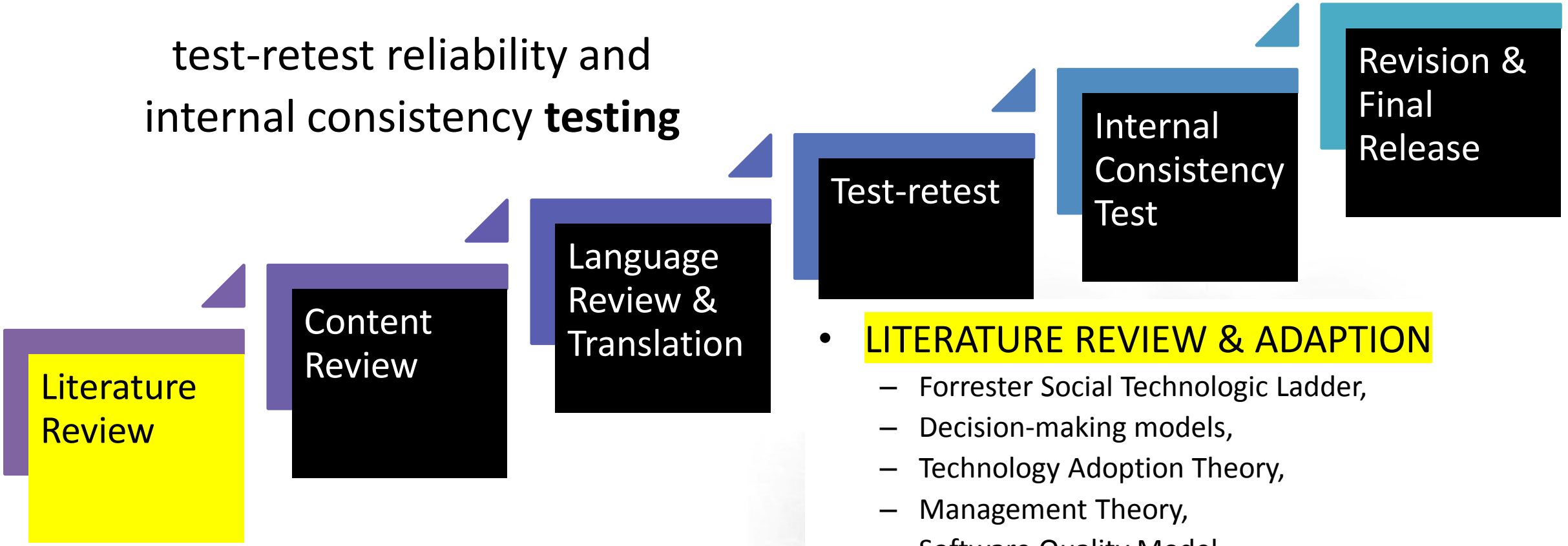
METHODS

test-retest reliability and internal consistency **testing**

- Literature Review
- Content Review
- Language Review & Translation
- Test-retest
- Internal Consistency Test
- Revision & Final Release

METHODS

test-retest reliability and internal consistency **testing**



- LITERATURE REVIEW & ADAPTION
  - Forrester Social Technologic Ladder,
  - Decision-making models,
  - Technology Adoption Theory,
  - Management Theory,
  - Software Quality Model,
  - General Data Protection Regulation Principles,
  - Digital Citizenship Principles, and Caldicott Principles

METHODS

test-retest reliability and internal consistency **testing**

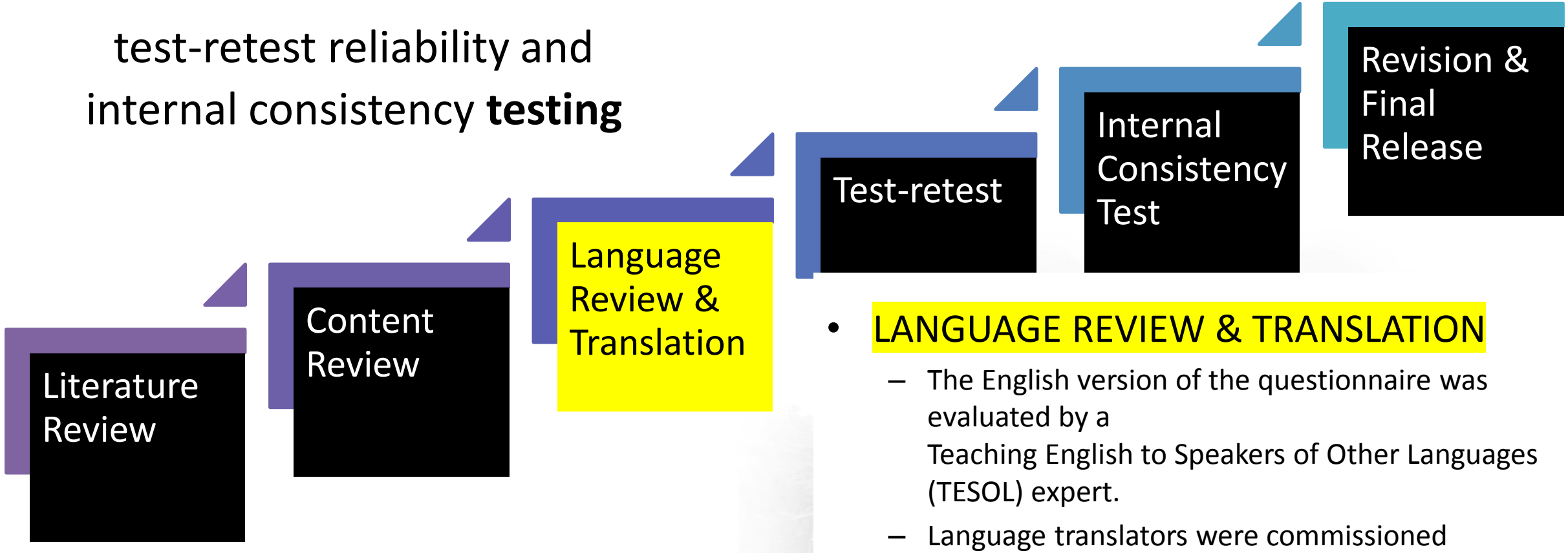
- Literature Review
- Content Review
- Language Review & Translation
- Test-retest
- Internal Consistency Test
- Revision & Final Release

CONTENT REVIEW

3 Industry practitioners
3 University professors

METHODS

test-retest reliability and internal consistency **testing**



- LANGUAGE REVIEW & TRANSLATION
  - The English version of the questionnaire was evaluated by a Teaching English to Speakers of Other Languages (TESOL) expert.
  - Language translators were commissioned
    - German, Chinese, Japanese, South Korean, Russian, Portuguese, Spanish, and Thai.

METHODS

test-retest reliability and internal consistency **testing**

The Filipino-participants are all professionals and currently working in a Philippine company. On the other hand, the German-participants are undergraduate students but working part-time in any company in Germany. The administration of the test-retest was delivered online. All participants were brief about the purpose of the testing. For monitoring, email addresses and IP addresses were required during the tests.

Literature Review

Content Review

Language Review & Translation

Test-retest

Internal Consistency Test

Revision & Final Release

- TEST-RETEST
  - Germany and the Philippines in a week interval in January 2019.
  - Quota and convenience sampling among similarly situated participants.
  - The Philippines group has 32 test-retest responses while Germany has 51 responses.

METHODS

test-retest reliability and internal consistency **testing**

The administration of the pre-testing was delivered online through the country representative as appointed by the project leader. For monitoring, email and IP addresses were required during the test. This was clearly explained to the participants.

Literature Review

Content Review

Language Review & Translation

Test-retest

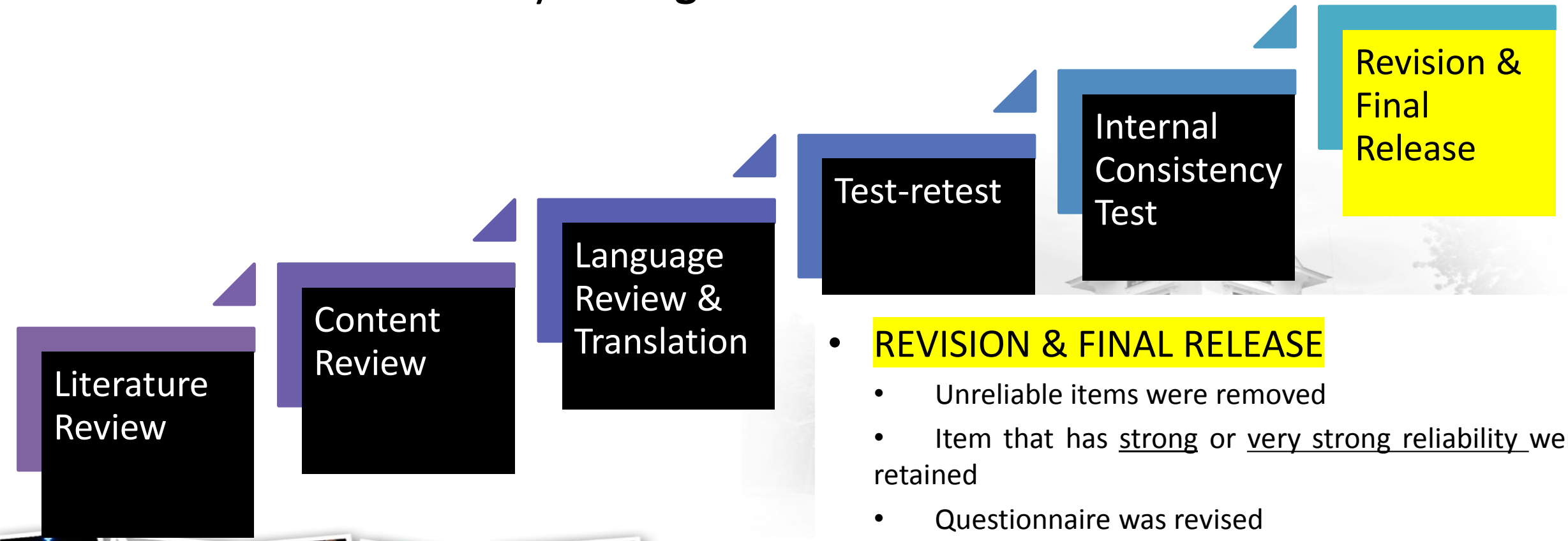
Internal Consistency Test

Revision & Final Release

- INTERNAL CONSISTENCY TEST
  - conducted in China, Japan, South Korea, Paraguay, Russia, Brazil, Thailand, USA, and the United Kingdom
  - from June to November 2019.
  - A quota and convenience sample of 376 was collected, inclusive of the test responses of Germany and the Philippines.

METHODS

test-retest reliability and internal consistency **testing**

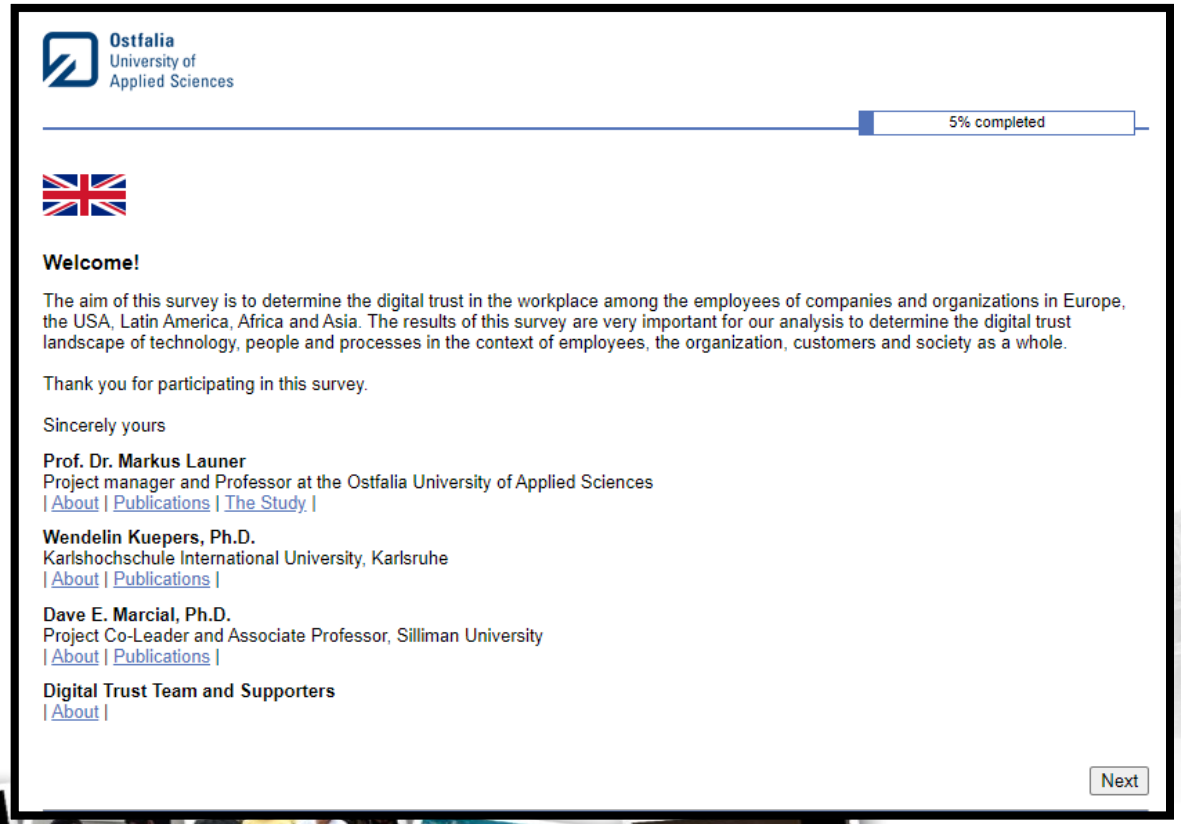


- REVISION & FINAL RELEASE
  - Unreliable items were removed
  - Item that has strong or very strong reliability were retained
  - Questionnaire was revised

METHODS

Survey Administration

- Online
- https://www.soscisurvey.de/digitaltrust/index.php
- Country representative, collaborators

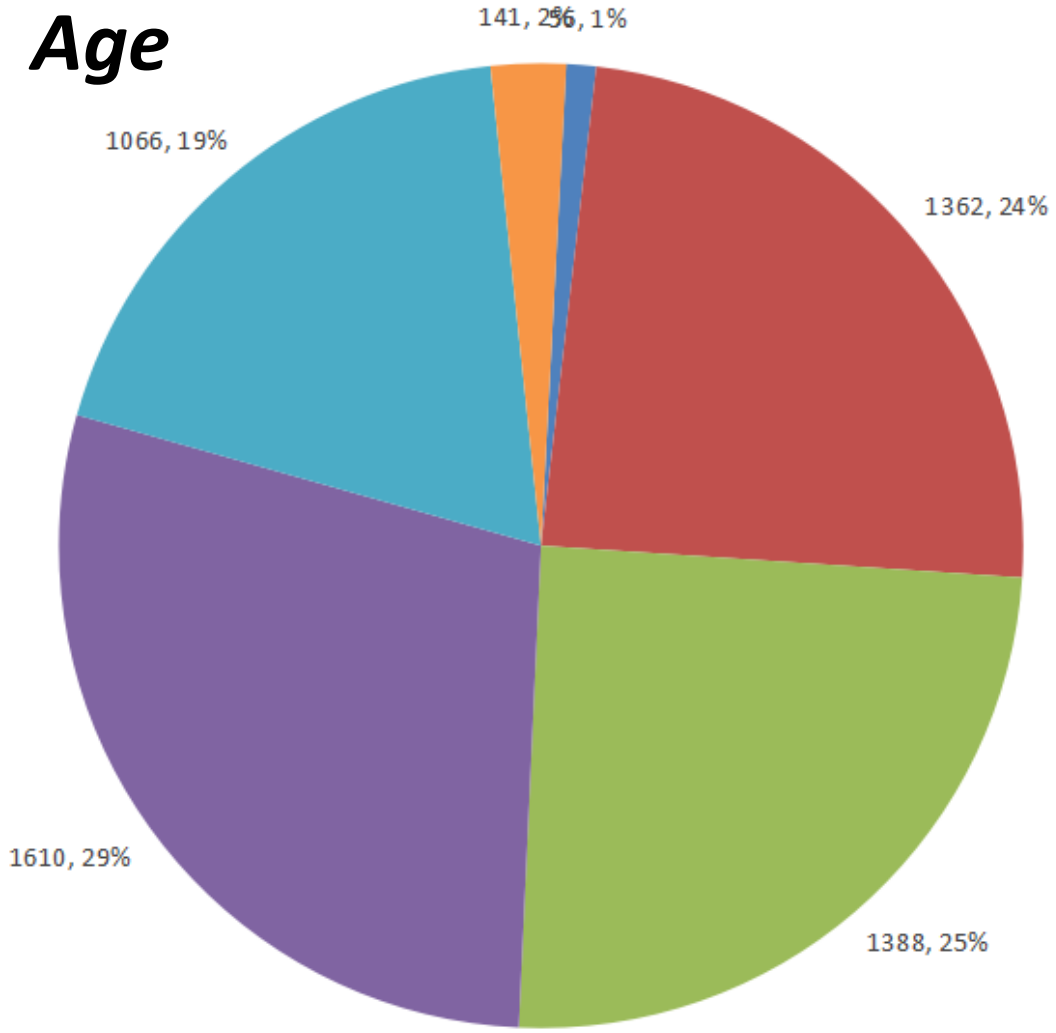


RESULTS

- **DEMOGRAPHIC PROFILE**
  - Age (range)
  - Gender
  - Civil status
  - Highest educational attainment
  - Country

RESULTS

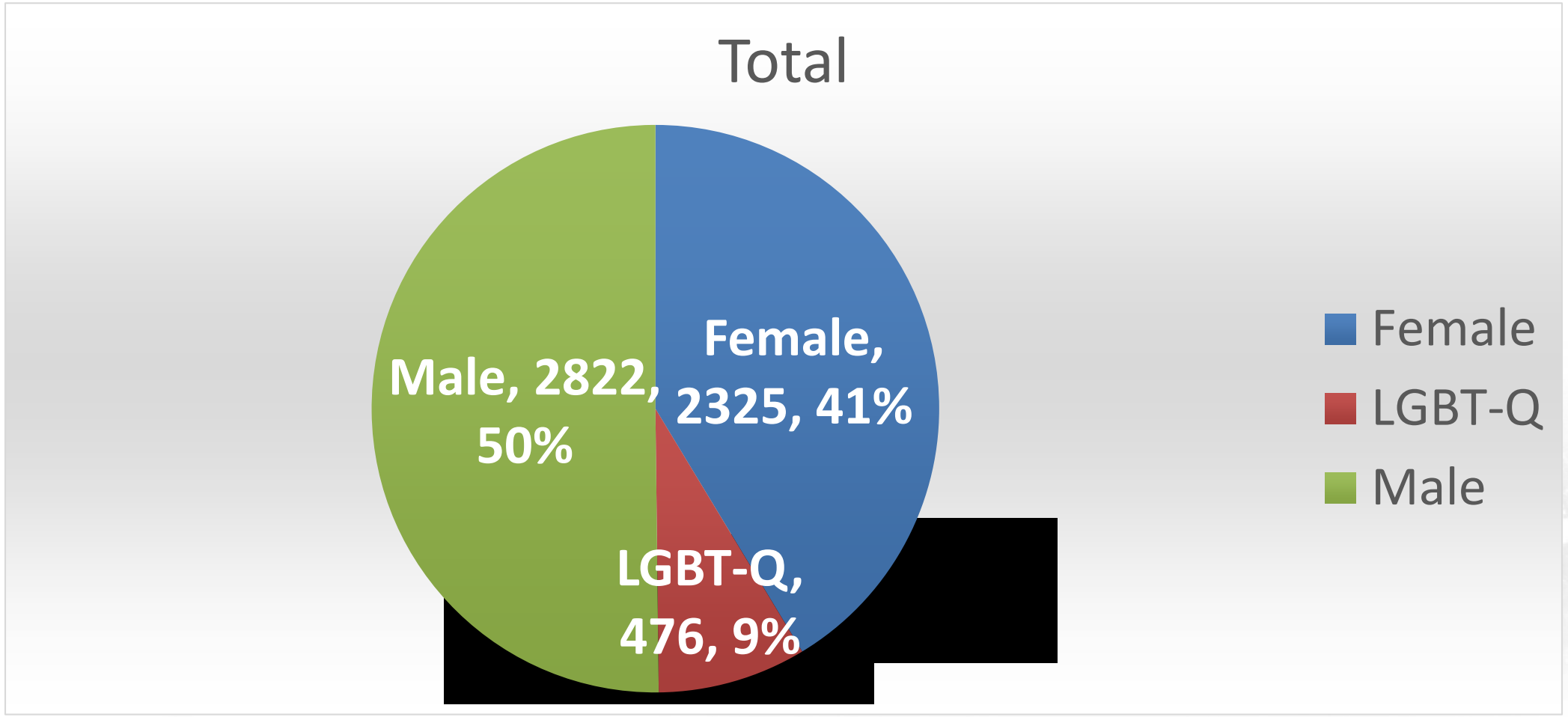
- ***Age***



Age	Count of Age	Percentage
18 or younger	56	1%
19 - 28	1362	24%
29 - 38	1388	25%
39 - 48	1610	29%
49 - 58	1066	19%
59 & older	141	3%
Grand Total	5623	100%

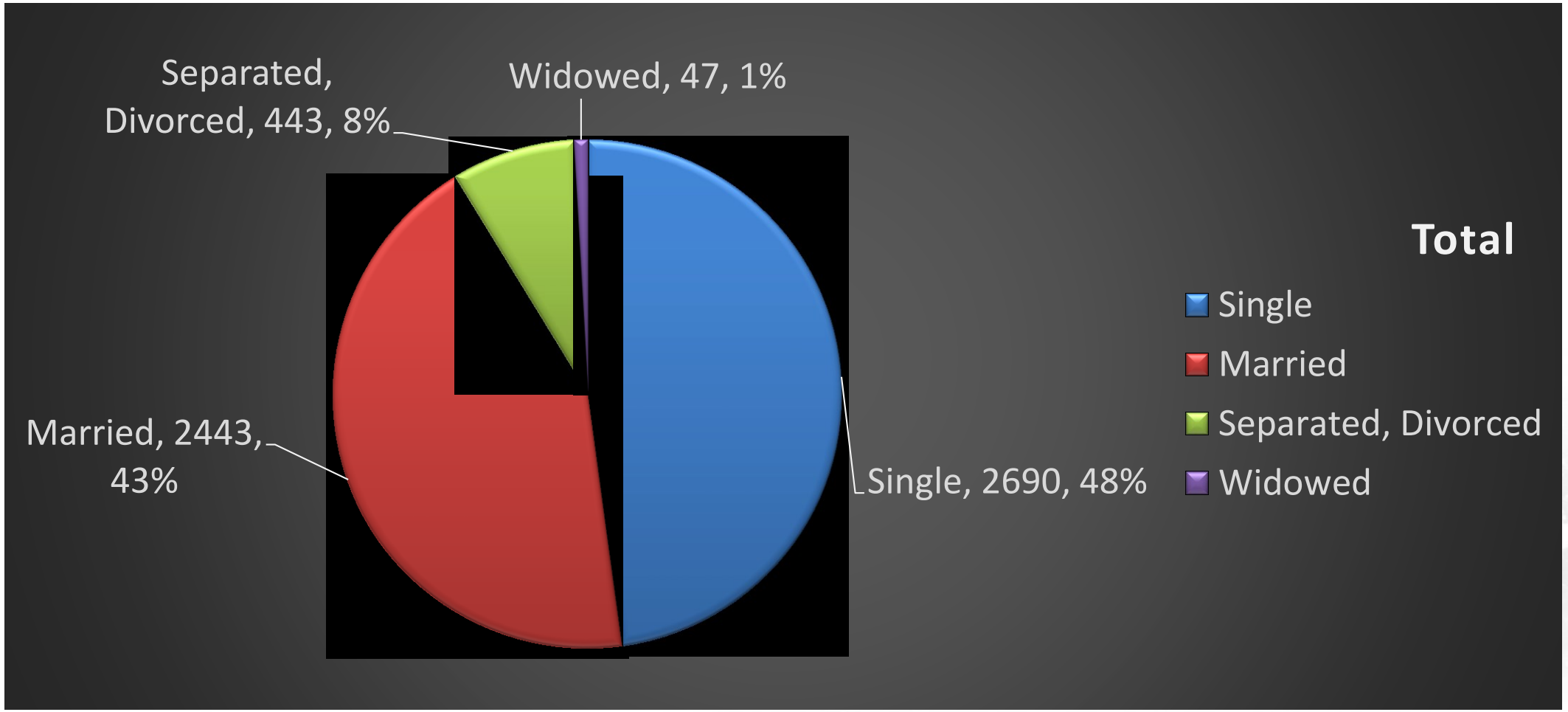
RESULTS

- ***Gender***



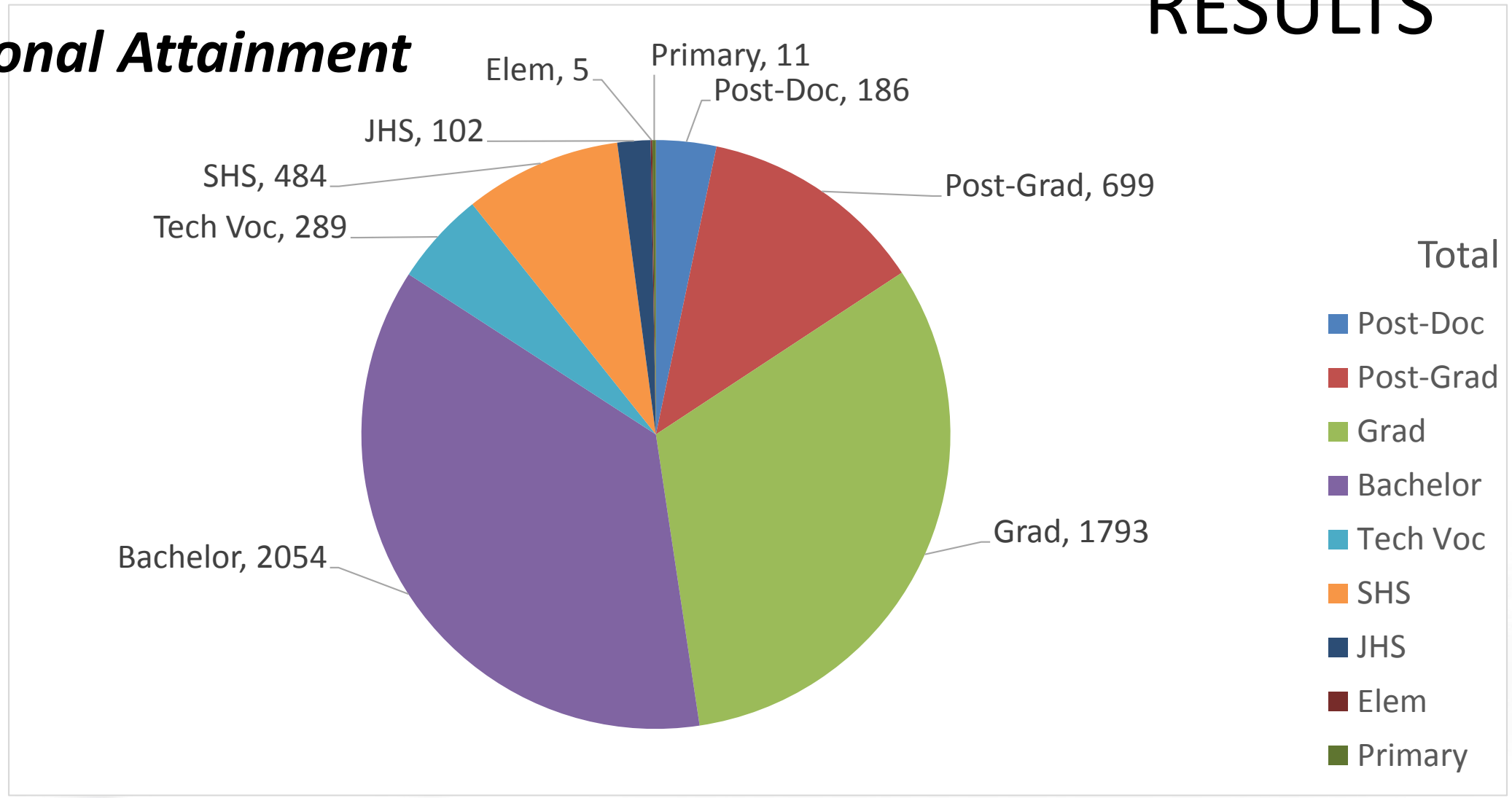
RESULTS

- ***Civil Status***



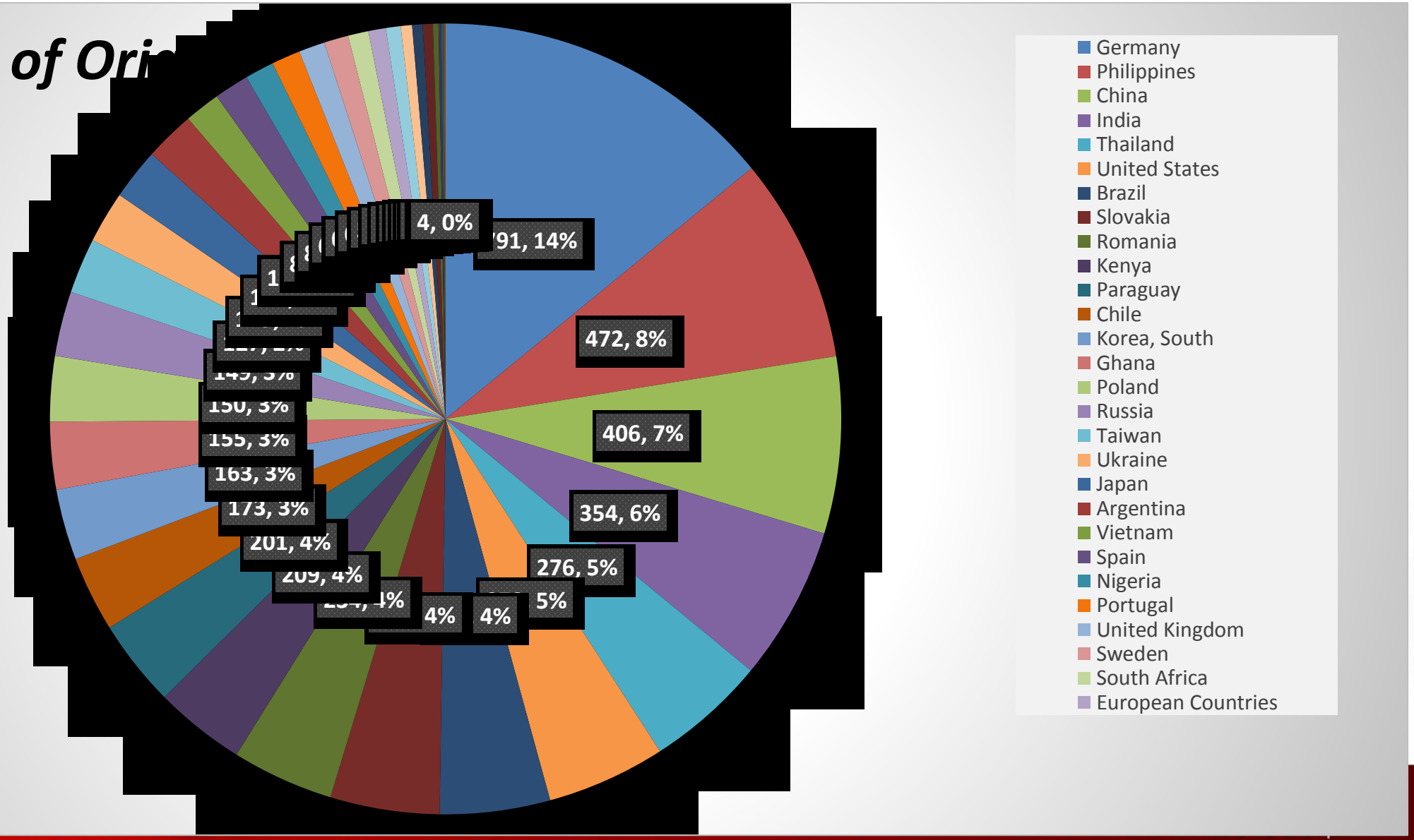
RESULTS

- ***Educational Attainment***

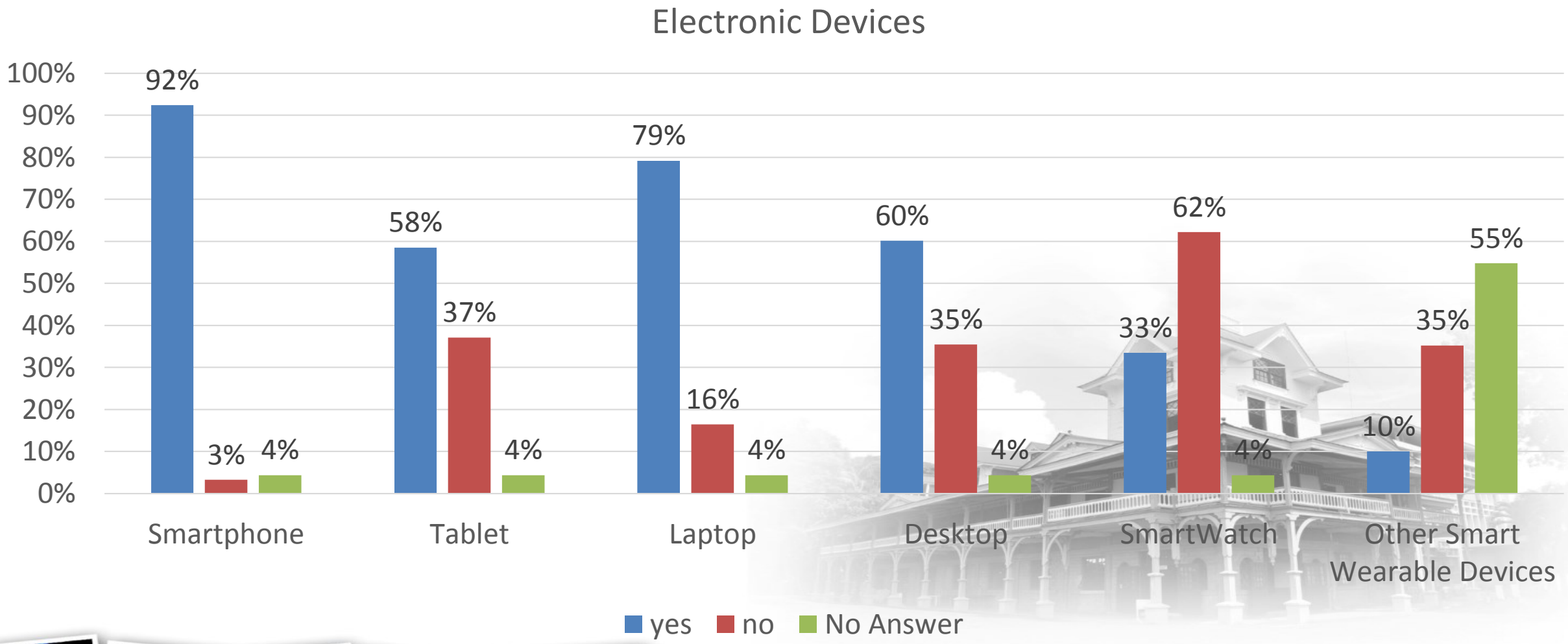


RESULTS

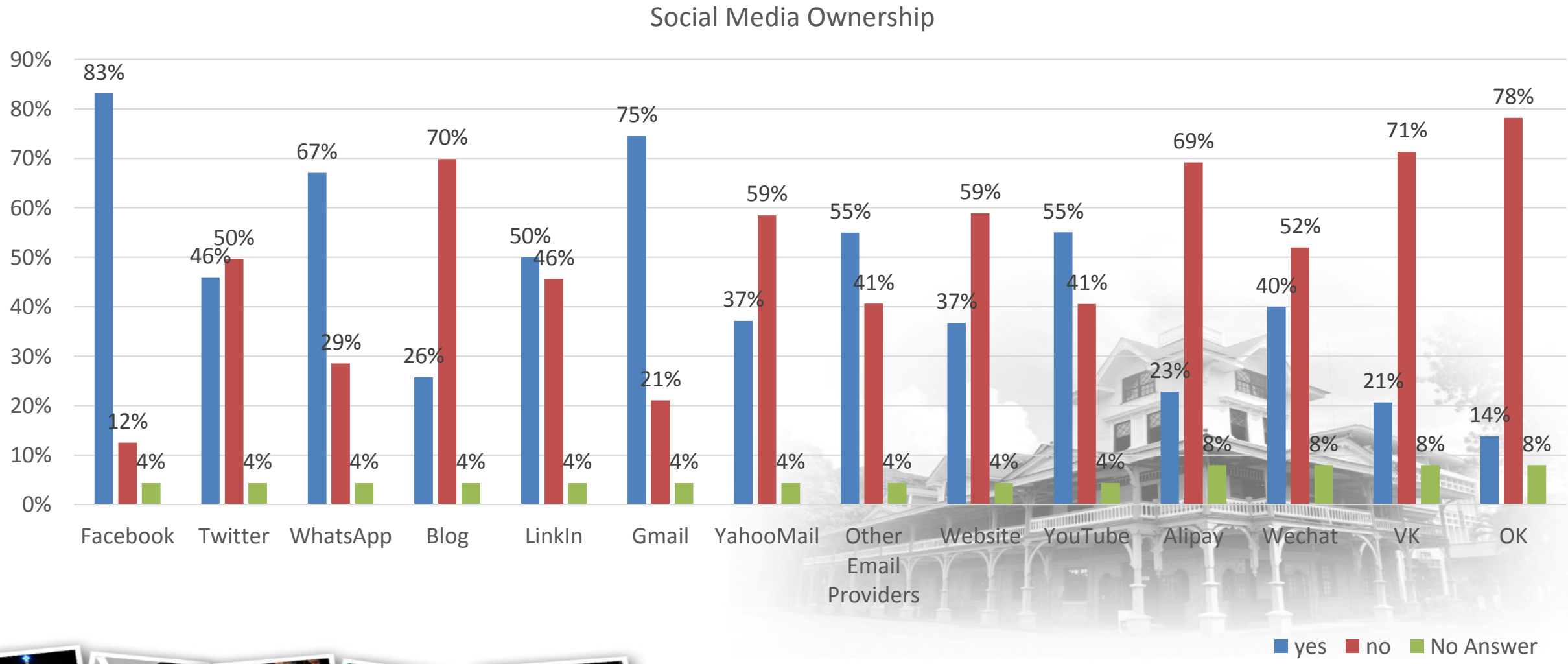
- ***Country of Ori***



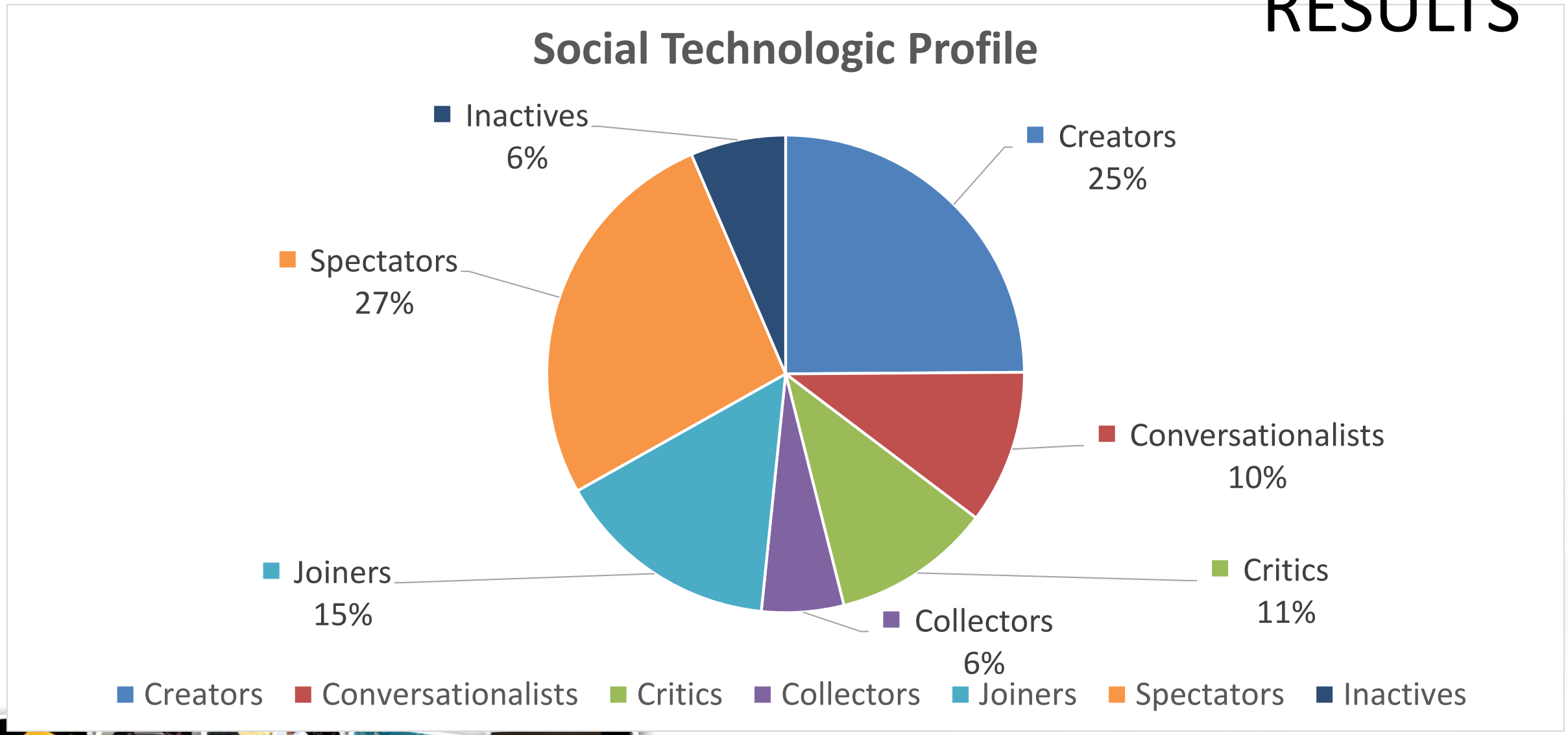
RESULTS


Electronic Devices
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
92%
3%
4%
58%
37%
4%
79%
16%
4%
60%
35%
4%
33%
62%
4%
10%
35%
55%
Smartphone
Tablet
Laptop
Desktop
SmartWatch
Other Smart Wearable Devices
yes
no
No Answer

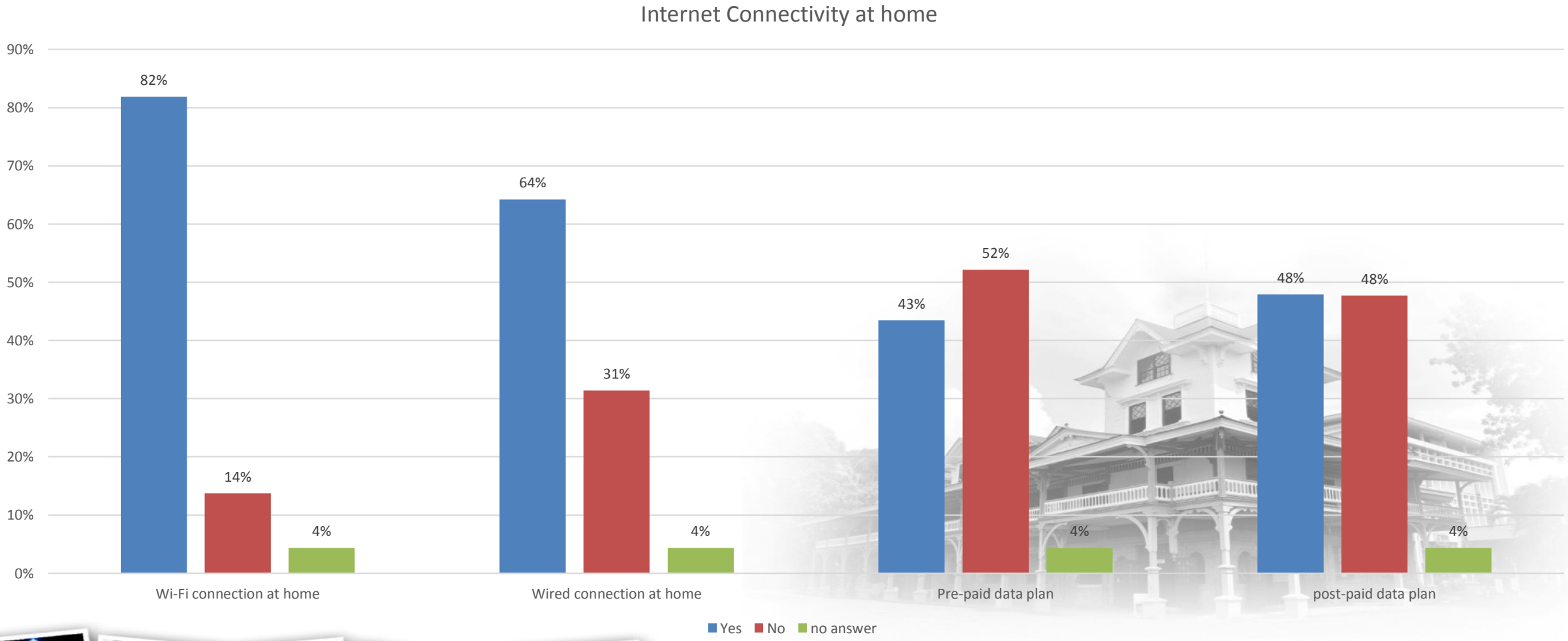
RESULTS


Social Media Ownership
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
83%
12%
4%
46%
50%
4%
67%
29%
4%
26%
70%
4%
50%
46%
4%
75%
21%
4%
37%
59%
4%
55%
41%
4%
37%
59%
4%
55%
41%
4%
23%
69%
8%
40%
52%
8%
21%
71%
8%
14%
78%
8%
Facebook
Twitter
WhatsApp
Blog
LinkIn
Gmail
YahooMail
Other Email Providers
Website
YouTube
Alipay
Wechat
VK
OK
yes
no
No Answer

RESULTS


Social Technologic Profile
Inactives 6%
Creators 25%
Spectators 27%
Conversationalists 10%
Joiners 15%
Critics 11%
Collectors 6%
Creators
Conversationalists
Critics
Collectors
Joiners
Spectators
Inactives

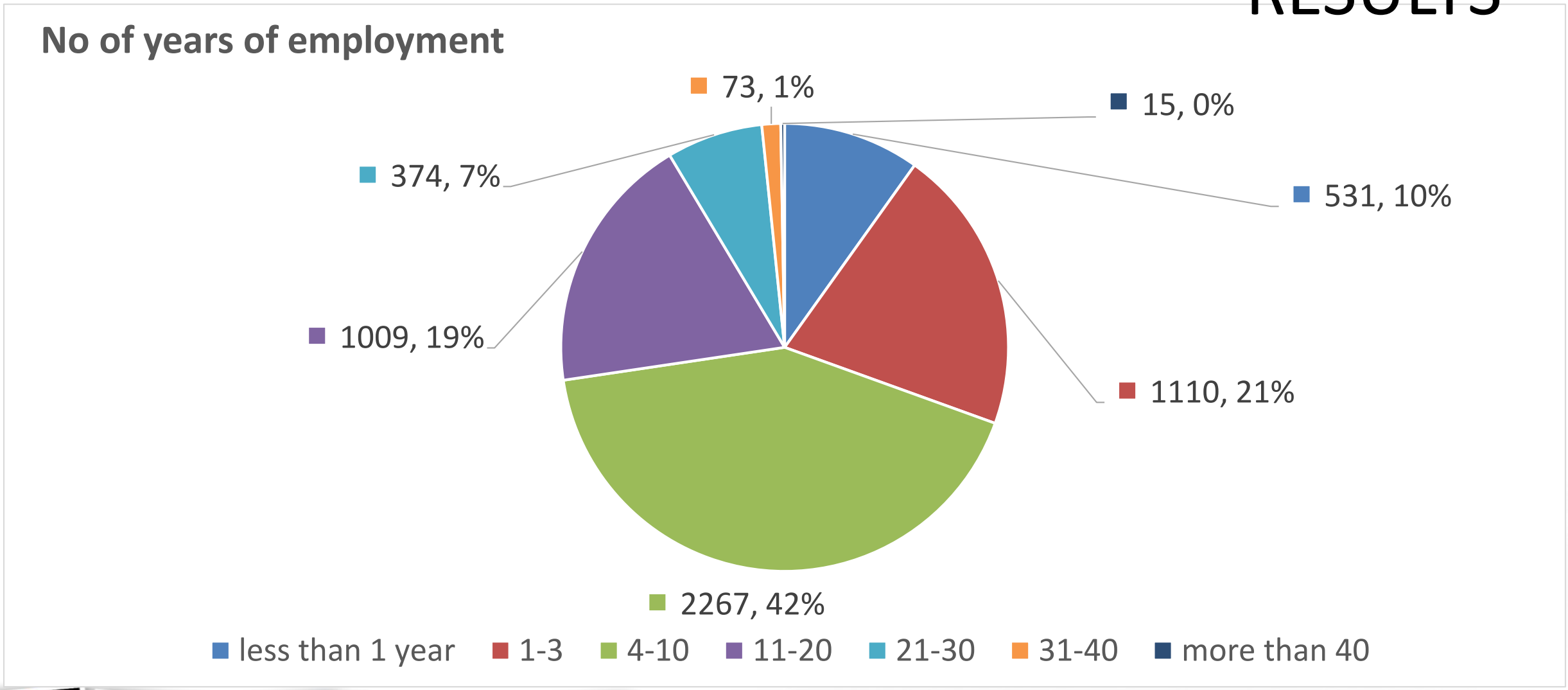
RESULTS


Internet Connectivity at home
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
82%
14%
4%
64%
31%
4%
43%
52%
4%
48%
48%
4%
Wi-Fi connection at home
Wired connection at home
Pre-paid data plan
post-paid data plan
Yes
No
no answer

RESULTS

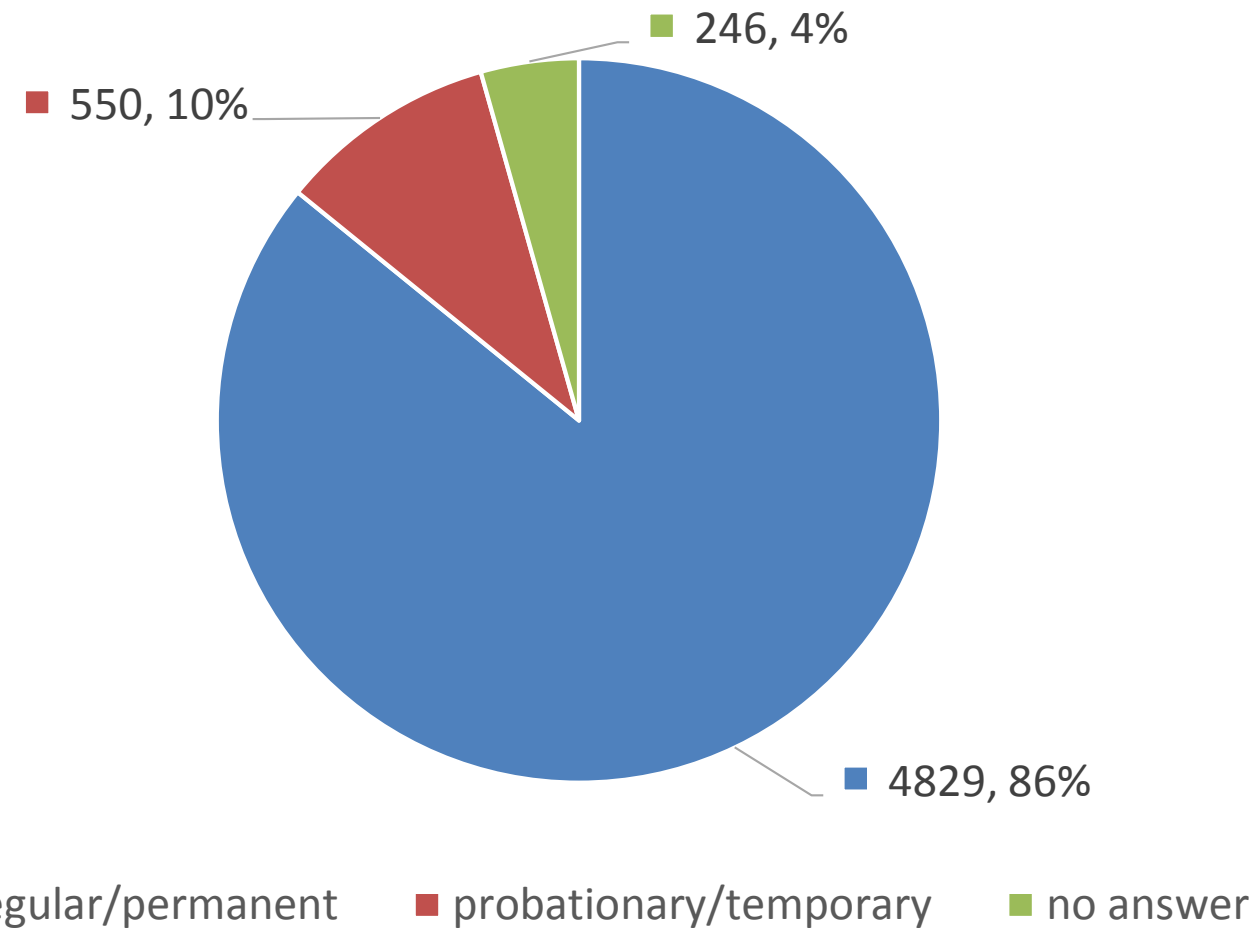
- **EMPLOYMENT PROFILE**
  - Years at work
  - Employment status
  - Job position
  - Total employees
  - Company type
  - Company form

RESULTS

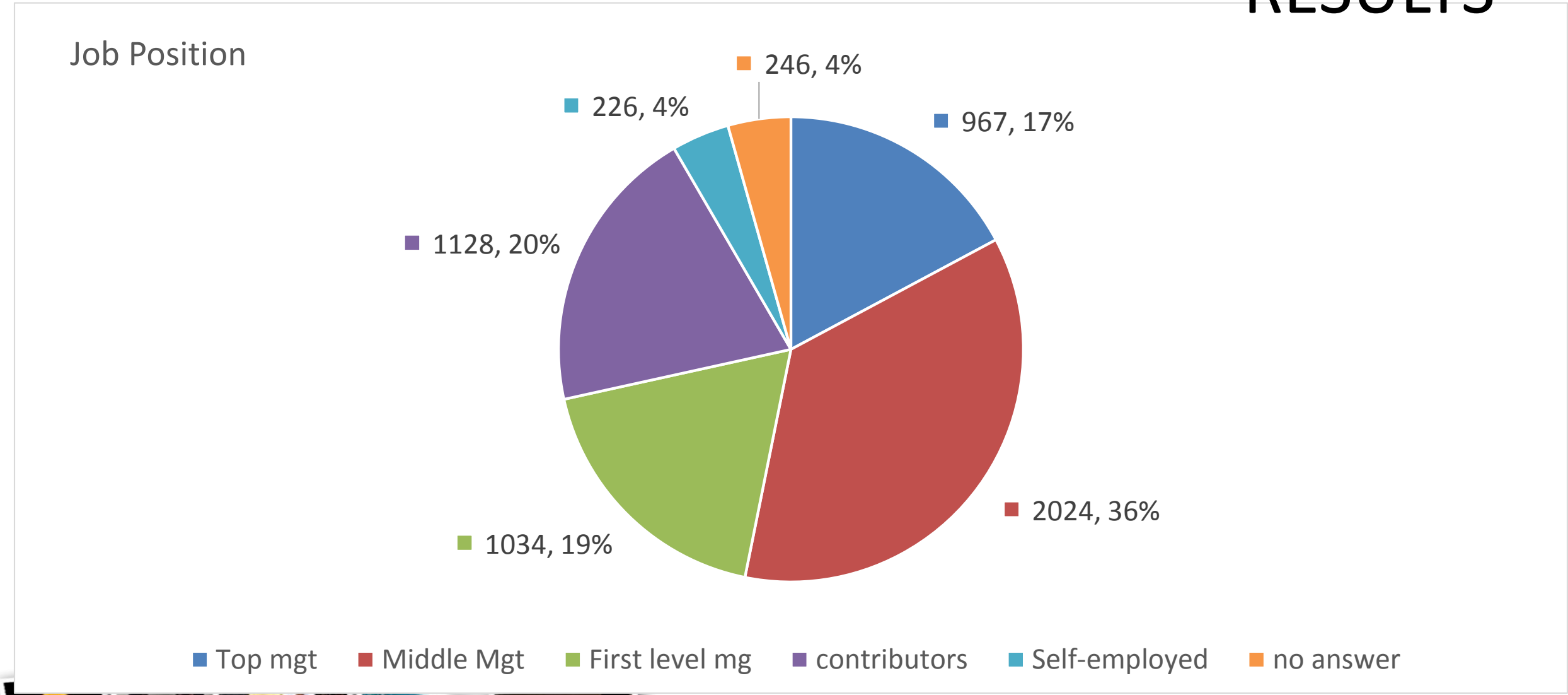

No of years of employment
73, 1%
15, 0%
374, 7%
531, 10%
1009, 19%
1110, 21%
2267, 42%
less than 1 year
1-3
4-10
11-20
21-30
31-40
more than 40

RESULTS

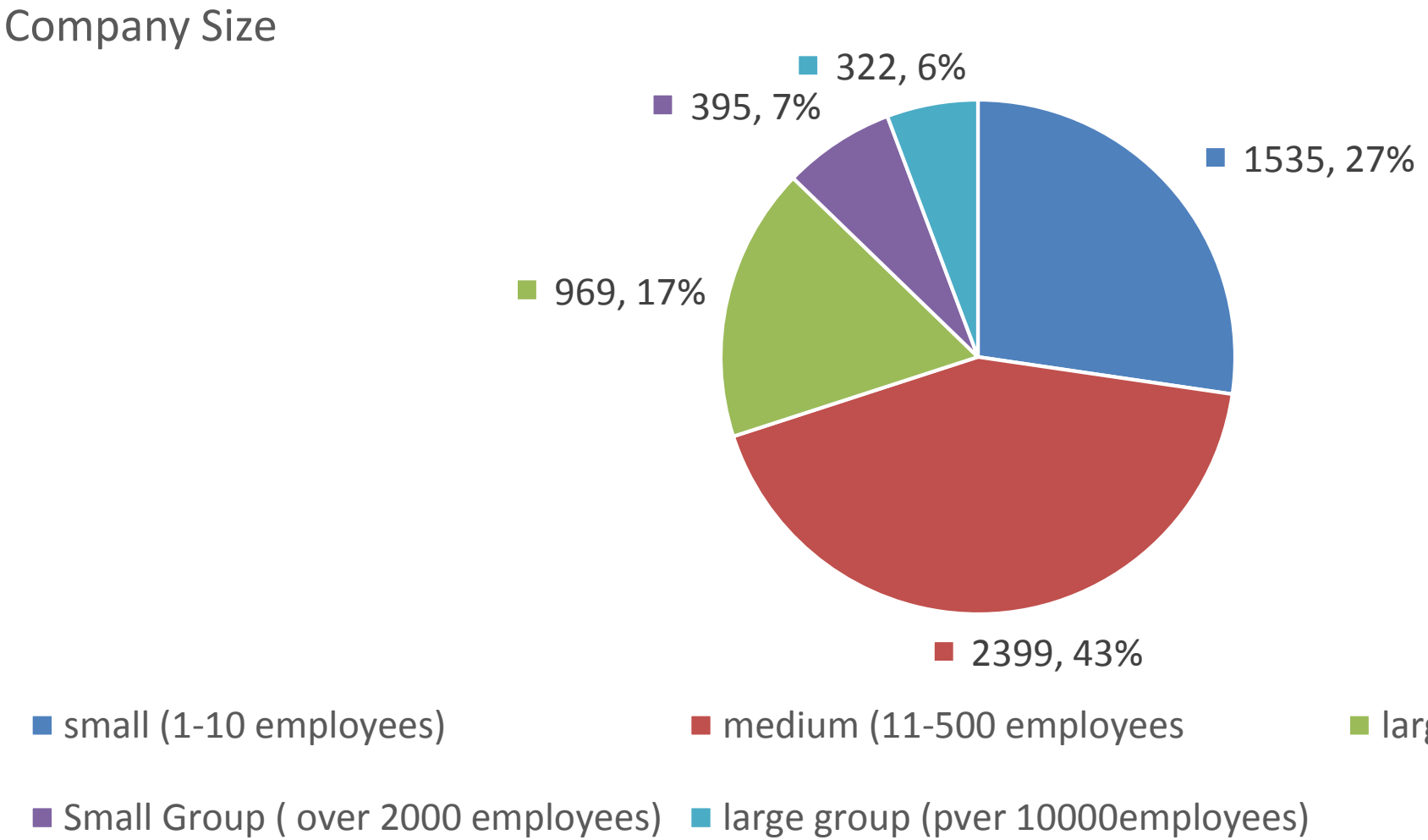
Employment Status



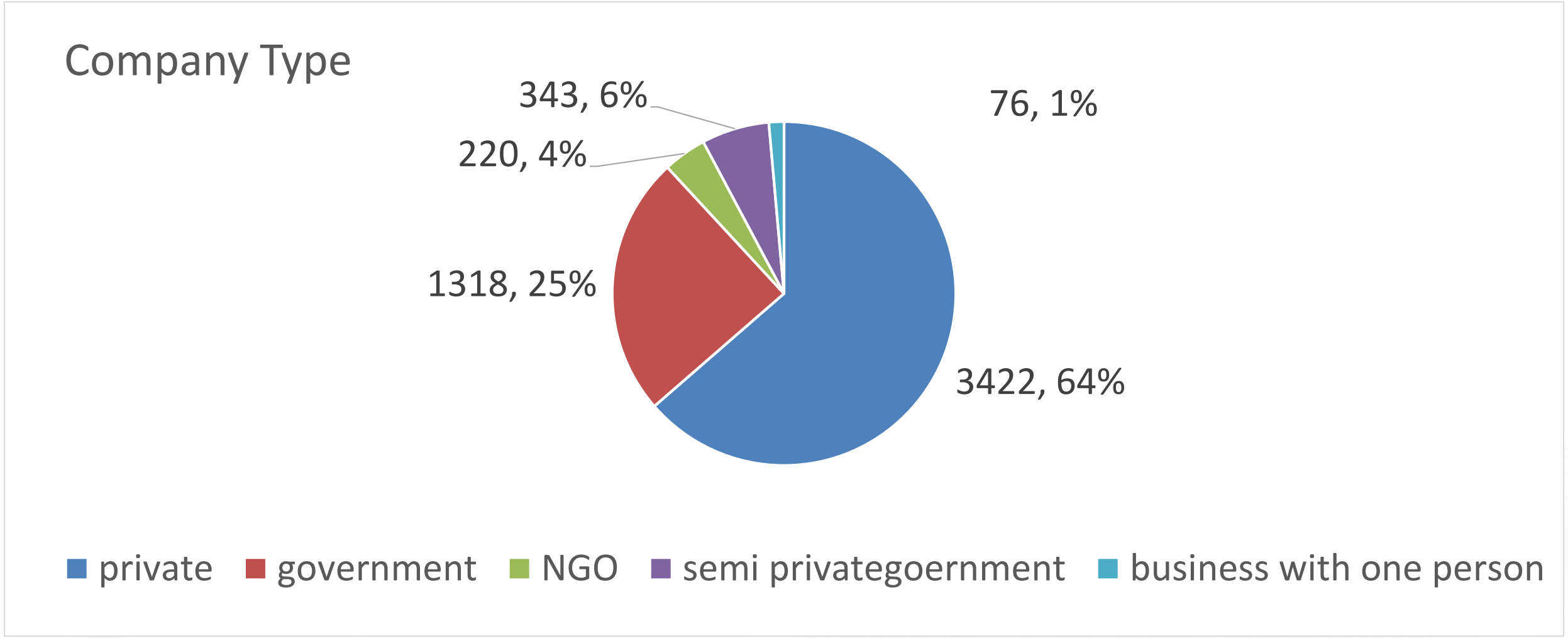
RESULTS


Job Position
246, 4%
226, 4%
967, 17%
1128, 20%
2024, 36%
1034, 19%
Top mgt
Middle Mgt
First level mg
contributors
Self-employed
no answer

RESULTS

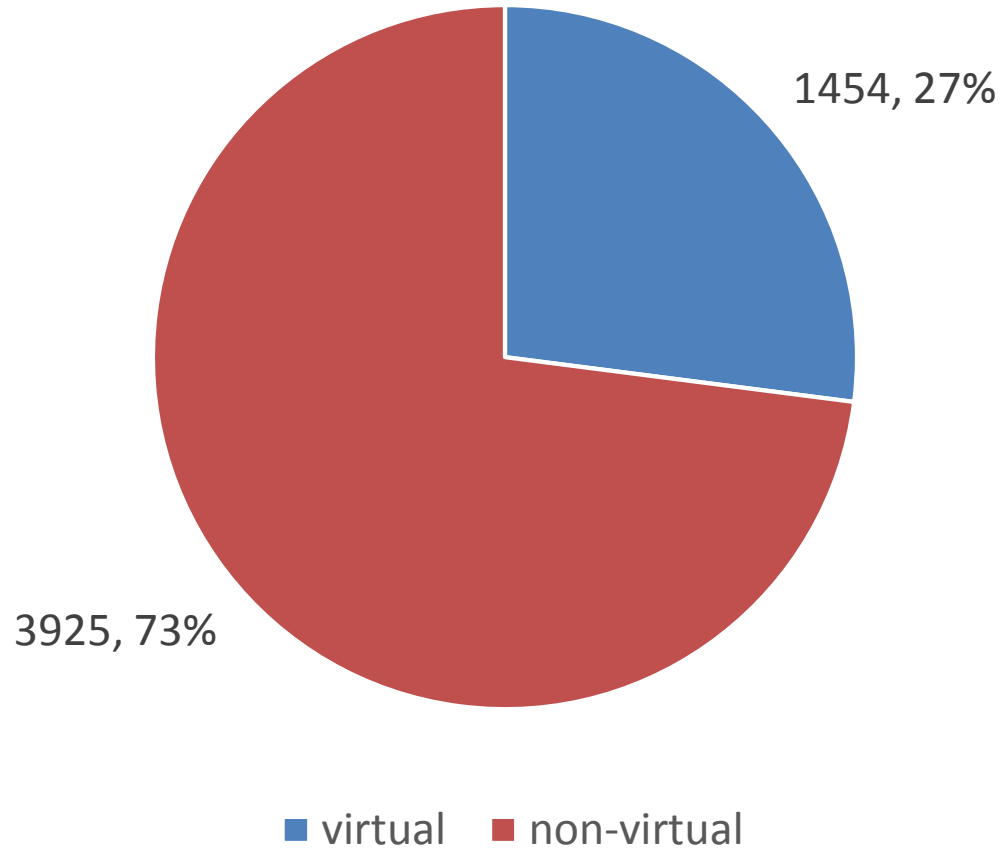

Company Size
322, 6%
395, 7%
1535, 27%
969, 17%
2399, 43%
small (1-10 employees)
medium (11-500 employees
large (501-2000 employees)
Small Group (over 2000 employees)
large group (pver 10000employees)

RESULTS


Company Type
343, 6%
76, 1%
220, 4%
1318, 25%
3422, 64%
private
government
NGO
semi privategoernment
business with one person

RESULTS

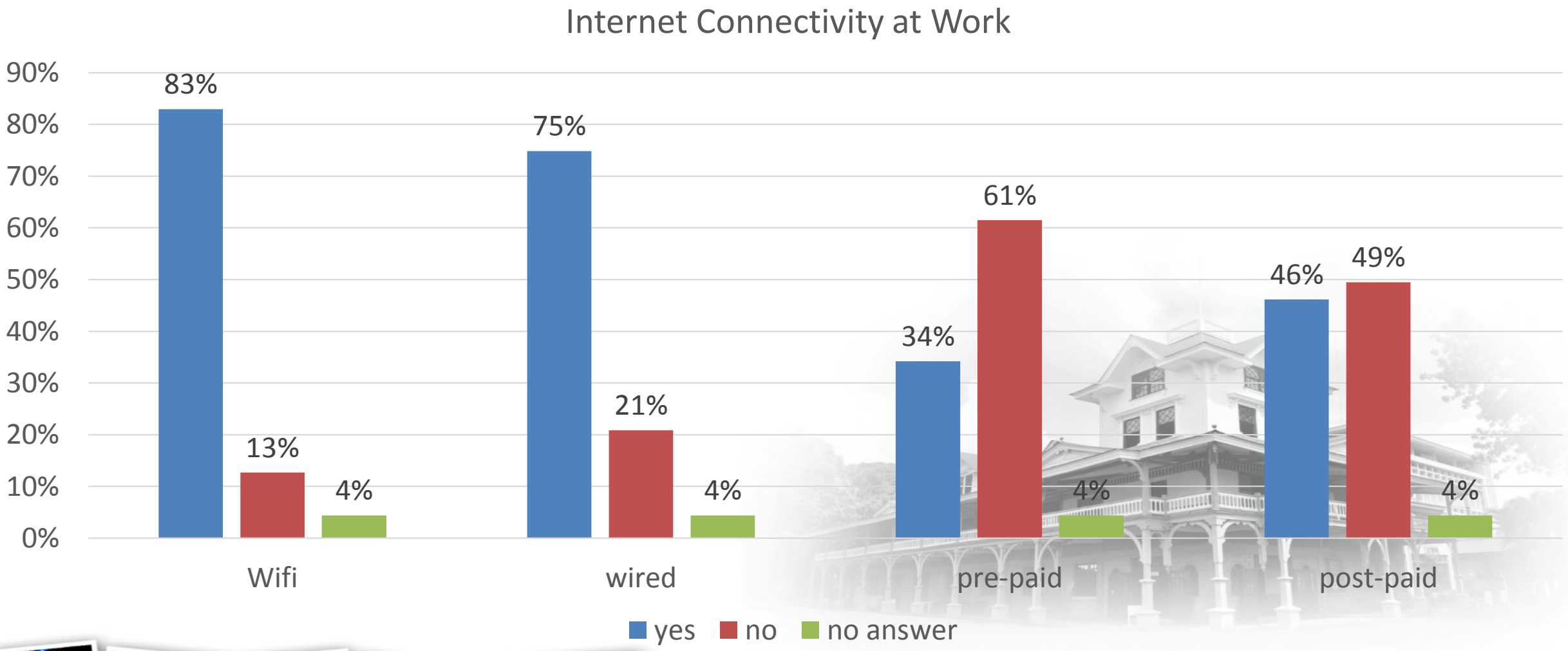
Company Form



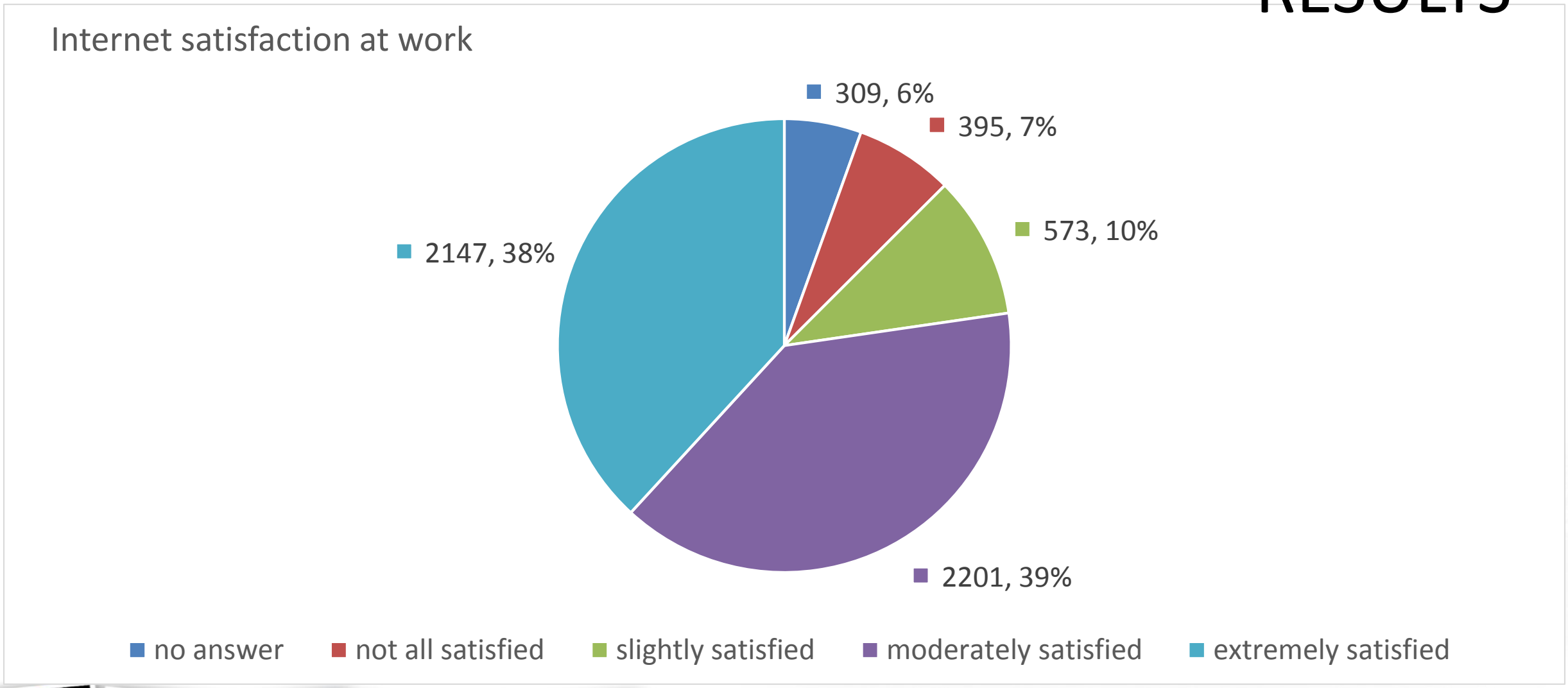
RESULTS

- TECHNOLOGY INTEGRATION IN THE WORKPLACE
  - Internet connectivity
  - Internet satisfaction
  - Digital platforms
  - Means of communication

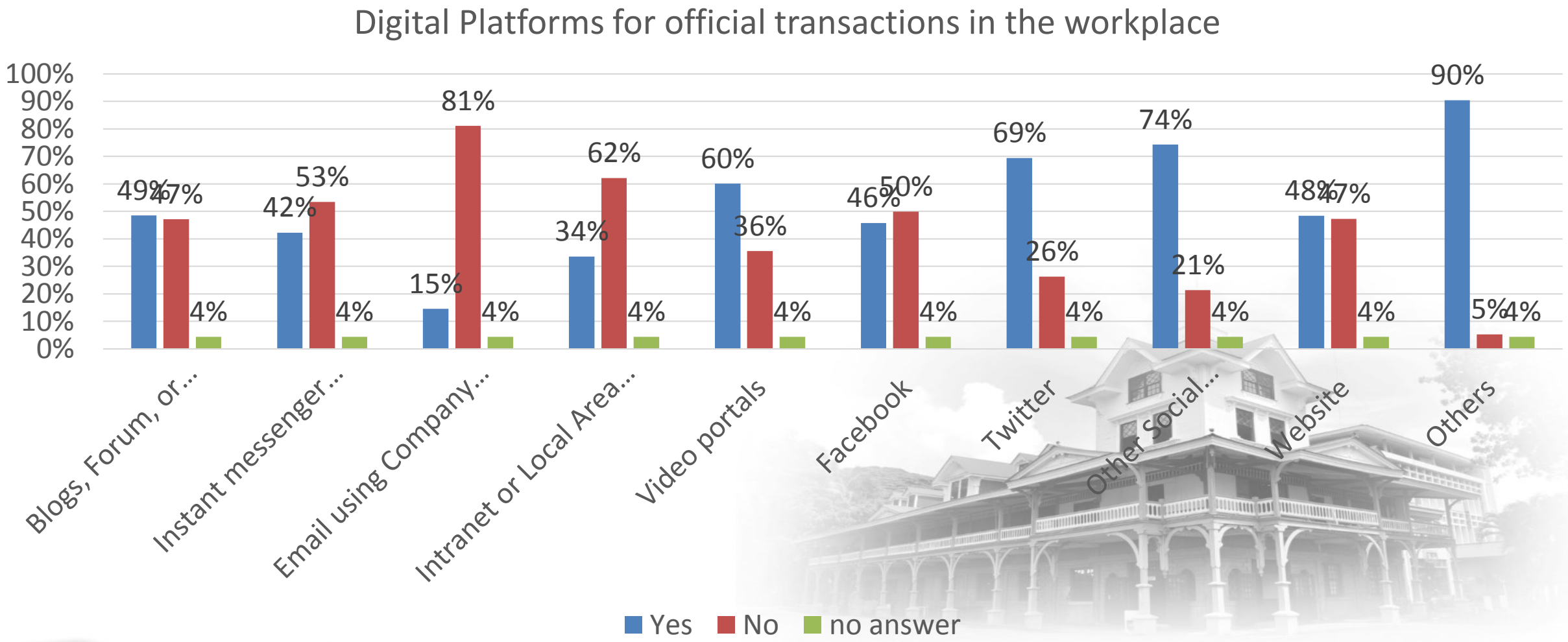
RESULTS


Internet Connectivity at Work
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
83%
13%
4%
75%
21%
4%
34%
61%
4%
46%
49%
4%
Wifi
wired
pre-paid
post-paid
yes
no
no answer

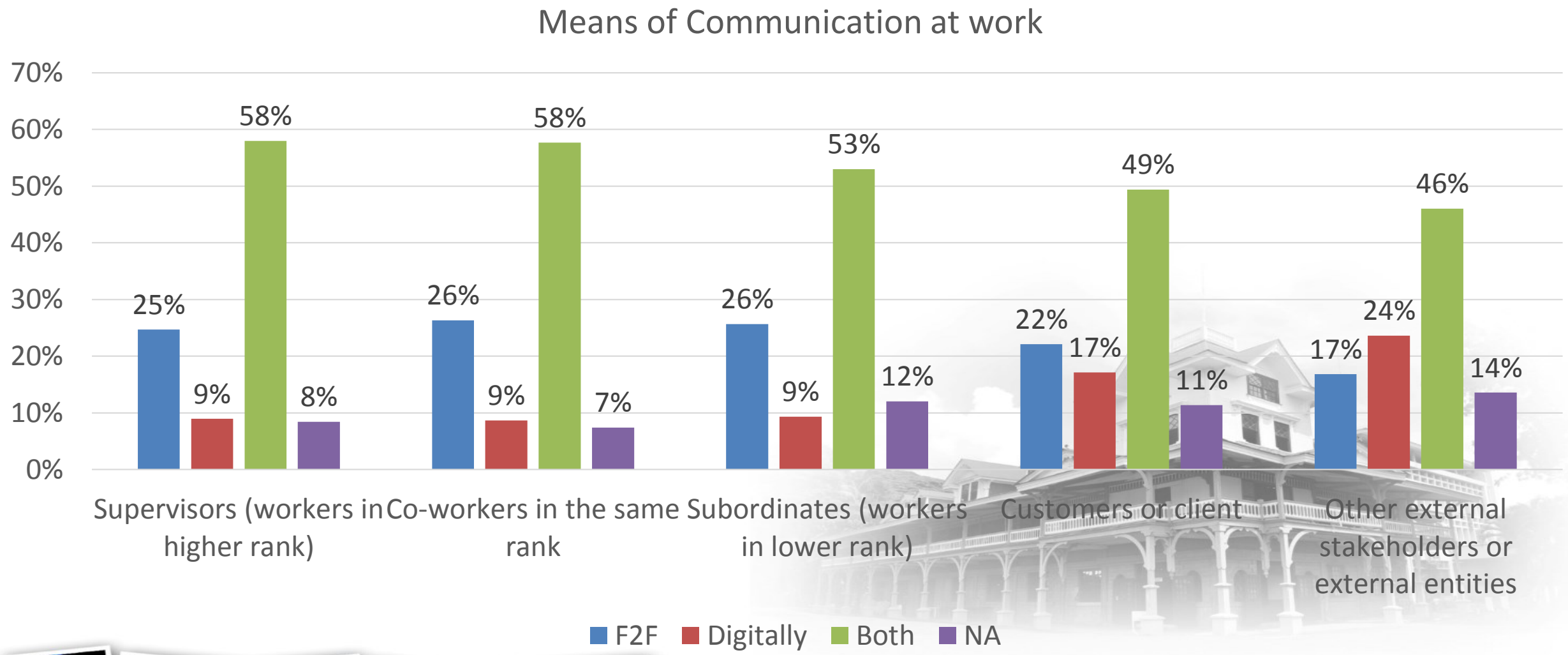
RESULTS


Internet satisfaction at work
309, 6%
395, 7%
573, 10%
2201, 39%
2147, 38%
no answer
not all satisfied
slightly satisfied
moderately satisfied
extremely satisfied

RESULTS

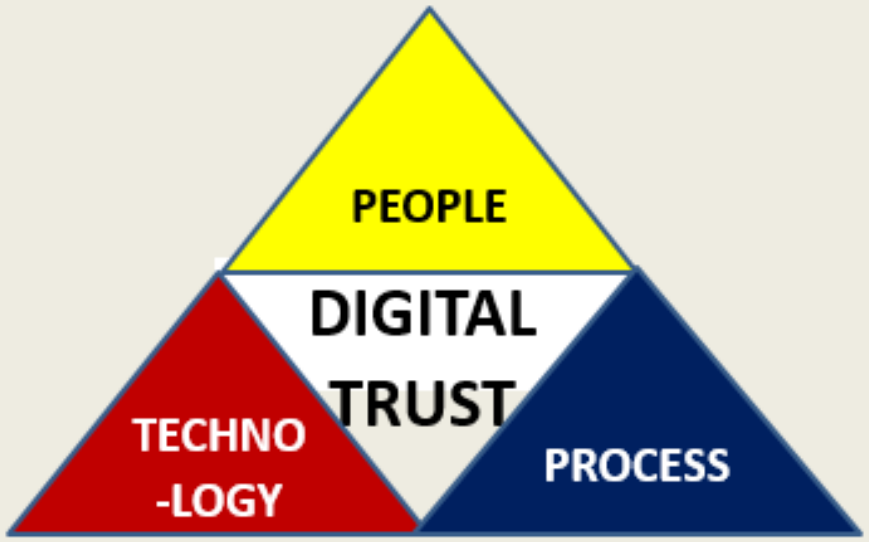

Digital Platforms for official transactions in the workplace
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
49%
47%
4%
42%
53%
4%
15%
81%
4%
34%
62%
4%
60%
36%
4%
46%
50%
4%
69%
26%
4%
74%
21%
4%
48%
47%
4%
90%
5%
4%
Blogs, Forum, or...
Instant messenger...
Email using Company...
Intranet or Local Area...
Video portals
Facebook
Twitter
Other Social...
Website
Others
Yes
No
no answer

RESULTS


Means of Communication at work
70%
60%
50%
40%
30%
20%
10%
0%
25%
9%
58%
8%
26%
9%
58%
7%
26%
9%
53%
12%
22%
17%
49%
11%
17%
24%
46%
14%
Supervisors (workers in higher rank)
Co-workers in the same rank
Subordinates (workers in lower rank)
Customers or client
Other external stakeholders or external entities
F2F
Digitally
Both
NA

RESULTS

- DIGITAL TRUST LEVEL



BUILDING COMPETENCE, CHARACTER & FAITH

DIGITAL TRUST TECHNO -LOGY

RESULTS

Technology and Information System Features	Mean	Description
Accuracy of data	3.37	high
Reliability & business continuity (availability, predictability, accuracy)	3.35	high
Personal data protection	3.32	high
Ethics and control of data access and use	3.31	high
Consumer or client benefits and value	3.28	high
Control and security	3.28	high
Performance (speed, resource consumption, throughput, capacity, scalability)	3.27	high
Safety & Exploitability	3.24	moderate
Interaction through the internet	3.19	moderate
Overall Mean	3.29	high
Legitimacy	3.16	moderate
Relevance	3.16	moderate
Usability (human factors, aesthetics, consistency, documentation, responsiveness)	3.16	moderate
Shareability	3.04	moderate
Integrity of processes	3.02	moderate
Integration and reusability	2.96	moderate
Systems of accountability	2.96	moderate
Digital risk resilience	2.93	moderate
Overall Mean	**3.18**	**Moderate**

RESULTS

Devices	mean	description
tablet	2.92	moderate
laptop	3.22	moderate
smart watch	2.58	moderate
others	2.70	moderate
Overall Mean	**2.86**	**moderate trust**

DIGITAL TRUST TECHNO -LOGY RESULTS

Hardware and Software Systems Installed in the workplace	Mean	Description
Video Surveillance (CCTV)	2.88	moderate
ID System in Daily Time Recording	2.99	moderate
ID System of doors, gates, and other entrance and exit in the company or organization	3.08	moderate
ID System in Cafeteria	2.90	moderate
ID System in Printing and Duplication Services	2.99	moderate
Workflow management (e.g., Groupware systems)	3.04	moderate
Email Tracking and Monitoring System	2.96	moderate
Global Positioning Services (GPS) in Cars	2.86	moderate
Others	3.43	high
Overall Mean	**3.01**	**moderate**

RESULTS

Information Systems	Mean	Description
Executive Information Systems	3.13	moderate
Group Decision Support Systems	2.94	moderate
Computer Supported Co-operative work / Collaboration tools	3.08	moderate
Logistics systems	3.02	moderate
Financial Planning systems	2.96	moderate
Spreadsheet Models	3.13	moderate
Sales management systems	2.99	moderate
Inventory control systems	2.87	moderate
Budgeting systems	2.82	moderate
Management Reporting Systems	3.04	moderate
Personnel (HRM) systems	3.02	moderate
Payroll systems	3.15	moderate
Reservation systems	3.01	moderate
Stock control systems	2.85	moderate
Internet bots (also known as web robots, WWW robots or bots)	2.62	moderate
Others (please specify)	2.78	moderate
Overall Mean	2.96	moderate

PEOPLE DIGITAL TRUST

RESULTS

Management & Other Internal Entities	Mean	Description
Top Management (CEO, President, Board Members, Vice Presidents)	3.16	moderate
Middle Management (Department Heads, Branch Managers)	3.07	moderate
First Level Management (Supervisors, Foreman, Office Managers)	3.05	moderate
Contributors (Salesmen, Clerical, Secretarial, Technical Employees)	2.9	moderate
Co-workers at the Strategic Business Unit	3.03	moderate
Co-workers at the Research and Development Unit	3.07	moderate
Overall Mean	**3.05**	**moderate**

PEOPLE DIGITAL TRUST

RESULTS

IT & Data Support	mean	description
Personal information processor (any natural or juridical person or any other body to whom a personal information controller may outsource or instruct the processing of personal data about a data subject)	3.00	moderate
Computer Systems Development Team (e.g. Analyst, Designer, Programmer, Tester, Trainer)	3.00	moderate
Information Systems Supervisory Team (e.g., Manager, Head, Director)	3.01	moderate
IT Librarian	2.92	moderate
Data Encoder	2.95	moderate
Others (please specify)	2.8	moderate
Overall Mean	2.95	moderate

PEOPLE DIGITAL TRUST

RESULTS

External Entities	mean	description
Customers or clients	3.02	moderate
Logistics Providers	2.9	moderate
Retailers	2.82	moderate
Distributors or Wholesalers	2.81	moderate
Manufacturers	2.95	moderate
Suppliers	2.93	moderate
Government	2.73	moderate
Other non-government agencies	2.7	moderate
Journalists of online newspapers	2.47	low
Others (please specify)	2.76	moderate
Overall Mean	2.81	moderate

DIGITAL TRUST PROCESS

RESULTS

Information Systems operations	Mean	Description
The information systems have adequate throughput – the maximum rate of production or the maximum rate at which something can be processed.	2.89	agree
The output has adequate information and accurate.	2.42	disagree
The output contains information that is in a useful format	2.9	agree
The input data is accurately captured – does not contains errors.	2.39	disagree
Data is secure from accident or vandalism	2.82	agree
Data is flexible.	2.79	agree
The cost to implement and sustain the information system is justifiable	2.23	disagree
Input data is adequately edited in the computer system.	2.81	agree
No one violated data privacy regulations or guidelines	2.78	agree
There are adequate data controls in my workplace.	2.38	disagree
The effort required for tasks is not excessive	2.32	disagree
Materials required for tasks is not excessive	2.39	disagree
The system is easy to learn and use	2.39	disagree
The system is flexible to new or exceptional situations and changes	2.74	agree
The system is compatible with other systems, and it is not coordinated with other systems	2.39	Disagree
Overall Mean	**2.58**	**agree**

DIGITAL TRUST PROCESS

RESULTS

data protection and privacy in the workplace	mean	description
processes personal data lawfully and transparently, ensuring fairness towards the individuals.	3.11	agree
has specific purposes for processing the data and they indicate those purposes to individuals when collecting their personal data. The company does not simply collect personal data for undefined purposes.	3.02	agree
collects and processes only the personal data that is necessary to fulfill that purpose.	3.04	agree
ensures the personal data is accurate and up-to-date, having regard to the purposes for which it is processed, and correct it if not	3.02	agree
ensures that personal data is stored for no longer than necessary for the purposes for which it was collected)	2.98	agree
installs appropriate technical and organizational safeguards that ensure the security of the personal data, including protection against unauthorized or unlawful processing and accidental loss, destruction or damage, using appropriate technology	3.02	agree
in special cases, personal data is kept for a longer period for archiving purposes in the public interest or for reasons of scientific or historical research, provided that appropriate technical and organizational measures are put in place)	2.96	agree
ensures that the data held is accurate and kept up-to-date	3.01	agree
Overall Mean	**3.02**	**agree**

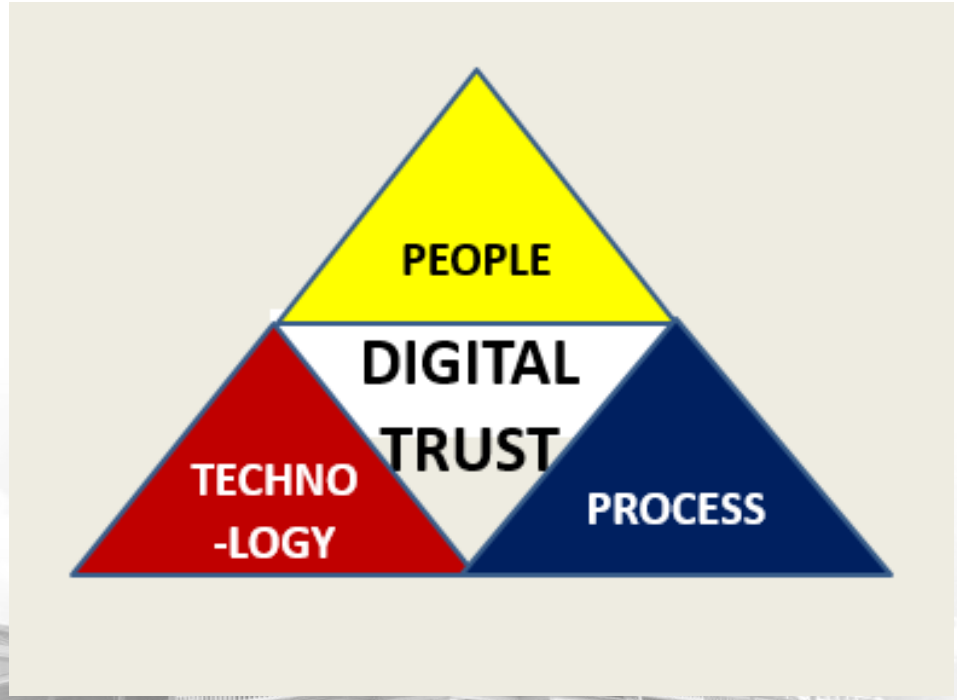
DIGITAL TRUST PROCESS

RESULTS

Netizenship & Responsible Use of Social Media	mean	description
registering with a Web site (i.e., giving my name, e-mail address, medical registration number, etc.) may not enable that site to keep track of what I view or spend online.	3.14	agree
information given to a company website will not be passed on to third parties.	2.48	disagree
my web-browsing habits are not being tracked.	2.39	disagree
that providing personal information in social media is safe.	2.35	disagree
my co-workers do not spread unverified information on social media – especially those that do nothing but provoke fear in the community.	2.73	agree
my co-workers do not post information on social media that would tend to worsen the situation	2.76	agree
my countrymen use confidential information when absolutely necessary.	2.56	agree
my countrymen understand their responsibilities, and they are responsible netizens.	2.50	disagree
my countrymen understand and comply with the data and privacy law.	2.50	disagree
my government protects our personal information.	2.48	disagree
Overall Mean	**2.59**	**agree**

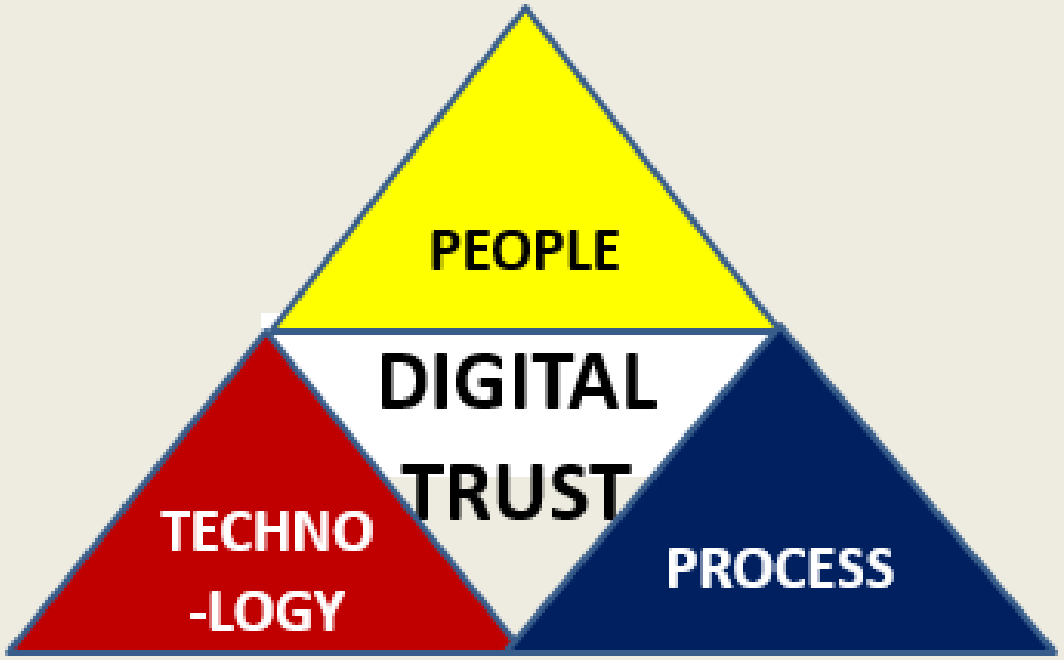
RESULTS

- Age,
- Job Position
- Digital platforms for official communications
- Internet Connectivity
- Means of communication



Work in Progress

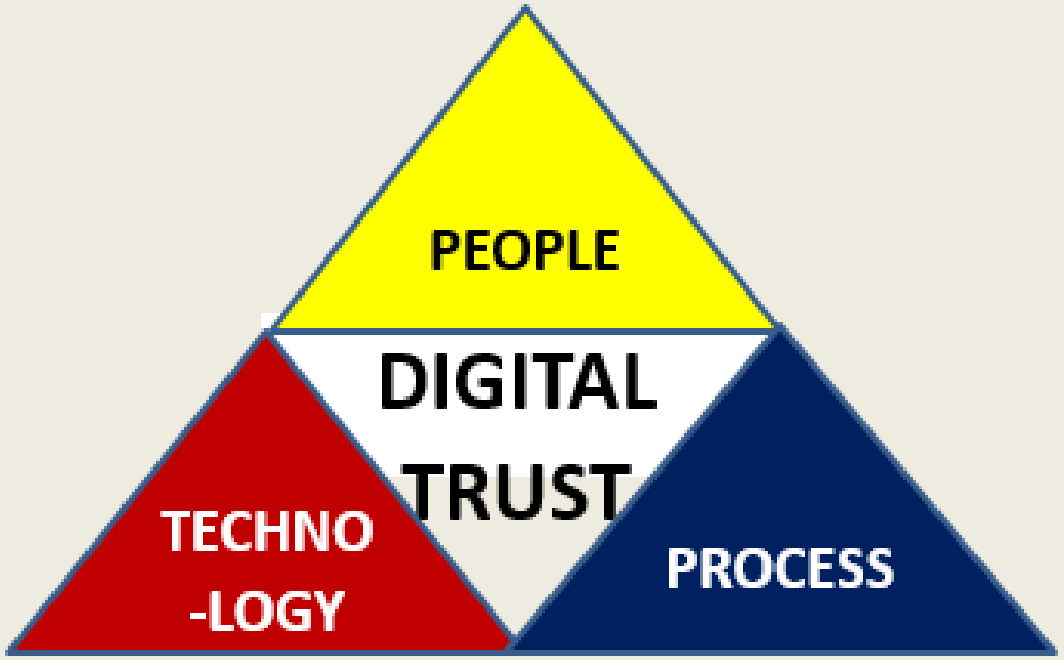
- ✓ **adequate level of confidence in people, processes, and technology**
- ✓ ***sufficient reliance on the character, ability, strength, or certainty***



Work in Progress

- ✓ Digital trust and technology integration
- ✓ Digital trust and demographic profiles
- ✓ Digital trust and technologic profiles
- ✓ Digital trust and social technologic profile
- ✓ Digital trust and Decision-making skills
- ✓ Digital trust and personality types

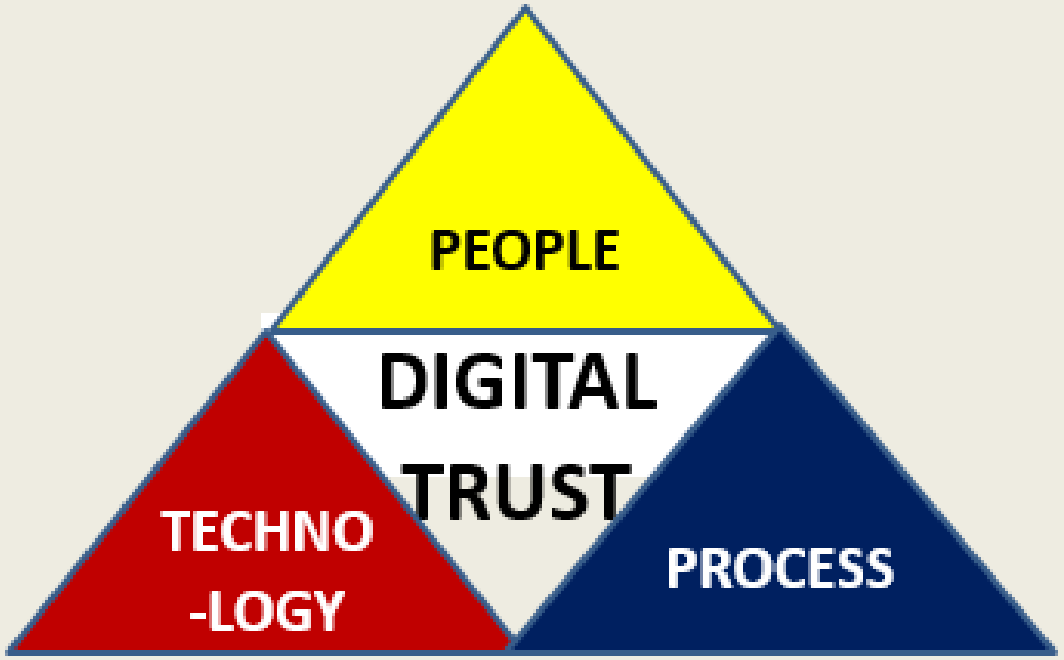
and many more.



Work in Progress

✓*Lets collaborate!*

*and **explore the impact of** **digital trust** in the **workplace***



Ostfalia
University of
Applied Sciences

Digital Trust in the Workplace:

Preliminary Results

Dave E. Marcial, Ph.D.
Silliman University
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Digital Trust & Intuition at the Workplace

4th International Service Management Congress

Academic Workshops and International Lectures

Hosted by Ostfalia University of Applied Sciences, Germany

DIGITAL TRUST AND FOREIGNERS IN KOREA:

Data privacy and protection perspectives

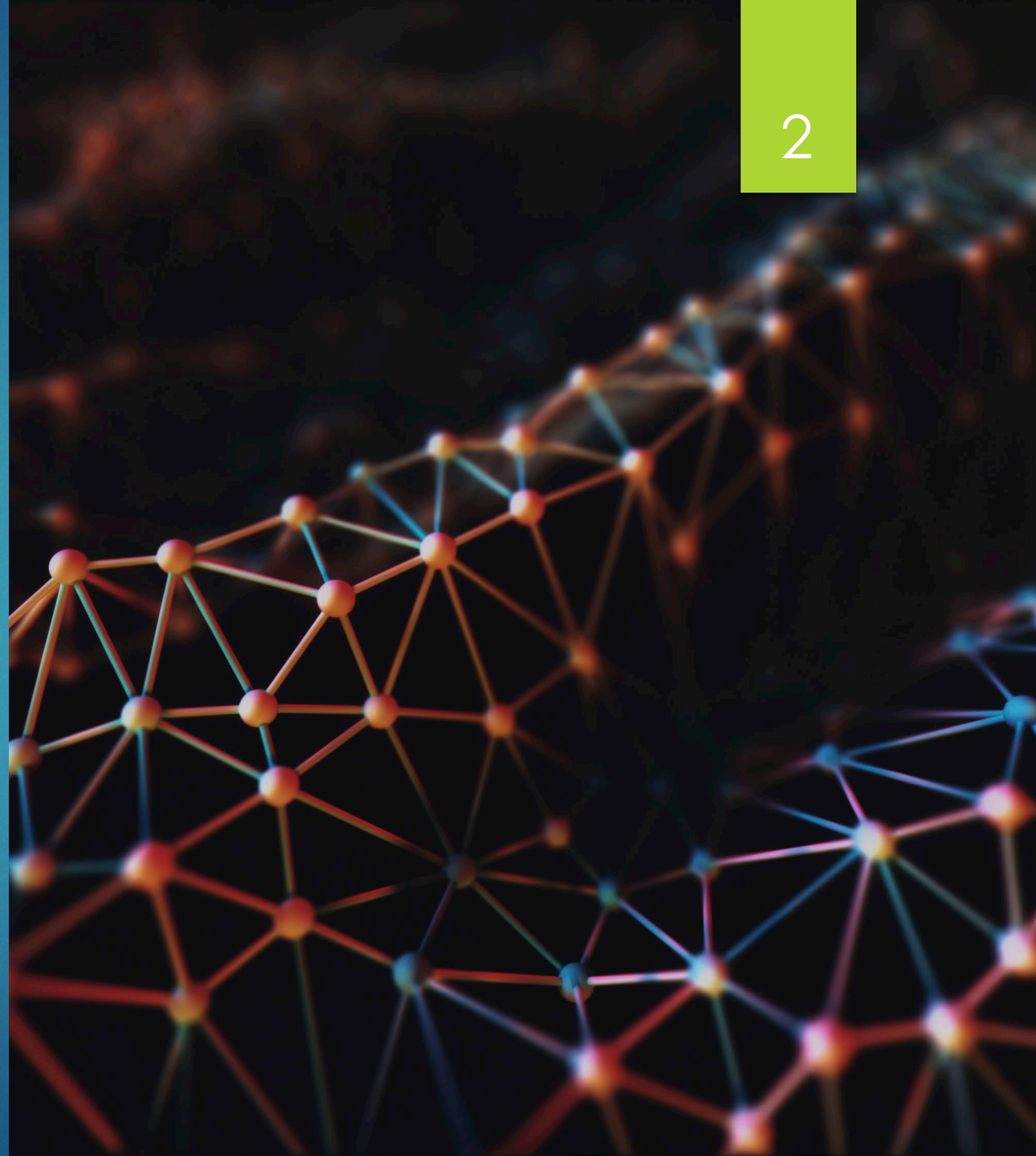
Prof. Joeffrey Maddatu Calimag, Ph.D., SCPM

University of Ulsan, KOREA

11 November 2020

Agenda

1. Introduction
2. Research
3. Wrap-up



1. Introduction: Digital and Innovative Korea

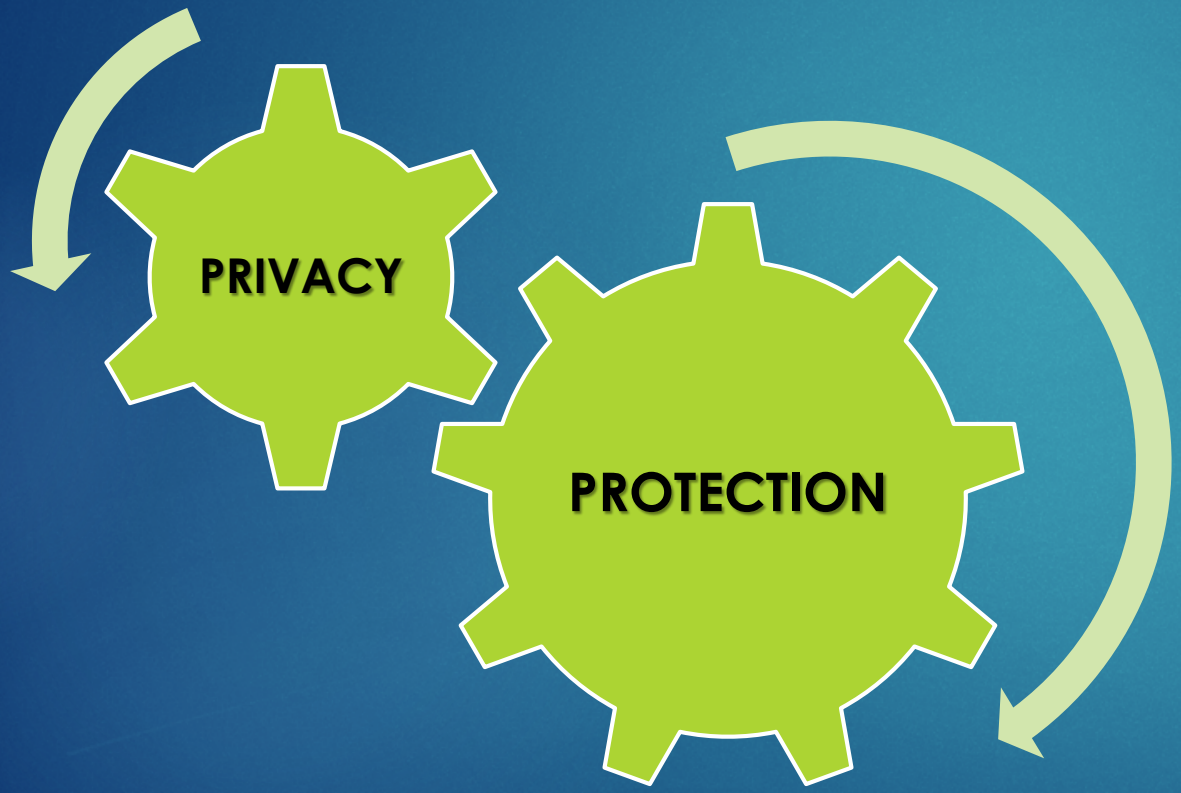
- Nearly all-digital ecosystem
  - World's number one producer in mobile phones, displays, semiconductors and shipbuilding
  - Ranked 1st in the world for 6 consecutive years (2014-2019) according to the Bloomberg Innovation Index
  - In 2018, Korea spent 4.5% of its GDP, or a total of US$69.73 billions on R&D (R&D spending to GDP ratio highest in the world)
  - Samsung Electronics is the 2nd company spending most on R&D in the world in 2019

Source: The Science & Technology Office Seoul website (A section of the Embassy of Switzerland in Korea and an integral part which is a key component of Swiss foreign policy to promote science, technology, innovation and higher education.

1. Introduction: Data and Information

- **Digital Economy**
  - Production, distribution and consumption of digital data
  - Advancements and breakthroughs in machine learning, artificial intelligence and automation
  - Post-COVID19 – mitigation and migration

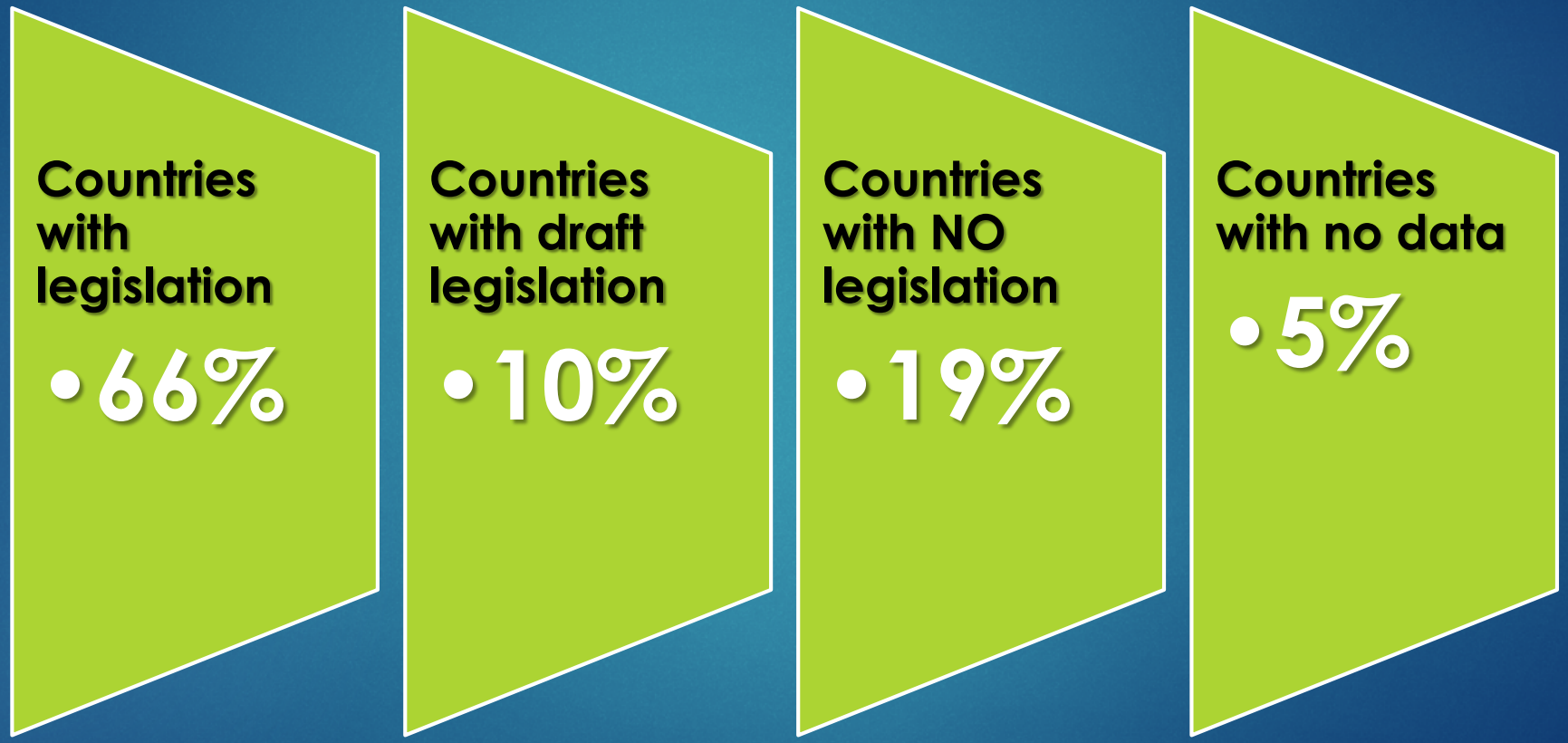
1. Introduction: Data and Information



Source: Image by Bookafy

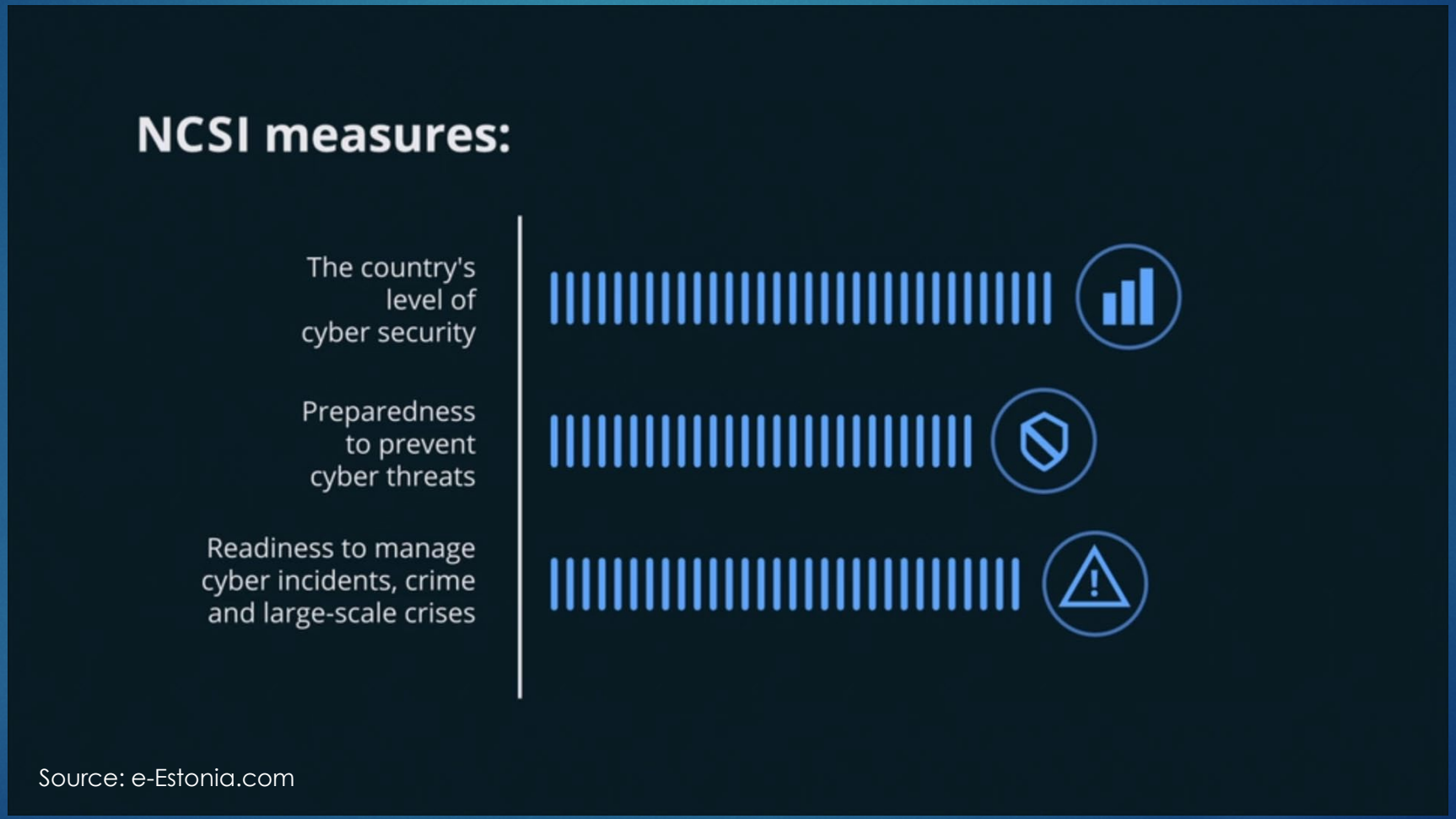
1. Introduction: Legislation

Data Protection and Privacy Legislation Worldwide, UNCTAD



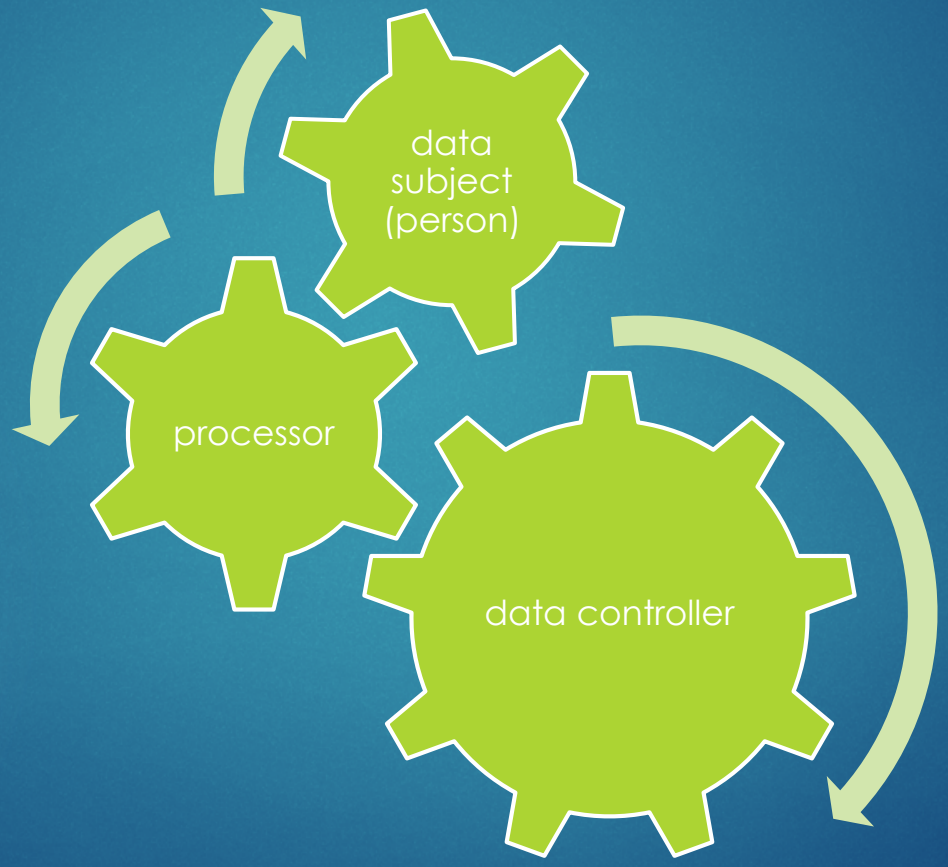
1. Introduction: NCSI

National Cyber Security Index (e-governance Academy, Estonia



1. Introduction: GDPR

General Data Protection Regulation, EU



1. Introduction

Data Privacy and Protection in Korea

January 9, 2020 → **August 5, 2020**

- Amendments to Three Data Laws including PIPA passed by the National Assembly (similar to GDPR)
- With the implementation of the PIPA, a unified personal information protection system has been established which enables businesses to relieve regulatory burdens and implement systematic policies.
- The legal grounds for big data use have been prepared, and the legal responsibilities of companies have been strengthened through powerful sanctions.
- The PIPA has been revised through the agreement between stakeholders, gathering public opinions and discussion between the ruling and the opposition parties.

1. Introduction

Data Privacy and Protection in Korea

A. Centralization the personal information protection system

B. Preparation of legal grounds for big data analysis and use and strengthening business accountability

C. The use and provision of personal information without the consent of the data subject

1. Introduction
Data Privacy and Protection in Korea

A. Centralization the personal information protection system

- The personal information protection functions distributed among the Ministry of Interior and Safety (General), the Korea Communications Commission (Online), the Financial Services Commission (Commercial companies), and the PIPC were unified into the PIPC and the similar and redundant regulations of the PIPA and Communication Network Act were integrated into the PIPA.

- The PIPC will be launched as a central administrative agency playing the role of the data protection supervisory authority.

1. Introduction
Data Privacy and Protection in Korea

B. Preparation of legal grounds for big data analysis and use and strengthening business accountability

- The pseudonymized information can be used for such purposes as scientific research, statistical and public record preservation without the data subject's consent.

- The legal grounds for combinations of pseudonymized data were established, and the basis for safe use was provided by allowing only the designated expert organizations can conduct the data combinations.

1. Introduction
Data Privacy and Protection in Korea

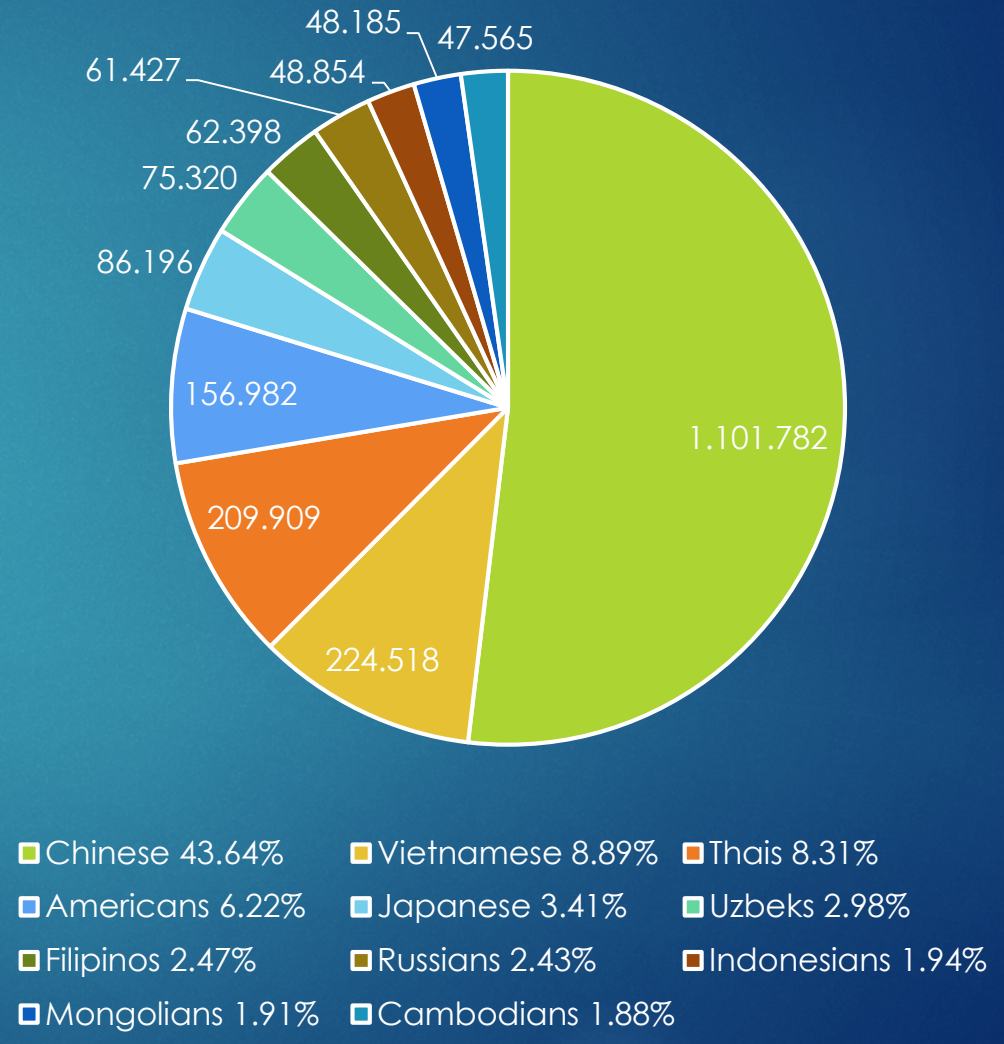
C. The use and provision of personal information without the consent of the data subject

- The data service providers can use and provide with additional personal information in accordance with Presidential Decree within the scope that is reasonably related to the initial purpose of the collection.

1. Introduction
Understanding Data Privacy in Korea

- Among foreigners
  - Language
  - Access to information
  - Seemingly not an issue among
  - Do they even care? (Of course they do!)

1. Introduction: Foreigners in Korea



2. Research: Trust and Distrust

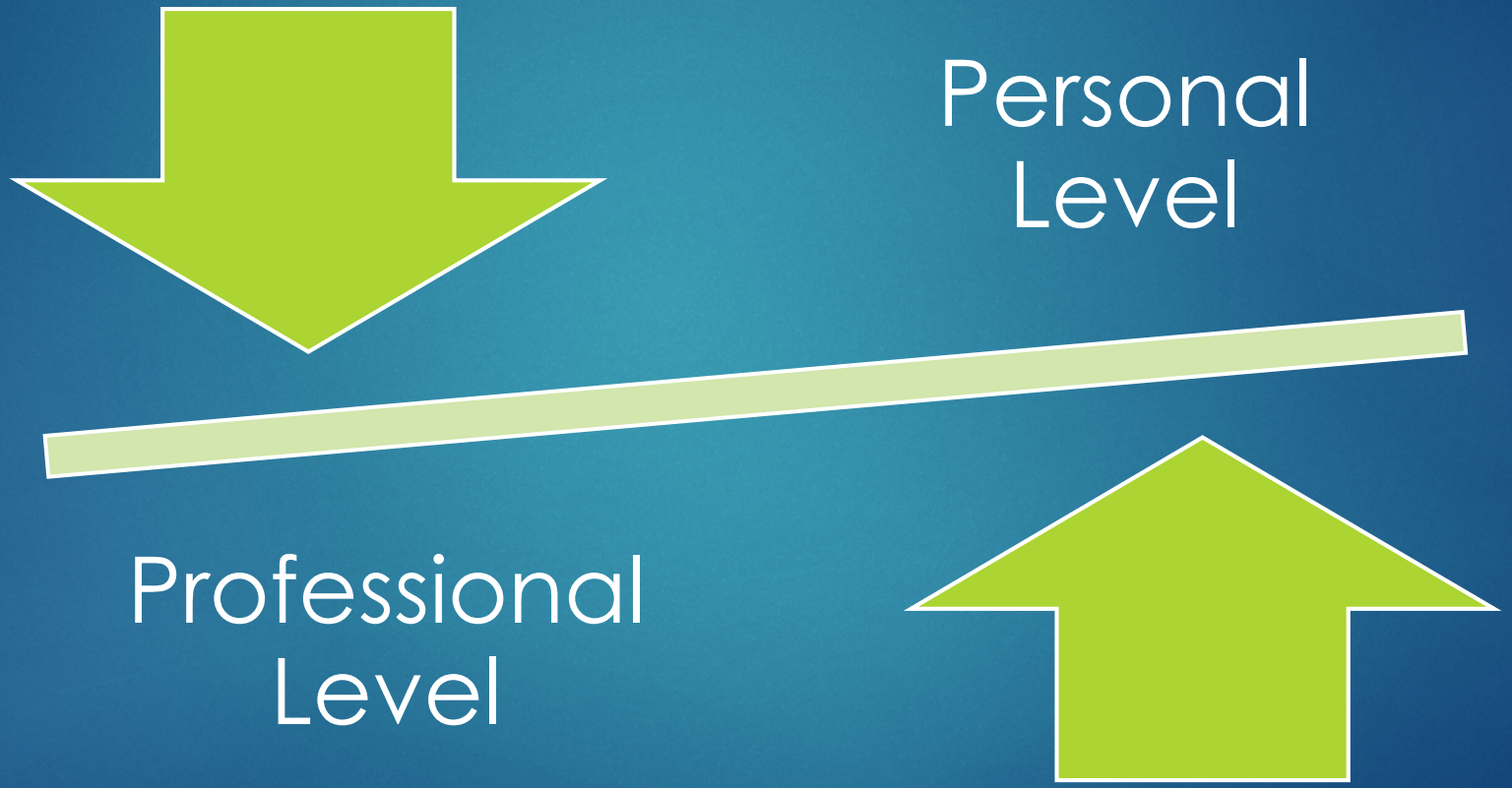
Presumption:

- Varying perceptions and understanding on data privacy and protection
- Differences in the level of concern for data and information privacy and protection

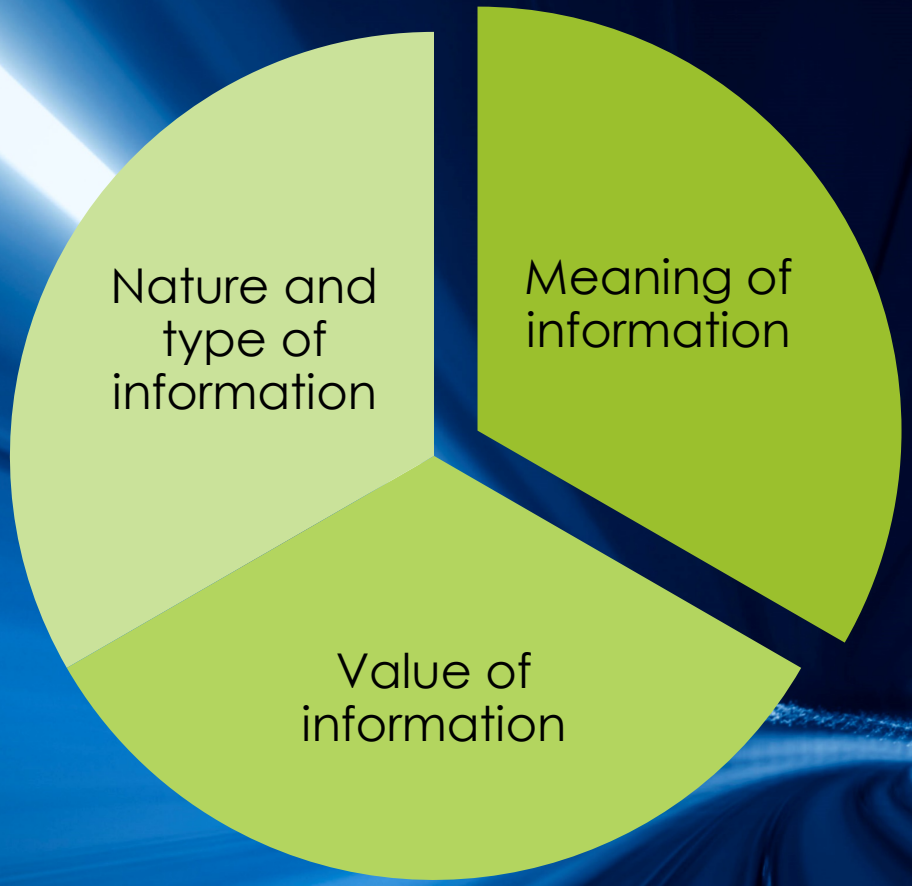
***GPS during the COVID-19 pandemic (tracking, etc.)

2. Research: Trust and Distrust

Concern for Data Privacy and Protection



DATA & INFORMATION



2. Research: Nature of trust

- MNC Managers (home and host country connection)
  - Reporting (differences in definition)
    - Confidentiality
    - Reporting standards
    - Securing communication

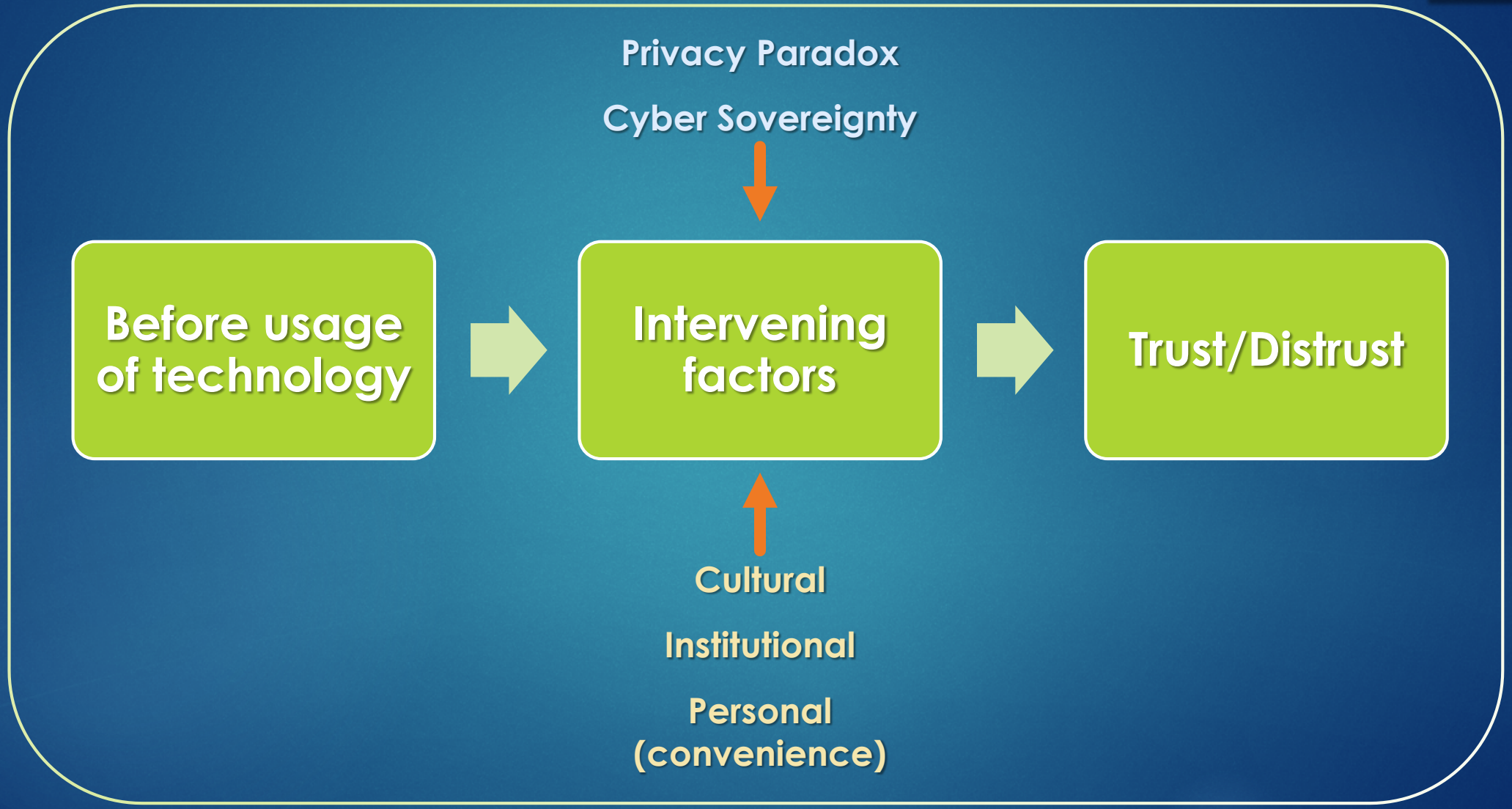
2. Research: Nature of trust

- Migrant workers (all workers)
  - Day-to-day affairs
    - Ordering and payment
    - Security CCTV on private premises
  - At the workplace
    - Use of email
    - Use of resources (personal vs. company)
    - Trust issues at the workplace (effect on foreign workers)

2. Research: Digital Trust & Intuition

- Theoretical framework
- Theoretical foundations
  - Context and definition

2. Research: Intuition



2. Research: Objectives

1.Understand the level of awareness of foreigners about data privacy and protection

Evaluate the discrepancy on trust between home and host countries' data privacy and protection

Identify the different intervening factors towards their level of trust and confidence in the digital ecosystem of Korea

2. Research: RQs

1. 1.Do foreigners trust or distrust the digital ecosystem of Korea? What are the factors affecting their decision to trust or distrust?
2. Why does disparity in digital trust in Korea and their home country exist among foreigners in South Korea?
3. How does the background of the foreigner influence its trust or distrust to the digital ecosystem? What is the relationship of digital trust and cyber reputation of the home country and to status in Korea?

2. Research: Methods

1. Data collected (from the group)
2. Interview
3. Another simple survey

2. Research
High Level of Trust and Convenience

- Preliminaries
  - There is high level of trust in the digital ecosystem in South Korea by foreigners
  - There is discrepancy in trust between home country and South Korea based on their personal experiences
  - Utilization of online services is based on trust derived from confidence and positive perception on protection guaranteed by Korean government agencies and stakeholders' cooperation

3. Wrap-up

Thank You!

Prof. Joeffrey Maddatu Calimag, Ph.D., SCPM

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Understanding Digital Trust in the Workplace: The Case of the Philippines

Joane V. Serrano, Markus Launer, Janele Belegal

Objectives

1. Examine the level of trust on digital technology among Filipinos;
2. Explore the key digital disruptions that necessitates digital trust;
3. Develop a framework to further understand how digital trust is built specifically in the context of the Philippines.

Trust - enables decisions to be made between two or more entities that reflects a level of confidence both in terms of quantifiable risk and subjective reputation that enable a transaction to occur for mutual benefit (IDC 2020).

Digital Trust

Digital trust - is the measure of consumer, partner and employee confidence in an organization’s ability to protect and secure data the privacy of individuals (CSO 2018)

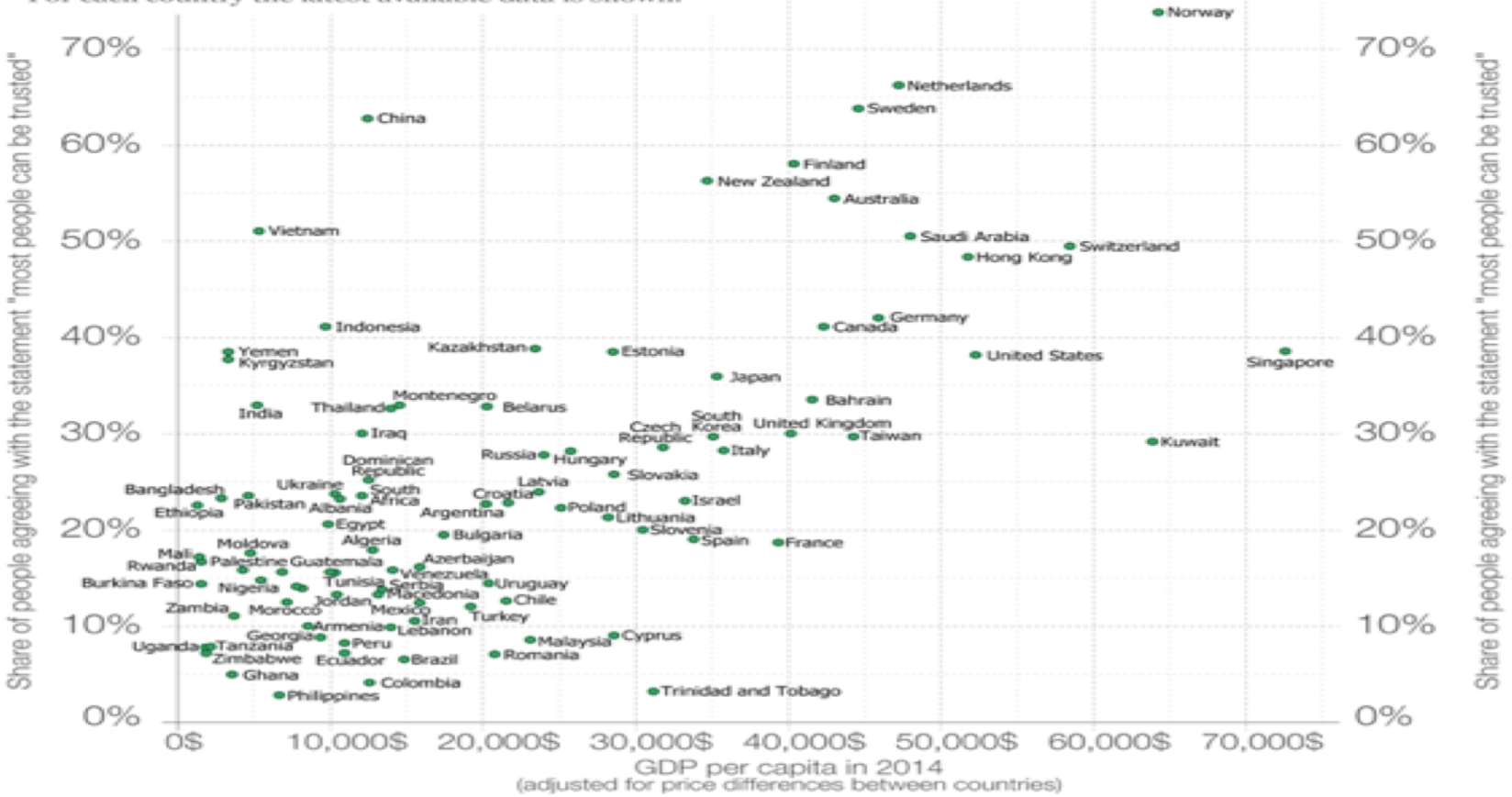
“Never before has the concept of trust been so critical to business. As we are unable to socially interact, digital interaction has become, for many, the only way to doncut business and deliver work” Simon Piff, IDC Vice President of Security

- “The type of trust and relationships that are possible via digital communication are shaped both by the nature of the medium and the interactions undertaken. Technology, and what people do with it, is provisional, impermanent and in flux on many levels including the speed of development, and the type of relationships people are having when mediated by technology. Digital environments are designed to provoke users to disclose a significant amount of information” (Dwyer, 2011).
- Digital trust stems from a combination of different factors: security, identifiability, and traceability (Mattila & Seppala, 2016)
- Platforms evolve over time and create diverse logics, resulting in inter- and intra-platform differences (Mohlmann, 2016)

Country by country: Trust vs. GDP per capita

Shown is the share of people agreeing with the statement "most people can be trusted".
For each country the latest available data is shown.

Our World in Data



Methodology

This study made use of mixed method design.

Data were collected concurrently. In a concurrent data collection, the quantitative and qualitative data collection occur at different level (at different levels of analysis).

For the quantitative data, data from the Philippines from the global research on Digital Trust and Teamwork headed by Prof. Markus Launer were analyzed. For the qualitative data, responses by Filipino professionals mostly from the academe were analyzed.

Results and Discussion

Demographic Information

Table 1. Age range of study participants.

Age Range	Frequency
19-28 years old	81
29-38 years old	137
39-48 years old	105
49-58 years old	138
59 years old and older	11

Table 2. Gender of study participants.

Gender	Frequency
Female	188
LGBT-Q	40
Male	244

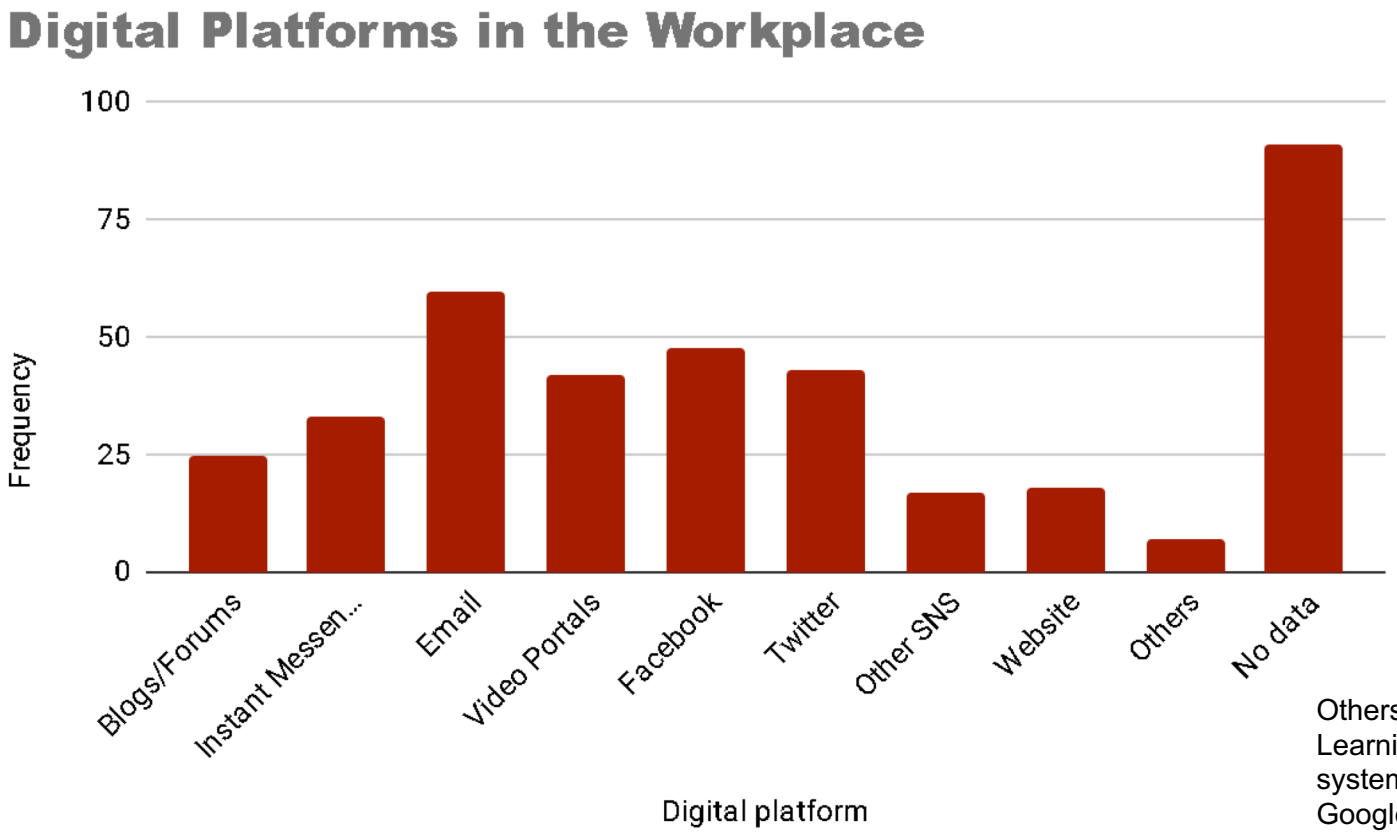
Table 3.Organizational affiliation of study participants.

Organization	Frequency
Private	219
Government	127
Non-government	12
Semi-private and semi-government	19
Business with one person	4
No data	91

Results and Discussion

Level of Trust on Digital Technology among Filipinos

1. Digital platforms available and used in the workplace
2. Means of communication in the workplace
3. Sought out features of digital technologies
4. Level of trust with digital technologies in the workplace
5. Level of trust with people in the workplace (management, IT and data support, external entities)



Others:
Learning management system; Messenger; Google Classroom; Microsoft Teams; Zoom; Personal emails; Workplace by Facebook

Figure 1. Digital platforms available and used in the workplace.

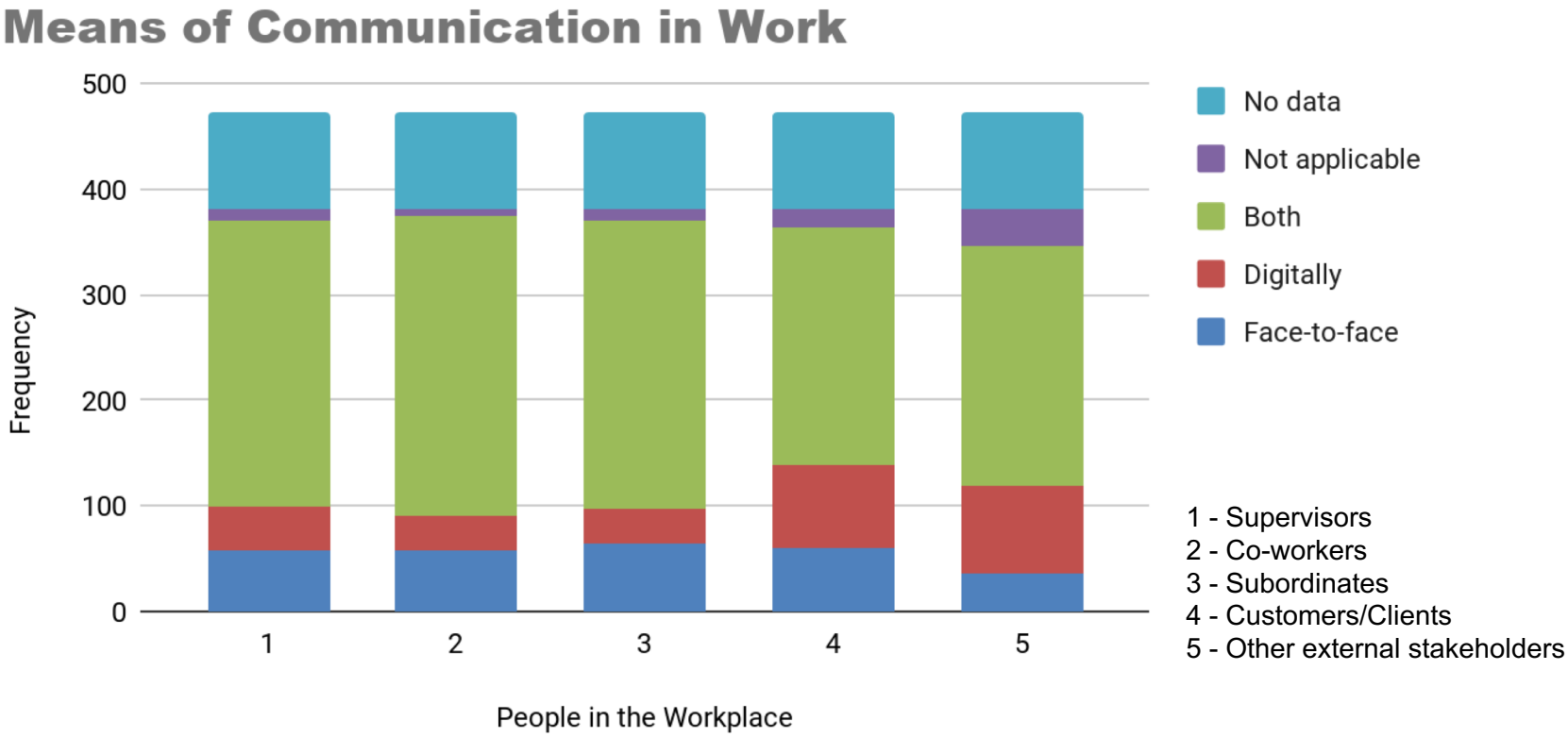


Figure 2. Means of communication with people in the workplace.

Table 4.1 Trusting digital technology.						
Degree of priority	Frequency					
	Consumer or client benefits and value	Digital risk resilience	Ethics and control of data access and use	Integration and reusability	Integrity of processes	Interaction through the internet
Not a priority	16	16	10	18	15	10
Less priority	50	100	48	81	68	52
Priority	132	128	132	146	145	165
High priority	182	134	190	133	150	151
Does not apply	1	3	1	3	3	3
No data	91	91	91	91	91	91

Table 4.2 Trusting digital technology.

Degree of priority	Frequency					
	Legitimacy	Personal data protection	Relevance	Safety and Exploitability	Control and security	Shareability
Not a priority	7	15	12	15	9	17
Less priority	58	50	64	51	55	67
Priority	136	106	149	128	127	177
High priority	176	210	154	185	189	118
Does not apply	3	0	2	2	1	2
No data	91	91	91	91	91	91

Table 4.3 Trusting digital technology.

Degree of priority	Frequency				
	Systems of accountability	Accuracy of data	Performance	Usability	Reliability & business continuity
Not a priority	8	12	11	13	13
Less priority	71	42	61	53	60
Priority	143	121	131	150	135
High priority	157	204	178	165	172
Does not apply	2	2	0	0	1
No data	91	91	91	91	91

Level of Trust on Digital Technology among Filipinos

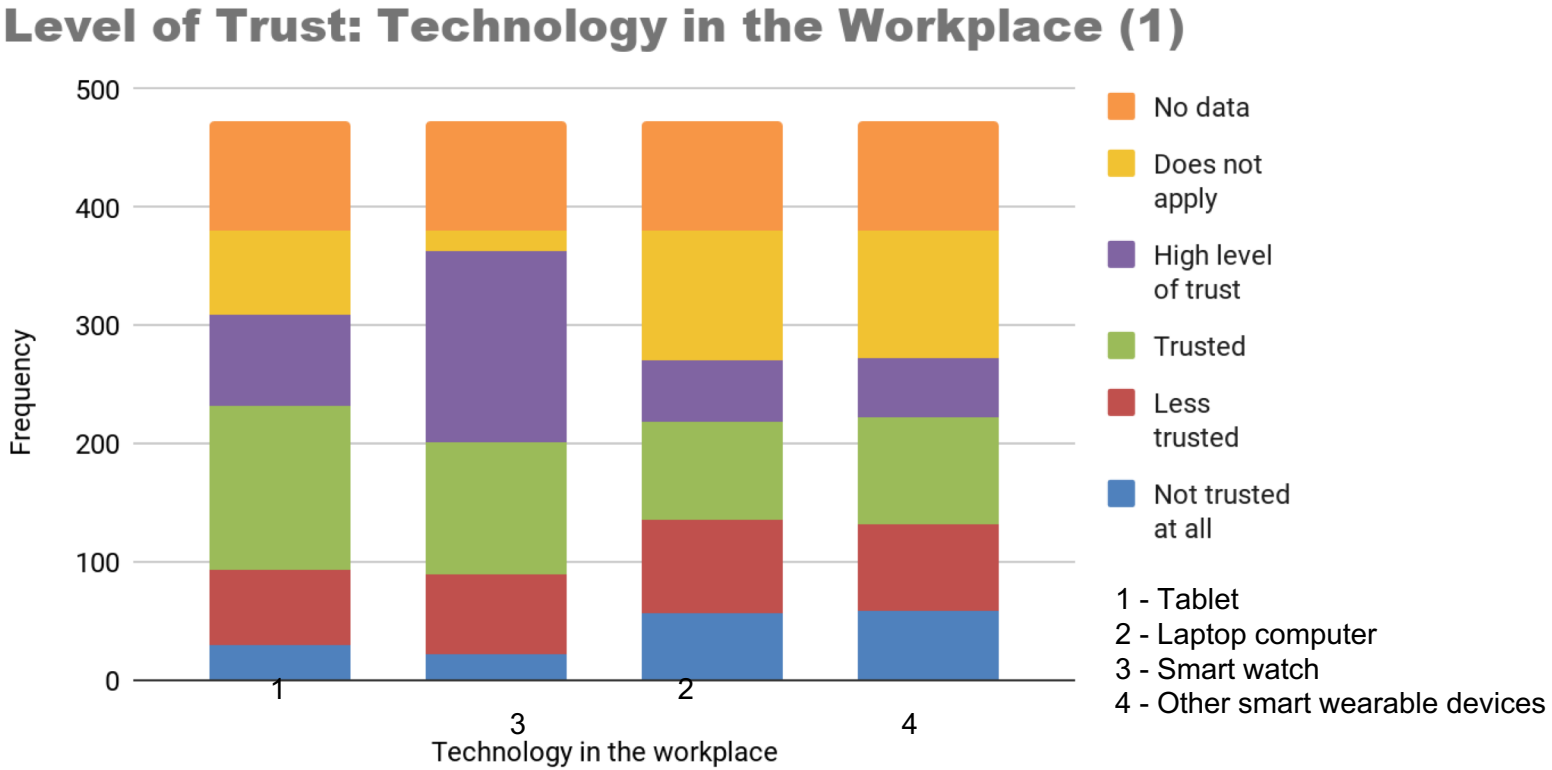


Figure 3. Level of trust in technologies in the workplace.

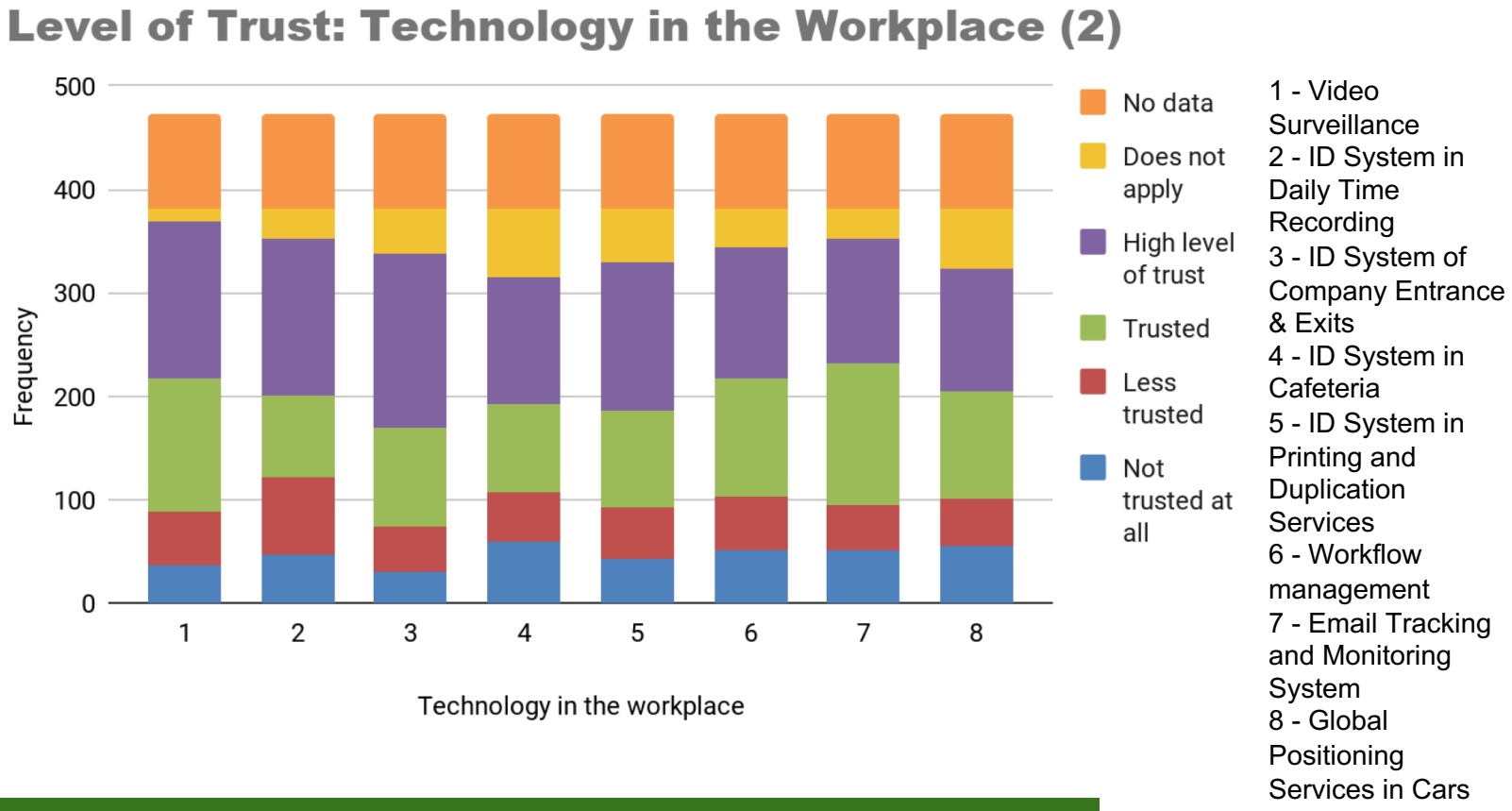
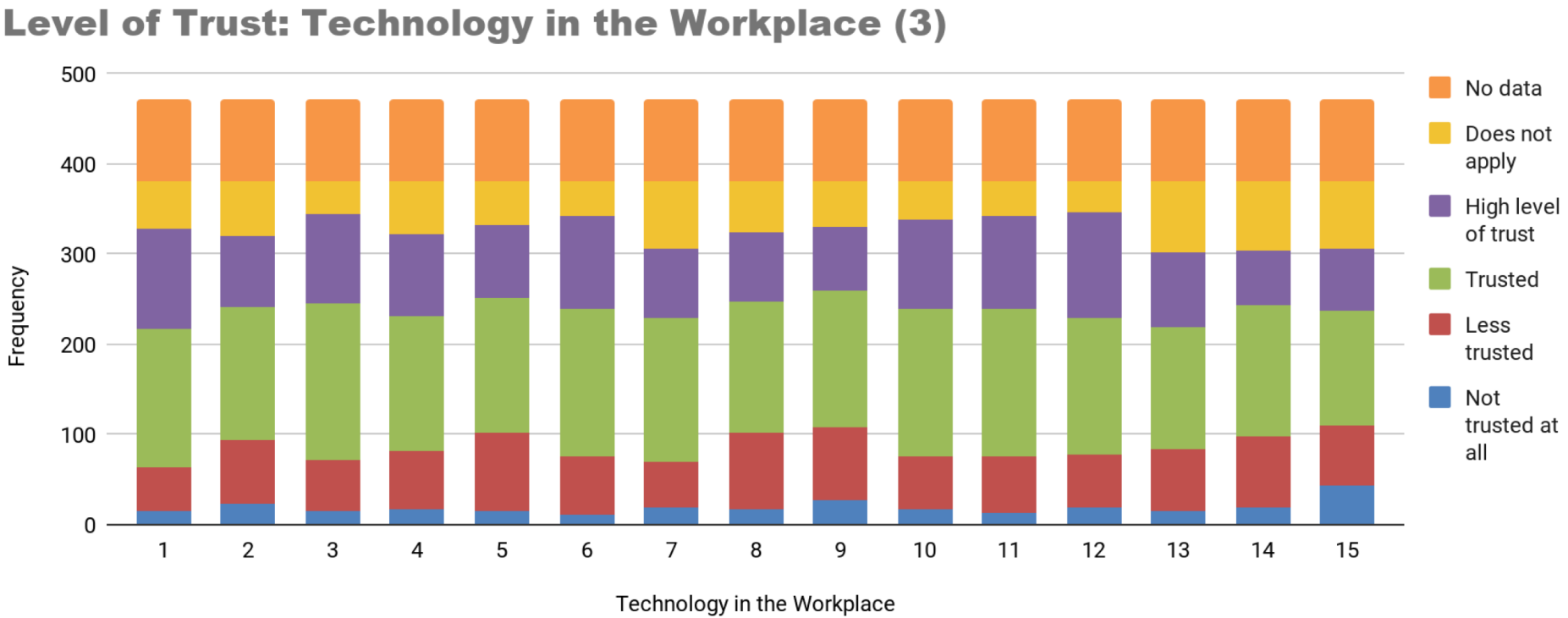


Figure 4. Level of trust in technologies in the workplace.



1 - Executive Information Systems; 2 - Group Decision Support Systems; 3 - Collaboration Tools; 4 - Logistics Systems; 5 - Financial Planning Systems; 6 - Spreadsheet Models; 7 - Sales Management Systems; 8 - Inventory Control Systems; 9 - Budgeting Systems; 10 - Management Reporting Systems; 11 - Personnel (HRM) Systems; 12 - Payroll Systems; 13 - Reservation Systems; 14 - Stock Control Systems; 15 - Internet Bots

Figure 5. Level of trust in technologies in the workplace.

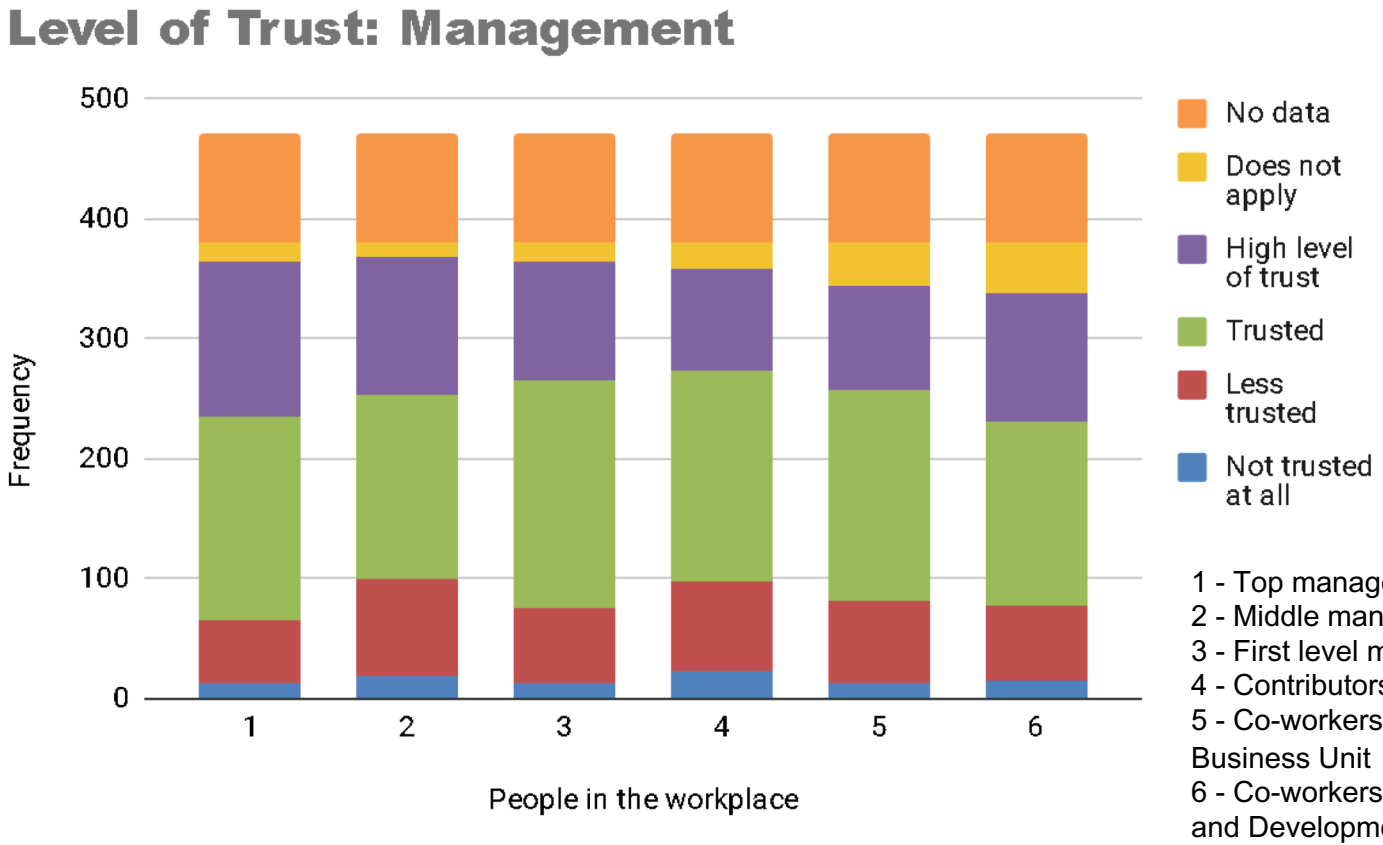


Figure 6. Level of trust in the management of the workplace.

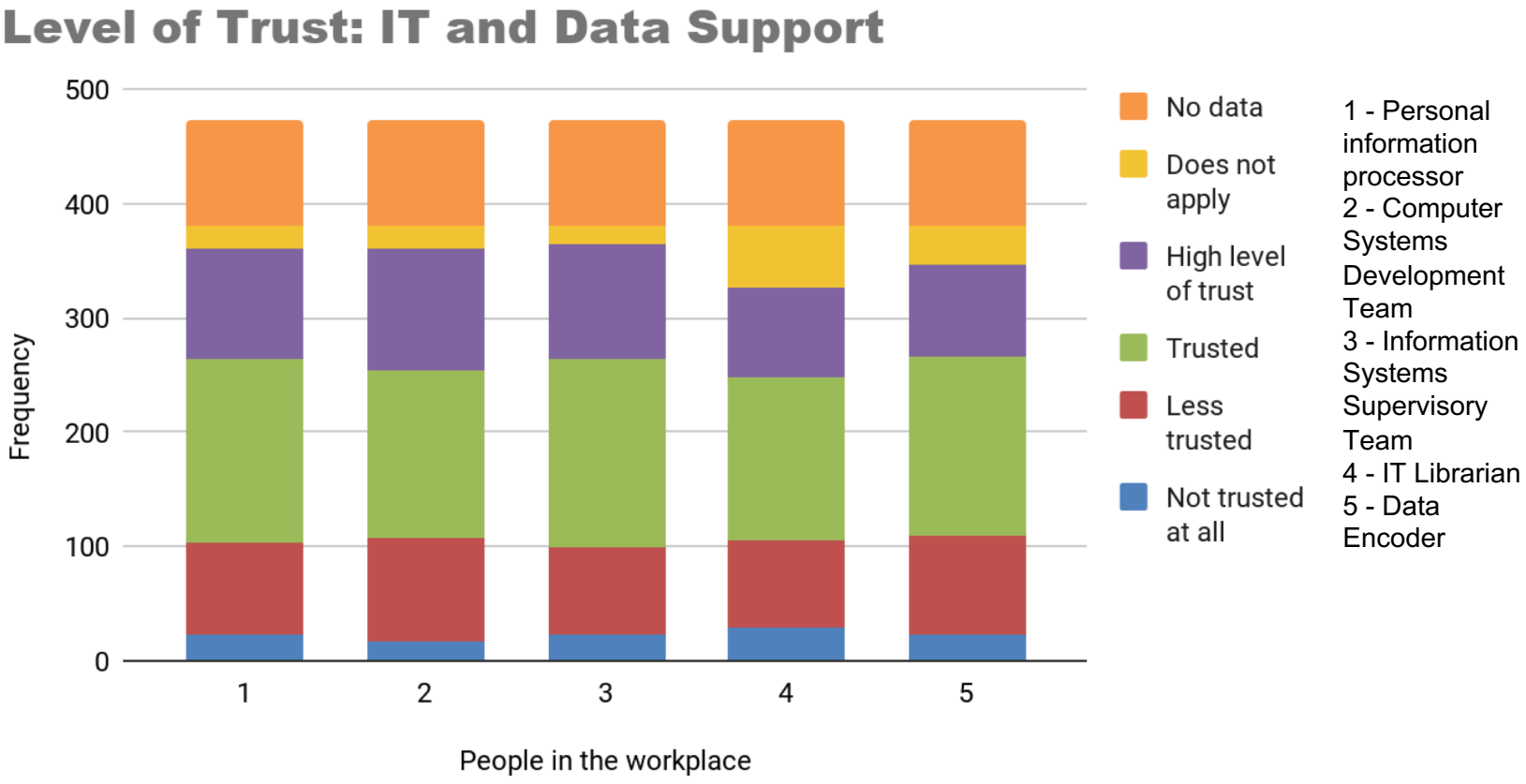


Figure 7. Level of trust in the IT and data support team of the workplace.

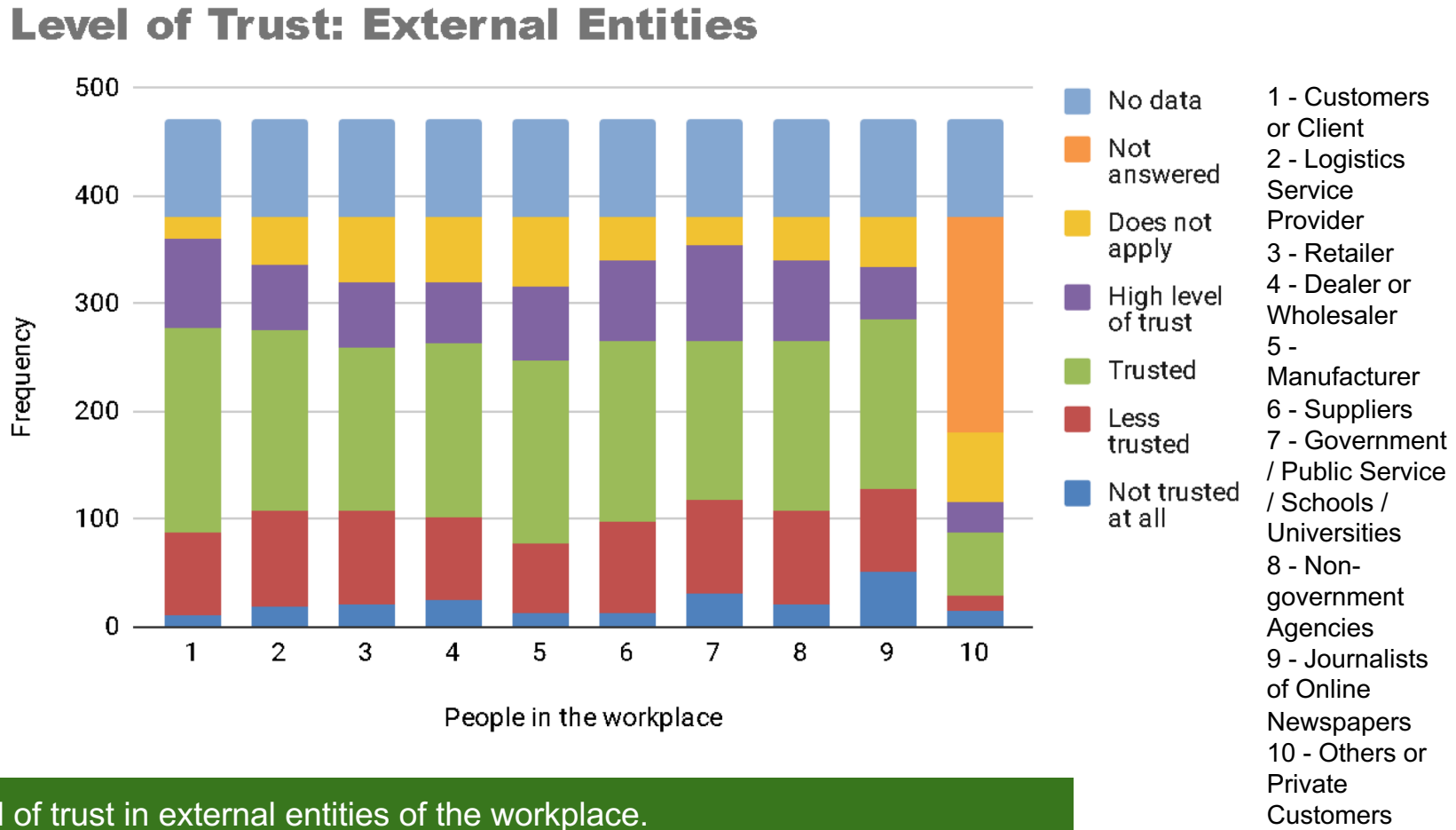


Figure 8. Level of trust in external entities of the workplace.

Digital disruptions that require digital trust

1. WFH technology and arrangements
2. Online learning
3. Social media
4. Cloud
5. Speed of technology change
6. Increase in digital transactions

WFH Technology

- Need for secure, appropriate, and available infrastructures and resources
- Need for secure online transactions or processes related to work
- Need for proper training sessions for using ICTs
- Cloud storage of work files
- Primary concern for Filipinos is internet availability and connectivity
    - Followed by time management

Online Learning

- Primary concern for Filipinos is internet access and connectivity
- Need for definite and clear guidelines for online learning
- Need for secure, appropriate, and available infrastructures and resources
- Need to address accessibility, inclusivity, and quality
- Teachers and students must overcome the fear of potentially wasting time, disclosing sensitive information, and losing submitted work

Social Media

- Need for secure platforms
- Platforms with instant messaging, and that uses small internet bandwidth are preferred
- Users must be critical of information that are shared through social media
- Prone to easy spread of fake news and misinformation
- Need to improve digital skills
- Allows for building of relationships similar to real world setting

Cloud

- Need for secure platforms
- Privacy of data in cloud storage
- Allows for flexible work arrangements
- More resilient

Speed of Technology Change

- Technology-driven processes
- Need to invest in technology that can adapt to future changes

Increase in digital transactions

- Need for secure platforms
- Trust in the system
- Digital skills are essential


Security
Data Access and Control
Value
Trust
Accountability and Self-disclosure
Accuracy
Resilience

Dr. Kandappan Balasubramanian

Associate Professor
School of Hospitality, Tourism & Events
Associate Director - Human Capitalization
Centre for Research and Innovation in Tourism
Taylor's University, Malaysia

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WHY I'M HERE

DIGITAL TRUST IN THE WORKPLACE

PROF MARKUS LAUNER AND TEAM – GLOBAL PROJECT

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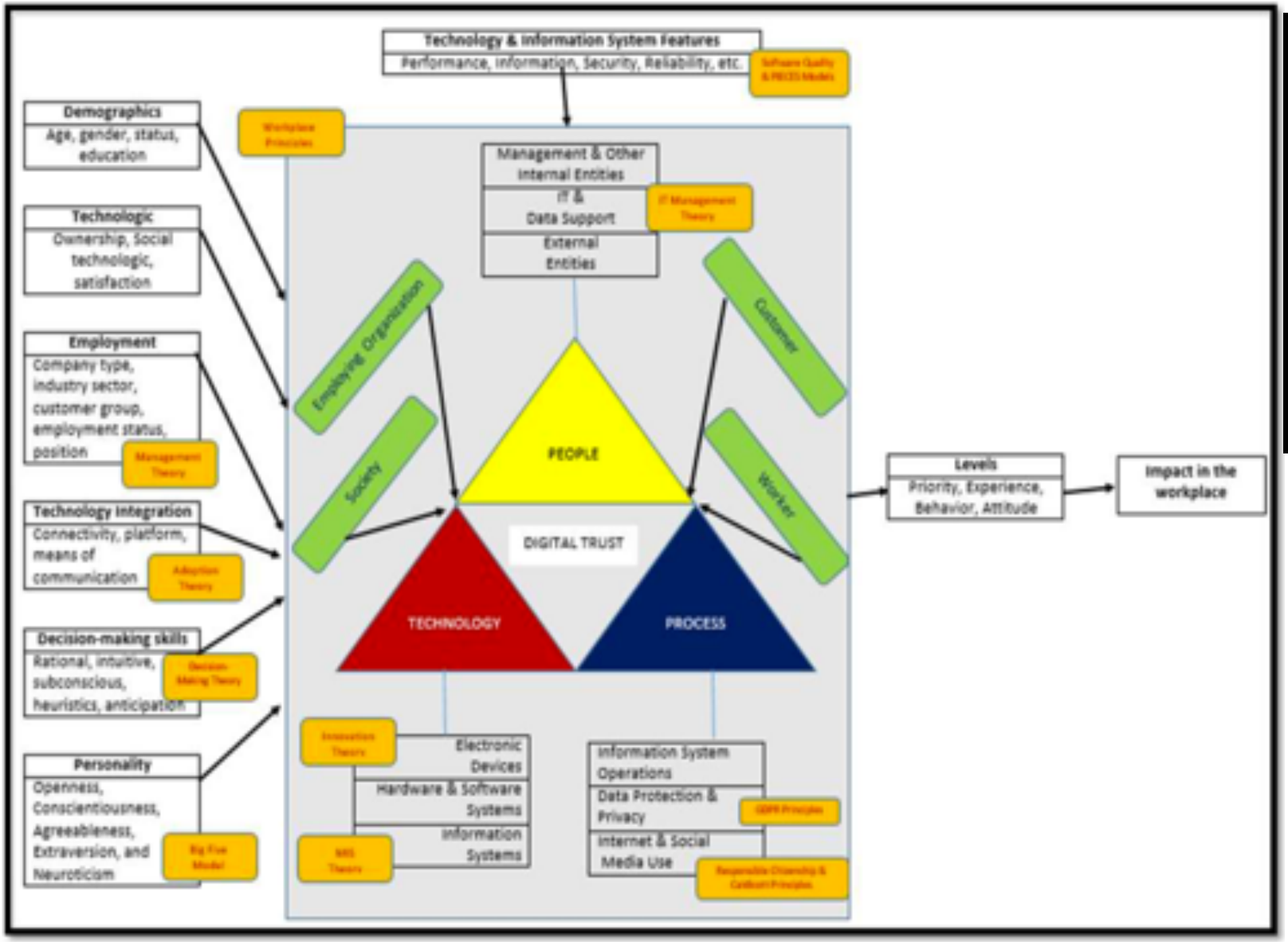
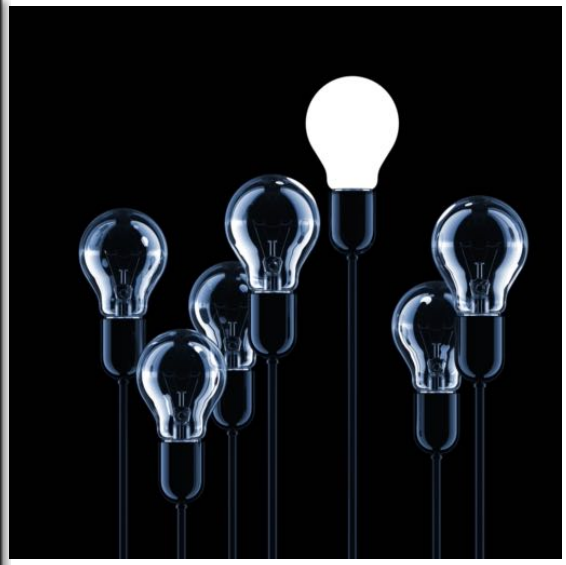


Theoretical Framework of the Study "Digital Trust in the Workplace"



Source:
Dave E. Marcial , Markus A. Launer (2019)

Trust is defined as "our willingness to be vulnerable to the actions of others because we believe they have good intentions and will behave well toward us."

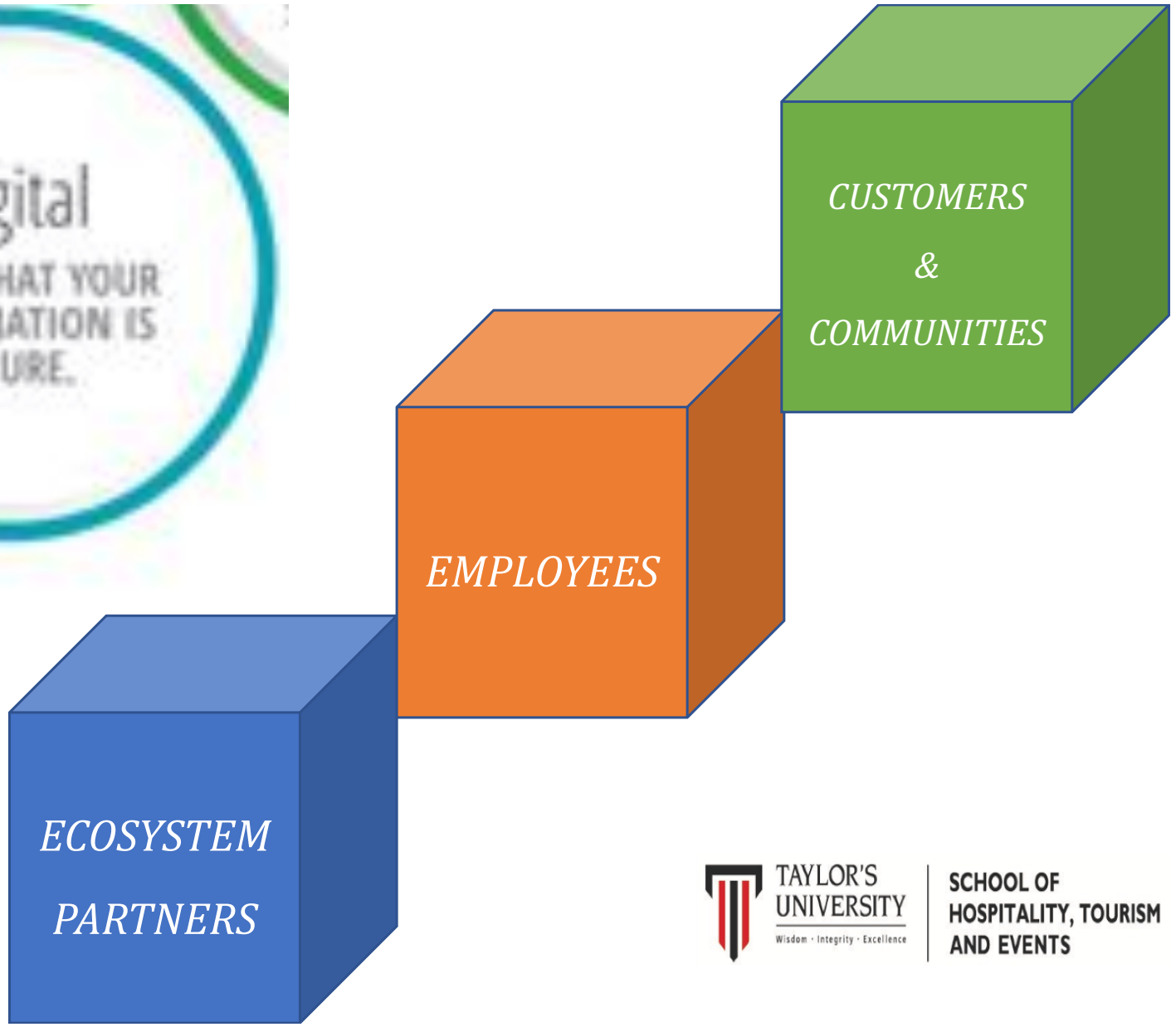
(SOURCE: Sandra Sucher and Shalene Gupta, "The trust crisis," Harvard Business Review, July 23, 2019)

Trust is associated with

- *stronger economic growth*
- *increased innovation*
- *greater stability, and*
- *better health outcomes.*

Dimensions of trust: physical, digital, emotional, financial

Source: Deloitte analysis.



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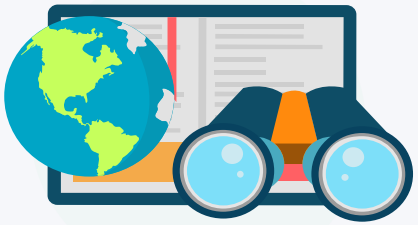


DIGITAL TRUST

HOW TO CREATE AN DIGITAL TRUST

CLOUD SHARING

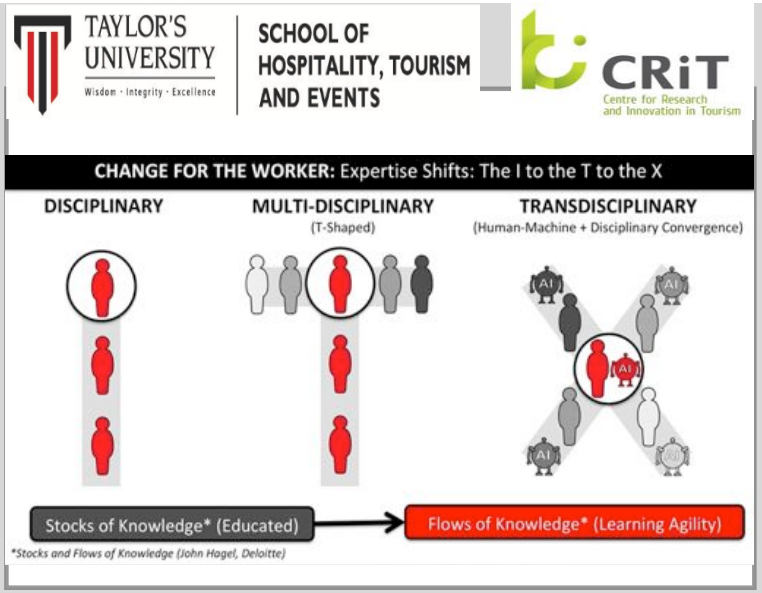
PRIOR KNOWLEDGE

GLOBAL ACCESS

USER EXPERIENCE

BLOGS/SOCIAL MEDIA


CONTEXT: Talent Shifts in The Next Era
TIME: WE ARE HERE
OUR MENTAL MODELS ARE HERE
Hunter – Gather Era
Agricultural Era
Industrial Era
Information Era
Augmented Era
TIMESPAN
1,000,000s
1,000s
100s
10s
TALENT
Strength + Speed
Know How + Stamina
Efficiency + Optimization
Acquired Knowledge + Skill
Creativity, Agility + Adaptability
TOOLS
Labor Efficiency
Labor Augmentation
Labor Replacement
Cognitive Reduction
Cognitive Augmentation
Concept of Augmented Era © Jeff Kowalski, CTO Autodesk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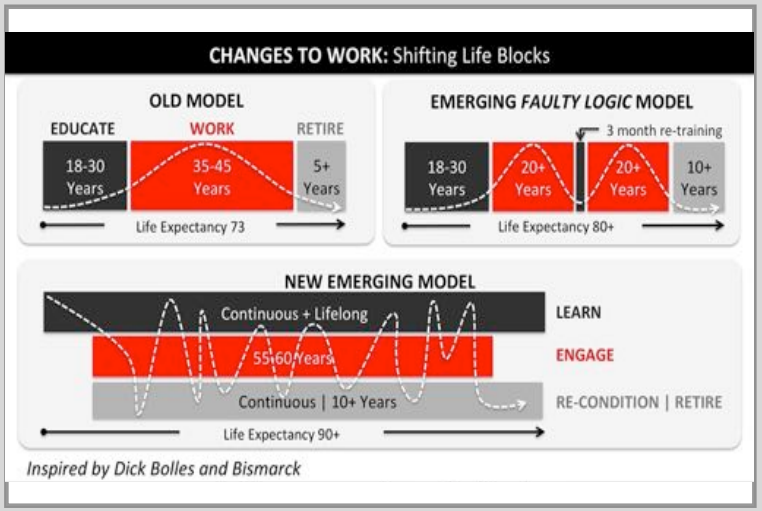
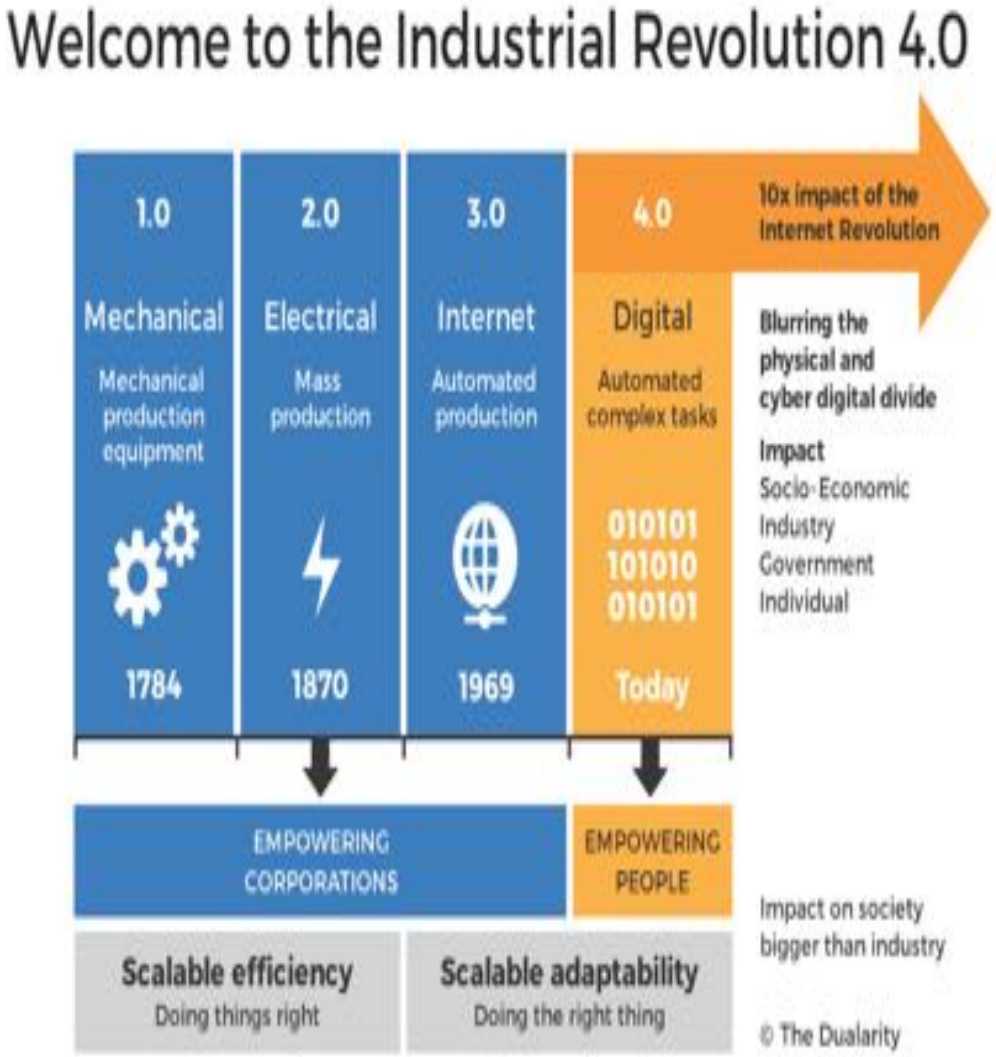
CHANGE FOR THE WORKER: Expertise Shifts: The I to the T to the X
DISCIPLINARY
MULTI-DISCIPLINARY
(T-Shaped)
TRANSDISCIPLINARY
(Human-Machine + Disciplinary Convergence)
Stocks of Knowledge* (Educated)
Flows of Knowledge* (Learning Agility)
*Stocks and Flows of Knowledge (John Hagel, Deloitte)


CHANGES TO WORK: Shifting Life Blocks
OLD MODEL
EDUCATE
WORK
RETIRE
18-30 Years
35-45 Years
5+ Years
Life Expectancy 73
EMERGING FAULTY LOGIC MODEL
3 month re-training
18-30 Years
20+ Years
20+ Years
10+ Years
Life Expectancy 80+
NEW EMERGING MODEL
Continuous + Lifelong
LEARN
55-60 Years
ENGAGE
Continuous | 10+ Years
RE-CONDITION | RETIRE
Life Expectancy 90+
Inspired by Dick Bolles and Bismarck

THE INDUSTRIAL & INSTITUTIONAL EVOLUTION

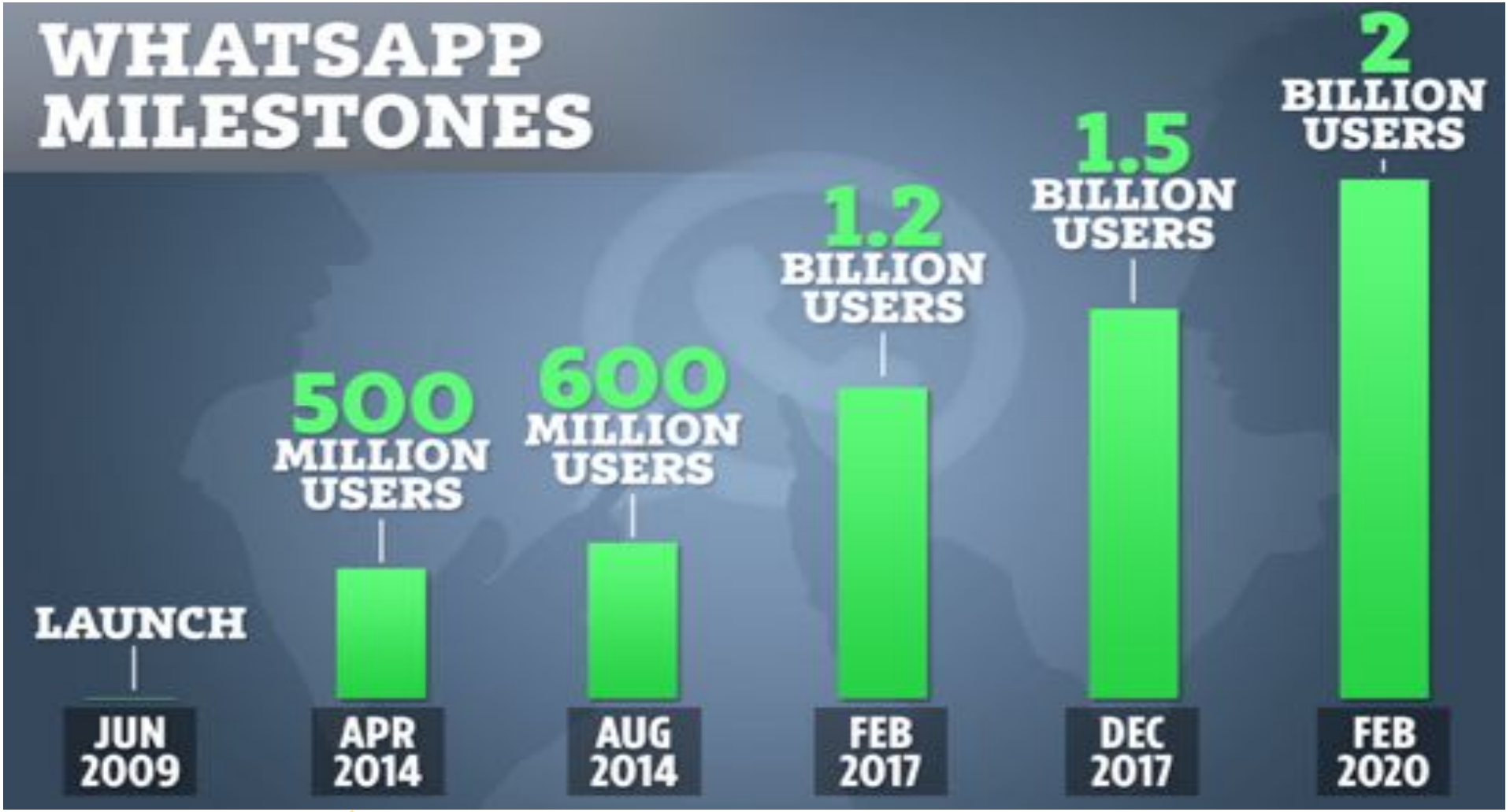


	2013	2014	2015	2016	2017	2018	2019
Facebook	461805 logins	600,000 logins	650,890 status updated	701,389 logins	835,620 logins	973,000 logins	1 million logins
Instagram	38,000 photos uploaded	42,000 photos uploaded	85,000 photos uploaded	110,800 photos uploaded	150,950 scrolling IG	174,000 scrolling IG	347,222 scrolling IG
Twitter	387,000 tweets	433,000 tweets	547,200 tweets	347,222 tweets	420,200 tweets	481,000 tweets	87,500 tweets
Pinterest	2700 pins added	3400 pins added	4500 Pins added	6500 pins added	8200 pins added	9600 pins added	12,000 pines added
Google	4.11 million search queries	4.19 million search queries	4.28 million search queries	4.12 million search queries	3.12 million search queries	3.7 million search queries	3.8 million search queries
Vines	360 vines uploaded	450 vines uploaded	570 vines uploaded	650 vines uploaded	720 vines uploaded	700 vines uploaded	Shutting Down
Youtube	103 hrs of YT content uploaded	306hrs of YT content uploaded	910hrs of YT content uploaded	100,50 hrs of YT content viewed	800,222 hrs of YT content viewed	1.5 million hrs of YT content viewed	4.5 million hrs of YT content viewed
Apple and Google Store	37,000 apps downloaded	50,200 apps downloaded	72,400 apps downloaded	95,000 apps downloaded	185,222 apps downloaded	375,000 apps downloaded	390, 030 apps downloaded
Spotify	20 songs added	35 songs added	90 songs added	150 songs added	300 songs added	450 songs added	666 songs added
Amazon	$66,200 amazon sales	$80,000 amazon sales	$120,000 amazon sales	$420,200amazon sales	$700,000 amazon sales	$862,823 amazon sales	$996,959 amazon sales
Emails	127,013,889 emails sent	127,013,889 emails sent	150 million emails sent	162 million emails sent	175million emails sent	187 million emails sent	188 million emails sent

LifeFalcon.com

Life Falcon

(Source: Datin Paduka Ir. Dr. Siti Hamisah Tapsir, , University Presidential forum 2017)


WHATSAPP MILESTONES
LAUNCH
JUN 2009
500 MILLION USERS
APR 2014
600 MILLION USERS
AUG 2014
1.2 BILLION USERS
FEB 2017
1.5 BILLION USERS
DEC 2017
2 BILLION USERS
FEB 2020

Top Grossing Photo & Video Apps Worldwide for May 2020

SensorTower

	Overall Revenue	App Store Revenue	Google Play Revenue
1	TikTok	TikTok	Disney+
2	YouTube	YouTube	Twitch
3	Disney+	Disney+	TikTok
4	Twitch	Kuaishou	Microsoft OneDrive
5	Kuaishou	MangoTV	PicsArt
6	MangoTV	Twitch	VivaVideo
7	PicsArt	Bilibili	Likee
8	Facetune2	Facetune2	STARZ
9	Bilibili	VK	LINE LIVE
10	VK	VSCO	Bermuda

Note: TikTok includes spending in Douyin. Does not include revenue from third-party Android stores in China or other regions.

SensorTower Data That Drives App Growth sensortower.com

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Top Food Delivery Apps Worldwide for May 2020 by Downloads

SensorTower

	Overall Downloads	App Store Downloads	Google Play Downloads
1	Uber Eats	Uber Eats	Uber Eats
2	McDonald's	McDonald's	McDonald's
3	Walmart	DoorDash	Foodpanda
4	DoorDash	Walmart	Domino's
5	Foodpanda	KFC	iFood
6	KFC	Domino's	Jumia
7	Domino's	Pizza Hut	Grab
8	iFood	US Group Take-Out	Walmart
9	Burger King	Luckin Coffee	Rappi
10	Grab	Grubhub	DoorDash

Note: Does not include downloads from third-party Android stores in China or other regions.

SensorTower Data That Drives App Growth sensortower.com

Jewellery /Apparel Shop Concept

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Would you eat your food in virtual reality?

Korean tech giant is offering its Gear VR gadgets to restaurants that want to 'stand out from the crowd'

V R *in* I N D U S T R Y

A.I. VIRTUAL IR 4.0 SMART TOUR

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A R *in* I N D U S T R Y

ROBOTIC | RESTAURANT | IR 4.0 | SMART | MR SERVICE

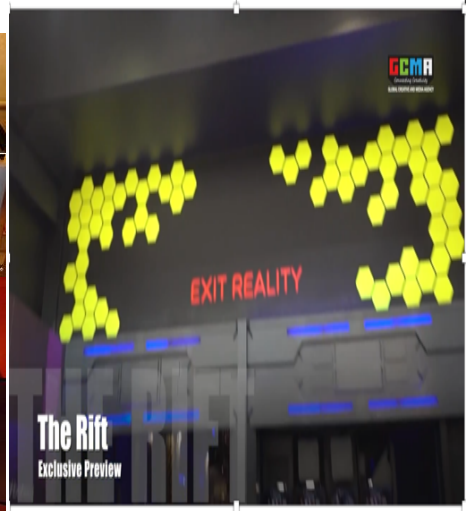
Park Avenue Rochester's robot, Singapore

Delivery Room Service

New customer experience

Attract Millennial Market

NEW MR EXPERIENCE - MALAYSIA



INTRODUCTION

02

The teaching and learning using technology (digital-tools) are student-centered and have impact on student interest to learn and engage in the classroom activities, also mainly to explore the education arena in an interactive way of learning

Johnson, Adams Becker, Estrada, and Freeman (2014), believe that these techniques can improve the student's satisfaction and enrich the user's experience in the multimodal learning environments.

03

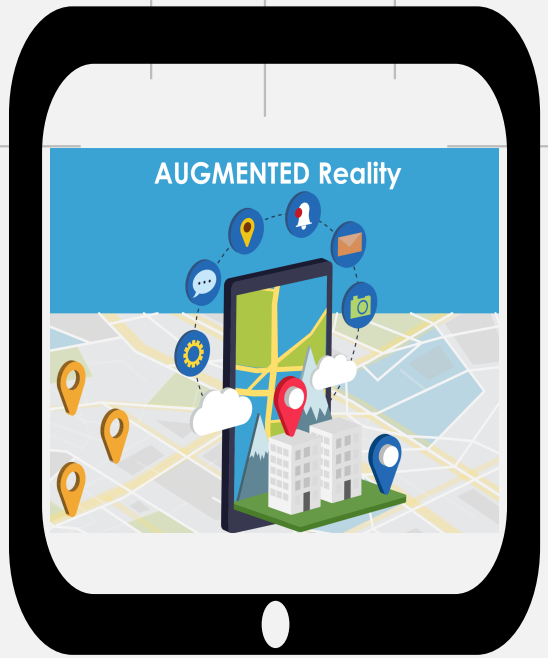
04

Hospitality firms' tomorrow will look and behave differently from what is familiar today (Olsen & Connolly, 2000).

In the field of education industry, personalization is going to be success key of the future classroom

01

During the last decade, the advent of the internet revolutionizes the education and shift the paradigm in general (Moreira, Pereira, Durão, & Ferreira, 2018).



05

Dunleavy, Dede and Mitchell (2009) mentioned the AR could help to 'combine the physical and virtual worlds' and change the traditional classroom environment

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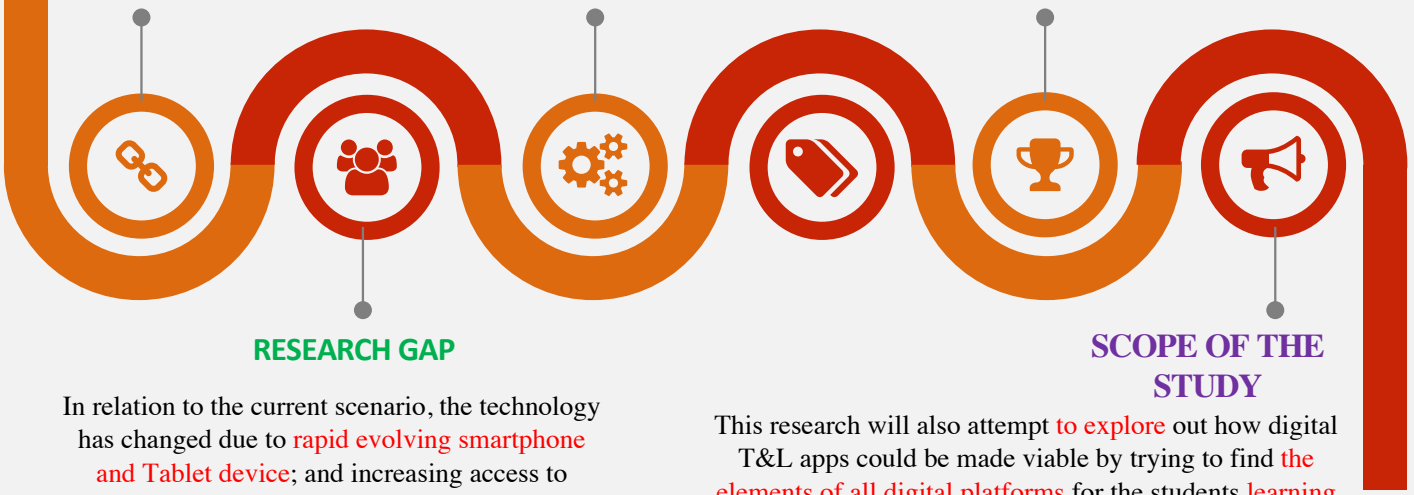
BACKGROUND OF THE STUDY

Education industry continuous expansion and Diversification to become one of the largest and the fastest growing sectors in the world to adapt the new technology into practices

The increasing number of mobile application user proves the great potential of using as New teaching & learning tool in Malaysia Higher Education.

The constant growth in mobile technology has created a prospect for the education sector to use as a new immersive teaching and learning in this Education 4.0



RESEARCH GAP

In relation to the current scenario, the technology has changed due to rapid evolving smartphone and Tablet device; and increasing access to technology in the classroom. Research remains unaddressed how best to use digital T&L apps in the higher education classroom to create 21st Century graduate capabilities and skills

SCOPE OF THE STUDY

This research will also attempt to explore out how digital T&L apps could be made viable by trying to find the elements of all digital platforms for the students learning experiences. (reading, support, activities and other learning activities)

It will also transform the learning space to create a borderless classroom / immersive learning space.

RETHINKING THE LEARNING EXPERIENCE

Empowering Learning Space With Augmented Reality (AR) Applications – A New *Immersive* Teaching & Learning Paradigm In *Education 4.0*

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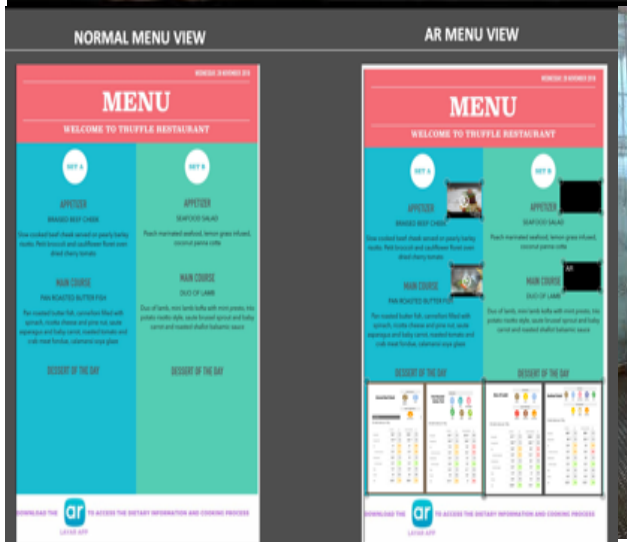

WEARABLE EXPERIENCE FOR KNOWLEDGE INTENSIVE TRAINING & DEVELOPMENT OF SKILLS AMONG LEARNERS

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RECENT ONLINE CLASS PRESENTATION

ENGAGE &GAMIFY THE LEARNING

CREATING COMPETITIVE SKILLS


Quizizz
Gamified Quizzes for Classroom!


Kahoo

BORDERLESS CLASSROOM?

CREATING AN INTERACTIVE TEACHING

E-GOVERNANCE MODEL IN EDUCATION

(PIES)

PROPOSED MODEL: Kandappan Balasubramanian, 2020

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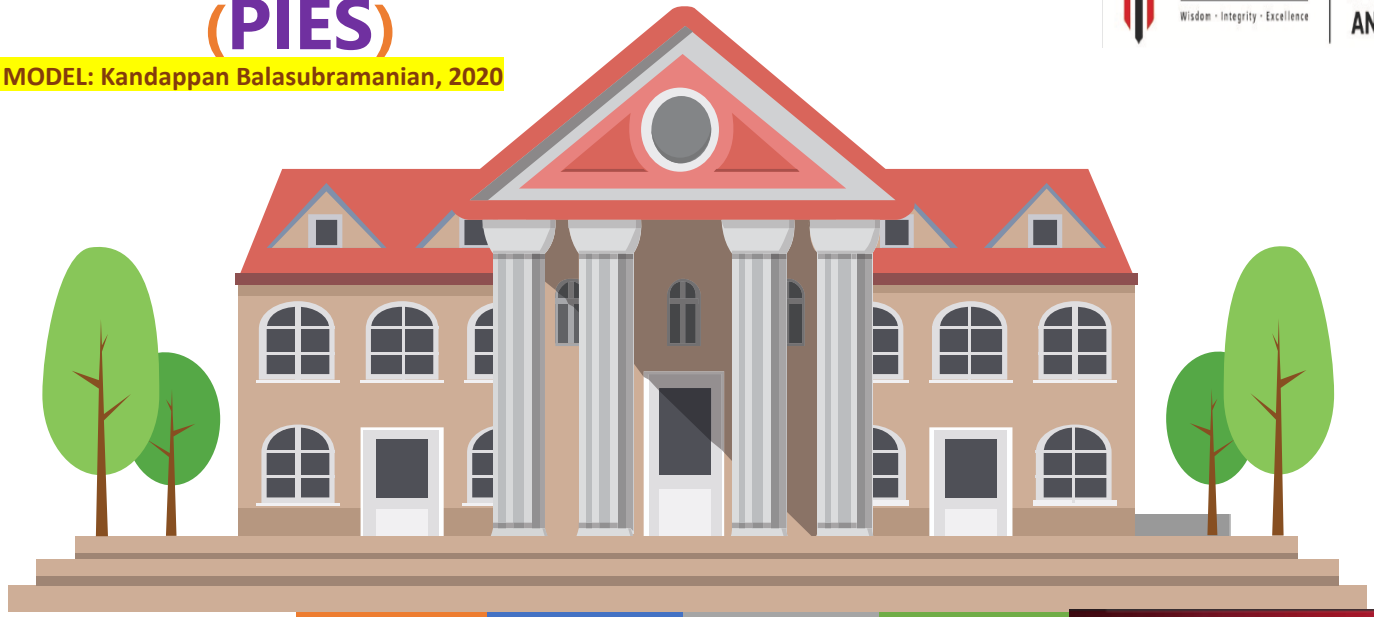
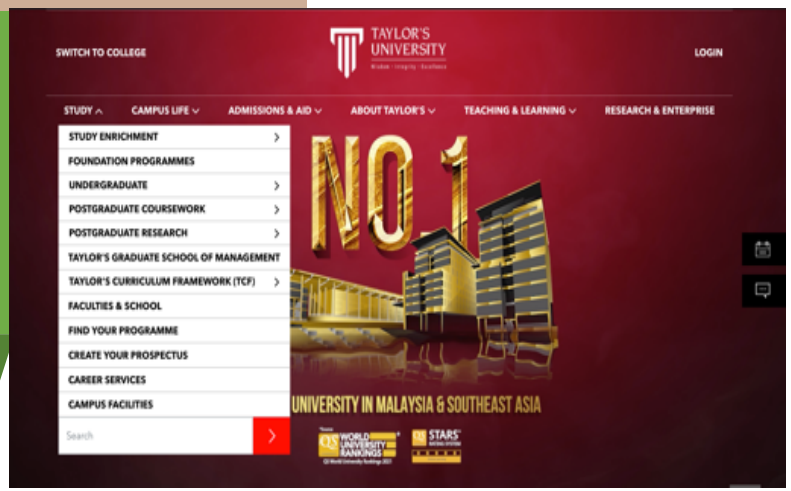


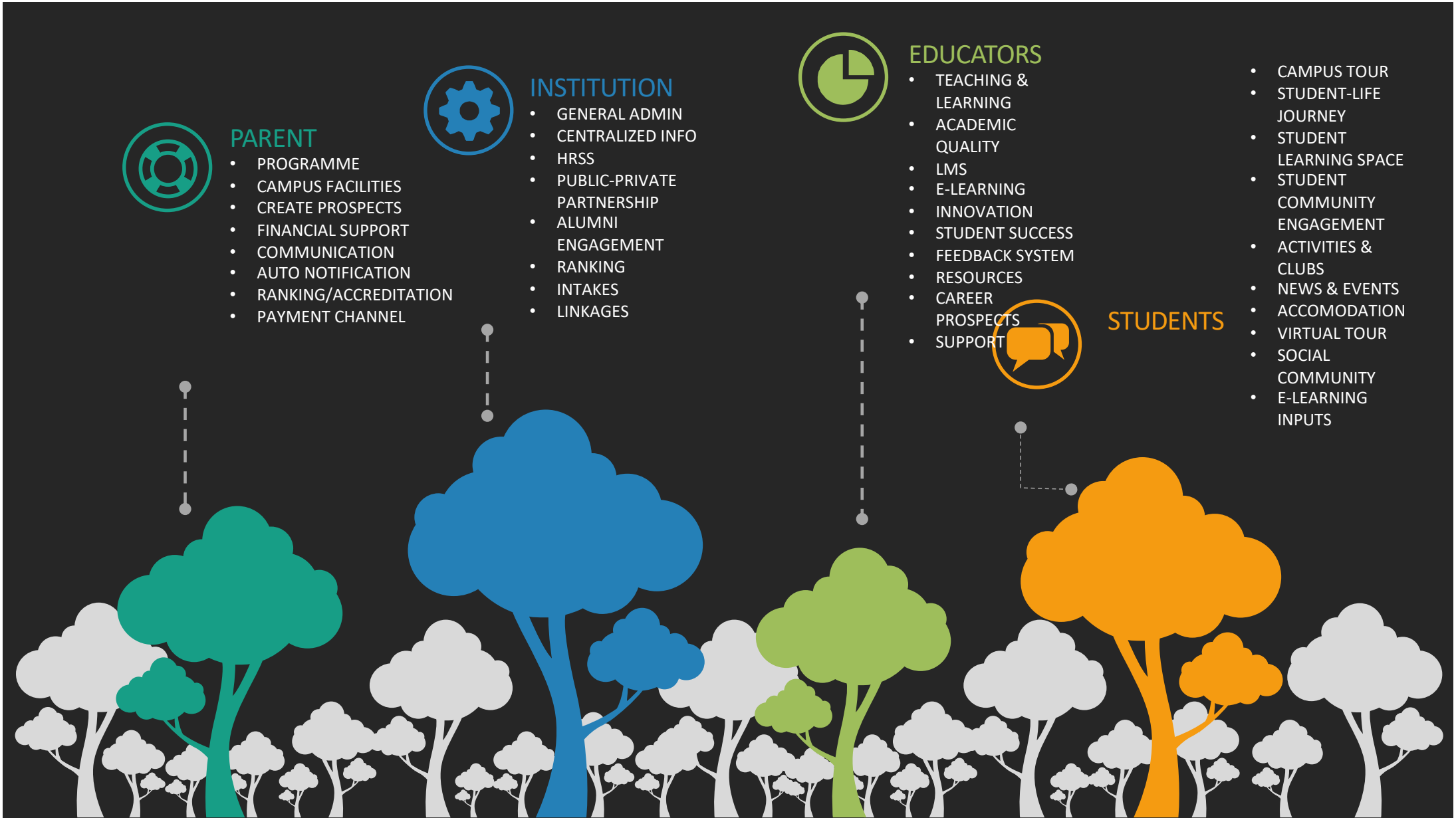
PARENTS FINANCIAL SUPPORTERS — **P**

INSTITUTIONS SERVICE PREVIDERS — **I**

EDUCATORS BRINGING TALENTS OUT — **E**

STUDENTS CORE PURPOSE — **S**

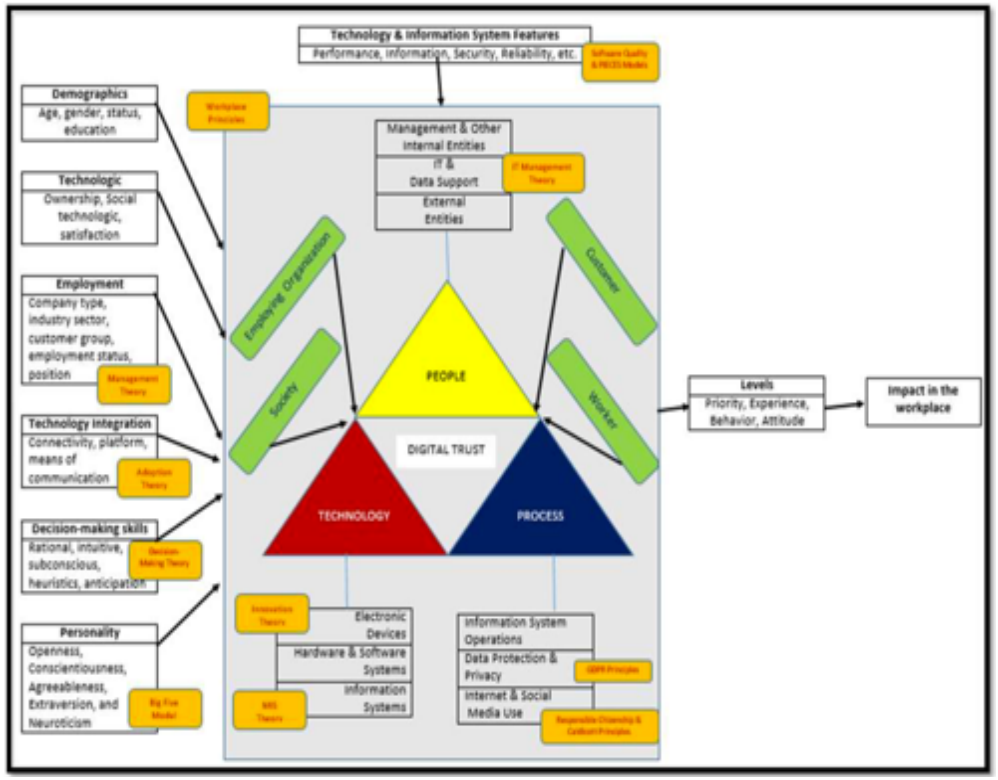



PARENT
• PROGRAMME
• CAMPUS FACILITIES
• CREATE PROSPECTS
• FINANCIAL SUPPORT
• COMMUNICATION
• AUTO NOTIFICATION
• RANKING/ACCREDITATION
• PAYMENT CHANNEL
INSTITUTION
• GENERAL ADMIN
• CENTRALIZED INFO
• HRSS
• PUBLIC-PRIVATE PARTNERSHIP
• ALUMNI ENGAGEMENT
• RANKING
• INTAKES
• LINKAGES
EDUCATORS
• TEACHING & LEARNING
• ACADEMIC QUALITY
• LMS
• E-LEARNING
• INNOVATION
• STUDENT SUCCESS
• FEEDBACK SYSTEM
• RESOURCES
• CAREER PROSPECTS
• SUPPORT
STUDENTS
• CAMPUS TOUR
• STUDENT-LIFE JOURNEY
• STUDENT LEARNING SPACE
• STUDENT COMMUNITY ENGAGEMENT
• ACTIVITIES & CLUBS
• NEWS & EVENTS
• ACCOMODATION
• VIRTUAL TOUR
• SOCIAL COMMUNITY
• E-LEARNING INPUTS

COLLABORATION WITH ***PROF MARKUS & PROF DAVE MARCIAL***

(FUTURE RESEARCH)

DIGITAL TRUST MODEL IN THE HIGHER EDUCATION



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REACH ME

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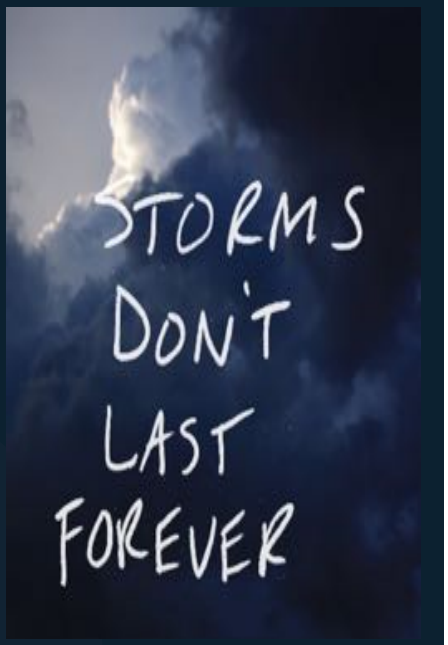

THANKS FOR LISTENING

"Every day is a new day with new learning, every new learning imparts new knowledge; every new knowledge is a new experience." - Stay Positive Always. (Kandappan Balasubramanian, 2020)

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Special Thanks

My Gratification

Prof Markus Launer
Ostfalia University, Germany

Learning Supporting Team

Digital Trust of Young Poles in online shopping

Dr Anna Jasiulewicz
Warsaw University of Life Sciences
Institute of Management

anna_jasiulewicz@sggw.edu.pl

Plan of Presentation

- **Digital trust in online shopping in the context of key antecedents of consumer trust in online shopping - literature review**
- **Objective of study**
- **Data and Methodology**
- **Results**
- **Conclusions and disscussion**
- **Limitations**

Conclusions on the basis of literature studies:

- Trust has been positively recognized to influence online consumers' purchase intentions. Lack of trust is frequently indicated as the reason for consumers not purchasing from online store.
- Online trust includes consumer perceptions of how the online stores would deliver on expectations, how believable the website's information is, and how much confidence the stores website commands. Many antecedents may drive these perceptions. Antecedents and factors for trust in online shopping have been recognized and indicated by many researchers.
- Despite a large amount of scientific studies on consumer trust in online shopping, very few researches has been carried out in Poland.

Definition of online trust
(Mayer, J. Davis and D. Schoorman 1995)

"online trust is the willingness of a consumer to be vulnerable to the actions of an online store based on the expectation that the online store will perform a particular action important to the consumer, irrespective of their ability to monitor or control the online store".

Key antecedents of consumer trust in online shopping – brief literature review

Reputation

- Company reputation (Doney and Cannon, 1997; Pavlou 2002; Kim, Xu, and Koh 2004; Kim,and Ahn 2007; Arora and Rahul 2017; Oliveira et al. 2017)
- Size of the company (Jarvenpaa et al. 2000)
- The vendor perceived integrity and competence (Cheung and Lee 2000, McKnight et al. 2002; Chen and Dhillon 2003);

Key antecedents of consumer trust in online shopping – brief literature review

Brand

- Brand strenght (Bart at al. 2005)

Security and privacy

- Perceived security controls (Cheung and Lee 2000; Gauzente 2004; Kim, Xu, and Koh 2004)
- Perceived privacy controles Cheung and Lee (2000); Belanger et al., 2002; Kim, Xu, and Koh (2004), Kim et al.(2008); Tsai et al. (2011)
- Situational factors Ring & Van De Ven (1992); Lewicki and Bunker (1995); Sitkin (1995); Bigley and Pearce (1998); Hagen and Choe (1998)

Key antecedents of consumer trust in online shopping – birief literature review

Third

- Third party certification (Hoffmann et al. 1999; Jarvenpaa and Grazioli 1999; Kovar et al. 2000ab; Cheung and Lee 2000; McKnight and Chervany 2001)
- Legal framework (Fukuyama 1995; Bigley and Pearce 1998; Cheung and Lee 2000)

Recommendations

- Recommendations and testimonials (Jarvenpaa et al. 2000 ; Kim and Prabhakar 2002; Grabner-Kräuter 2002)
- WOM (Debei et al. 2015; Arora and Rahul 2017)

Key antecedents of consumer trust in online shopping – brief literature review

Product

- Product information (Lee and Turban 2001; Grabner-Kräuter 2002)

Fulfilment

- Other fulfilment (Bart et al. 2005; Shergill and Chen 2005)

Service

- Service quality Kim, Xu, and Koh (2004);
- Fast delivery, Vendors reaction with a complaint, Easy return of goods,Possibility of monitoring the product delivery from the very moment of the registration of the purchase (Rybak 2017; Shergill and Chen 2005)

Website design and quality

- Information design, navigation design, information quality, perceived web quality (Lee and Turban 2001; Kim, Xu and Koh 2004; Koufaris and Hampton-Sosa 2004; Shergill and Chen 2005; Lovry et al. 2014; Al-Debei et al. 2015; Pengnate and Sarathy 2017; Bahalla 2020; Arora and Rahul 2017)

Key antecedents of consumer trust in online shopping - literature study

Beliefs

- Trusting beliefs (Barber 1983; Covello 1992; Peters et al. 1997; Mayer et al. 1995; Cheung and Lee 2000; Lee and Turban 2001; Bhattacharjee 2002; McKnight et al. 2002; Chen and Dhillon 2003)

Consumer characteristics

- Knowledge-based familiarity with the firm (Bhalla 2020; Koehn 2003, Rybak 2017)
- Familiarity with the web site Yoon 2000; Bart et al. 2005, Jahn et al 2017; Bahala 2020)
- On line savvy/expertise (Novak et al. 2000; Lee and Turban 2001; Bart et al. 2005)
- Internet shopping experience (Bart et al. 2005; Agag and El-Masry 2017; Oliveira et al. 2017, Rybak 2017; Inman and Zeelenberg 2020)
- On line entertainment or chat experience Bart et al. (2000)
- Attitude (Vander Heijden 2003; Aladwani 2006; Pavlou and Fygenson 2006; Hassanein and Head 2007; Laohapensang 2009; Limbu et al. 2011; Arora and Rahul 2017)

Key antecedents of consumer trust in online shopping – brief literature review

Perceived Benefits (Bhalla 2020)

- Convenience
- Ease of shopping and product selection

Culture

- Culture (Teo and Liu 2007)
- Collectivist versus individualist propensity, Masculinity versus feminity propensity, Uncertainity avoidance propensity (Hallikainen and Laukkanen 2018)

Objectives of the study

To examine the issue of young Polish consumers digital trust in online shopping regarding the antecedentes of trust

Data and Methodology

- **CAWI technique**
- **Research instrument: online questionnaire**
- **Snow ball methods**
- **Pre-test conducted to establish the clarity of questionnaire**
- **Consumer sample (n=374)**

Criteria:

  - ✓ **15 - 35 years old**
  - ✓ **Polish nationality**
  - ✓ **Consumers shopping online**

- **Data collected from October 26, 2020 to November 2, 2020.**

Antecedents of consumer trust in online shopping considered in the study –adapted scales

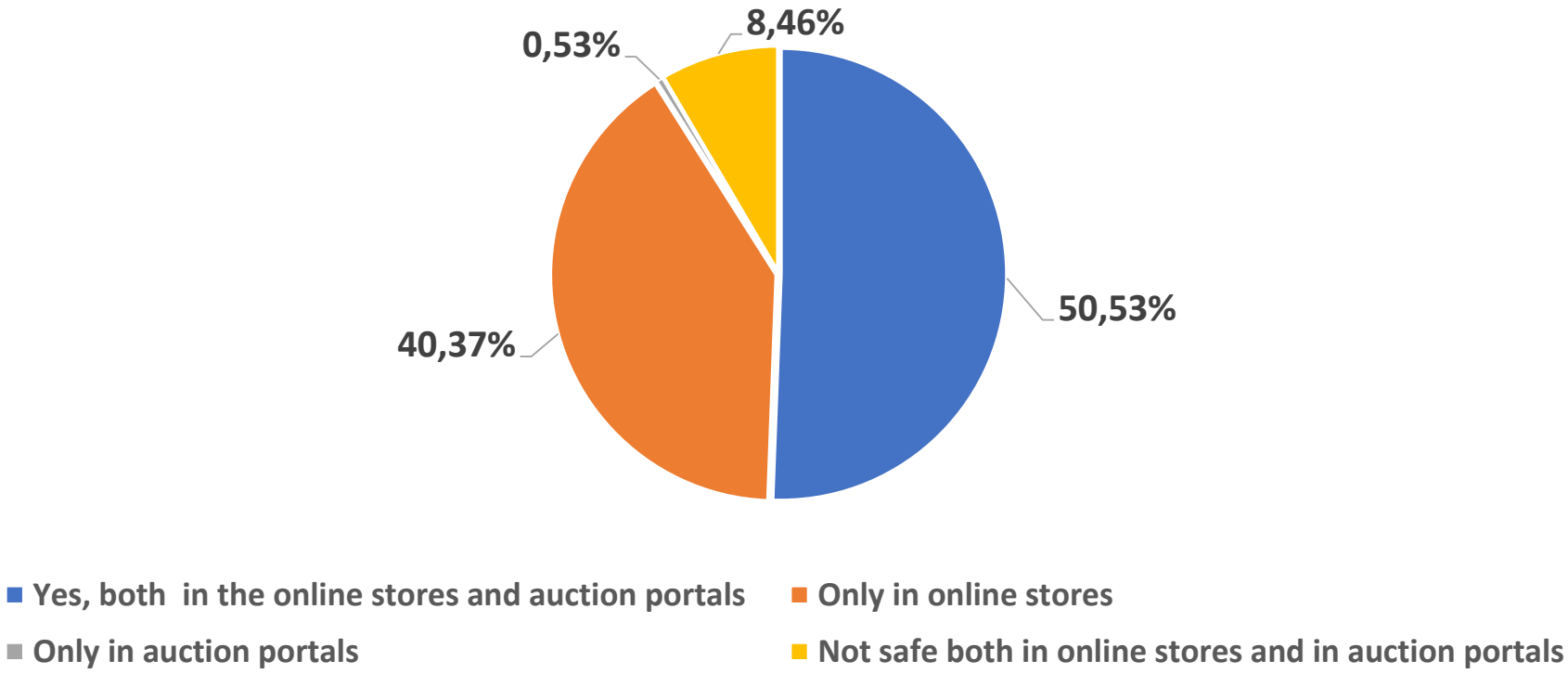
- **Knowledge-based familiarity** adapted from Gefen (2000)
- **Security and privacy protection** adapted from Kim et al. (2008)
- **Website design and Website quality adapted from Osman et al.** (2010) McKnight et al. (2002), Constantinides et al. (2010)
- **Perceived benefits** adapted from Forsythe et al. (2006)
- **Word of mouth** adapted from Ha (2004), Al-Debei et. al. (2015)
- **Service in online stores** adapted from Rybak (2017)
- **Digital trust** adapted from Pennington et al. (2003) and Constantinides et al. (2010)
- **Online shopping intention** adapter from Moon and Kim (2001).

Evaluation in 5 point scale :

- *1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree*
- *1 = Definitely Unimportant, 2 = Not important, 3 = Neutral, 4 =Important, 5 = Definitely Important*

SURVEY RESULTS

Figure 1: Consumer confidence in online shopping safety due to the type of purchasing platform



Source: Own elaboration

Table 1: Online Buyers' Perception of Knowledge-Based Familiarity

Scale: *1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree*

Knowledge-Based Familiarity Variables	Mean
I am familiar with online websites	3.05
I am familiar with searching for items on website	3.27
I am familiar with the process of purchasing from the on line stores	3.22
Overall mean of Knowledge-Based Familiarity Factor	3,18

Source: Own elaboration

Table 2: Online Buyers' Perception of Security and Privacy

Scale: *1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree*

Security and Privacy Protection Variables	Mean
The website implements security measures to protect the online shopper	3.07
I feel safe in making transaction online	2.85
The website of online store usually ensures that my personal information is protected	2.75
Overall Mean of Security and Privacy Factor	2.89

Table 3: Online Buyers' Perception of Website Designe

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree,

5 = Strongly Agree

Source: own elaboration

Website Design Variables	Mean
The website design helps me in searching for the products easily	3.46
While shopping online, I prefer to purchase from a website that provides safety and ease of navigation and order	3.51
The website layout helps me in searching for and selecting the right product while shopping online	3.35
I believe that familiarity with the website before making actual purchase reduces the risk of shopping online	2.91
I prefer to buy from a website that provides me with quality information.	3,38
Overall mean of Website Design Factor	3.32

Table 4: Online Buyers' Perception of Website Quality

1 = Definitely Unimportant, 2 = Not important, 3 = Neutral, 4 =Important, 5 = Definitely Important

Website Quality Variables	Mean
The online store web site internal browsing meets my needs	2.95
The ordering process used by the online store web site is simple	3.33
The online stores web page content quickly loads	3.16
Little search effort is needed to find the needed products/information in the online store website	3.18
Overall mean of Webside Quality Factor	3,15

Table 5: Online Buyers' Perception of Benefits

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree

Source: own elaboration

Perceived Benefits Variables	Mean
I do not have to leave home if I shop online	2.97
I can shop online whenever I want	3.51
I get a broader selection of products while shopping online	3.25
While shopping online, I can have access to many brands and retailers	3.54
I get the chance to try new experiences while on the website	2.66
Overall mean of Perceived Benefits Factor	3.18

Table 6: Online Buyers' Perception of WOM

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree

Word of Mouth Variables	Mean
I often read online recommendations to buy products from online store	3.19
I often post positive online comments about my online purchases	!! 1.67
I often read positive online reviews about the products in online stores	3.14
Overall Mean of Word of Mouth Factor	2.67

Table 7: Online Buyers' Perception of Service

Scale: 1 = Definitely Important, 2 = Important, 3 = Neutral,

4 = Not important, 5 = Definitely Unimportant

Source: own elaboration

Service Variables	Mean
Service quality	3.38
Quick delivery	3.45
Supplier response to complaints	3.29
Easy return of goods	3.42
Overall Mean of Service Factor	3.39

Table 8: Online Buyers' Perception of Digital Trust

***Scale:** 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree*

Trust Variables	Mean
On the website, I believe proper technology has been put in place that would assure me of an errorfree transaction.	3.1
On the website, I believe appropriate safeguards have been put in place that would ensure me of a successful transaction.	3.12
There is enough information on the website to assure me the site is legitimate.	2.74
Overall Mean of Trust Factor	2.99

Table 9: Online Buyers' Shopping Intention

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 =Agree, 5 = Strongly Agree

Source: own elaboration

Online shopping Intention Variables	Mean
I will probably buy a product online soon.	3.30
The Internet will probably be the medium I will do my shopping in the future.	2,89
I intend to use the Internet to buy a product soon.	3,13
Overall Mean of Online Shopping Intention Factor	**3,1**

Table 10: Overall Mean of 9 Factors

Variables	Mean
Overall mean of Knowledge-based Familiarity Factor	3,18
Overall mean of Security and Privacy Factor	2,89
Overall mean of Website Design Factor	3,32
Overall mean of Webside Quality Factor	3,15
Overall mean of Perceived Benefits Factor	3.18
Overall Mean of Word of Mouth Factor	2.67
Overall Mean of Service Factor	3,39
Overall Mean of Trust Factor	2,99
Overall Mean of Online Shopping Intention Factor	3,1
Overall Mean of 9 Factors	**3,1**

Conclusions

- **The purpose of this study was to examine the issue of digital trust of Poles in online shopping and important antecedents of that trust.**
- **Knowledge-based Familiarity, Website Designe and Service provided by e-retailers may have a significant direct positive impact on online shopping intention and indirect impact on consumer trust in online shopping. The similar results were provided by Al-Debei (2015), Wang and Lin (2017), Bhalla (2020), Shergill and Chen (2005), Batty and Lee (1995).**
- **The consumer perception of The Security and Privacy antecedent can be considered as a potential barrier to consumers shopping online. The considerably low evaluation of Trust implies that consumers may consider this factor to be a possible obstacle to their online purchasing. Especially the not sufficient information on the website assuring consumer about site legitimacy. These findings are consistent with the findings of Jarvenpaa and Todd [1997] , Vellido et al. [2000], Shergill and Chen (2005), Gauzente (2004), Ranganathan and Ganapathy (2002).**

Conclusion

- **Level of digital trust impacts significantly the perception and evaluation of the importance of all factors treated as antecedents of consumer trust in online shopping that were previously indicated by many researchers. Digital Trust influences highly on the consumer assessment of all factors. These results supports the findings of previous studies (i.e. Bhalla 2020, Zheng 2017, Agag and El-Masry, 2017).**

Limitations

- **This study is not devoid of limitations. The shortcomings of this paper include the research method adopted by the author. Author used selected databases in the literature review, so article do not exhaust the subject.**
- **Moreover the result of the own study is not representative, so it should be interpreted with great caution. Due to the adopted methods of selecting a research sample, it is difficult to generalize the results obtained for the entire population. Only young people (>35 years old) were included in the study. Probably the research results could be different if other age groups were taken into account.**
- **Although the article uses the results of empirical research, it should be treated primarily as a signalling of a research problem, which is the influence of antecedents of Digital Trust on online shopping.**
- **However, empirical material allows for the formulation of conclusions presenting the most important antecedents of trust in online shopping in the case of young Polish consumers.**

Young Female Entrepreneur surviving Covid19-Pandemic
Digital Trust and Intuition by young business people in the Philippines

MARY MAY G. SESTOSO

Bachelor of Science in Information Technology, ACT

Computer Business with Family and Fashion Start-up Business online

4th international Service Management Congress

November 12, 2020

Young Female Entrepreneur from Cebu, Philippines

MARY MAY G. SESTOSO

- Bachelor of Science in Information Technology
- Admin Officer of Security Agency
- Coin Operated Computer Business in Urban area
- Online selling of Fashion Dresses & Home made Food

Participating in the global study

DIGITAL TRUST & INTUITION @ the Workplace

Young Female Entrepreneur surviving Covid19-Pandemic

Case Study about a young female entrepreneur

- Living in Cebu, Philippines

Special situation

- Global Corona-Pandemic leads to complete shut down in Cebu City
- No buses / jeepney driving anymore
- Bankruptcy by a lot of firms
- No people are allowed to go outside their home

- Thank you for letting me speak from the Philippines, representing millions of Filipinas

Young Female Entrepreneur with Bachelor Degree

Role Models for young Female Entrepreneurs

Role Models for Entrepreneurs

- Ivanka Trump is one of the young female entrepreneur role model
- But she has a very successful father – **not me**

Role Models for young Female Entrepreneurs

Role Models for Filipina Entrepreneurs

- Ivanka Trump is one of the young female entrepreneur role model
- But she has a very successful father – **not me**

Judith Balea · 26 May 2015

10 Filipino women entrepreneurs who smashed the glass ceiling

https://www.techinasia.com/

But you need the Support from Friends & family

Role Models for Filipina Entrepreneurs

- Business together with my brother
- **Support by my family**
- **Support by great friends**
- **Support by partner**

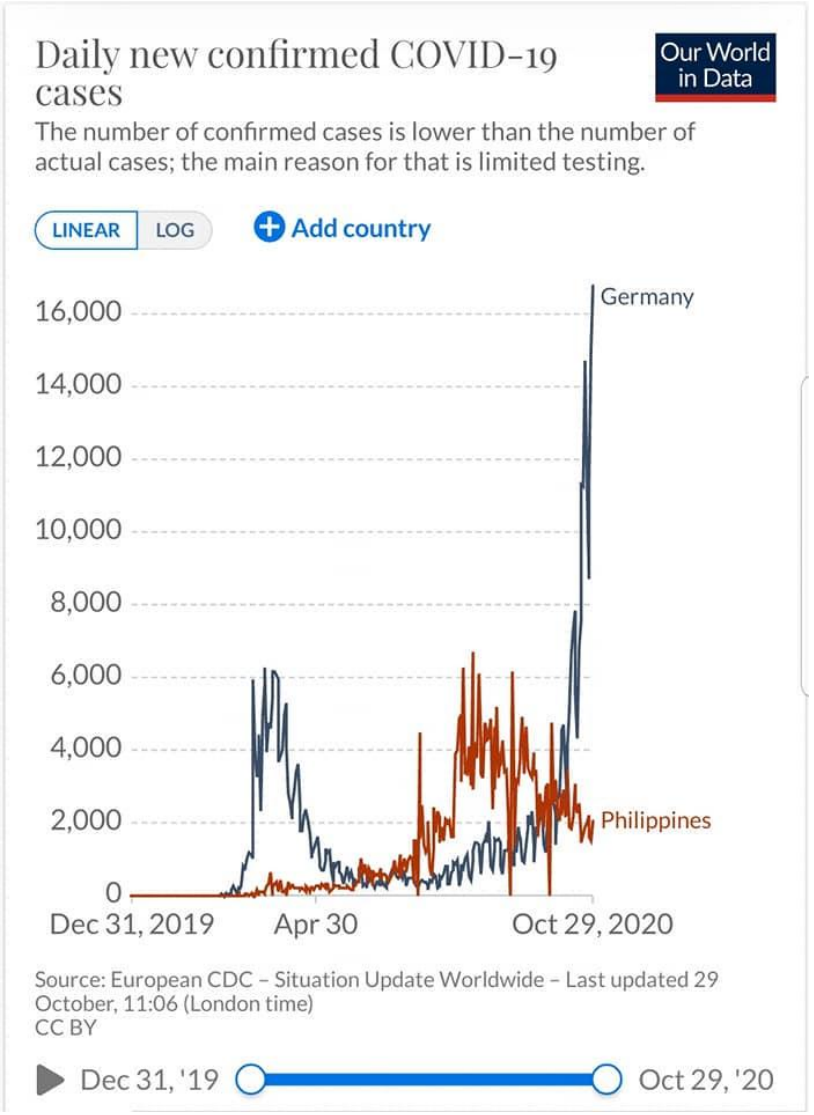
Supported by partner & great friends

The current Problem for Entrepreneur: Covid19-Pandemic

Academic Research
Coronavirus Disease (COVID-19) –Statistics and Research
by Max Roser, Hannah Ritchie and Esteban Ortiz-Ospina

While most of our work focuses on large problems that humanity has faced for a long time – as child mortality, natural disasters, poverty and almost 100 other problems –this article focuses on a new, emerging global problem: the ongoing outbreak of the *coronavirus disease*.

The outbreak started in late 2019 and developed into a global pandemic by March 2020.



Corona infections compared Philippines and Germany…

The current Problem for Entrepreneur: Covid19-Pandemic

Totally shut down due to corona-pandemic…

Theoretical Framework
DIGITAL TRUST & INTUITION @ the Workplace

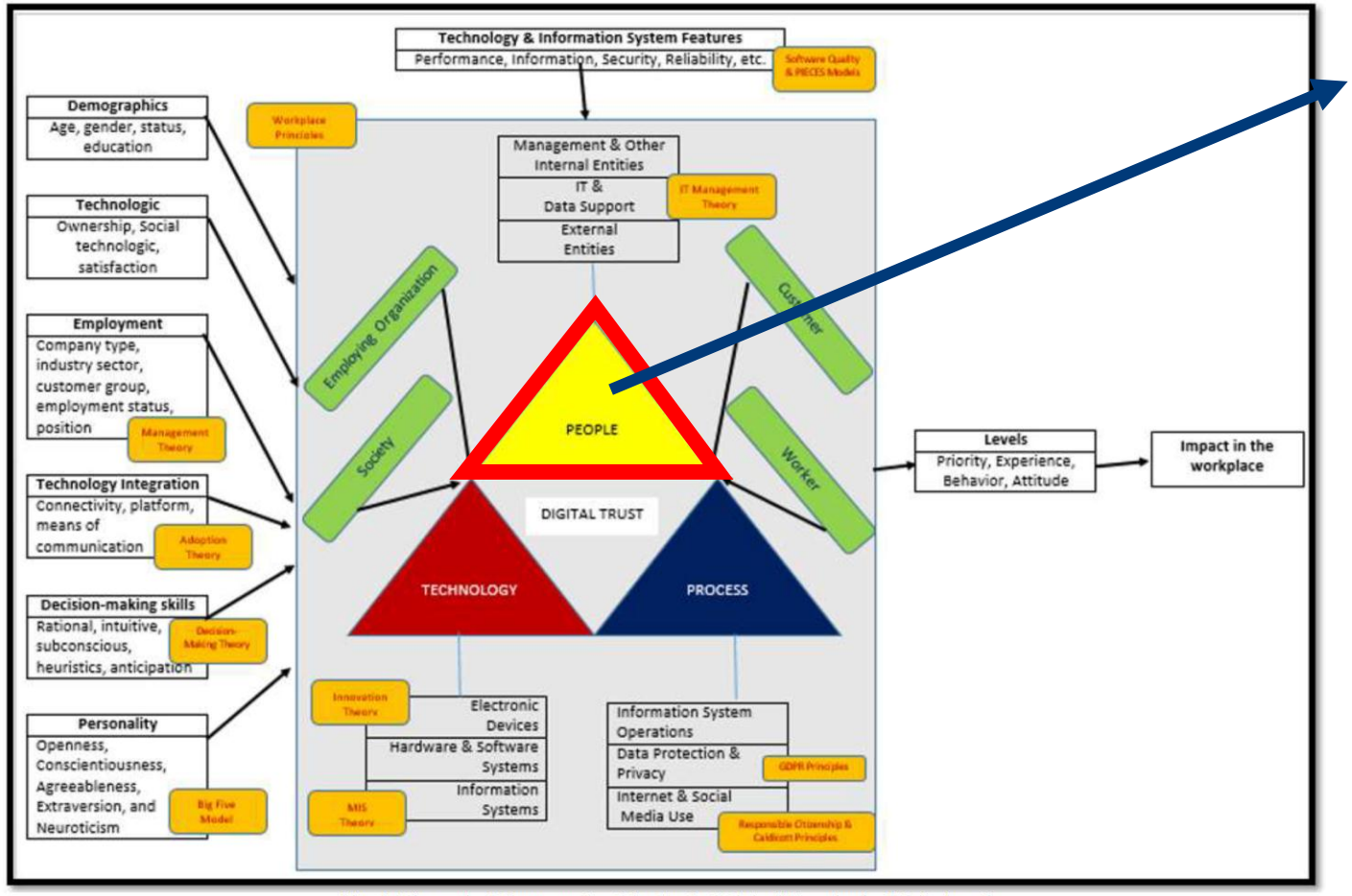


Fig. 1. Theoretical Framework of the Study "Digital Trust in the Workplace"

My special topic is about the PEOLPLE

Digital Trust by people

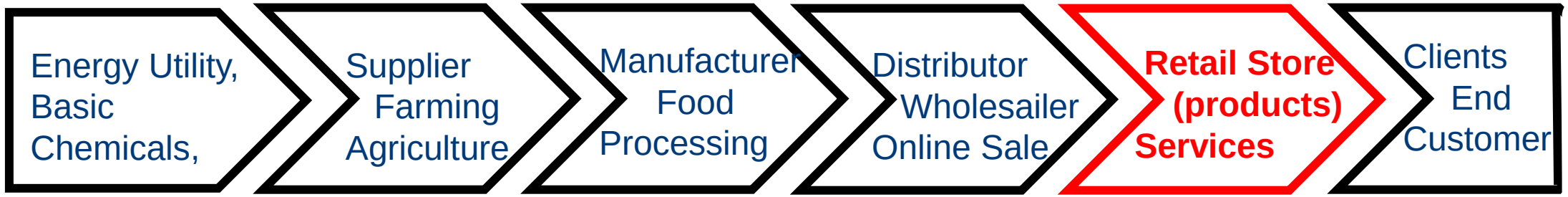
Intuition by people

A new approach by
Prof. Dr. Dave Marcial
Prof. Dr. Markus Launer

Published in: International Journal of Scientific Engineering and Science
Volume 3, Issue 12, pp. 1-7, 2019.
ISSN (Online): 2456-7361

Theoretical Framework
My business is Online Retail → Close to the customer

Supply Chain Theory



Chemicals, Construction, Machine and Equipment Engineering

Automotive and Ship Building, Manufacturing

Bio Technology and Pharmaceuticals, Food processing

Banking and Finance (to end customers), Healthcare, Electrical Services, Gaming, Hotel, Restaurants, Real Estate, Tourism,

Supporting the development of a CASE STUDY with Prof. Dr. Erich Spencer, Universidad de Chile

I loved Case Studies @ University → very practical

Over the last forty years, case study research has undergone substantial methodological development. This evolution has resulted in a pragmatic, flexible research approach, capable of providing comprehensive in-depth understanding of a diverse range of issues across a number of disciplines. Change and progress have stemmed from parallel influences of historical transformations in approaches to research and individual researcher's preferences, perspectives, and interpretations of this design. Researchers who have contributed to the development of case study research come from diverse disciplines with different philosophical perspectives, resulting in a variety of definitions and approaches. For the researcher new to using case study, such variety can create a confusing platform for its application. In this article, we explore the evolution of case study research, discuss methodological variations, and summarize key elements with the aim of providing guidance on the available options for researchers wanting to use case study in their work. Helena Harrison, Melanie Birks, Richard Franklin & Jane Mills (2017).

Case Studies

1. A case study is an empirical inquiry that
   - investigates a contemporary phenomenon within its real-life context, especially when
   - the boundaries between phenomenon and context are not clearly evident
2. The case study inquiry
   - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
   - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
   - benefits from the prior development of theoretical propositions to guide data collection and analysis'.

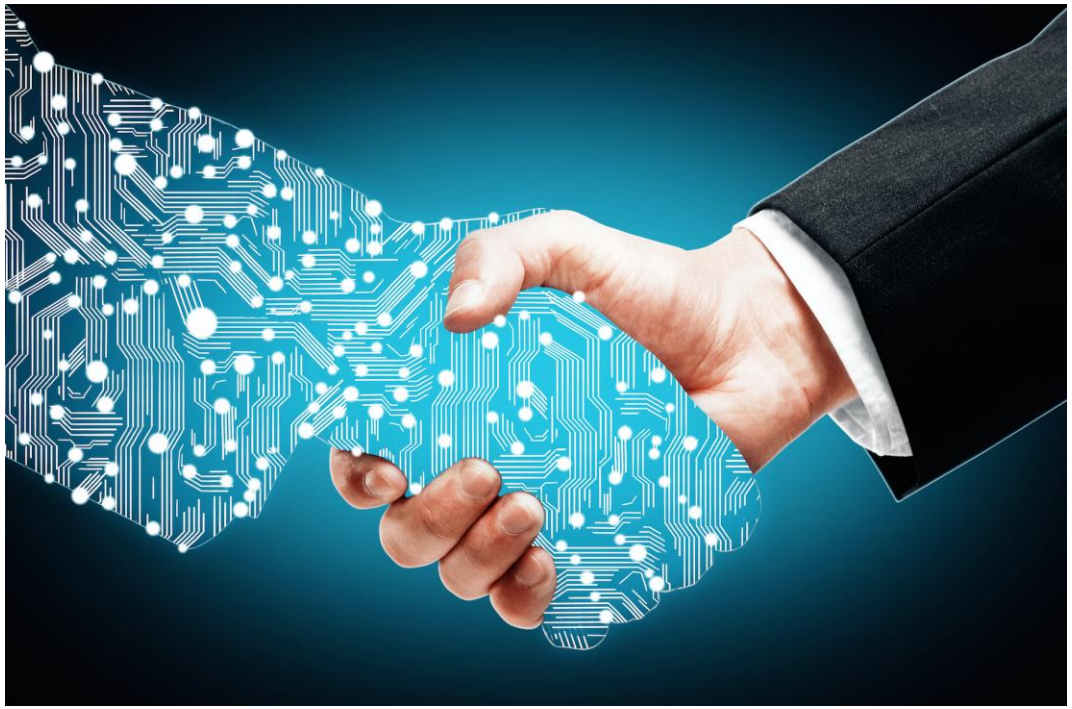
Basic research model for the study INTUITION and DIGITAL TRUST @ the Workplace by Prof. Dr. Erich Spencer (University de Chile) and Prof. Dr. Markus Launer

Determining Levels of DIGITAL TRUST @ the Workplace

The level of digital trust is measured in terms of the

- Information technology used
- People involved
- Digitalization process

@ the entrepreneur place.



Determining Levels of DIGITAL TRUST @ the Workplace

The level of digital trust is measured in terms of the

- Information technology used
- People involved
- Digitalization process

@ the workplace.

Academic Background

“An information system can be any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization” [43]. It is “a set of interrelated components that collect, manipulate, store, and disseminate data and information and provide a feedback mechanism to meet an objective” [44]. It provides a competitive advantage in society, business, industry, and workplaces around the globe if applied thoughtfully and carefully [44]. There are two significant factors for the successful management of information systems [43]. These are: “a major functional area of the business equally as important to business success as the functions of accounting, finance, operations management, marketing, and human resource management; and an important contributor to operational efficiency, employee productivity, and morale, and customer service and satisfaction.” In this study, the level of digital trust is measured in terms of the information technology used, people involved, and the digitalization process in the workplace.

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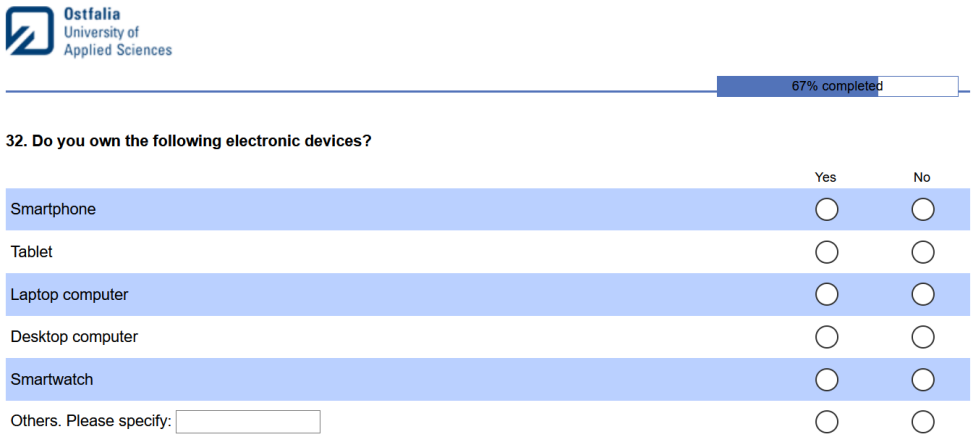
[44] R. M. Stair and G. W. Reynolds, Principles of Information Systems: A Managerial Approach, Boston, MA 02210: Course Technology, Cengage Learning, 2010.

Determining Levels of DIGITAL TRUST @ the Workplace

The level of digital trust in ELECTRONIC DEVICES

- Filipinos are always online
- Filipinos have Mobile Phone or Computer Shop
- Almost no laptop or desktop



Ostfalia
University of
Applied Sciences

67% completed

32. Do you own the following electronic devices?

	Yes	No
Smartphone	○	○
Tablet	○	○
Laptop computer	○	○
Desktop computer	○	○
Smartwatch	○	○
Others. Please specify:	○	○

Determining Levels of DIGITAL TRUST @ the Workplace

The level of digital trust in ELECTRONIC DEVICES

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- Filipinos have Mobile Phone or Computer Shop
- Almost no laptop or desktop

Philippines takes top spot as heaviest internet users worldwide — report by CNN Philippines Staff

Published Feb 1, 2019

Determining Levels of DIGITAL TRUST @ the Workplace

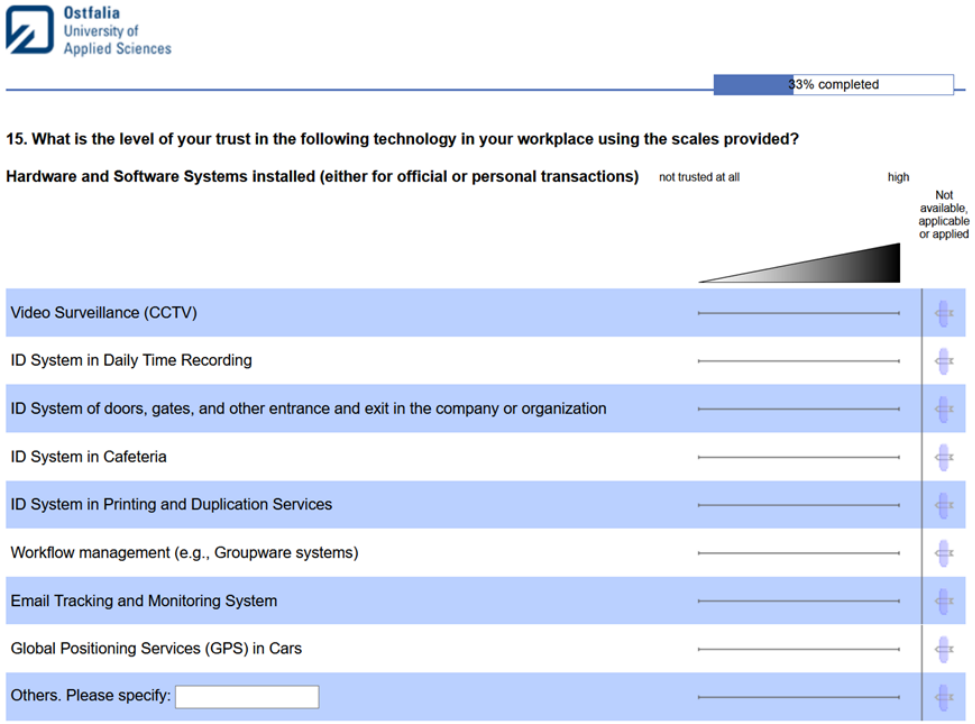
Starting my fist Business: Computer Shop

- Filipinos in Cebu need more Computer Access
- Filipinos are online via Mobile Phone
- But working on a phone is difficult
- Offering Workspace for local people
- Local business – no online business yet

Determining Levels of DIGITAL TRUST @ the Workplace Information Technology

The level of digital trust in HARDWARE AND SOFTWARE

- Filipinos have no fear of CCTV
- No fear of recordings
- Example: Using a lot Tic Toc → problematic with data protection
- No fear of E-Mail tracking



Ostfalia
University of
Applied Sciences

33% completed

15. What is the level of your trust in the following technology in your workplace using the scales provided?

Hardware and Software Systems installed (either for official or personal transactions)	not trusted at all → high	Not available, applicable or applied
Video Surveillance (CCTV)		
ID System in Daily Time Recording		
ID System of doors, gates, and other entrance and exit in the company or organization		
ID System in Cafeteria		
ID System in Printing and Duplication Services		
Workflow management (e.g., Groupware systems)		
Email Tracking and Monitoring System		
Global Positioning Services (GPS) in Cars		
Others. Please specify:		

Determining Levels of DIGITAL TRUST @ the Workplace

The level of digital trust in Information Systems

- Investment into a Computer Shop
- Offering Microsoft Software: Word, Excel, PowerPoint
- But most people play online games

Popular online games:

16. What is the level of your trust in the following technology in your workplace using the scales below?

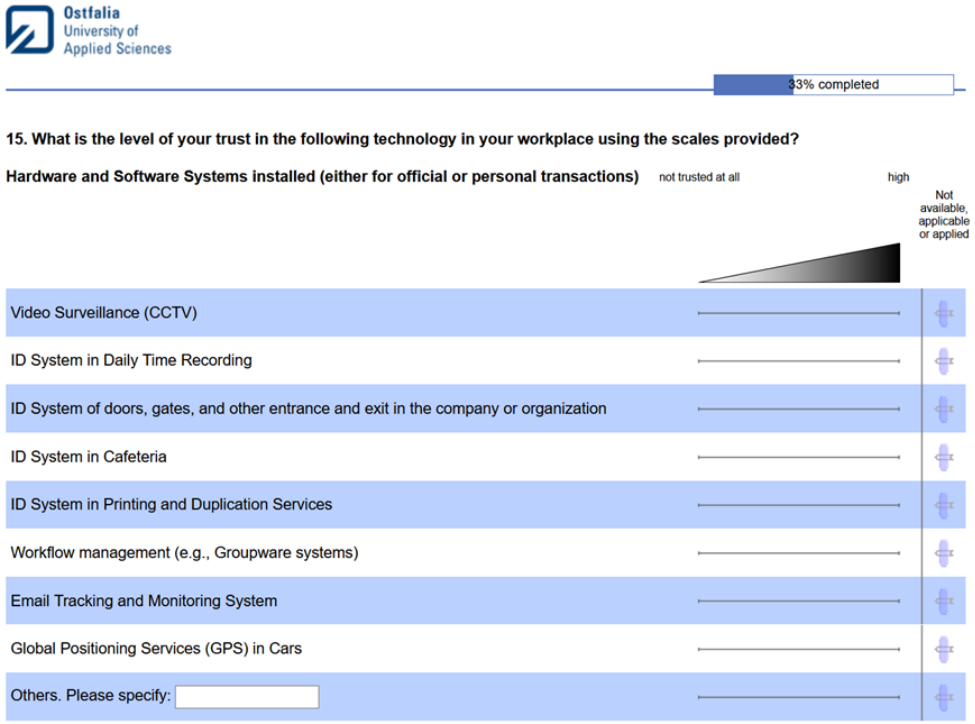
Information systems that are implemented (regardless of your usage)	not trusted at all → high	Not available, applicable or applied
Executive Information Systems		
Group Decision Support Systems		
Computer Supported Co-operative work / Collaboration tools		
Logistics systems		
Financial Planning systems		
Spreadsheet Models		
Sales management systems		
Inventory control systems		
Budgeting systems		
Management Reporting Systems		
Personnel (HRM) systems		
Payroll systems		
Reservation systems		
Stock control systems		
Internet bots (also known as web robots, WWW robots or bots)		
Others. Please specify:		

Determining Levels of DIGITAL TRUST @ the Workplace

Modern Technology for Online Sales

- Filipinos love to shop
- Filipinos buy online
- Filipinas love fashion – all girls love fashion

Starting my second Business



Ostfalia
University of
Applied Sciences

33% completed

15. What is the level of your trust in the following technology in your workplace using the scales provided?

Hardware and Software Systems installed (either for official or personal transactions)	not trusted at all → high	Not available, applicable or applied
Video Surveillance (CCTV)		
ID System in Daily Time Recording		
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ID System in Cafeteria		
ID System in Printing and Duplication Services		
Workflow management (e.g., Groupware systems)		
Email Tracking and Monitoring System		
Global Positioning Services (GPS) in Cars		
Others. Please specify:		

Determining Levels of DIGITAL TRUST @ the Workplace

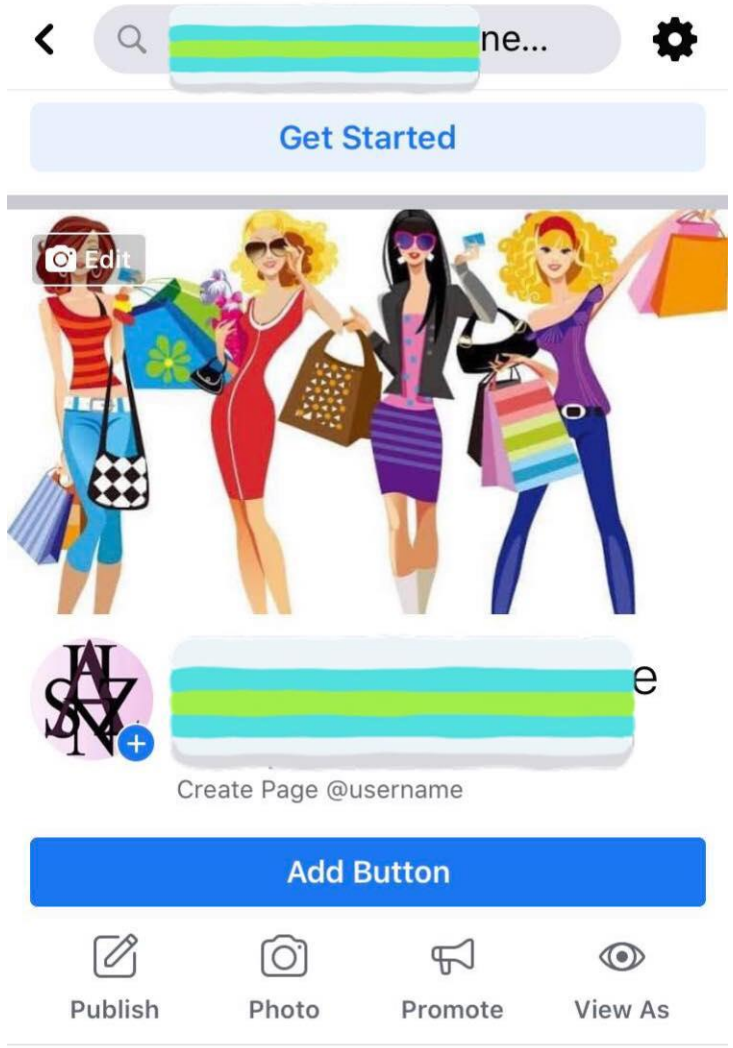
Modern Technology for Online Sales

- Filipinos love to shop
- Filipinos buy online
- Filipinas love fashion – all girls love fashion

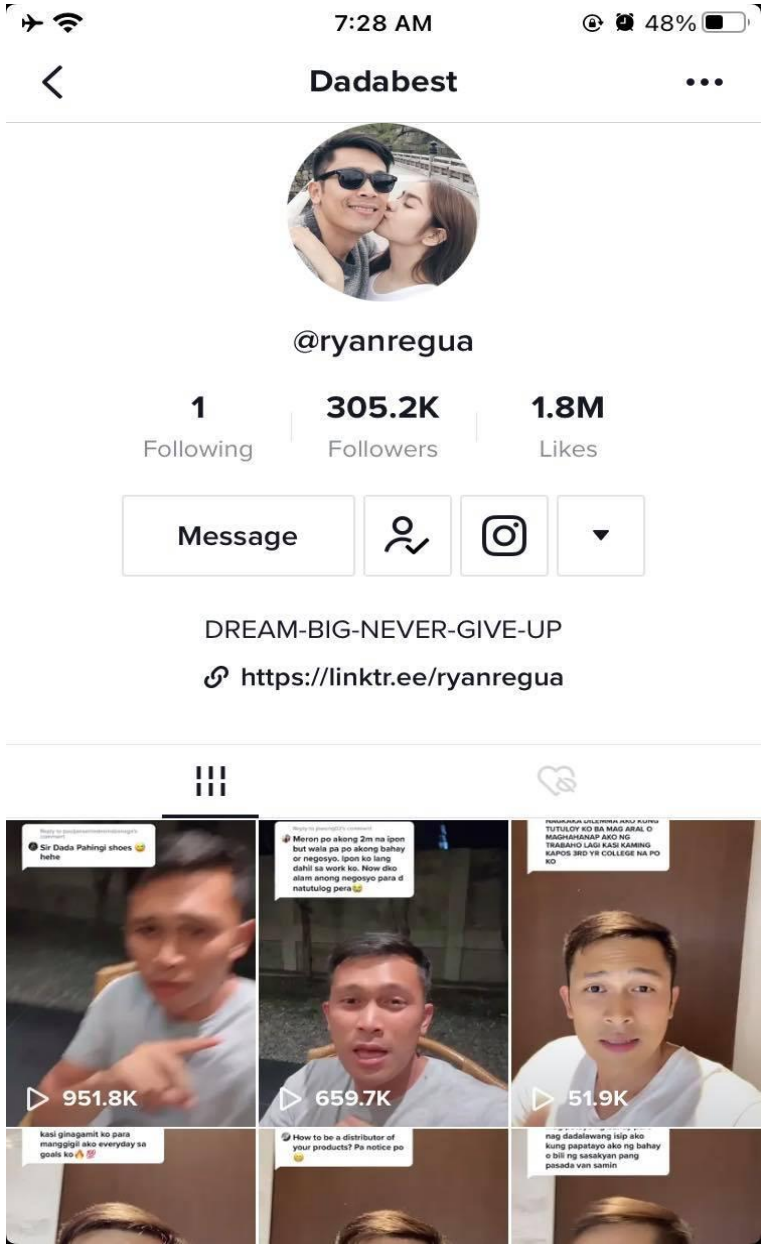
Starting my second Business

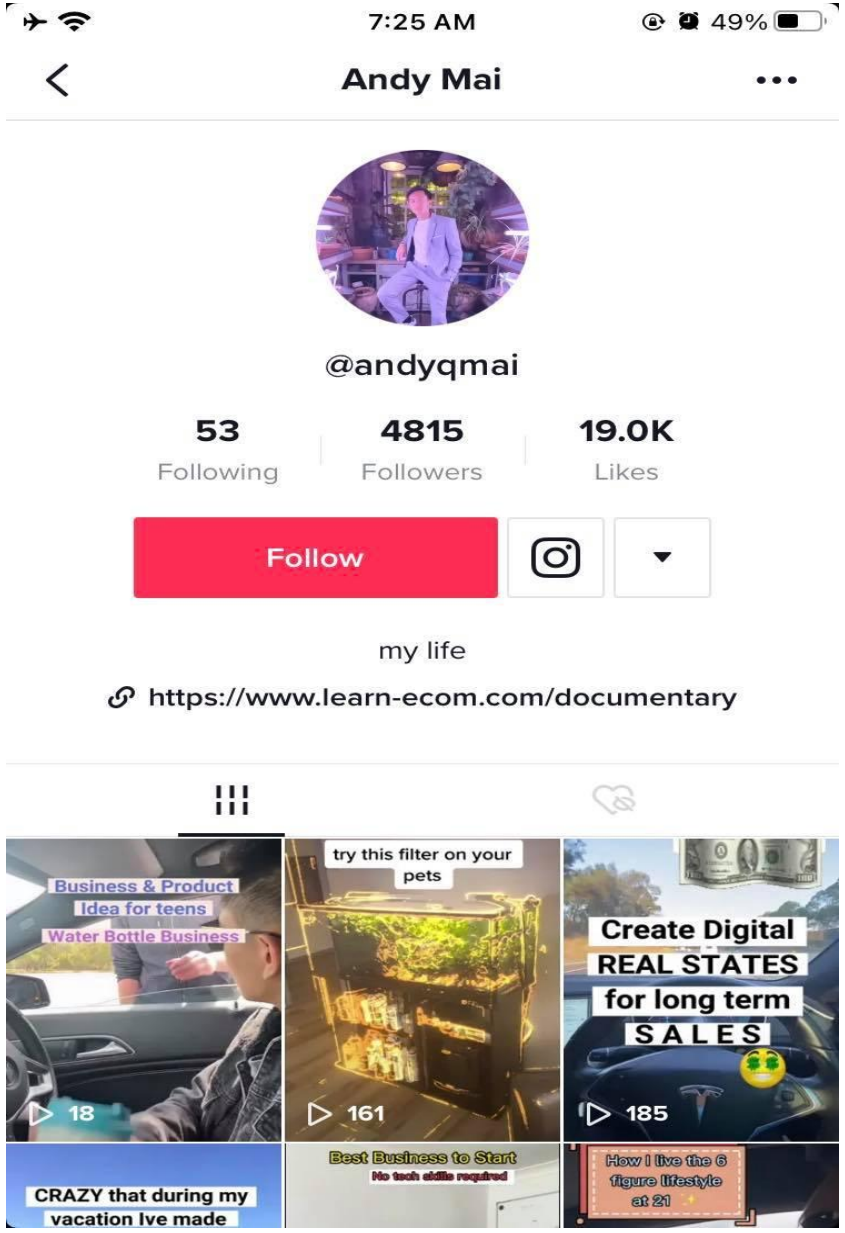
Determining Levels of DIGITAL TRUST @ the Workplace

I modelled my own item to sell:



Did PHOTOSHOOT to save and earn:





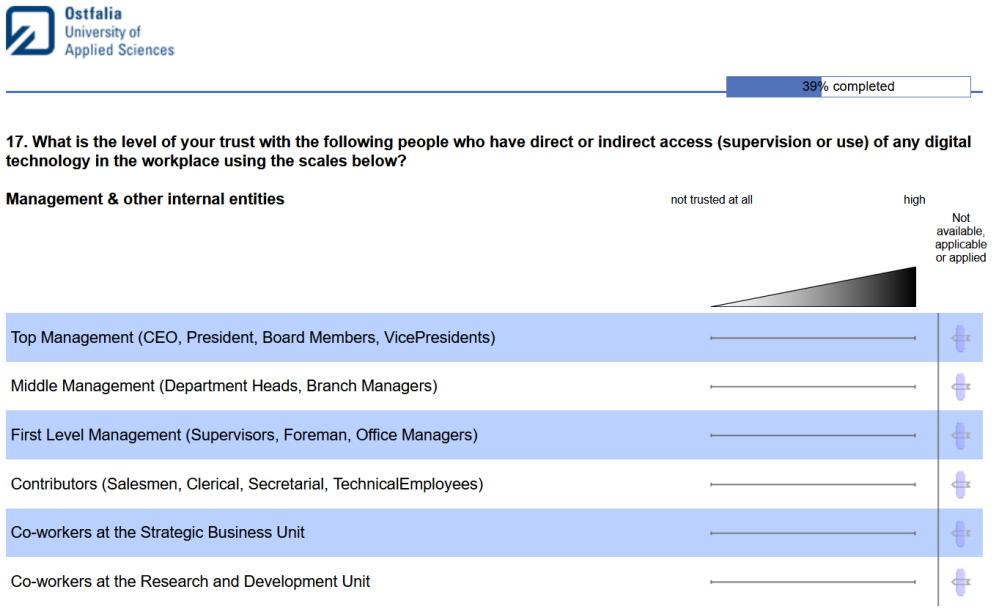
Good Influencers on TIKTOK

Determining Levels of DIGITAL TRUST @ the Workplace

The level of digital trust in People

- As an entrepreneur you need to trust yourself
- Trust in your abilities
- Trust in your strength

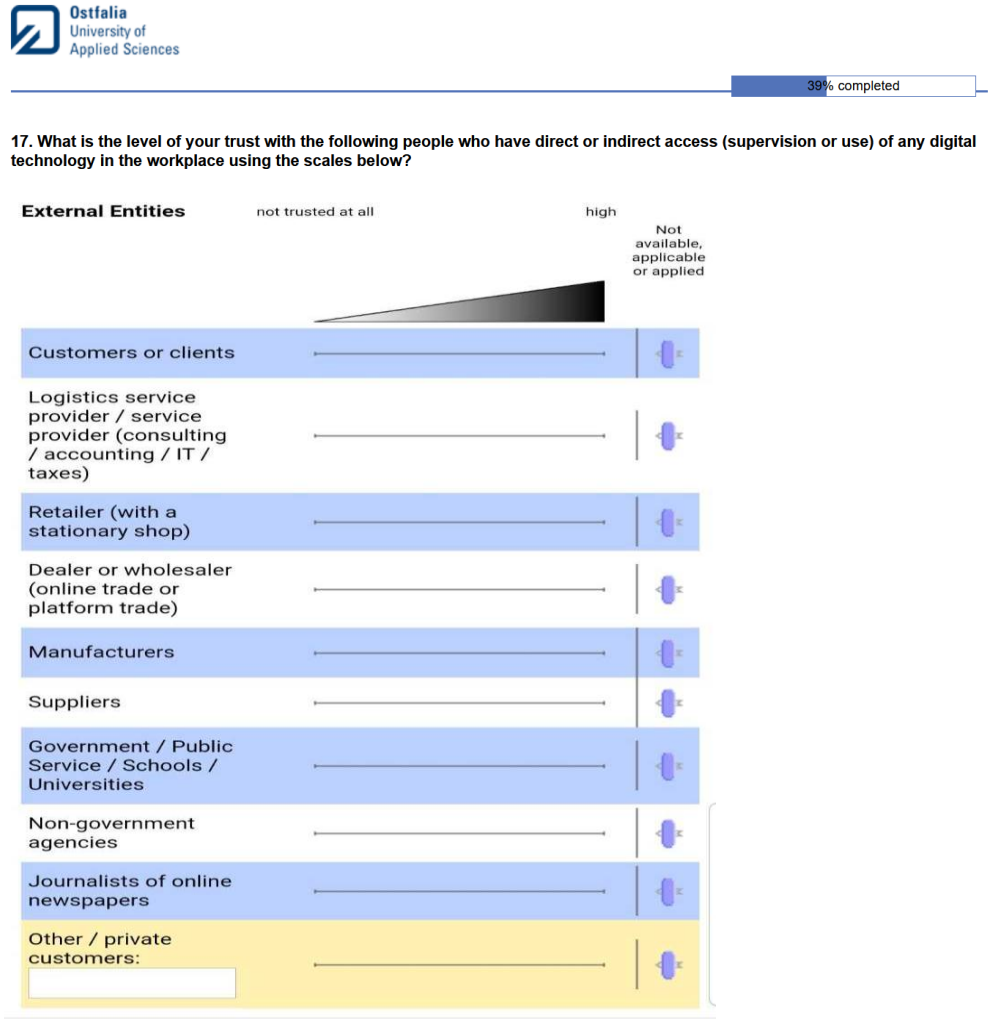
- Make your customers happy



Level of DIGITAL TRUST @ the Workplace

The level of digital trust in External Entities

- Make your customers happy
- Trust in Logistics (problem during Covid19)
- Compete with other Retailers or cooperate
- Good relationship with Wholesalers is important
- Supply from ……
- Government regulations are very strict in Philippines
- No support by government agencies



Context Factors for DIGITAL TRUST @ the Workplace

Trust varies in term of
- Age cohorts
- Gender
- Degree of trustworthiness
- Race and ethnicity and
- Other social classes

Studies show that generalized trust is affected by age, which is moderated by contextual factors like income inequality, developing status, and individualism [14] and trust varies in term of age cohorts [15], [16]. Likewise, gender affects trust, the possibility of being trusted, and the degree of trustworthiness [17] in differing levels [18], [19], [20]. Trust also differs in terms of race and ethnicity [21] and other social classes [22].

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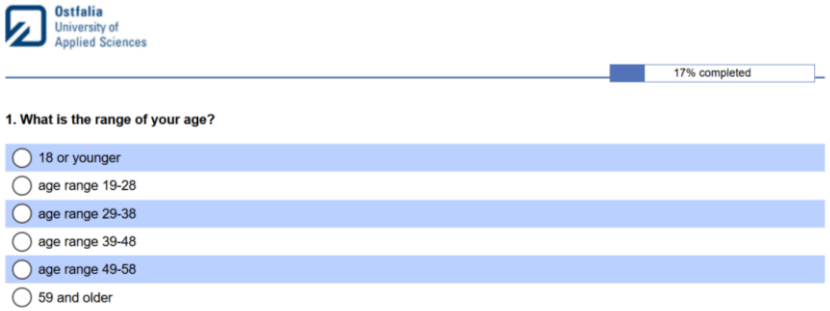
Context Factors for DIGITAL TRUST @ the Workplace

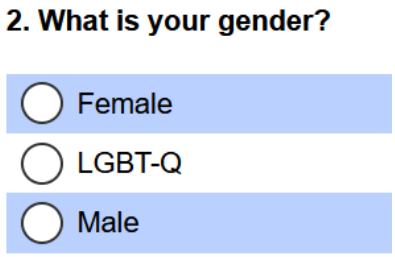
Trust varies in term of
- Different generations (gen x, y, z)



- Young people are not aware of the word “privacy”
- Posting directly on social media without analyzing the outcome
- More on mobile phones wasting time

Context Factors for DIGITAL TRUST @ the Workplace

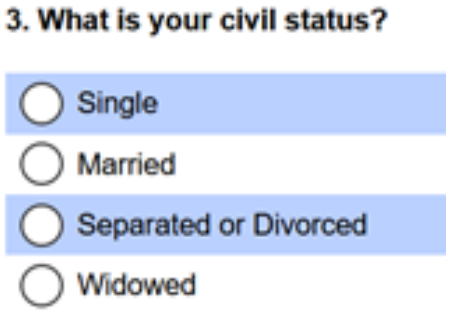
Trust varies in term of
- Gender (male, female, LGBT-Q+)



Problems of females in the Philippines
- ……
- Female have only Mid level of trust
- Male have higher level of trust
- LGBT+: Highest level of trust, the y are always online

Context Factors for DIGITAL TRUST @ the Workplace

Trust varies in term of
- Civil status (single, married, divorced, widowed),



Hypothesis per civil status: **?????**
- Single: Highest level of trust → online relationship management (privately)
- Married: Mid level of trust → Kids are steadily online → mistrust
- Separated: Highest level of trust → online relationship management (privately)
- Widowed: Low level of trust → disappointment

Context Factors for DIGITAL TRUST @ the Workplace

Trust varies in term of
- Highest educational attainment

4. What is the highest level of education you completed?

- ◯ Post-Doctoral (Fellowships)
- ◯ Post-Graduate (Doctoral, PhDs)
- ◯ Graduate (Master's Degree)
- ◯ Bachelor's Degree
- ◯ Technical, Vocational, or Skill Diploma
- ◯ Middle School / Senior High School Diploma
- ◯ Junior High School Diploma
- ◯ Elementary Diploma
- ◯ Primary Diploma

Education is key
- Without education it is very hard to start or run a business
- Bachelor dregree is necessary
- Atleast college level to find a job

Context Factors for DIGITAL TRUST @ the Workplace

Trust varies by use of electronic devices

- Smartphone
- Tablet handheld computer
- Desktop computer
- Smartwatch
- Other Wearables

[23] D. Gefen, E. Karahanna and D. W. Straub, “Trust and TAM in online shopping: an integrated model,” MIS Quartely, vol. 27, no. 1, pp. 51-90, March 2003.
[24] W. Wang and I. Benbasat, “Trust and TAM for Online Recommendation Agents,” in Americas Conference on Information Systems 2004 Proceedings, 2004.
[25] M. J. Ashleigh and J. Nandhakumar, “Trust and technologies: Implications for organizational,” Decision Support Systems, p. 607 – 617, 2007.

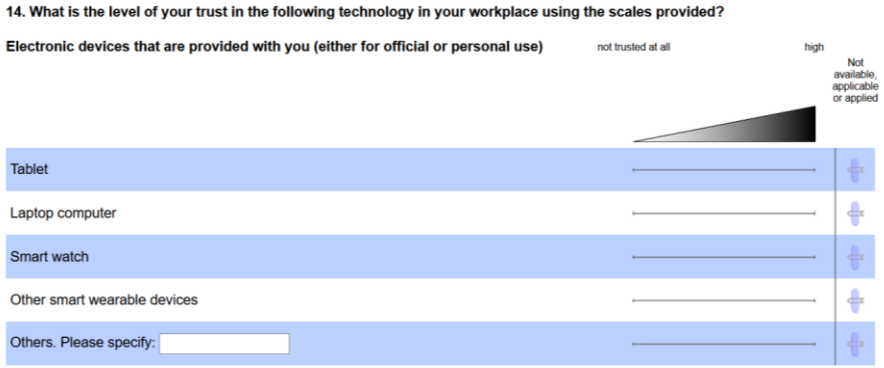
Technologic profiles

E-commerce studies showed that digital trust is influenced by perceived usefulness and perceived ease-of-use of the technology [23], [24]. Both are the main components in the Technology Acceptance Model, an adaptation of the theory of reasoned action of Fishbien and Ajzen. In the model, perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance." On the other hand, perceived ease-of use, as defined by Davis, refers to "the degree to which a person believes that using a particular system would be free from effort." In an interview among workers in energy distribution control rooms, [25] found out that quality of instruction is perceived to be the most critical factor in digital trust, followed by reliability, performance, understanding, communication, expectancy, confidence, proactively, ability, respect, and honesty. In this study, technologic profiles refer to the ownership of electronic devices that are usually use at the workplace, such as smartphones, tablets, laptops, desktop, smartwatch, and other wearable devices.

Context Factors for DIGITAL TRUST @ the Workplace

Trust varies by use of electronic devices

- Smartphone
- Tablet handheld computer
- Desktop computer
- Smartwatch
- Other Wearables



14. What is the level of your trust in the following technology in your workplace using the scales provided?

Electronic devices that are provided with you (either for official or personal use)

not trusted at all — high — Not available, applicable or applied

Tablet	
Laptop computer	
Smart watch	
Other smart wearable devices	
Others. Please specify:	

Investment in electronic devices is a problem in the Philippines

- Smartphone → many are using mobile phones
- Tablet handheld computer → use for children watching videos
- Desktop computer → expensive to buy
- Smartwatch → not necessary, ordinary watch will do
- Other Wearables → wireless headphones, wristband, etc.

Context Factors for DIGITAL TRUST @ the Workplace

Trust varies in term of SOCIAL TECHNOGRAPHICS

- Types Creators, Conversationalists, Critics, Collectors, Joiners, and Inactives
- Facebook, Linkedin, and/or Twitter (Social Media), WhatsApp and/or Blog (Messenger), Gmail, Yahoo mail, or other email providers, Website, or YouTube
- Employee's Internet access at home and their overall satisfaction with the connectivity of their Internet.

April 19, 2007

Social Technographics®

Mapping Participation In Activities Forms The Foundation Of A Social Strategy

by Charlene Li

with Josh Bernoff, Remy Fiorentino, and Sarah Glass

[26] C. Li, “Forrester's new Social Technographics report,” 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.

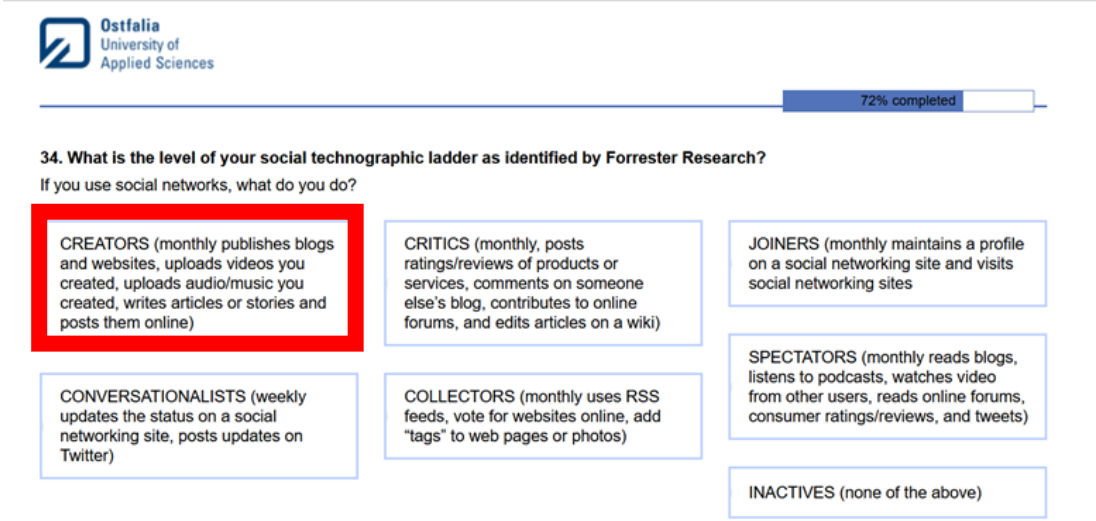
Technologic profile

Technologic profile in this study also refers to the ownership of social media and other online accounts such as Facebook, Twitter, WhatsApp, blog, Linkedin, Gmail, Yahoo mail, website, YouTube, and other email providers. This study will also describe employee's social technographics by [26], which is based on Forrester Research, Inc. Although applied indigital marketing, the technographic social tool will help in understanding how the employees in the workplace "approach social technologies - not just the adoption of individual technologies" [26]. Further, the technologic profile in this study includes employee's Internet access at home and their overall satisfaction with the connectivity of their Internet.

Context Factors for DIGITAL TRUST @ the Workplace
Social Technographics

Trust varies in term of the social technographic ladder

- Types Creators, Conversationalists, Critics, Collectors, Joiners, and Inactives



Social Technographics

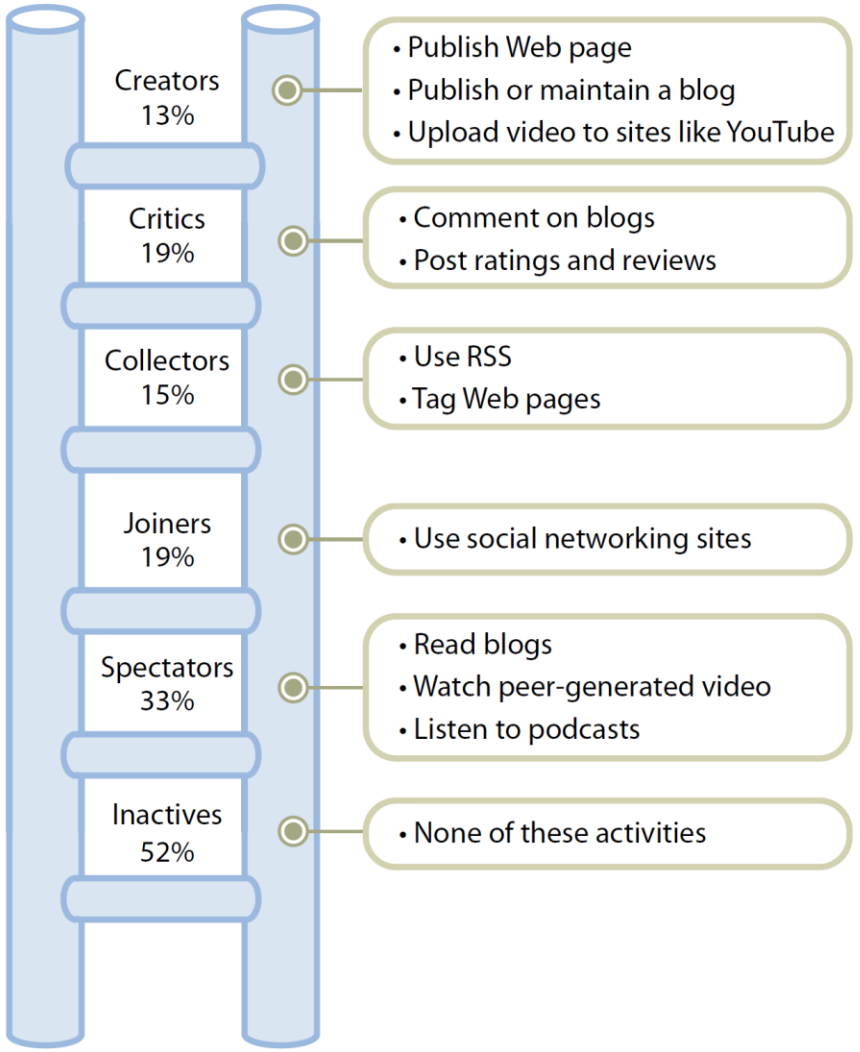
Forrester categorizes social computing behaviors into a ladder with six levels of participation; we use the term "Social Technographics" to describe analyzing a population according to its participation in these levels. Brands, Web sites, and any other company pursuing social technologies should analyze their customers' Social Technographics first, and then create a social strategy based on that profile.

[26] C. Li, "Forrester's new Social Technographics report," 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.

Context Factors for DIGITAL TRUST @ the Workplace
Social Technographics

Trust varies in term of the social technographic ladder

- **Creator**
- Conversationalist
- Critics
- Collectors
- Joiners
- Spectators
- Inactives

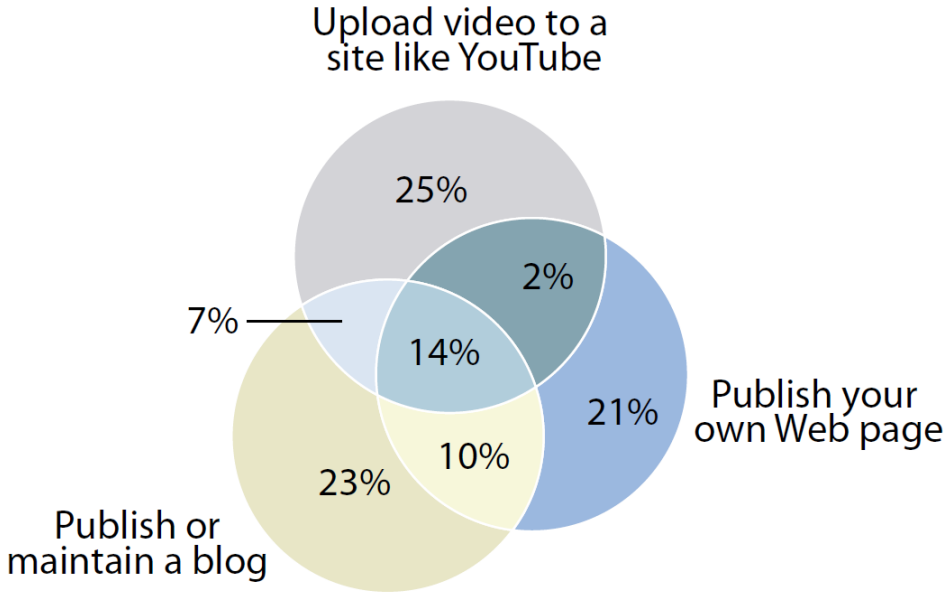


[26] C. Li, “Forrester's new Social Technographics report,” 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.

Context Factors for DIGITAL TRUST @ the Workplace

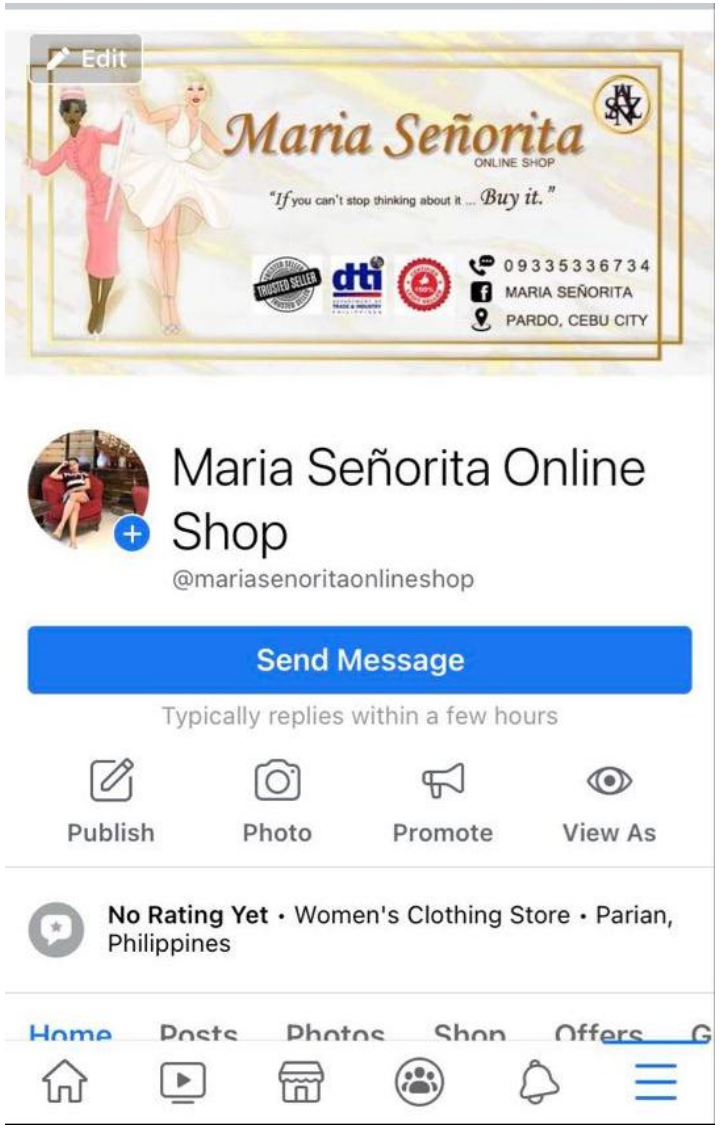
Social technographic ladder: I am a CREATOR

At the top of the ladder are Creators — online consumers who publish blogs, maintain Web pages, or upload videos to sites like YouTube at least once per month. Creators, an elite group, include just 13% of the adult online population. Creators are generally young — the average age of adult users is 39 — but are evenly split between men and women. Their participation in creation activities is varied; just 14% do all three activities while another 19% participate in two creator activities



[26] C. Li, “Forrester's new Social Technographics report,” 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.

- I create my own page and
- I am also the admin who replies to inquiries.
- I am hands on to everything I did online.

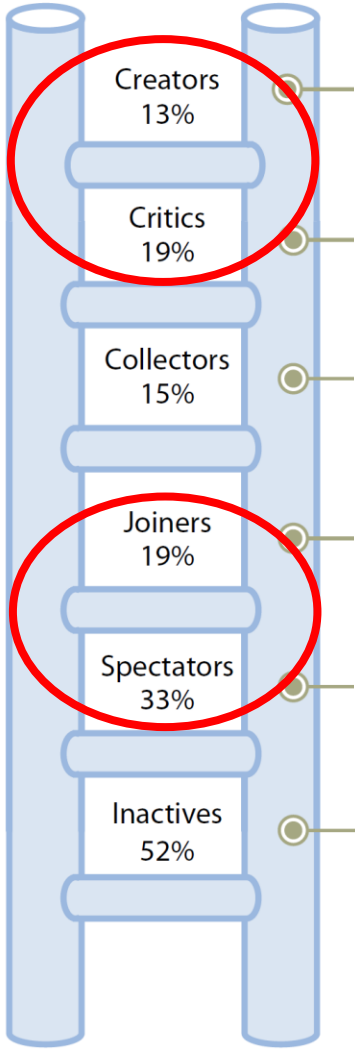


Context Factors for DIGITAL TRUST @ the Workplace

Social technographic ladder: Teenager / Young People

Teenagers create more than any other generation. Youth between 12 and 17 years old are avid users of Social Computing technologies, with more than one-third engaging as Creators. But this is a fairly self-centered age group — while very likely to create their own content, they are less likely than Gen Yers to be Critics and Collectors. And true to their social nature, nearly half of these teenagers are in social networks, while just one-third are Inactives. The key to reaching this group will be to appeal to its need for self-expression. For example, the social networking site Piczo has a large following of 13-to15-year-old girls because new members are presented with a completely blank page — perfect for a young teenage girl, but intimidating to her older sister or mother.

[26] C. Li, “Forrester's new Social Technographics report,” 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.



Ostfalia
University of
Applied Sciences

1. What is the range of your age?

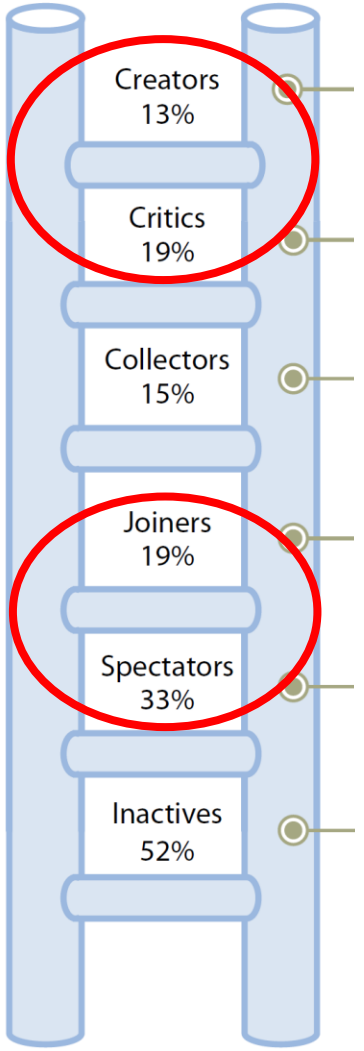
- 18 or younger
- age range 19-28
- age range 29-38
- age range 39-48
- age range 49-58
- 59 and older

Context Factors for DIGITAL TRUST @ the Workplace

Social technographic ladder: Gen Y / Young People

Joiners dominate Gen Yers. While this age group has higher percentages in each category than every other age group (except for youth Creators), it's their sky-high participation in social networks that stands out. In fact, there are slightly more Joiners than Spectators — meaning that Gen Yers are less likely to passively read, watch, or listen to social media, even when it's created by their peers. So while marketers use profiles on MySpace.com and Facebook to reach this generation, successful marketers make sure that viral elements — not static links and videos — are a key feature. Nike Soccer's page on MySpace.com promotes Joga.com — a social networking site built around the World Cup last summer — which at its peak had more than 1 million worldwide members.

[26] C. Li, "Forrester's new Social Technographics report," 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.



Ostfalia
University of
Applied Sciences

1. What is the range of your age?

- 18 or younger
- age range 19-28
- age range 29-38
- age range 39-48
- age range 49-58
- 59 and older

Context Factors for DIGITAL TRUST @ the Workplace

Social Technographics: Media Use

- Facebook
- Twitter
- WhatsApp
- Blog
- Linkedin
- Gmail
- Yahoo mail,
- Website,
- YouTube
- Other email providers
- Snapchat
- Instagram
- Tiktok

Technologic profile

Technologic profile in this study also refers to the ownership of social media and other online accounts such as Facebook, Twitter, WhatsApp, blog, Linkedin, Gmail, Yahoo mail, website, YouTube, and other email providers. This study will also describe employee's social technographics by [26], which is based on Forrester Research, Inc. Although applied indigital marketing, the technographic social tool will help in understanding how the employees in the workplace "approach social technologies - not just the adoption of individual technologies"

[26] C. Li, “Forrester's new Social Technographics report,” 23 April 2007. [Online]. Available: https://www.socialmediatoday.com/content/forresters- new-social-technographics-report.

Context Factors for DIGITAL TRUST @ the Workplace

Social Technographics: Media Use

- Facebook, LinkedIn, and/or Twitter (Social Media)
- WhatsApp and/or Blog (Messenger)
- Gmail, Yahoo mail, or other email providers
- Website
- YouTube

I use for my business

- Social Media → Facebook, Instagram …..
- Messenger → for Communication and Transaction
- E-Mail → almost no use anymore!!!!
- Website → Not needed, Facebook is the key
- YouTube → Create and upload videos
- GCASH & PAYMAYA → For mode of payment
- DELIVERY → Book for MAXIM or GRAB app

33. Do you have an active account of the following media providers? (multiple answers possible)

	Yes	No
Facebook	○	○
Twitter	○	○
WhatsApp	○	○
Blog	○	○
LinkedIn	○	○
Gmail	○	○
Yahoo mail	○	○
Other e-mail providers	○	○
Website	○	○
YouTube	○	○
Others. Please specify:	○	○
Alipay	○	○
WeChat	○	○
VK	○	○
OK	○	○

PayMaya

CT

ACT

PALAWAN EXPRESS

PERA PADALA

RATES

ACT


PALAWAN
PAWNSHOP
PALAWAN
EXPRESS


CEBUANA
LHUILLIER
INSURANCE • BILLS PAYMENT • E-LOAD
HIGHER APPRA

For deliver the items: We book here online.

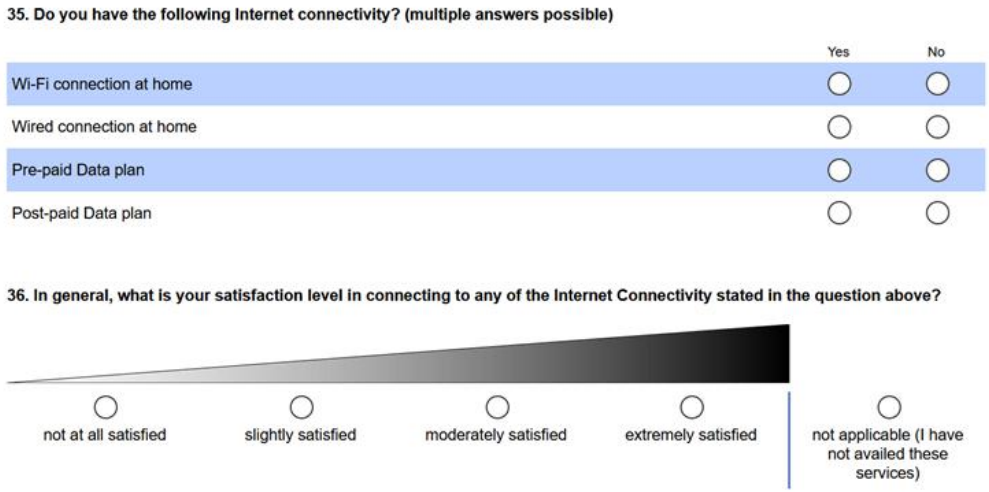
Context Factors for DIGITAL TRUST @ the Workplace

Social Technographics: Media Use

- Employee's Internet access at home
- Their overall satisfaction with the connectivity of their Internet.

You need high speed internet!!!!

- WiFi access at home →
- Wired connection at home →
- Post-Paid data plan is important, be careful with your contract
- Do not use Post-Paid data plans

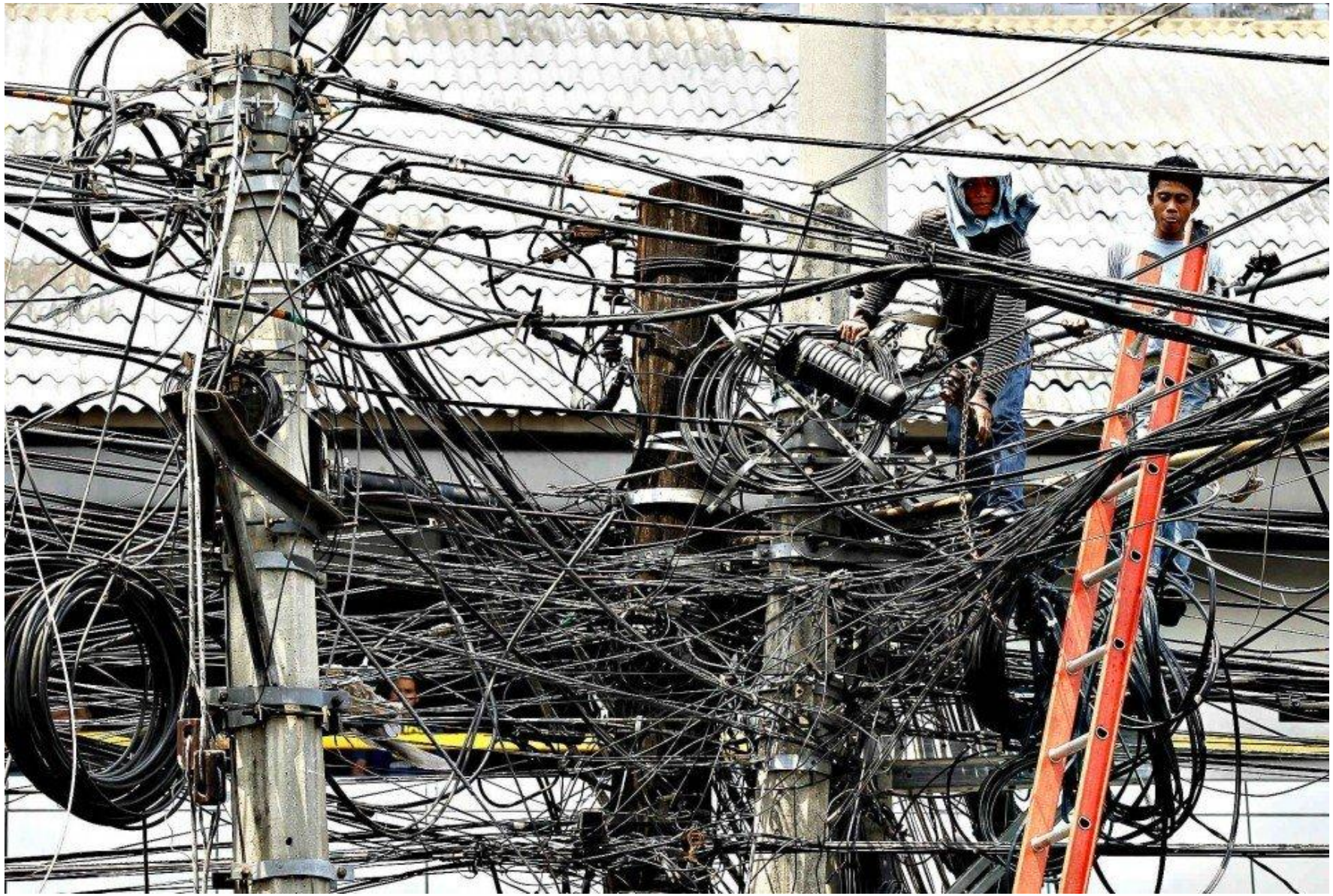


35. Do you have the following Internet connectivity? (multiple answers possible)

	Yes	No
Wi-Fi connection at home	○	○
Wired connection at home	○	○
Pre-paid Data plan	○	○
Post-paid Data plan	○	○

36. In general, what is your satisfaction level in connecting to any of the Internet Connectivity stated in the question above?

○ not at all satisfied ○ slightly satisfied ○ moderately satisfied ○ extremely satisfied | ○ not applicable (I have not availed these services)



Context Factors for DIGITAL TRUST @ the Workplace

Trust varies by Technology Integration

- Availability of Internet connectivity
- Satisfaction with internet services in the workplace
- Communication platforms like blogs, instant messenger, Facebook, and other social media platforms
- Employee's communication with a supervisor, a co-worker in the same rank, as well as in the lower position

[30] G. Vagnani and L. Volpe, “Innovation attributes and managers' decisions about the adoption of innovations in organizations: A meta-analytical review,” International Journal of Innovation Studies, vol. 1, no. 2, pp. 107- 133, 2017.
[31] N. Gurjar, “Understanding Technology Adoption: Theory and Critical Review of Seminal Research. In E. Langran & J. Borup (Eds.),” in Proceedings of Society for Information Technology & Teacher Education International Conference, Washington, D.C., United States, 2018.
[32] W. W. LaMorte, “Diffusion of Innovation Theory,” 2018. [Online]. Available:http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories4.html
[33] E. T. Straub, “Understanding Technology Adoption: Theory and Future Directions for Informal Learning,” vol. 79, no. 2, pp. 625-649, 2009.

Technology integration

Technology adoption and integration is a multifaceted process that influences technology adoption decisions. According to the innovation theory, five main factors influence the adoption of an innovation. These are relative advantage, compatibility, complexity, traceability, and observability (Rogers, 1983, cited in [30]). This study will look at the digital trust of employees toward the technology that they are using in the workplace. It can be argued that trust toward technology will start from the adoption stage. Technology adoption is "a complex process where individual perceptions of technology are formed within a socio-cultural context" [31]. "The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative“ [32]. Technology adoption addresses cognitive, emotional, and contextual concerns [33], which are relevant in determining digital trust. Several theories were reviewed with an emphasis on technology, environment, employee's interest, management interest, individual interest, and organizational interest.

Context Factors for DIGITAL TRUST @ the Workplace

Trust varies by Technology Integration

- Availability of Internet connectivity
- Satisfaction with internet services in the workplace

Connectivity in the Philippines is ……

In the CITY

Island Connectivity

Ostfalia University of Applied Sciences

22% completed

9. Do you have the following Internet connectivity in the workplace? (multiple answers possible)

	Yes	No
Wi-Fi connection	◯	◯
Wired connection	◯	◯
Pre-paid Data plan	◯	◯
Post-paid Data plan	◯	◯

10. In general, what is your satisfaction level in connecting to any of the Internet Connectivity stated in the question bevor?

◯ not at all satisfied ◯ slightly satisfied ◯ moderately satisfied ◯ extremely satisfied | ◯ not applicable (I have not availed these services)

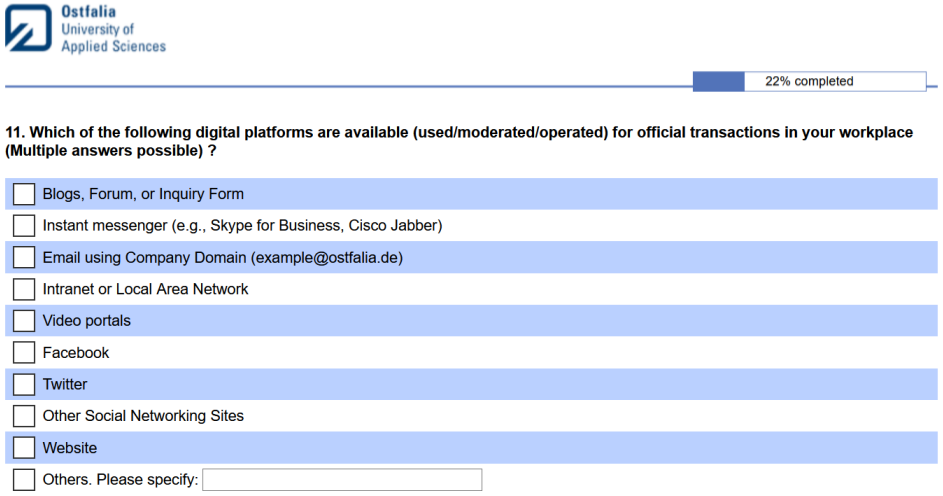
Context Factors for DIGITAL TRUST @ the Workplace

Trust varies by Technology Integration

– Communication platforms like blogs, instant messenger, Facebook, and other social media platforms

- Technology Integration in the Philippines is very popular and we have use social media most of the time.
- We use social media to entertain and business.

If you want to reach / make business transactions to young people, you can reach them via online/social media.


Ostfalia
University of
Applied Sciences

22% completed

11. Which of the following digital platforms are available (used/moderated/operated) for official transactions in your workplace (Multiple answers possible) ?

- ☐ Blogs, Forum, or Inquiry Form
- ☐ Instant messenger (e.g., Skype for Business, Cisco Jabber)
- ☐ Email using Company Domain (example@ostfalia.de)
- ☐ Intranet or Local Area Network
- ☐ Video portals
- ☐ Facebook
- ☐ Twitter
- ☐ Other Social Networking Sites
- ☐ Website
- ☐ Others. Please specify:

INTUITION@ the Workplace - Theory

Trust varies by Decision Making Skills

- Rational decisions
- Intuitive decisions
- Subconscious decisions (long-term)
- Fast decisions based on Heuristics
- Anticipation or pre-cognition

Decision-making skills

Mosher [3] asserts that trust has a positive impact on workplace safety climate, which plays a role in employee decision-making. Studies show that trust is a pre-requisite in every decision-making in the workplace. In the same manner, digital technologies can support decision-making like those in a clinical setting [35]. The study of the trust-based mechanism for automatic decision-making was based on Bayesian Networks by [36] had proven “accurate decisions on adaptation which match user preferences and support user trust.” In this study, decision-making is categorized into different types, which are adaptations from existing decision making theories. These types are rational, intuitive, subconscious, heuristics, and anticipation. This study is also a baseline for future research on digital intuition.

[35] K. A. Hallgren, A. M. Bauer and D. C. Atki, “Digital Technology and Clinical Decision-Making in Depression Treatment: Current Findings and Future Opportunities,” Depress Anxiety, p. 494–501, 2017.
[36] M. Wißner, S. Hammer, E. Kurdyukova and E. André, “Trust-based Decision-making for the Adaptation of Public Displays in Changing Social Contexts,” Journal of Trust Management, vol. 1, no. 6, 2014.

INTUITION@ the Workplace

Entrepreneurs need good INTUITION

- Starting a business is difficult
- You never know how business will develop
- You are all on your own
- It is your own decision

May 29, 2019

3 Ways Entrepreneurs Can Tap Into Their Intuition To Get That Extra Edge

FORBES by Caroline Castrillon

https://www.forbes.com/sites/carolinecastrillon/2019/05/29/3-ways-entrepreneurs-can-tap-into-their-intuition-to-get-that-extra-edge/?sh=55b95be958bd

Oprah Winfrey has always listened to her intuition when making major career decisions

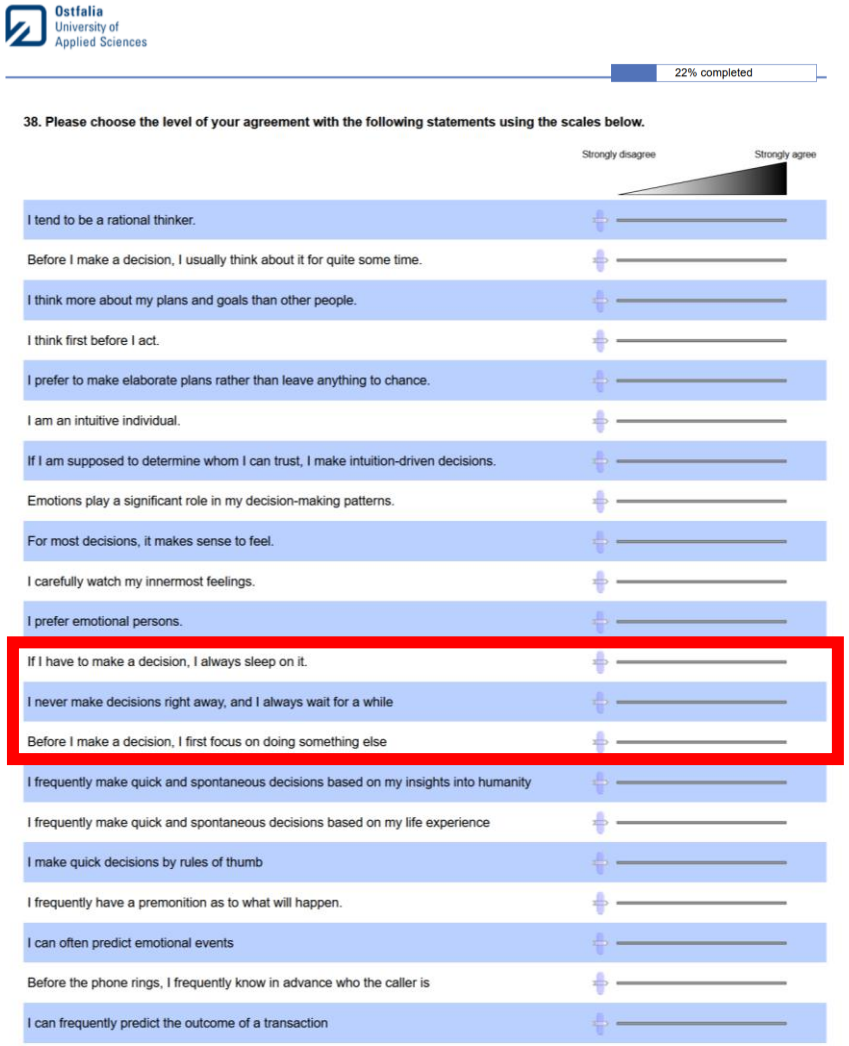
INTUITION @ the Workplace

Trust varies by Decision Making Skills

- Rational decisions
- **Intuitive decisions**
- **Subconscious decisions (long-term)**
- Fast decisions based on Heuristics
- Anticipation or pre-cognition

Entrepreneurs need a good subconscious thinking

- Think twice
- Sleep one night before deciding
- Analyses well
- Ask other people
- Ask experts



INTUITION @ the Workplace

Intuitive Decisions

- Trust your gut feeling
- Feel into yourself – is it right for you
- Test if you are healthy (sick people have a hard time starting a business
- Do you want risk or security?
- Do you have a need?
- Do you have to fix a problem? → Covid19

INTUITION @ the Workplace

Unconscious Thinking

- Always wait with your decisions
- Never decide fast
- Sleep one night before deciding

Sometimes relax ☺

DIGITAL TRIUST & INTUITION @ the Workplace
for young female Entrepreneurs

Thank you for having me at this Conference

MEASURING TRUST IN INFORMATION TECHNOLOGY IN THE WORKPLACE

Dave E. Marcial[1], Joy M. Dy[2], Alfie Arcelo[3], Markus Launer[4]

[1, 2, 3] Silliman University, Philippines

[4]Ostfalia University, Germany

EUROPÄISCHE UNION
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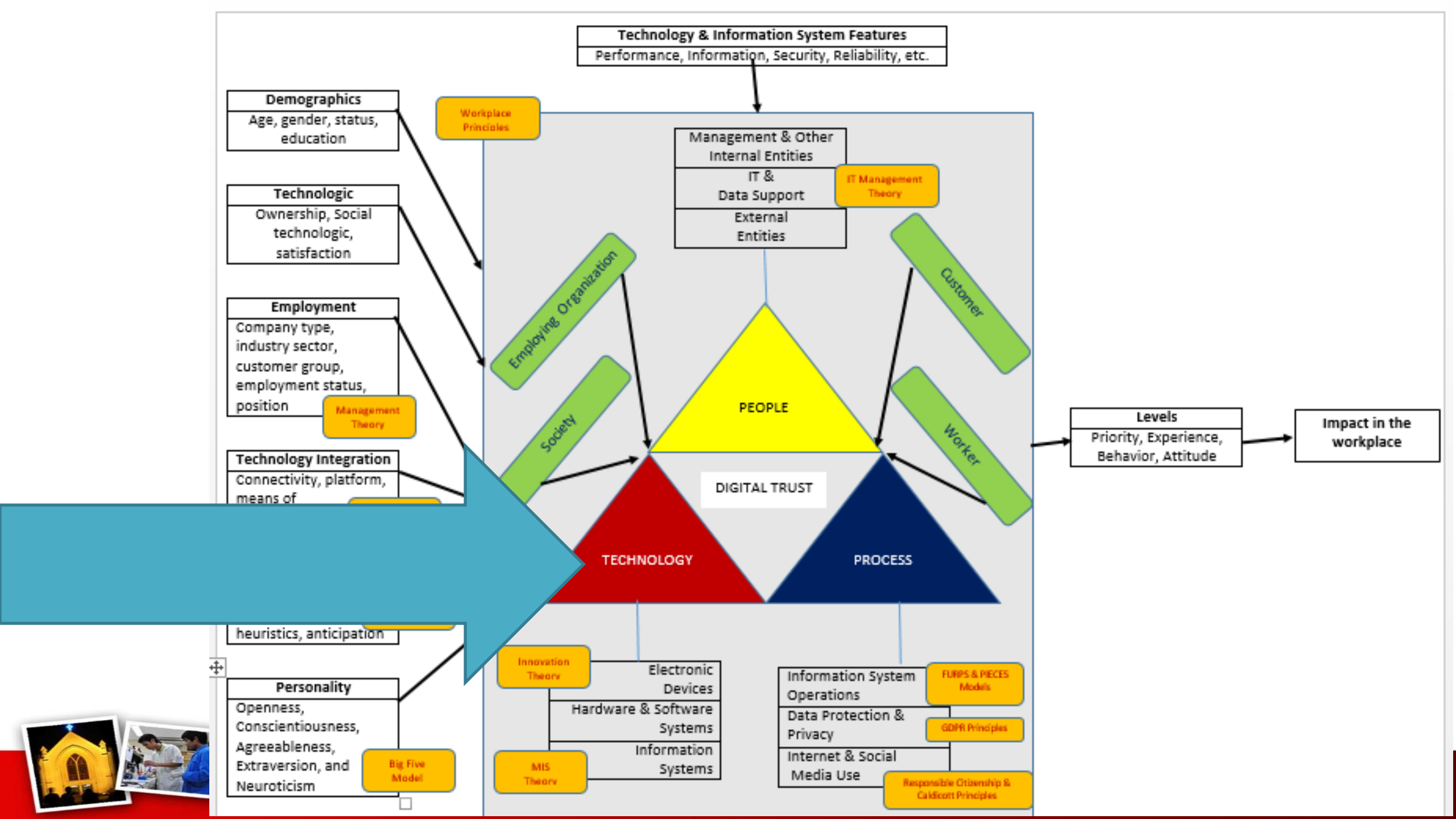
The Research

Digital Trust IN THE WORKPLACE


Technology & Information System Features
Performance, Information, Security, Reliability, etc.
Demographics
Age, gender, status, education
Technologic
Ownership, Social technologic, satisfaction
Employment
Company type, industry sector, customer group, employment status, position
Management Theory
Technology Integration
Connectivity, platform, means of
heuristics, anticipation
Personality
Openness, Conscientiousness, Agreeableness, Extraversion, and Neuroticism
Big Five Model
Workplace Principles
Management & Other Internal Entities
IT & Data Support
IT Management Theory
External Entities
Employing Organization
Customer
Society
Worker
PEOPLE
DIGITAL TRUST
TECHNOLOGY
PROCESS
Innovation Theory
Electronic Devices
Hardware & Software Systems
Information Systems
MIS Theory
Information System Operations
FURPS & PIECES Models
Data Protection & Privacy
GDPR Principles
Internet & Social Media Use
Responsible Citizenship & Caldicott Principles
Levels
Priority, Experience, Behavior, Attitude
Impact in the workplace

The fast-changing innovations of information technology have *transformed the nature of the workplace.*

More are produced in a short time (speed and efficiency)

Collaborative work is made easier

Remote work and telecommuting are options

IT dependence indicates trust of the workforce on IT.

Despite this, ***digital trust is still challenging to measure and define.***

Challenge to measure trust in information technology

Digital trust "underpins every digital interaction by **measuring and quantifying** the expectation that an entity is *who or what* it claims to be and that it will behave in an expected manner" (Gartner, Inc, 2017).

Trust affects

- responsibility norms and organizational outcomes (Salamon & Robinson, 2008)
- workplace safety climate (Mosher, 2013)
- employee's decision-making Mosher (2013)
- organizational performance (NICULESCU, 2015).
- innovation and creativity (MARTIC, 2020).

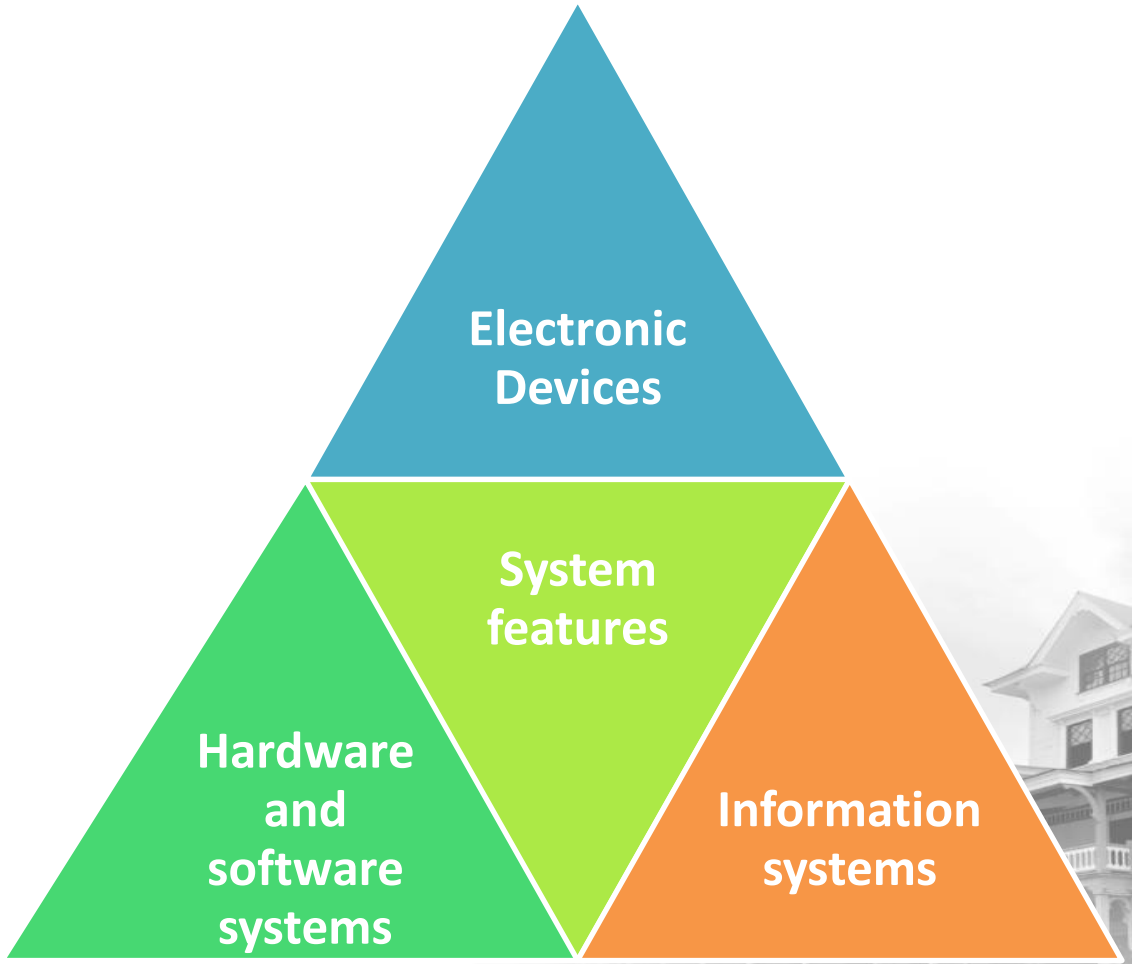
Information Technology is defined as

- computer software and hardware solutions
- any form of technology that handles information
  (computing, telecommunication technologies, and electronics and broadcasting)
- computer-based information systems
- embedded in 4IR-related fields
  (IoT, AI, robotics, big data, cryptocurrencies, AR/VR, cloud computing, smart technology, and cybersecurity)

(Onn and Sorooshian, 2013; Grauer, 2001; Sarosa and Zowghi, 2003; McGinnis, 2020)

These significant definitions of information technology through the years are *contributory to the workforce's level of trust in using these technologies in the workplace.*

Information Technology comprises



Components to measure trust in information technology

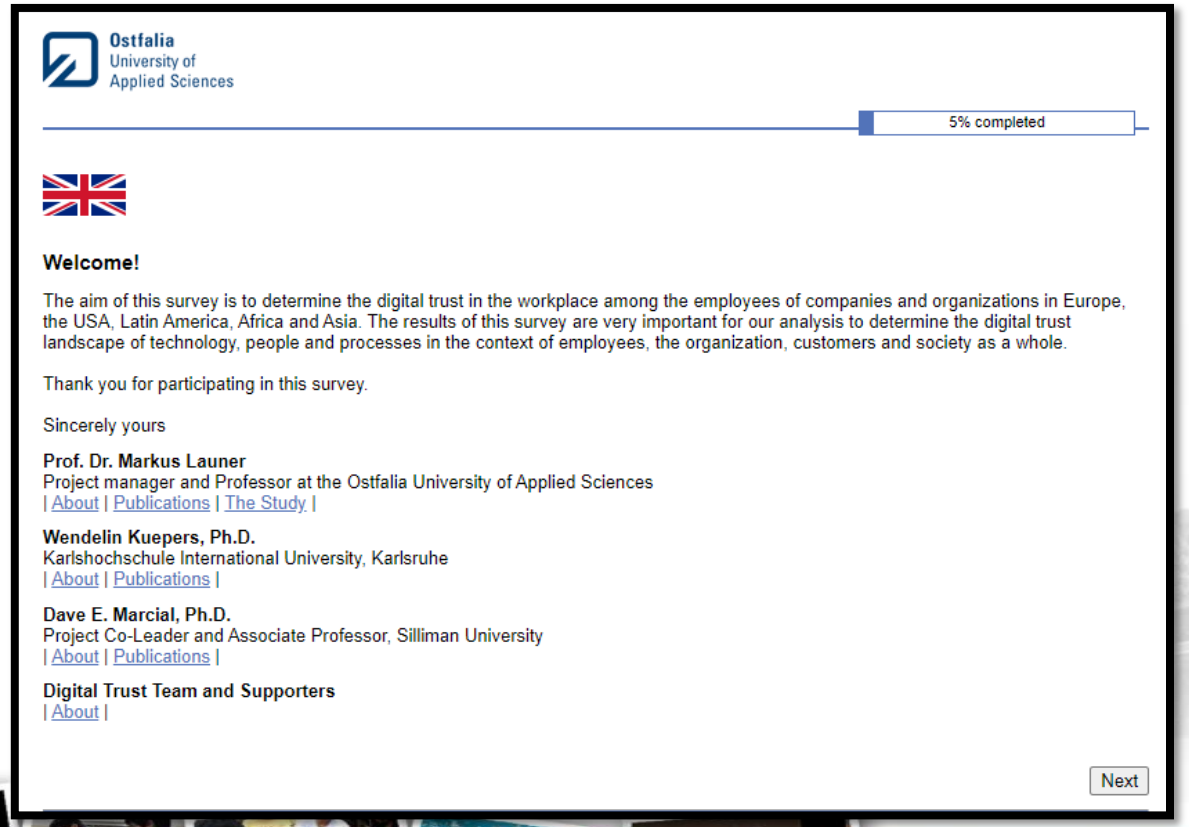
In this paper….

1. Priority level of system features
2. Trust levels in
   A. electronic devices
   B. hardware and software installed
   C. information systems
3. Test of relationships
4. Test of differences

METHODS

Survey Administration

- Online
- https://www.soscisurvey.de/digitaltrust/index.php
- Country representative, collaborators



METHODS

- Data sets were extracted from Marcial and Launer's Survey data on Digital Trust in the Workplace.
- 1=not trusted at all; 2=low; 3=moderate; 4=highly trusted
- Overall mean, mean of all means, Chi square, and ANOVA analysis.

Results

Priority Level of Technology and Information System Features

Technology and Information System Features	Mean	Description
Accuracy of data	3.31	high priority
Reliability & business continuity (availability, predictability, accuracy)	3.28	high priority
Personal data protection	3.27	high priority
Ethics and control of data access and use	3.25	medium
Consumer or client benefits and value	3.22	medium
Performance (speed, resource consumption, throughput, capacity, scalability)	3.20	medium
Control and security	3.20	medium
Safety & Exploitability	3.18	medium
Interaction through the internet	3.13	medium
Usability (human factors, aesthetics, consistency, documentation, responsiveness)	3.12	medium
Legitimacy	3.10	medium
Relevance	3.08	medium
Shareability	3.00	medium
Integration and reusability	2.91	medium
Systems of accountability	2.90	medium
Digital risk resilience	2.89	medium
Overall Mean	**3.12**	**medium**

1

Results

Trust Level in Electronic Devices

Electronic Devices that provided (either for official or personal use)	Mean	Description
Laptop	3.22	moderate
Tablet	2.92	moderate
Smart watch	2.58	moderate
Others	2.70	moderate
Overall Mean	**2.90**	**Moderate**

2A

Trust Level in Hardware and Software Systems

Hardware and Software Systems Installed (either for personal or official transactions)	Mean	Description
ID System of doors, gates, and other entrance and exit in the company or organization	3.08	moderate
Workflow management (e.g., Groupware systems)	3.04	moderate
ID System in Daily Time Recording	2.99	moderate
ID System in Printing and Duplication Services	2.99	moderate
Email Tracking and Monitoring System	2.96	moderate
ID System in Cafeteria	2.90	moderate
Video Surveillance (CCTV)	2.88	moderate
Global Positioning Services (GPS) in Cars	2.86	moderate
Others	3.43	high
Overall Mean	**3.01**	**moderate**

2B

Results

Trust Level in Information Systems

Information Systems that are implemented (regardless of usage)	Mean	Description
Payroll systems	3.15	moderate
Executive Information Systems	3.13	moderate
Spreadsheet Models	3.13	moderate
Computer Supported Co-operative work / Collaboration tools	3.08	moderate
Management Reporting Systems	3.04	moderate
Logistics systems	3.02	moderate
Personnel (HRM) systems	3.02	moderate
Reservation systems	3.01	moderate
Sales management systems	2.99	moderate
Financial Planning systems	2.96	moderate
Group Decision Support Systems	2.94	moderate
Inventory control systems	2.87	moderate
Stock control systems	2.85	moderate
Budgeting systems	2.82	moderate
Others	2.78	moderate
Internet bots (also known as web robots, WWW robots or bots)	2.62	moderate
Overall Mean	**2.96**	**Moderate**

2C

Results

Information Technology Trust Level

Information Technology Components	Mean	Description
Technology and Information System Features	3.12	medium
Hardware and Software Systems Installed (either for personal or official transactions)	3.01	moderate
Information Systems that are implemented (regardless of usage)	2.96	moderate
Electronic Devices that provided (either for official or personal use)	2.90	moderate
Mean of Means	**3.00**	**Moderate**

Measuring Trust in Information Technology in the Workplace

TEST OF RELATIONSHIPS AND DIFFERENCES OF INFORMATION TECHNOLOGY TRUST LEVEL

Results

Information Technology Trust and Social-demographics

Information Technology Trust	x^2 value	*p*-value	df	Remarks
Age	335.045	0.000	15	significant
Gender	193.587	0.000	6	significant
Status	93.606	0.000	9	significant
Educational Attainment	259.522	0.000	24	significant
Country	1627.611	0.000	102	significant

Information Technology Trust and Employment Profiles

Information Technology Trust	x^2 value	*p*-value	df	Remarks
Number of years of employment	215.857	0.000	18	significant
Employment status	25.791	0.000	3	significant
Job position	413.152	0.000	12	significant
Company Type	146.640	0.000	12	significant
Company Form	22.677	0.000	3	significant
Company Size	440.389	0.000	12	significant

3

Information Technology Trust and Technologic Profiles

Information Technology Trust	x^2 value	*p*-value	df	Remarks
Social Technographic Profile	358.66	0.000	18	significant
Internet Satisfaction	1240.170	0.000	9	significant

Results

Test of Difference of IT Trust Level Among the Groups of Respondents

Social-demographics	*F*	*p*-value	Remarks
by age range	6.889	0.000	significant
by gender	3.722	0.024	significant
by status	11.638	0.000	significant
by educational attainment	2.306	0.018	significant
by country	33.403	0.000	significant
Employment profiles	***F***	***p*-value**	**Remarks**
Number of years of employment	1.697	0.117	Not significant
Employment status	.945	0.331	Not significant
Job position	9.516	0.000	significant
Company Type	1.160	0.326	Not significant
Company Form	3.635	0.057	Not significant
Technologic profiles	***F***	***p*-value**	**Remarks**
Social Technographic Ladder	6.429	0.000	significant
Internet Satisfaction	373.685	0.000	significant

4

Conclusion

- **There is a reasonable trust in information technology that are utilized, installed, and implemented in the workplace.**
- **Workers and employees have a conservative level of confidence to the system features, electronic devices, hardware and software used, and the information systems installed in the workplace.**

Berufsbildende Schulen I Uelzen

Wir leben Nachhaltigkeit!

Welcome!
Sustainability and Digitalization in schools

4. internationaler Dienstleistungskongress
„Lokal verankert, international vernetzt“
Online-Keynote 11.11.2020

Berufsbildende Schulen I Uelzen

Wir leben Nachhaltigkeit!

<u>The main topics</u>:

- **excellent VET School Building and excellent learning rooms**
- **projects: excellent digital and sustainability oriented learn stations**
- **more funding for VET innovation**
- **cooperation between the VET actors, teach the teaching staff and trainers together**

Lernort mit Auszeichnung 2016
Weltaktionsprogramm Bildung für nachhaltige Entwicklung

Lernort mit Auszeichnung 2018/2019
Weltaktionsprogramm Bildung für nachhaltige Entwicklung

WERK STATT N PROJEKT 2016
Ausgezeichnet durch den NACHHALTIGKEITSRAT

A view on our Mission
– Agenda 2030, EU-Climate goals 2050, …

https://www.un-page.org/page-and-sustainable-development-goals

In Februar 2020 we produced a BBS I Uelzen Informationsfilm : www.bbs1-uelzen.de und https://www.youtube.com/watch?v=jf19H_UgFmo (Cooperations- und Finanialpartner – Prof. Dr. Launer).

Excellent school building must be a part of Sustainable Cities and Communities! General goal …

https://www.globalgoals.org/11-sustainable-cities-and-communities

Excellent school building has also a strong link to:

https://www.un-page.org/page-and-sustainable-development-goals

June 2019 – public presentation of the result „End of Phase Zero!“

Timeline

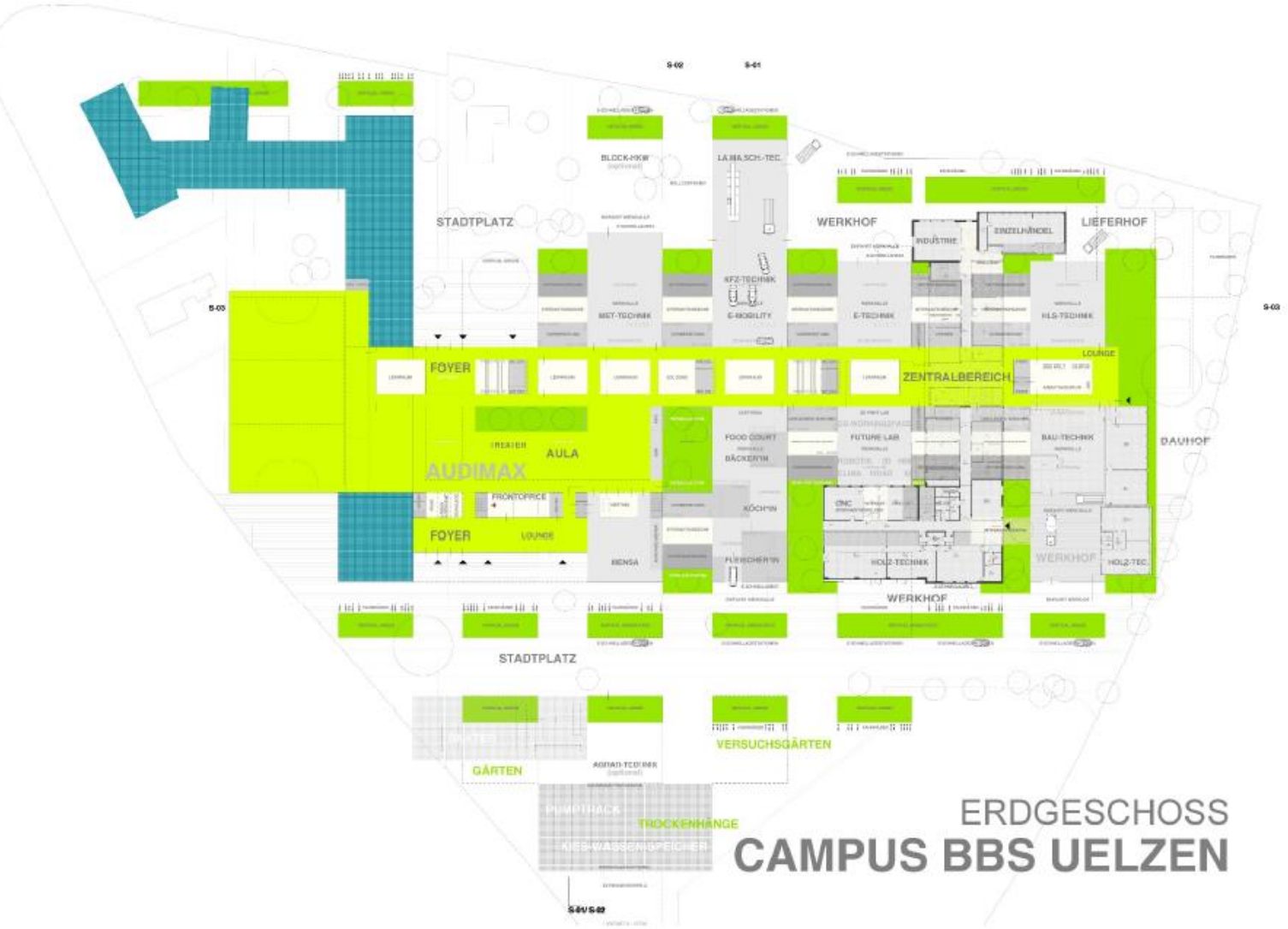
- Phase 0 (Zero) 2018 to 2019 – a lot of discussion cycles about the general function – coordinated by Conceptk and GM Uelzen
- The new BBS Campus is a part of the local area. Develope a local area concept for enery wining and sharing, sustainable traffic and mobility 2019 – September 2020
- Oktober 2020 – „Architect team PPP Kiel“ will start with the 3-D-Modelling
- Formation of a school consultionteam for the dialog and feedback rounds with the architect team ppp Kiel - Feb. 2021
- First step – building and construction – perhaps at the end of 2021
- First buildingcomplex will be ready - Summer 2024/2025
- Refreshing and modernising the two old buildingcomplexes
  2024-2027
- Design the green outdoor area and finaly the sustainabilityoriented local traffic and mobility - 2025-2028.

conceptk

Pädagogik, Nachhaltigkeit, Digitalisierung Berufsschulcampus Uelzen

Projektexposé 01.01.2020

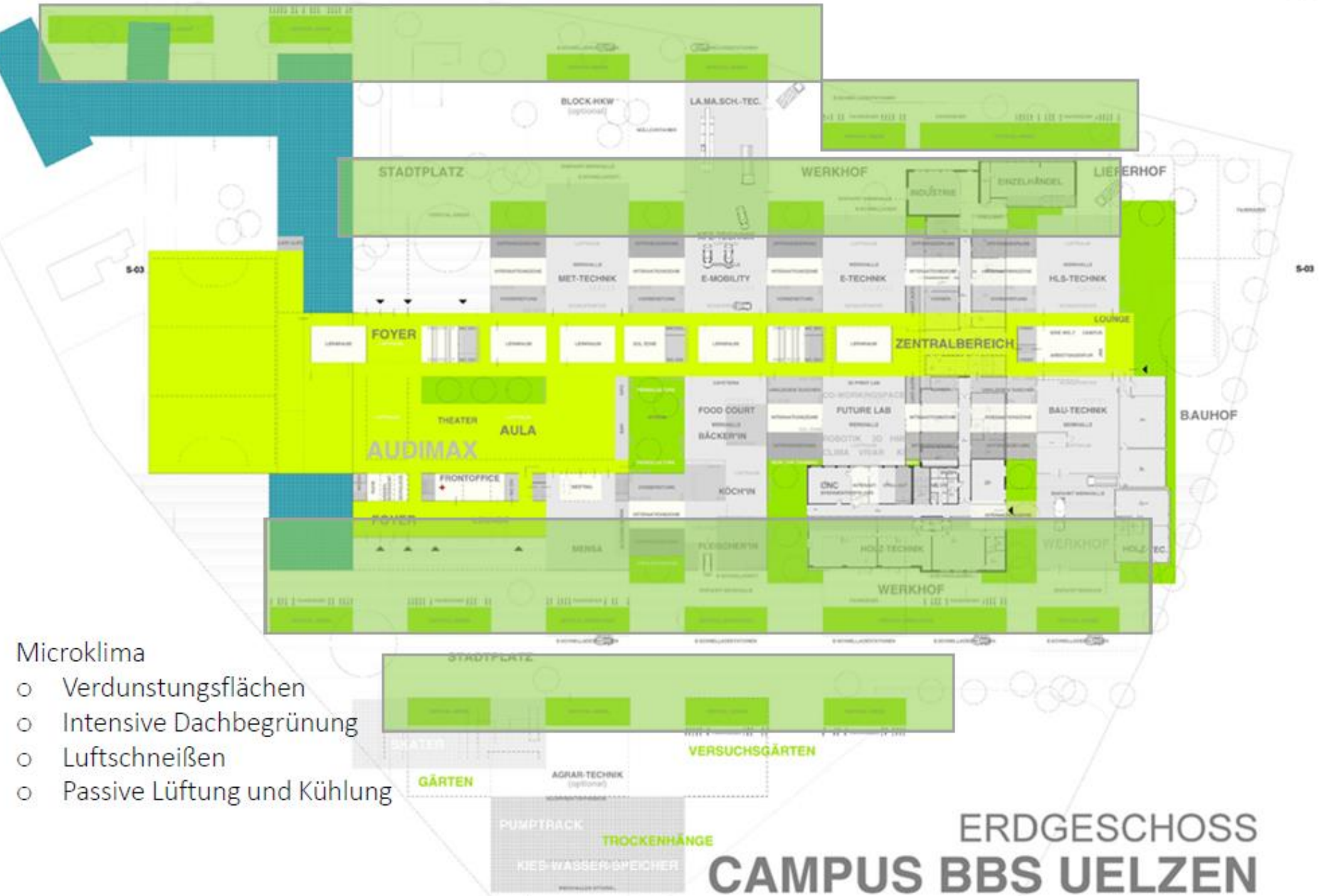
Prüfeninger Straße 22 D-93049 Regensburg Telefon +49 (0) 941 - 7 84 59 75 - 0



ERDGESCHOSS

CAMPUS BBS UELZEN

conceptk

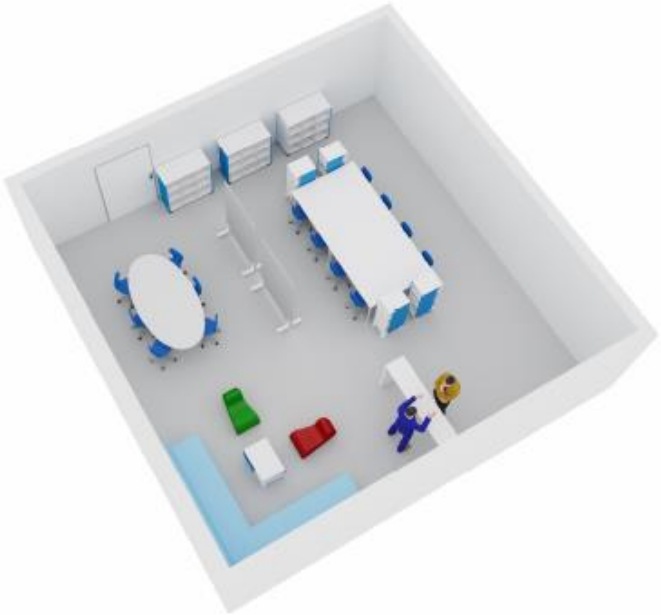


Microklima

- Verdunstungsflächen
- Intensive Dachbegrünung
- Luftschneißen
- Passive Lüftung und Kühlung

ERDGESCHOSS

CAMPUS BBS UELZEN




VORBEREITUNG
SCHAUFENSTER
SOL ZONE
WICKEL
SOL ZONE
PRÄSENTATION
LERNRAUM
WC DIV
INFO
PERMACULTURE
CAFETERIA

A excellent school buildung and excellent learning rooms are necessary to fulfill our mission! You find the complete concept under:

https://www.zukunftsraum-schule.de/pdf/kongress2019/VRfL/100_VRfL_LIESTMANN_PW.pdf

https://www.un-page.org/page-and-sustainable-development-goals

Projects: We develope(d) with regional and national experts and cooperation-partners excellent digital and sustainability oriented learning stations.

E-Learning-project language training for refugee students 2015-2016 with Prof. Dr. Launer, supported and financed by Toto-Lotto-Stiftung

E-Learning teacher training project 2018 with Prof. Dr. Markus Launer

Digi-hand-project 2017 - Exhibition: Experience Artificial Intelligence digital learning stations for craftsman tainees) in cooperation with the Institute for Future Studies and Technology Assessment (IZT), Berlin - financed by the Federal Ministry of Education and Research (BMBF) – see: https://www.digi-hand.de/

Digital- WAVE – project developed digital learning stations: **WAVE** – **W**issen (Knowing), **A**nwenden (Applying), **V**erstehen (Understanding) und **E**rfahren (Experiencing) von Künstlicher Intelligenz (AI) - **Exhibition: Experience Artificial Intelligence** 2019 in cooperation with the Institute for Future Studies and Technology Assessment (IZT), Berlin - supported and financed by the Federal Ministry of Education and Research (BMBF) – see: https://idw-online.de/de/news722342
https://www.izt.de/en/projects/view/project/ausstellung_ki_wave/

LamKI (A region with AI – created workshops and learning stations for schools) – project 2019-2020 – develop AI-learning stations - in cooperation with the Institute for Future Studies and Technology Assessment (IZT), Berlin supported and financed by German Sustainability Council - Fund

Kornscout – project for Baker profession 2018 - 2020 in cooperation with IZT and University Berlin supported and financed by Federal Ministry of Education and Research (BMBF)

Started with a **first iPad modell class** 2019 supported by the BBS I Uelzen Support Association e. V.

Erasmus + KA 2 – international network – DUNE-BB_EU project 2019 – 2021
Shaping digitally supported and sustainability-oriented VET Centers of Excellence in Europe
More information: https://www.bbs1-uelzen.de/BBS-Exzellenzzentren_EU.mp4

Smart factory project 2019-2020 supported by the lower Saxony administration/ Ministry for Education und Ministry for economy
More information: https://www.nibis.de/bbs---fit-fuer-40-smart-factory_9989

Application for a **3 D press technologic / additive production - manufacturing** 2021 – project supported by the lower Saxony administration/ Ministry for Education und Ministry of economy
…

We look for the best practice and learn together!

More information: https://www.bbs1uelzen.de/BBS_I_Imagefilm_v4.mp4
www.bbs1-uelzen.de

More funding for VET innovation

Regional, national and international VET experts and actors wish more funding for VET innovations.

Cooperation between the VET actors, teach the teachering staff and trainers together

Regional, national and international VET experts and actors wish more cooperation and more worktime for this.

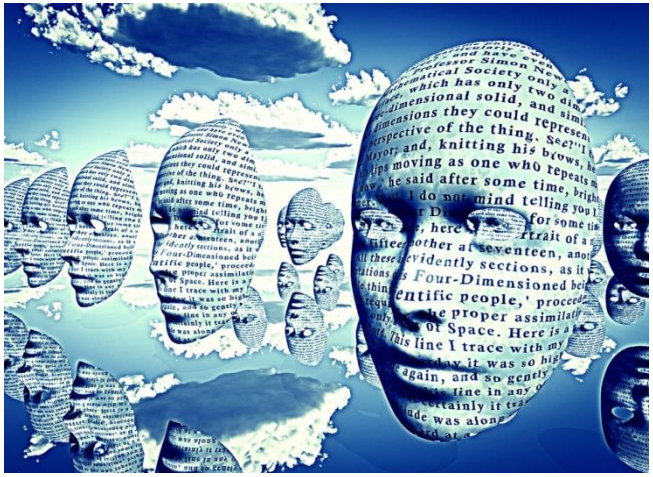
The VET actors wish a teaching program – teach the teachering staff and trainers together! We need a finance budget, worktime and other material resources to realize this important point.

Thank you for your attention!

Contact: BBS I Uelzen, Scharnhorststr. 10, D-29525 Uelzen

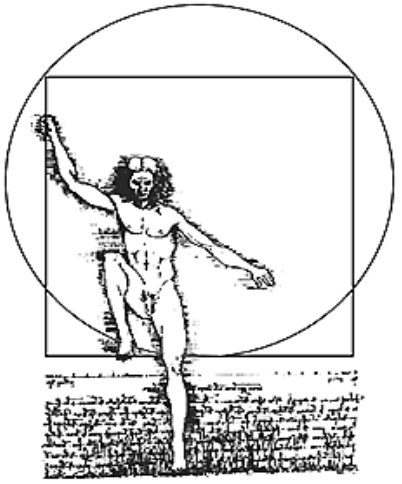
Head of VET-school: Stefan Nowatschin, OStD
Email: now@bbs1uelzen.de
Phone: +49(0)581 955 6
Homepage: www.bbs1-uelzen.de

Intuition & Digitalität, Digitalisierung



Prof. Dr. Wendelin Küpers

Karlshochschule
International University



Intuition & *Digitalität, Digitalisierung*

- **Einfuehrung**
  - Begriff und Besonderheiten der Intuition
- **Funktionen, Formen und Nutzen der Intuition**
  - Intuition in der Führungspraxis im digitalen Gestell
- **Voraussetzungen, Lernbarkeit und Förderung der Intuition *& Digitalität, Digitalisierung***
- **Grenzen und Integration des Intuitiven (auch mit *Digitalität, Digitalisierung)***

Intuition

ist leiblich vermitteltes ganzheitliches
affektives und kognitives
Erfahrungsgeschehen
& **emergenter** Prozess

Im Zusammenhang von repraesentationalen
Digitalität, Digitalisierung
bedarf es einer **erweiterten**
(Wieder-)Verleiblichung

um Intuition zu entwickeln und anzuwenden
bzw. intuitiv wirkungsvoll zu sein

Algorhythmus und Rhythmus?!

Begriff und Besonderheiten der Intuition

- **Wortherkunft Verb „intuieri“**
  - genau hineinsehen oder **Schau** / Anschauung
    - transzendenten & immanenten **Wahrnehmung**
  - **leiblichen & sinnlichen Ursprung des intuitiven Erlebens**
  - Grundform menschlichen Erkennens
    - Erfassen des **ganzen** Erkenntnisgegenstandes
      im Unterschied zur nur partiellen Erkenntnis
  - Ganzheitlich / Gestalt

Intuition

- *multidimensionales, kontextgebundenes Phänomen*
  - Wahrnehmungs-, Denk- & Handlungszusammenhang
  - Intuitives *Erleben* äußert sich in **leiblichen Manifestationen** (z.B. ein Kribbeln im Nacken ein spürbares Gefühl im Bauch)
  - Ausdruck in **spontanen** Einfall als Bild oder Gedanken- bzw. Gefühlsstrom, **Assoziationen**, Phantasievorstellungen oder Imaginationen
  - Vernachlässigung & diskreditiert in Organisationen?!

Arbeits-Definition

- leiblich-sinnlich und emotional vermitteltes Vermögen, **Sinnes- und Sinnzusammenhänge** sowie Ereignisse und Sachverhalte unmittelbar, umfassend und **ganzheitlich wahrzunehmen**.
- Intuition erfahren als schöpferische, **non-diskursive Ein-Gebung**
  - welche Einsichten und Ideen oder Lösungen hervorbringt und von Evidenzerlebnissen begleitet wird.
  - In besonderer Weise vermittelt sie eine subjektive **Stimmigkeit** durch spontane Schlüsse bzw. Begründungen, die **nicht bewusst rational** ab- oder hergeleitet, noch **repräsentational** verstanden oder dargestellt werden können.

Intuition

- integratives Erfahrungsgeschehen,
  - das sich einer einfachen sprachlichen Verbalisierung & **funktional-repraesentativen Erfassung via Digitalisierung entzieht / konfligiert**
  - moderierende Rolle von Affekten “to affect and be affected’ **Emotionen** in verschiedenen Ausprägungen (Intensitäten, Richtungen)
    - Abhängigkeit von emotionalen Zuständen bzw. Stimmungen und **Probleme im Digitalen (zoom fatique)**

Funktionen (eingeschränkt im Digitalen?)

- **explorativ**-transzendierende Funktion
  - (z. B. Entdeckungen **jenseits bisheriger** Logik und Wissen),
- **kreative** Funktion
  - (z. B. schöpferische Entwicklung von strategischen Alternativen)
- **operative** Funktion
  - (z. B. richtungsweisende Handlungsgestaltung),
- Prognostische „**possibilistische**“ Funktion
  - (z. B. Zukunftsahnungen oder Sinn für das Mögliche),
- **evaluative** Funktion
  - (z. B. emotionale Bewertung von Entscheidungsalternativen),
- **illuminative** Funktion
  - (z. B. **non-duales** Gewahrsein bzw. „Erleuchtung“). (Goldberg 1995)

Entscheidungen in komplexen Situationen & Ungewissheit

Intuition….

- formt den inneren Dialog und damit das Ich-Bild.
- vermittelt das Gefühl der **Evidenz**,
  das Handlungen absichert.
- lässt **Visionen** des Zukünftigen und eine ahnende,
  gefühlsmäßige Sicherheit des **Möglichen** entstehen.
- **bewertet unmittelbar** zwischen ‚Richtig' und ‚Falsch'
  und schafft damit einen Zugang zu ethischem Verhalten.
- ermöglicht **empathisches Einfühlen**
  in Beziehungen

(Heitkämper 2000)

- dient als **aktivierender Katalysator**
  für implizites Wissen

tacit knowledge (Polany)

Wir wissen mehr als was digital zu sagen ist

Intuition in Organisationen

- u. a. zur Lösung organisationspraktischer Probleme und Entscheidungs- & Visionsprozessen
- vielfältige Vorteile gerade in instabilen Umwelten
- Ignorieren irrelevanter Wissensinhalte oder Muster Konzentration auf kritische oder unbeachtete Aspekten - Sinn für Wesentliches!
- Berücksichtigung von strategischen Alternativen und Einbeziehung von reichhaltigerer, innovativerer und einsichtsvollerer Informationen & Synergien.
- aktivierender Zu- und Umgang & Katalysator für implizites (Erfahrungs-)Wissen und Lernen
- Unverzichtbare Führungsqualifikation

Erwerb & Anwendung

- Da Intuition ein Wissen und Können widerspiegelt, welches **nicht einfach in Worten und rationalen Konzepten** ausgedrückt werden kann,
- bedarf es des Erwerbs durch **wahrnehmungsbezogene, nicht-sprachliche Prozesse**
- **die über funktionale Medienbeziehung und digitale Mechanismen *hinausgehen*** (no App)

„Technology is the answer, but what was the question?"
Cedric Price, 1966

Wenn Digitalität, Digitalisierung die Loesung ist, was war/ist das Problem?

Vermittlung / Medialisierung

- Intuitive Prozesse lassen sich i. S. einer **Gastgeberschaft** - am besten durch geeignete **(sinnlich sinnvolle) Rahmenbedingungen** fördern
  (und eben wie Gäste einladen),
  ohne sich jedoch dadurch einseitig erzwingen oder **kontrollieren** zu lassen
  (was man als guter Gastgeben ebenfalls nicht tun würde).
  (Hänsel 2002, S. 216).
- Digital Media?:.
  - tuning in (composing with what's there),
  - slowing down (dwelling), letting go (drifting),
  - seeing anew (adopting a beginner's mindset).
  - clever *détournements*, & co-creation
  - surprising outcomes.

Erfordernis
Prozessual-Digitale Medien

- Emergentes Vermoegen zum Intuieren
  - unterstuetzt durch Delegation von Daten, Information, Wissen, Gedaechtnis via digitale Technologien
  - dass sich mit bewegenden Ereignissen zwischenleiblich verbinden kann waehrend sich diese entfalten

Algo **Rhythmus**

Grenzen (Anwendbarkeit und Bedingungen) der Intuition

- nicht immer anwendbar oder korrekte Antworten zur Problemlösung (**Kontextabhängigkeit**)
- **Konflikte** zwischen verschiedenen (scheinbar gleichwertigen) intuitiven Gewissheiten
- Kann zu **Dilemmata** und Entscheidungsaporien führen
- **nicht instrumentell mach- oder verfügbar**
- fehler- und irrtumsanfällig: Fehleinschätzung, Selbstüberschätzung oder Pseudo-intuitionen
  - Selektivität, Zuschreibungsfehler, illusionäre Korrelationen, Glaubenserhaltungen und heuristische Gewohnheiten
- Legitimations- & Bewertungsprobleme
- Status Gruppe? Status System? Integrationsbedarf!

Situiertheit

- Intuition ein tiefes **Verstehen** der (Entscheidungs-) **Situation** voraus.
  - Die Realisation eines erfolgreichen, intuitiven Prozessierens erfordert dazu oft jahrelange Erfahrungen und Expertise
  - optimal fuer lose strukturierte (analoge) Entscheidungskontexte
  - fuer fest strukturierte (digtalisierbare?) Entscheidungssituationen berechenbarer Komplexität sind analytische Verfahren besser

Intuition im Miteinander

- Intuition als soziale Kompetenz
  - bei der Kommunikation in Führungsbeziehungen zu Mitarbeitenden und Teams
  - empathischen Interpretation auch des non-verbalen Verhaltens von anderen
  - Informelle (analoge) Begegnungen

Intuition &

- **Praktische Weisheit**
- **engagierten Gelassenheit**
  - Situiertes Gegenwärtigen & Achtsamkeit

Eine leibliche Achtsamkeit, emotionale Klugheit, lebendige Intuition verbunden mit praktischer Weisheit und im Geist engagierter Gelassenheit erlauben die **kreative Verwirklichung** einer Exzellenz reflektierter Praktiker in deren lebensweltlicher und sozio-ökologischer Einbettung. ‚In situ' entwickelt und dann zur Gewohnheit geformt, trägt eine solchermaßen revitalisierte Integration zu einer **nachhaltigen** Praxis von Führung und Organisationen sowie ihren Anspruchsgruppen und in ökologischen Verhältnissen bei.

Gesamtintegration

- von Leiblichkeit, Emotionalität, Intuition, engagierte Gelassenheit und praktische Weisheit sowie eine entsprechend ver-antwortliche Führungs- und Organisationspraxis helfen, **adäquat und virtuos** auf Herausforderungen in der heutigen und erwartbar noch komplexeren Welt von Morgen in rechter Weise zu antworten bzw. sich einzulassen

Leitkultur integralen Intuition

- Wenn Leitkulturen der Führung und des Organisationalen ökonomische und gesellschaftliche Entwicklungen widerspiegeln und mitbeeinflussen, dann manifestiert eine emotions- und intuitionsintegrierende, weise Führung im Geist engagierter Gelassenheit eine auch zivilgesellschaftlich relevante Lebenspraxis, die über Unternehmen hinausgeht und wirksam wird.

The way to know…

- "the only way to know a thing is to '**enter into it' intuitively** – a process that involves **moving beyond 'the ready-made conceptions** which thought employs in its everyday operations"
  - (Bergson [1903]1999: 37; cited in Coleman 2008: 105, 112).
  - Coleman, R. 2008. 'A Method Of Intuition: Becoming, Relationality, Ethics'. *History of the Human Sciences*. 21: 4, 104-123.

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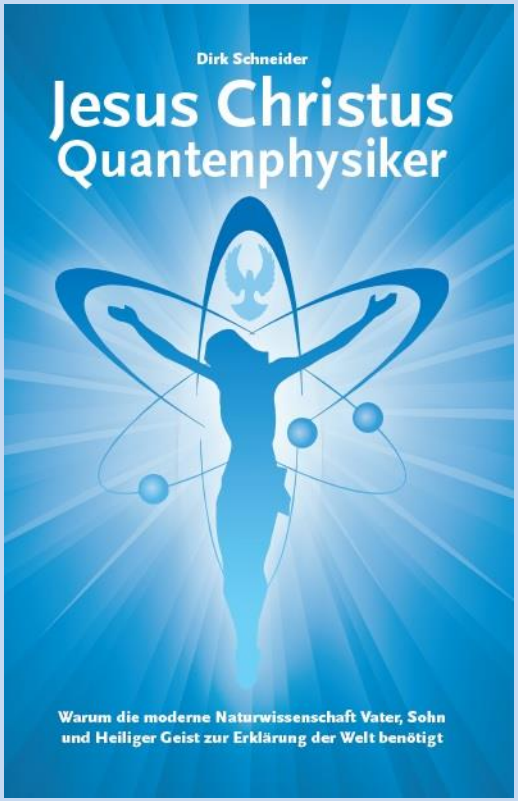
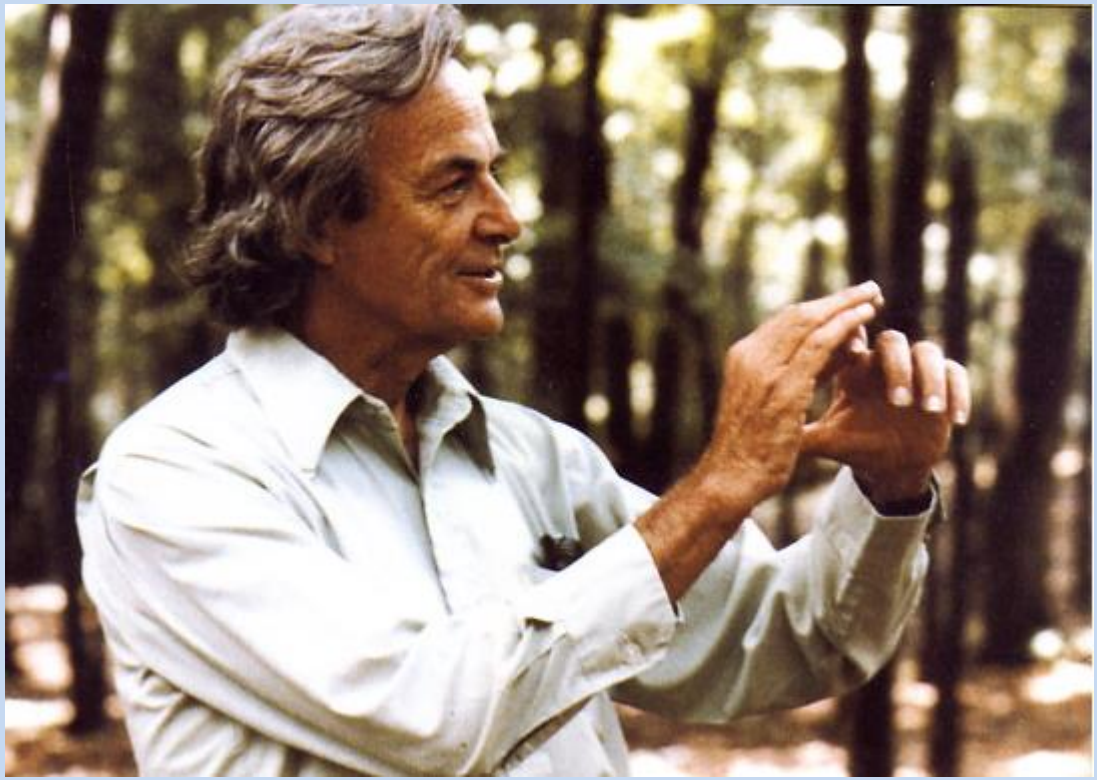
Quantenphysik und Religion



4. Dienstleistungskongress der Ostfalia Hochschule

Quantenphysik und Religion, 12.11.2020, 17:30 – 18:00 Uhr
Dirk Schneider



Richard Feynman

(1965 Nobelpreisträger der Physik)

“I think I can safely say that nobody understands quantum mechanics.”

Die 1920er Jahre

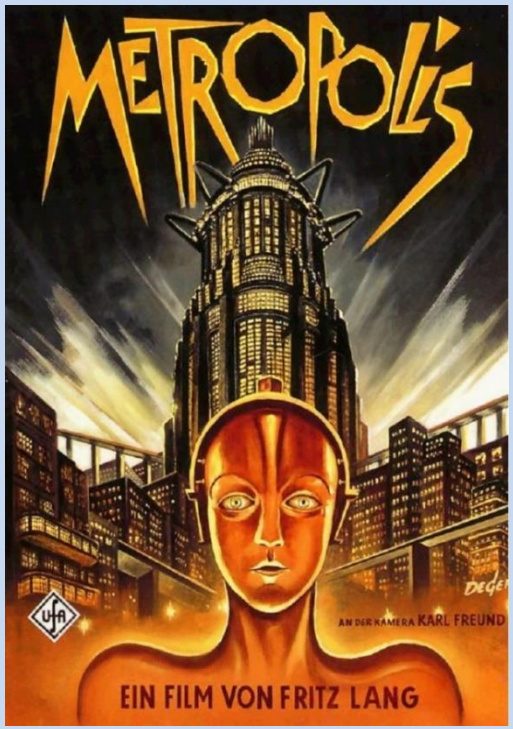
Was ist **dada**?

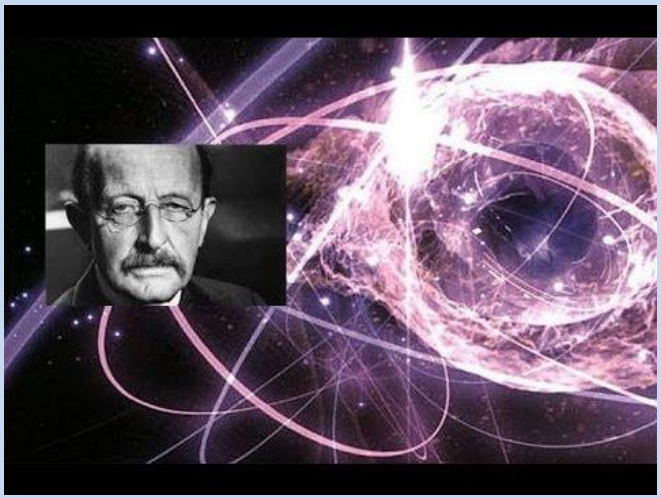
Eine Kunst? Eine Philosophie? eine Politik?
Eine Feuerversicherung?

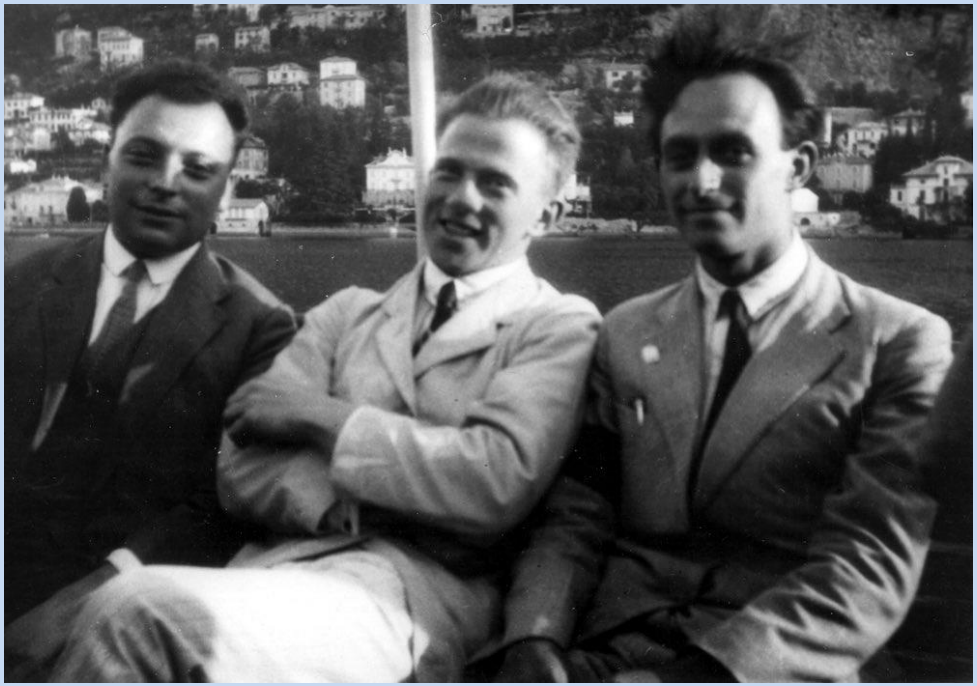
Oder: Staatsreligion?

ist **dada** wirkliche Energie?

oder ist es Garnichts, d. h.
alles?

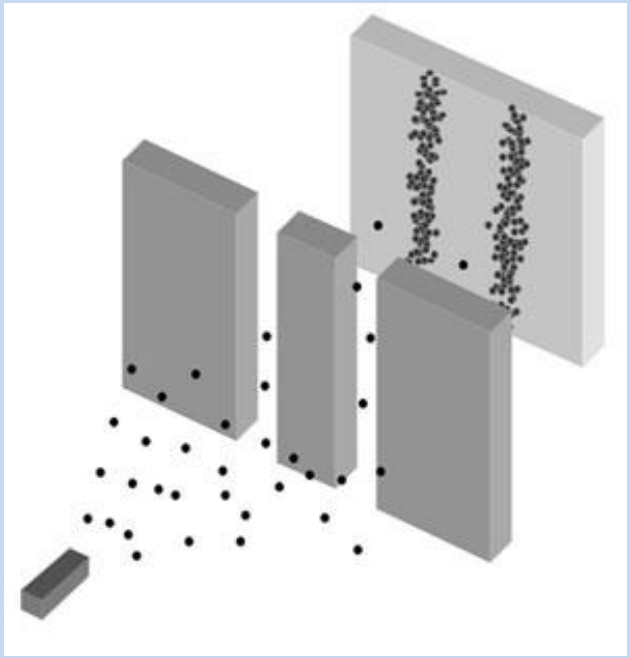


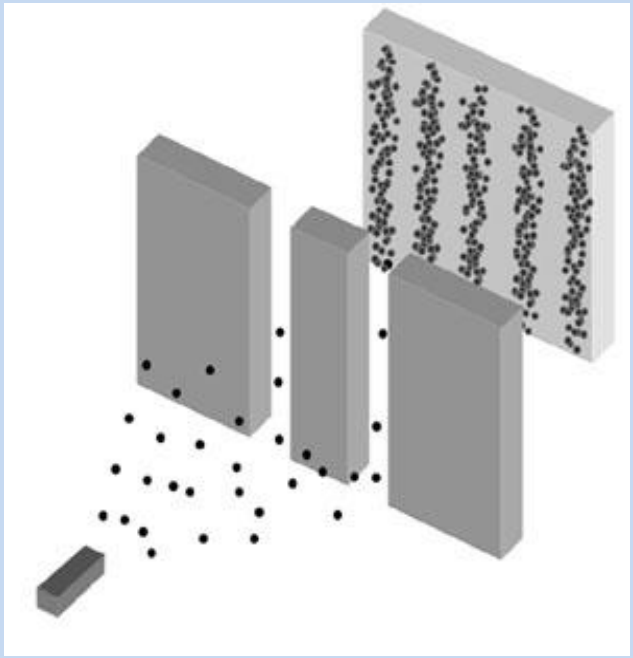


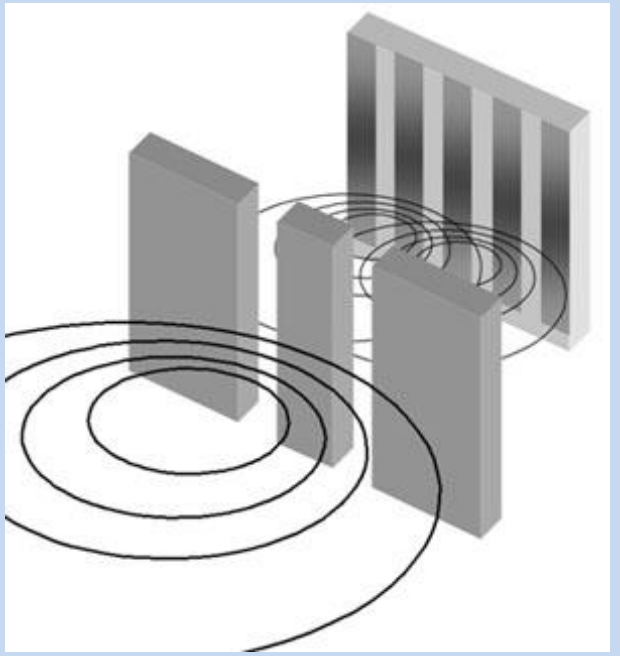


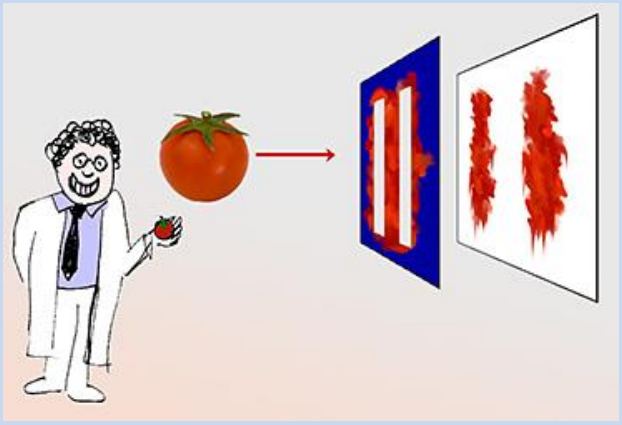
Im Juni des Jahres 1925 gelang hier auf Helgoland
dem 23-jährigen WERNER HEISENBERG
der Durchbruch in der Formulierung
der Quantenmechanik, … die das menschliche
Denken weit über die Physik hinaus
tiefgreifend beeinflusst hat.

Doppelspaltversuch

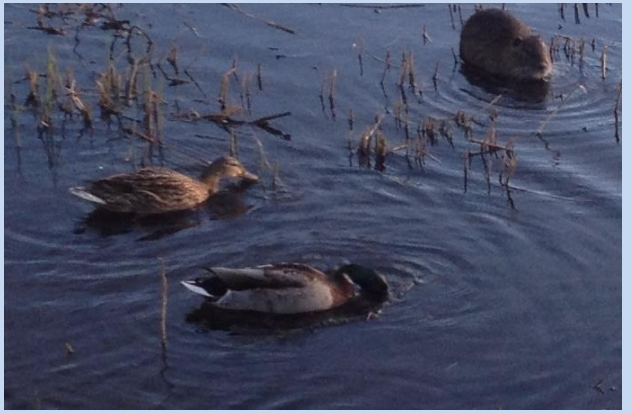






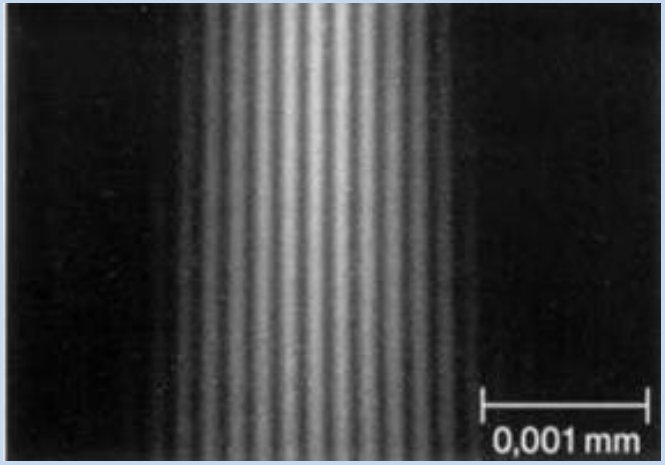


Quanten:
Interpretation bis heute strittig

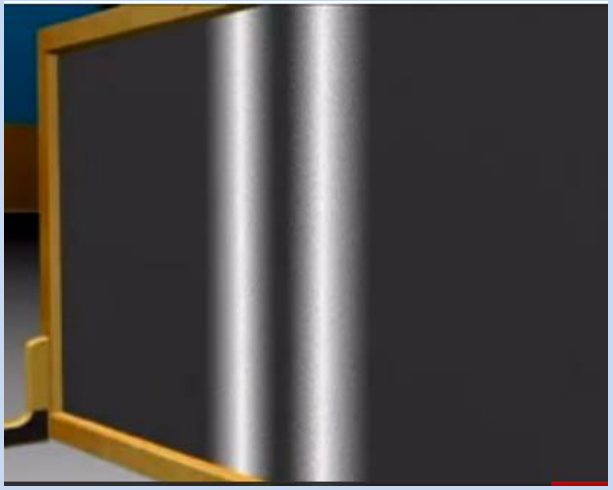


Was für eine Bedeutung hat die Welle?

Quanten ohne Beobachtung



Quanten unter Beobachtung



Erwin kann mit seinem Psi
kalkulieren wie noch nie.
Doch wird jeder leicht einsehen,
Psi läßt sich nicht recht verstehen.

$$H(t)|\psi(t)\rangle = i\hbar\frac{\partial}{\partial t}|\psi(t)\rangle$$

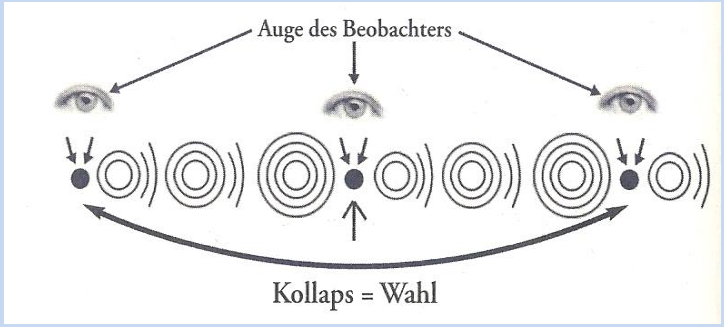
Schlussfolgerungen aus dem Doppelspaltexperiment

- Quantenwellen sind nichtmateriell (mathematische Beschreibungen von Möglichkeiten)

$$H(t)|\psi(t)\rangle = i\hbar\frac{\partial}{\partial t}|\psi(t)\rangle$$

- Quantenwellen beschreiben **In-Formationen der Manifestation** von Materie (Möglichkeiten)

- **Durch Beobachtung werden die Eigenschaften eines Objektes nicht festgestellt, sondern erst hergestellt**



Auswahl durch Beobachtung

Jürgen Moltmann

22.01.1968

PDF drucken | Senden | Merken

DER SPIEGEL 4/1968

THEOLOGEN / MOLTMANN

Kinder des Protestes

In drei Jahren stieg das Buch eines jungen deutschen Gottesgelehrten In die Spitzenklasse der theologischen Weltliteratur auf: die "Theologie der Hoffnung" des jetzt in Tübingen lehrenden Professors Jürgen Moltmann, 41*

Pressespiegel

Direkt zur Online-Ausgabe der NZZ

Jürgen Moltmann ausgezeichnet

Der evangelische Theologe Jürgen Moltmann (Tübingen) wird mit einem der höchstdotierten Preise der Welt, dem Grawemeyer-Preis, ausgezeichnet. Das teilte die Universität Tübingen mit. Demnach erhält Moltmann den «Grawemeyer Award in Religion 2000» für sein 1995 erschienenes Buch «Das Kommen Gottes. Christliche Eschatologie». Der Preis ist mit 200 000 US- Dollar dotiert. Er wird jährlich von der Grawemeyer Foundation an der Universität Louisville (Kentucky) und dem dortigen Presbyterian Theological Seminary vergeben. Nach Darstellung der Stiftung gilt Moltmann seit seinem ersten Buch «Die Theologie der Hoffnung» (1961) als «einer der aufregendsten und angesehensten Theologen der Welt, der es versteht, komplexe Sachverhalte einfach darzustellen». ***(dpa)***

Was bedeutet Himmel?

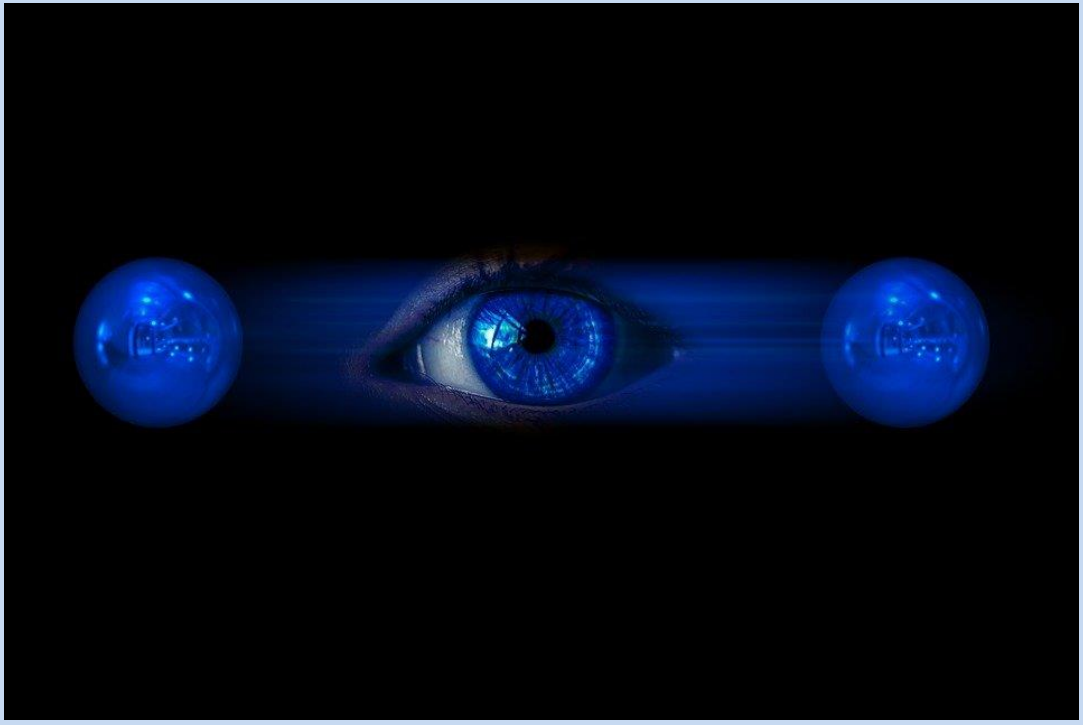
Jürgen Moltmann in „Gott in der Schöpfung“

„Mit dem „Himmel“ wird der Bereich der **schöpferischen Möglichkeiten** und Kräfte Gottes bezeichnet. … Mit der Erde wird der Bereich der **geschaffenen Wirklichkeit** … bezeichnet. … Alle erkennbaren Prozesse zeigen Zusammenhänge von **Wirklichkeit und Möglichkeit** auf: **Aus möglichen Wirklichkeiten werden verwirklichte Möglichkeiten**.“

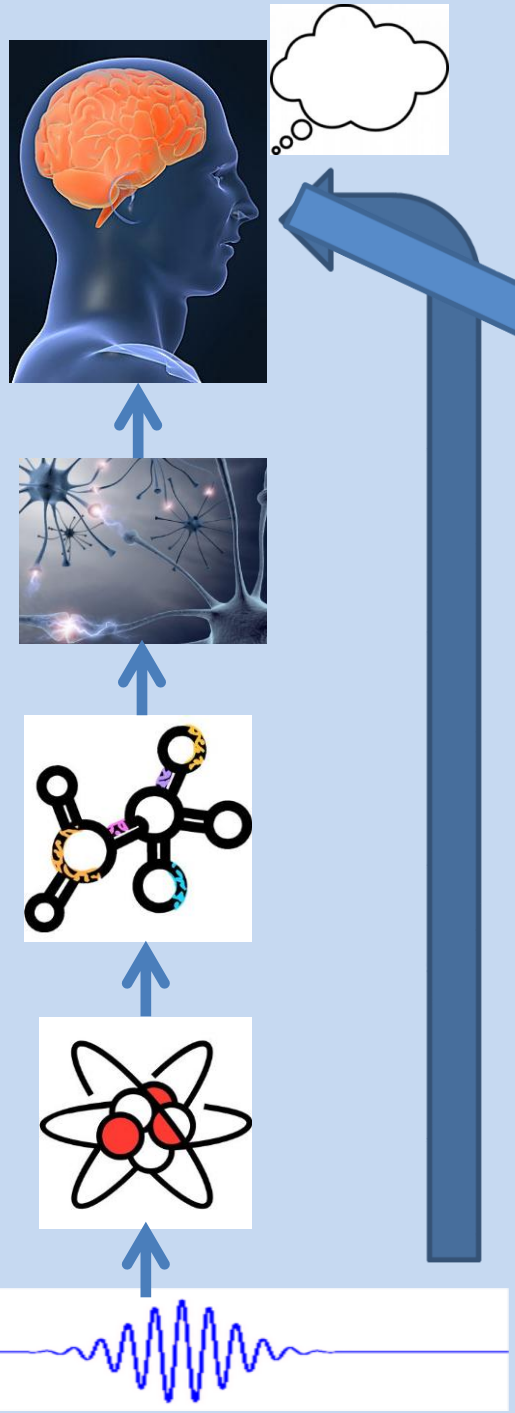
Fragen, die aus dem Doppelspaltexperiment resultieren:

Wer oder was ist ein Beobachter?

Wird das Bewusstsein durch das Gehirn erzeugt?



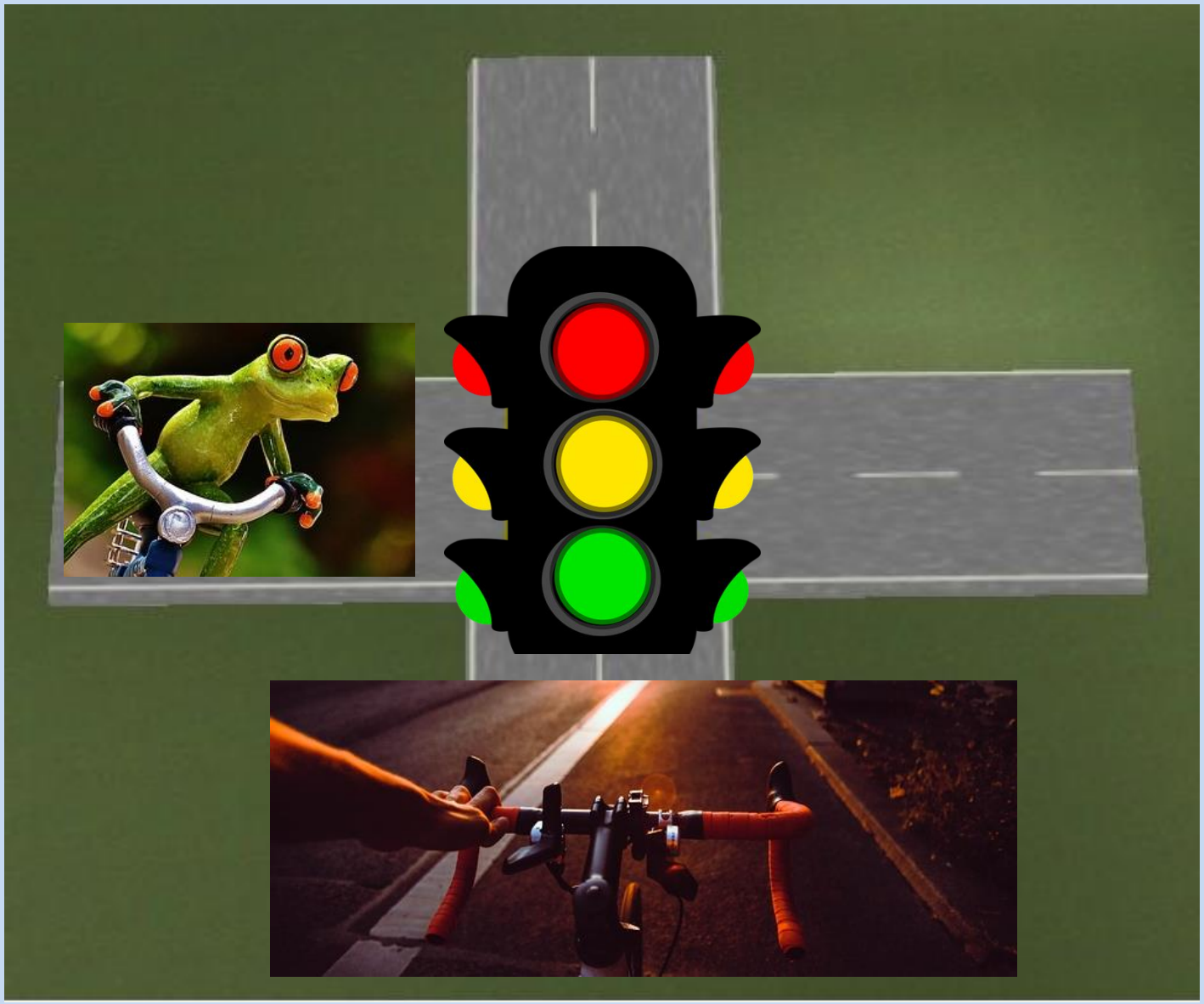
Das Paradoxon der Quantenphysik



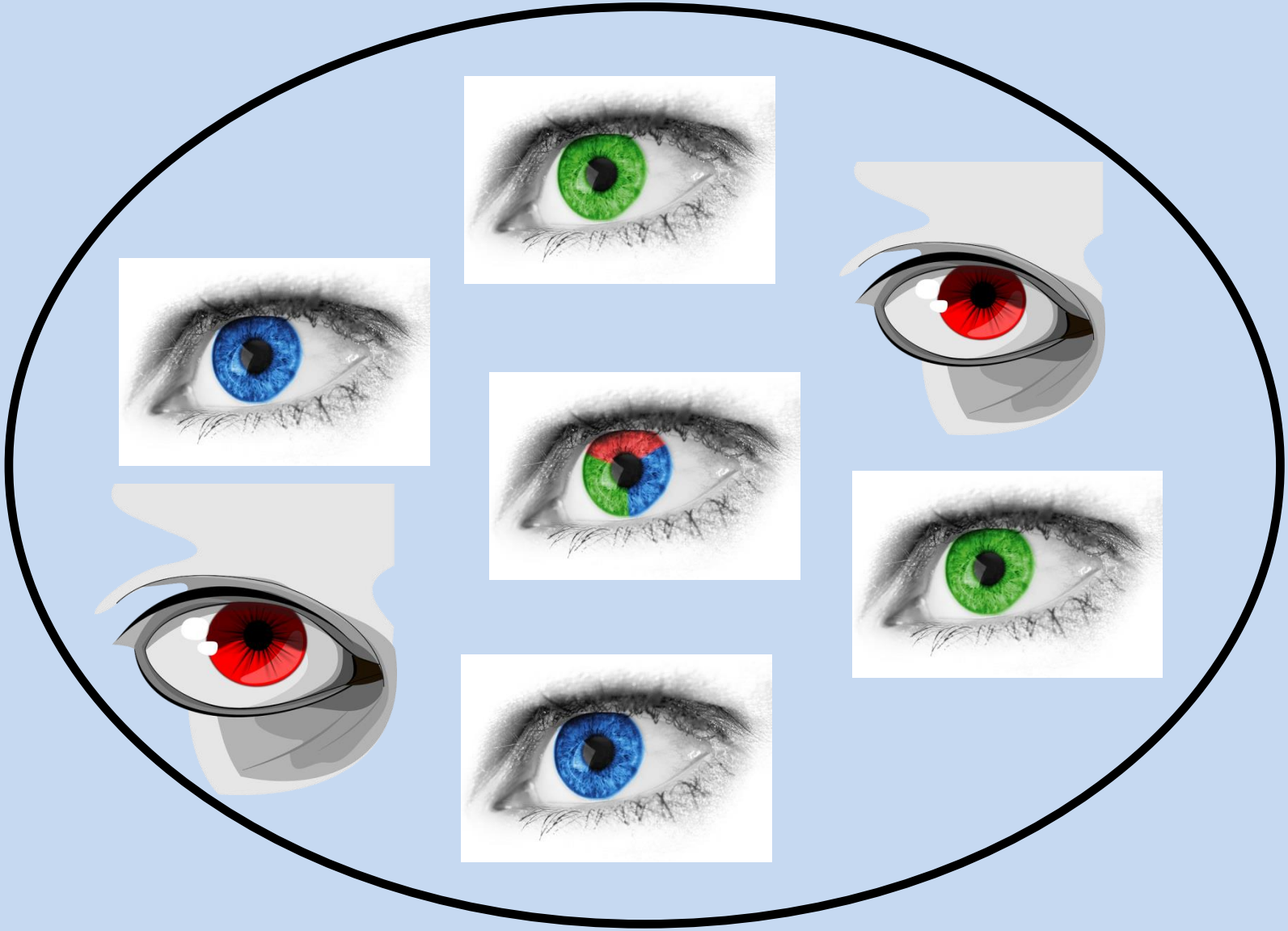
Ergebnis: Ein möglicher Beobachter beobachtet eine mögliche Tasse

Bewusstsein ist nichtmateriell

Wigners Freund

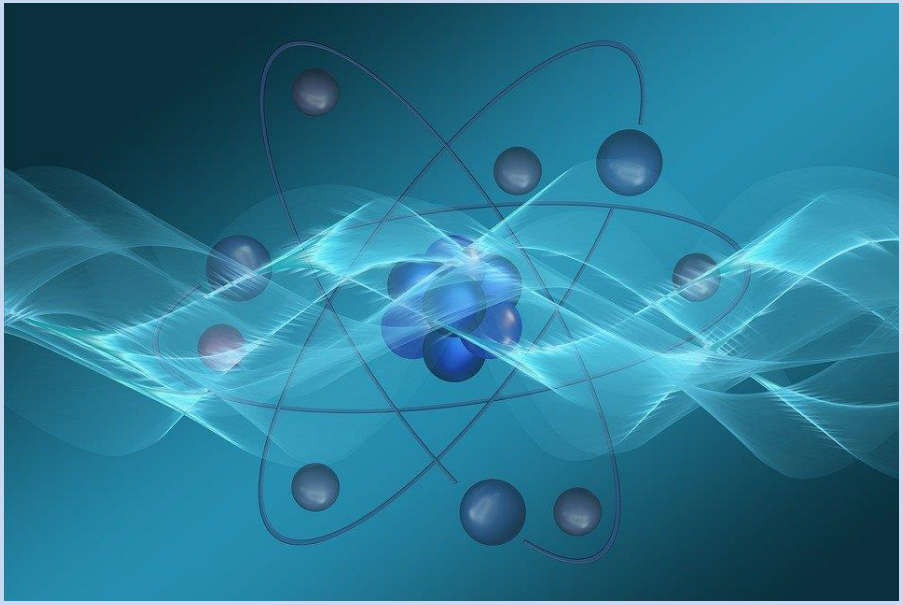


Das eine Quantenbewusstsein
(ein alle „Ichs“ vereinendes Bewusstsein)



Die „Trinität“ der Quantenphysik

Immaterielle Quantenwellen



Quantenbewusstsein =
Ein umfassendes Bewusstsein

Immanentes Bewusstsein = Gehirn-Geist

Die Trinität

Vater = Immaterielle Quantenwellen

Heiliger Geist = Quantenbewusstsein

Sohn = Immanentes Bewusstsein (Gehirn-Geist)

Joseph Ratzinger über Quantenwellen

„E. Schrödinger hat die Struktur der Materie als ‘Wellenpakete’ definiert …

… er bleibt ein erregendes Gleichnis …für ***das … Akt-Sein Gottes, und dafür, dass das dichteste Sein – Gott – allein in einer Mehrheit von Beziehungen, die nicht Substanzen, sondern nichts als ‘Wellen’ sind, bestehen …“***

Was bedeutet Heiliger Geist (das eine Quantenbewusstsein)?

- Kontinuierlicher Schöpfungsprozess

Psalm 104, 29,30: „Du nimmst weg ihren Odem, so vergehen sie und werden wieder zu Staub. Du lässest aus dein Odem, so werden sie geschaffen, und du erneuerst die Gestalt der Erde“

- Gott ist Geist

- Gott ist nicht nur transzendent, sondern auch immanent

  - 1. Korinther 6,19 : “Oder wisst ihr nicht, dass euer Leib ein Tempel des Heiligen Geistes ist, der in euch ist …“

  - Theresa von Avila:
    Beschreibung des Menschen als Innere Burg – Wohnung Gottes

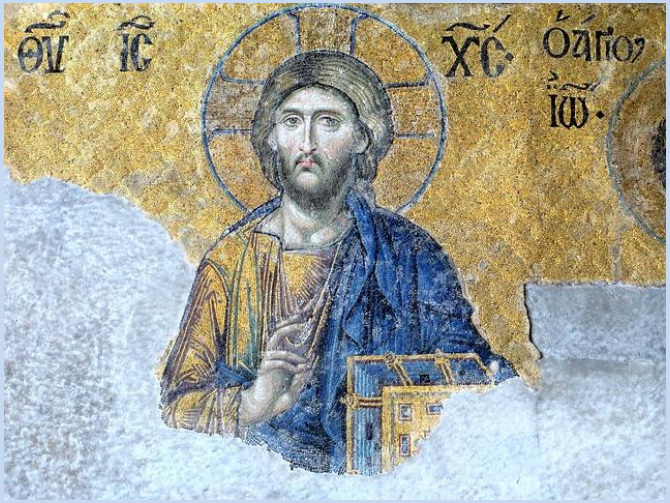
Was bedeutet Sohn?

Mensch:

- *„Vater unser …“*

- *Galater 4,6-7*

„ Daher bist du nicht mehr Sklave, sondern Sohn; … “



Jesus:

- *Johannes 10,30*
  „Ich und der Vater sind eins.“

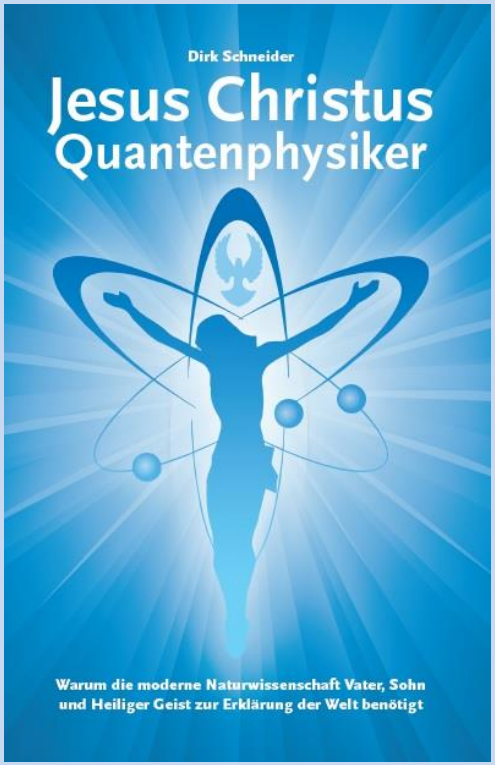
- Johannes 14, 8
  „Wer mich sieht, der sieht den Vater.“

- Lukas 22, 59-62
  Die Verleugnung des Petrus
  -> Zeitliche Distanz = 0 = Ewigkeit

- Matthäus 8, 5-13
  Der Hauptmann von Kapernaum
  -> Räumliche Distanz = 0 = Allgegenwart

Weitere Themen:

- Was bedeutet Ewigkeit?
- Was bedeutet Allgegenwart?



Werner Heisenberg:
„Der erste Trunk aus dem Becher der Naturwissenschaft macht atheistisch; aber auf dem Grund des Bechers wartet Gott.“

Kontakt: schneider_dirk@web.de

Hochschule für
Wirtschaft und Umwelt
Nürtingen-Geislingen

Anwendungen von künstlicher Intelligenz in der Praxis

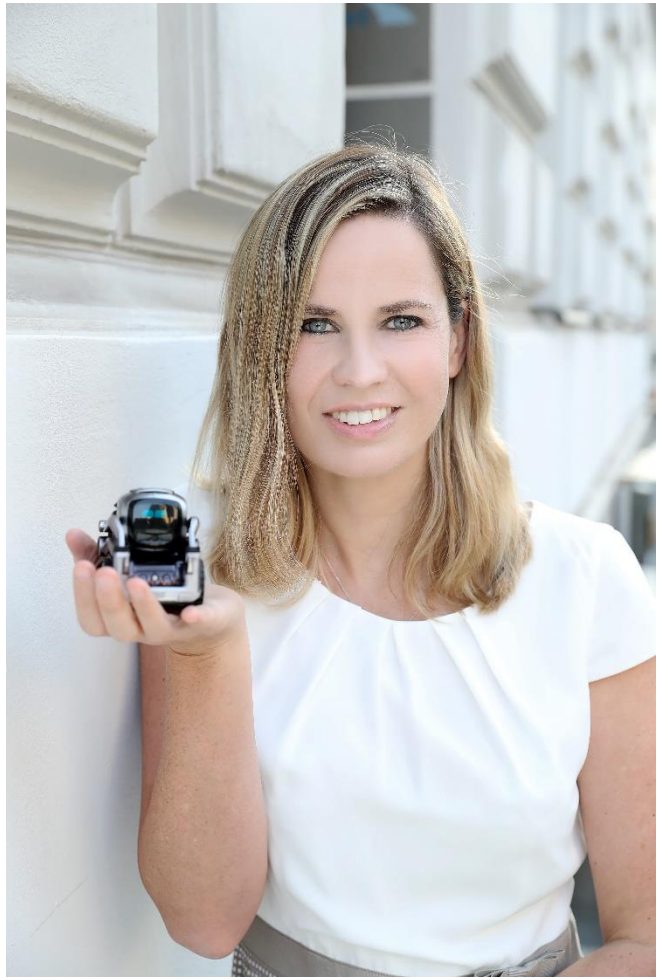
4er Internationaler Dienstleistungskongress

Julia Lehmann

Gründerin OnFore

München, 12. November 2020

Kurzvorstellung



- Gründerin von Socialware, einem der ersten Anbieter für Social Media Monitoring in Deutschland und dem OnFore Innovation Lab.
- OnFore hilft Kunden mit der strategischen und technischen Entwicklung von digitalen Geschäftsmodellen und Produkten mit Schwerpunkt in den Bereichen KI and Cognitive Computing.
- Mehr als 100 Digital Projekte für Unternehmen aus allen Branchen, auch DAX 30.
- Seit 2019 Dozentin für Digital Marketing & Management (MBA) an der Universität für Hochschule für Wirtschaft und Umwelt in Nürtingen-Geislingen (HfWU)
- Advisor bei Citibeats, einem Startup für ethische KI

#ai #bigdata #digital #marketing #digitaltransformation #change #strategy #crm #ecommerce #analytics #customerexperience #cx #customercare #blockchain #socialmedia #onlinemarketing #chatbot #development #ethics

OnFore, Ein Test Lab für digitale Innovationen

Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen

CONSULTING

- DIGITAL STRATEGY
- CUSTOMER EXPERIENCE
- DESIGN THINKING
- PROBLEM SOLVING
- PROTOTYPING
- TECHNOLOGY CONSULTING

CUSTOM SOFTWARE DEVELOPMENT

- ENTWICKLUNG SAAS APPLIKATIONEN
- PLATFORM DEVELOPMENT
- NEAR-SHORE DEVELOPMENT
- BUILD DIGITAL UNITS

BLOCKCHAIN DEVELOPMENT

- SMART CONTRACTS
- TOKENIZATION
- PRODUCT DESIGN
- SOLUTION BUILD AND IMPLEMENTATION
- TRANSFORMATION
- PAYMENTS

AI SOLUTIONS

- ARTIFICAL INTELLIGENCE
- COGNITIVE SOLUTIONS
- SMART SEARCH
- IoT
- CHATBOTS

EXAMPLES OF APPLIED TECHNOLOGIES

IBM WATSON · Microsoft Cognitive Services · TensorFlow · elastic · citibeats · bitshares · EOS

Die richtige Datenstrategie als Basis für erfolgreiche Projekte

Herausforderungen der Digitalisierung

Vielzahl an Kundenberührungspunkten

Datensilos

Mindset

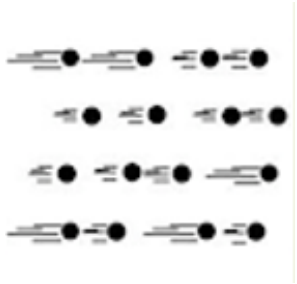
Große Daten Mengen „Big Data“

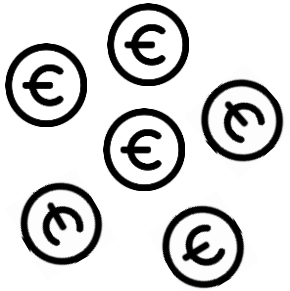
Algorithmen und Analysen

Vertrauen und Security

Die 5 V's von Big Data

Big Data unterstützt die wirtschaftlich sinnvolle Gewinnung und Nutzung entscheidungsrelevanter Erkenntnisse aus qualitativ vielfältigen und unterschiedlich strukturierten Informationen, die einem schnellen Wandel unterliegen und in bisher ungekanntem Umfang zu Verfügung stehen.





Volume

Anzahl von Datensätzen und Files

Variety

Daten Vielfalt

Velocity

Daten Geschwindigkeit

Veracity

Wahrhaftigkeit der Daten „Data in Doubt"

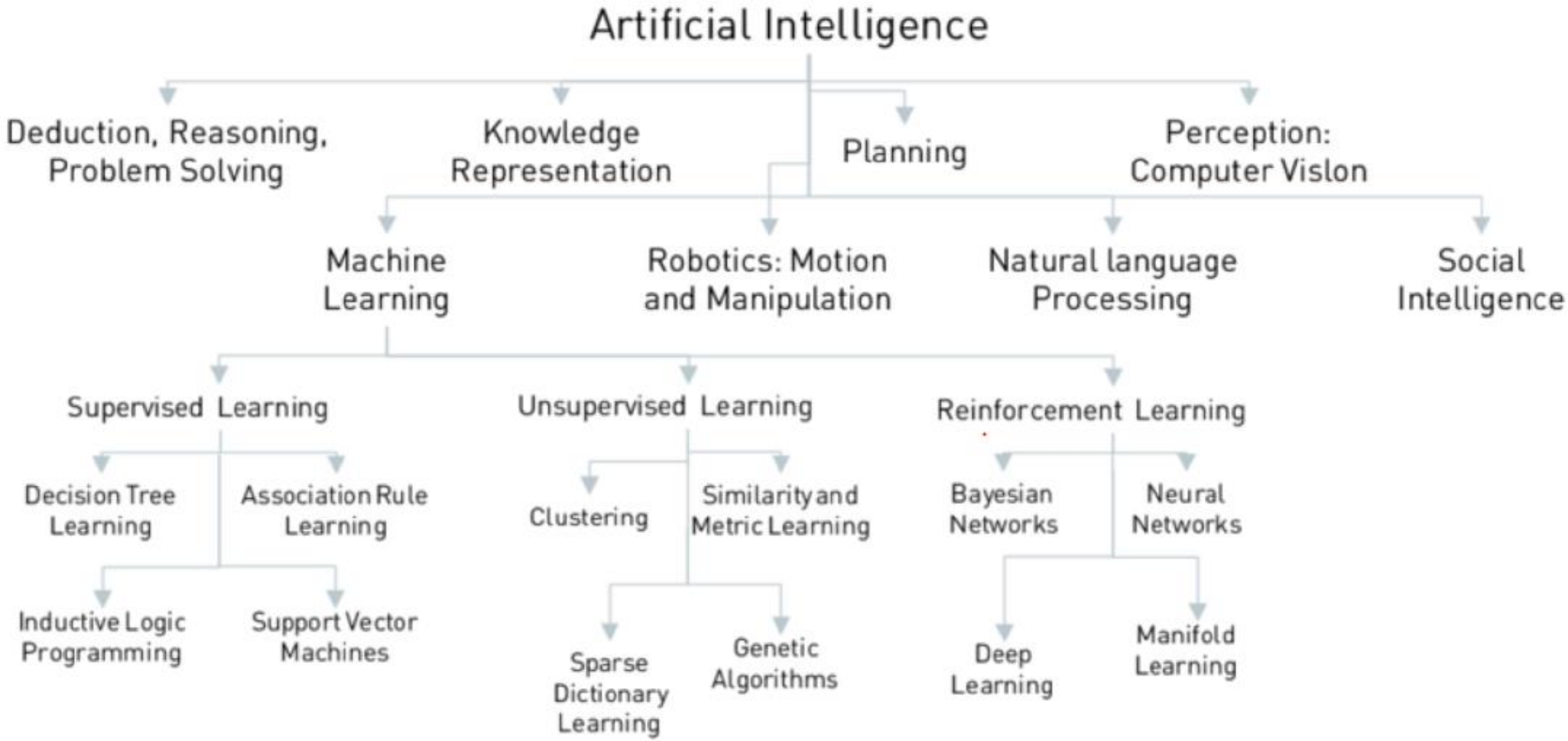
Value

Mehrwert, der durch Analysen generiert wird

Quelle Bitkom: Big Data im Praxiseinsatz – Szenarien, Beispiele, Effekte

Entmystifizierung der Künstlichen Intelligenz

KI Disziplinen

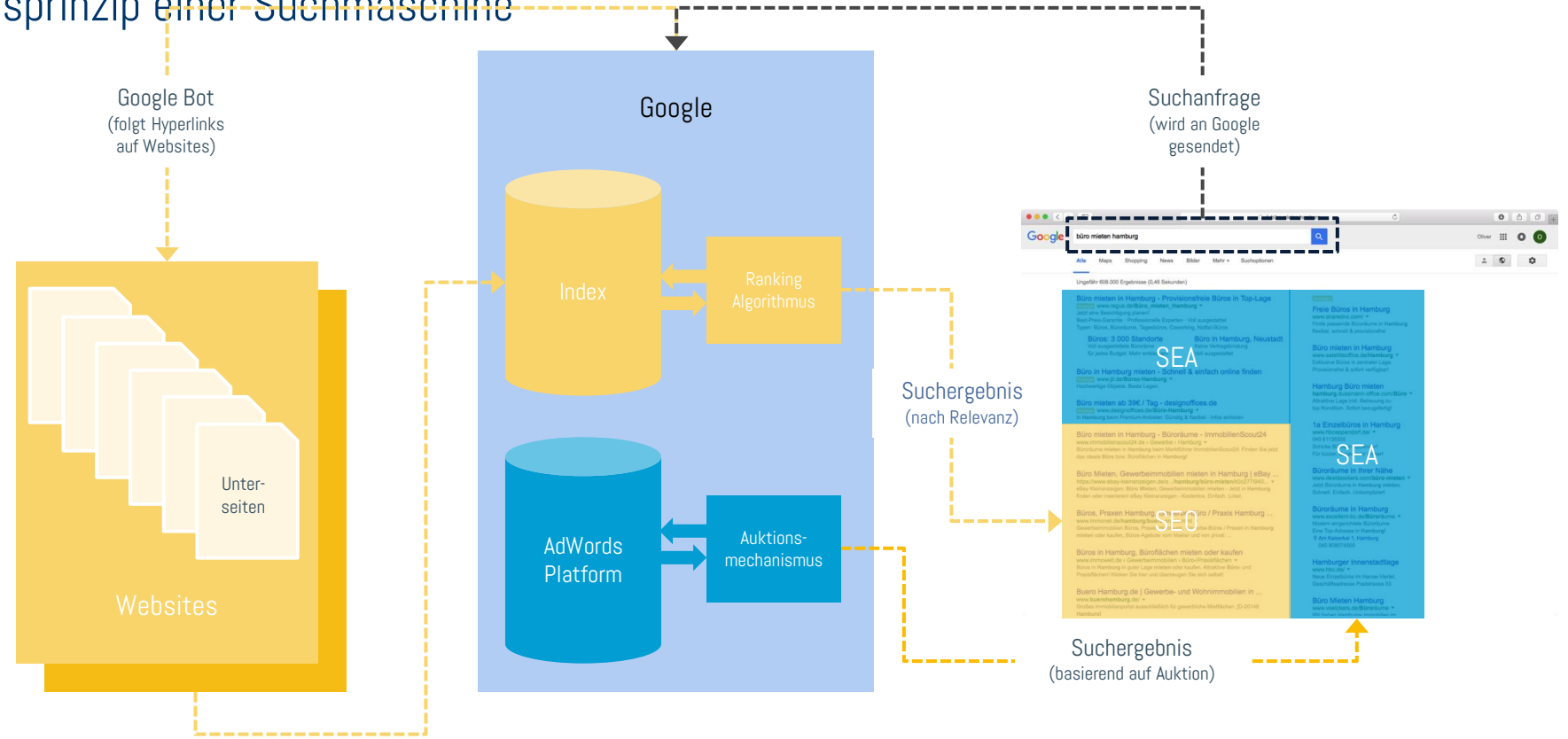


“Basically, our goal is to organize the world’s information and to make it universally accessible and useful.”

Larry Page (Google)

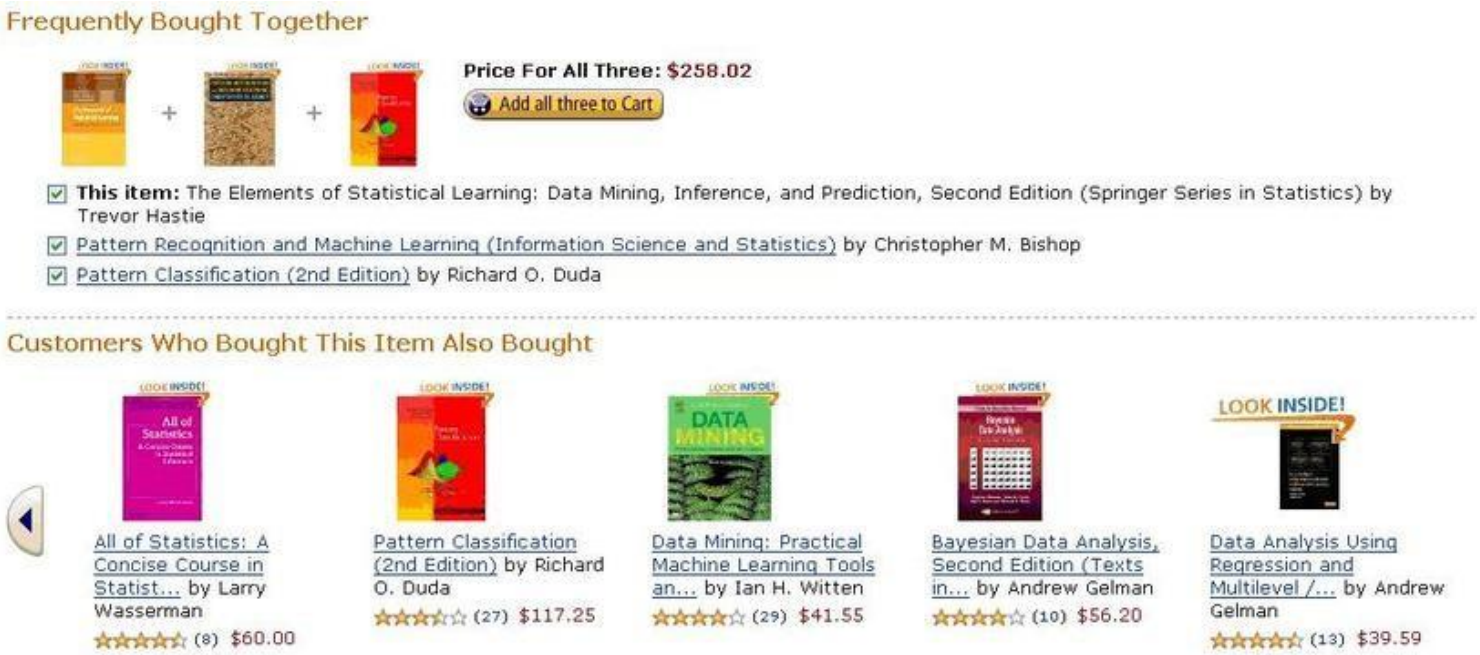
Künstliche Intelligenz ist im Alltag angekommen

Das Funktionsprinzip einer Suchmaschine



Amazon Empfehlungen

Recommender Engines

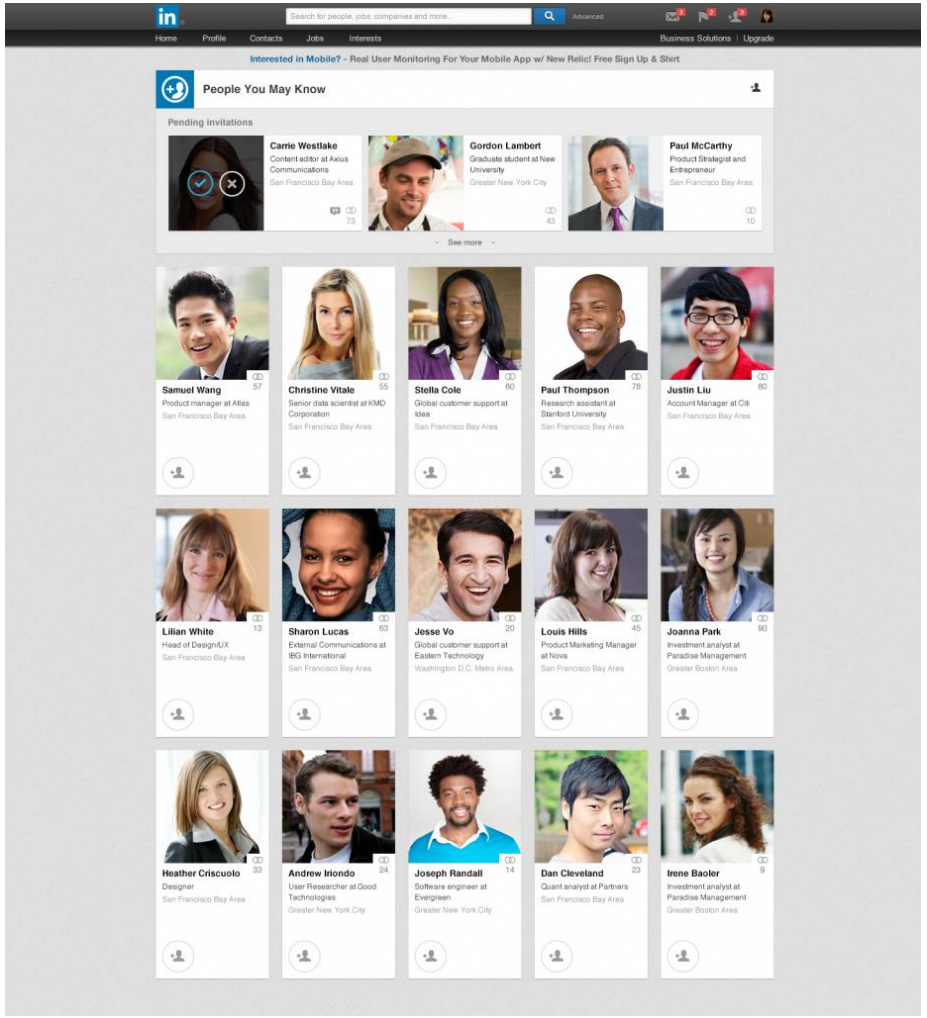


Einen großen Beitrag zu Amazons enormen Umsatzwachstum haben erfolgreich implementierte Empfehlungssysteme innerhalb der gesamten Buying Experience geleistet – von Product Discovery bis hin zum Checkout.

Netflix Filmempfehlungen

Mehr als 80% aller über Netflix angeschauten Serien werden über die Empfehlungssysteme der Plattform gefunden.

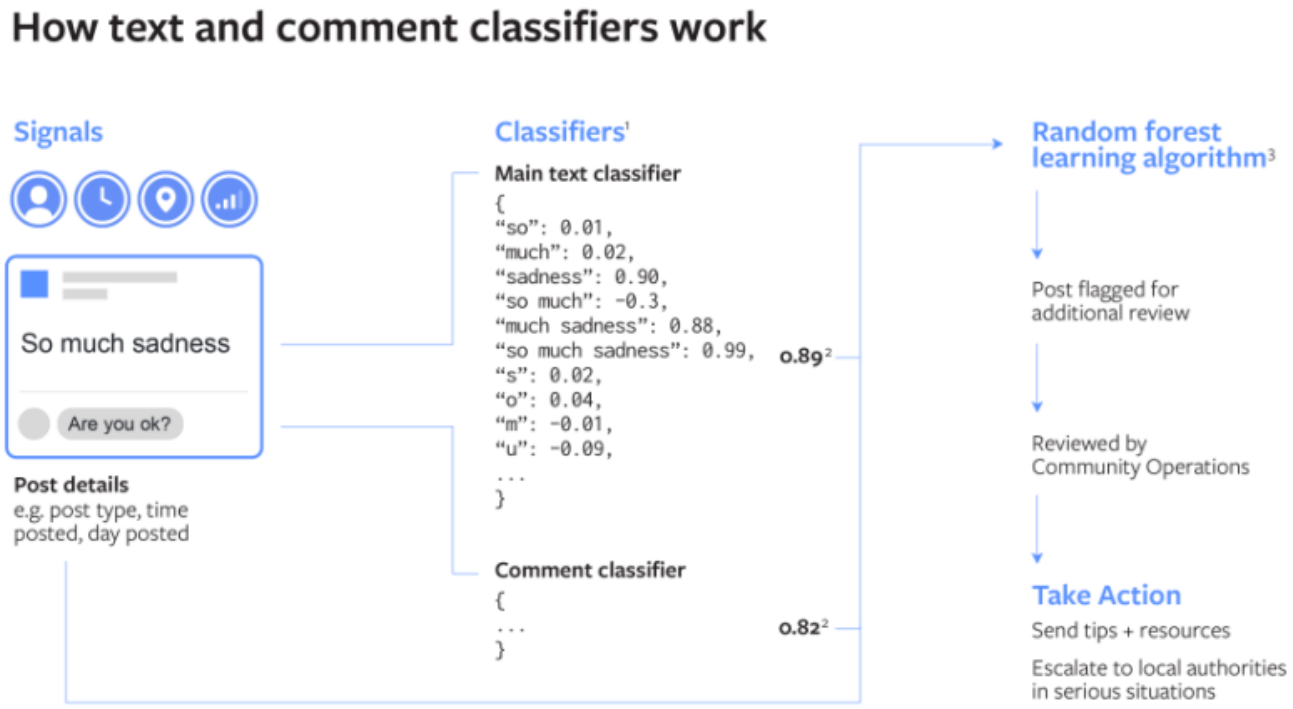
Collaborative Filtering bei Linkedin



LinkedIn macht intensiven Gebrauch von objektbezogenem Collaborative Filtering.

Beispielsweise wird auf jeder Mitgliedsseite auf Linkendin ein "People Who Viewed This Profile Also Viewed" Empfehlungsmodul angezeigt.

Von Facebook Edge Rank zu ML



CHANCEN VON CHATBOTS ZU CORONA ZEITEN

Herausforderung

Schnelle und korrekte Beantwortung von großen Mengen an Anfragen zum Thema Corona und neuen Maßnahmen

Ergebnis

- Unterstützung bei der Krisenkommunikation von Regierungen, Ämtern und Behörden
- Entlastung von Service Hotlines
- 24/7 Verfügbarkeit
- Multi-channel Zugang
- Voice und Text services in vielen verschiedenen Sprachen
- Volle Datenkontrolle
- Alle zuverlässigen und **aktualisierten**

Datenquellen an einer Stelle:

European Commission · tagesschau · Robert Koch Institut · Bundesministerium für Gesundheit · World Health Organization

Hochschule für
Wirtschaft und Umwelt
Nürtingen-Geislingen

Kontakt:

julia@OnFore.com
Twitter: Lajuli1982
Linkedin: OnFore

Danke für Ihre Aufmerksamkeit!

intersoft consulting

Datenschutz, IT-Sicherheit und IT-Forensik: Wir halten Sie auf Kurs.

IT-Sicherheitsvorfälle forensisch aufklären

IT-Forensik in der Praxis

Svenja Mischur, M.Eng.
Senior Consultant IT-Forensik
M.Eng. IT-Sicherheit und Forensik, Kriminalkommissarin
GIAC Certified Forensic Examiner, GIAC Advanced Smartphone Forensics, GIAC Cyber Threat Intelligence

Adrian Klick-Strehl
Senior Consultant IT-Forensik und IT-Sicherheit
GIAC Reverse Engineering Malware, GIAC Certified Forensic Examiner, GIAC Penetration Tester
ISO/IEC 27001 Practitioner - Information Security Officer

Grundlagen

1. Was ist IT-Forensik
2. Arbeitsfelder der IT-Forensik
3. Ursachen für IT-Sicherheitsvorfälle
4. Aufklären eines IT-Sicherheitsvorfalls

IT-Forensik

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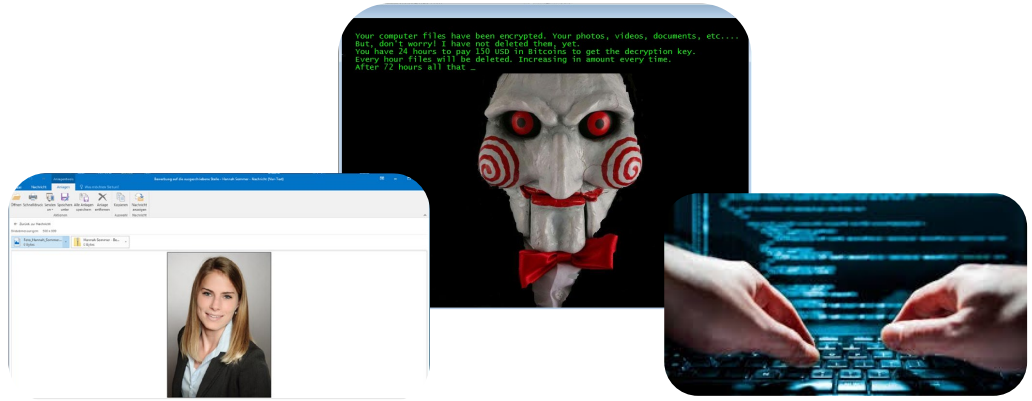
Klassische Forensik

IT-Forensik



Wofür braucht man IT-Forensik

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- Ermittlung des Täters
- Aufklärung des Tathergangs
- Erkennung von Sicherheitslücken
- Optimierung der IT-Sicherheit
- Nach einem Vorfall:
  Sicherer Normalbetrieb

Ablauf einer IT-forensischen Analyse

intersoft consulting

1. Beweissicherung		
Aufnahme der Geräte	Erstellung der Masterkopie	Erstellung der Arbeitskopie

2. Beweisermittlung		
Vorbereitende Maßnahmen	Datenanalyse	Funde verifizieren

3. Berichtserstattung		
Aufklärung des Sachverhalts	Ermittlung des Täters	Gerichtsfestes Gutachten

Grundlagen

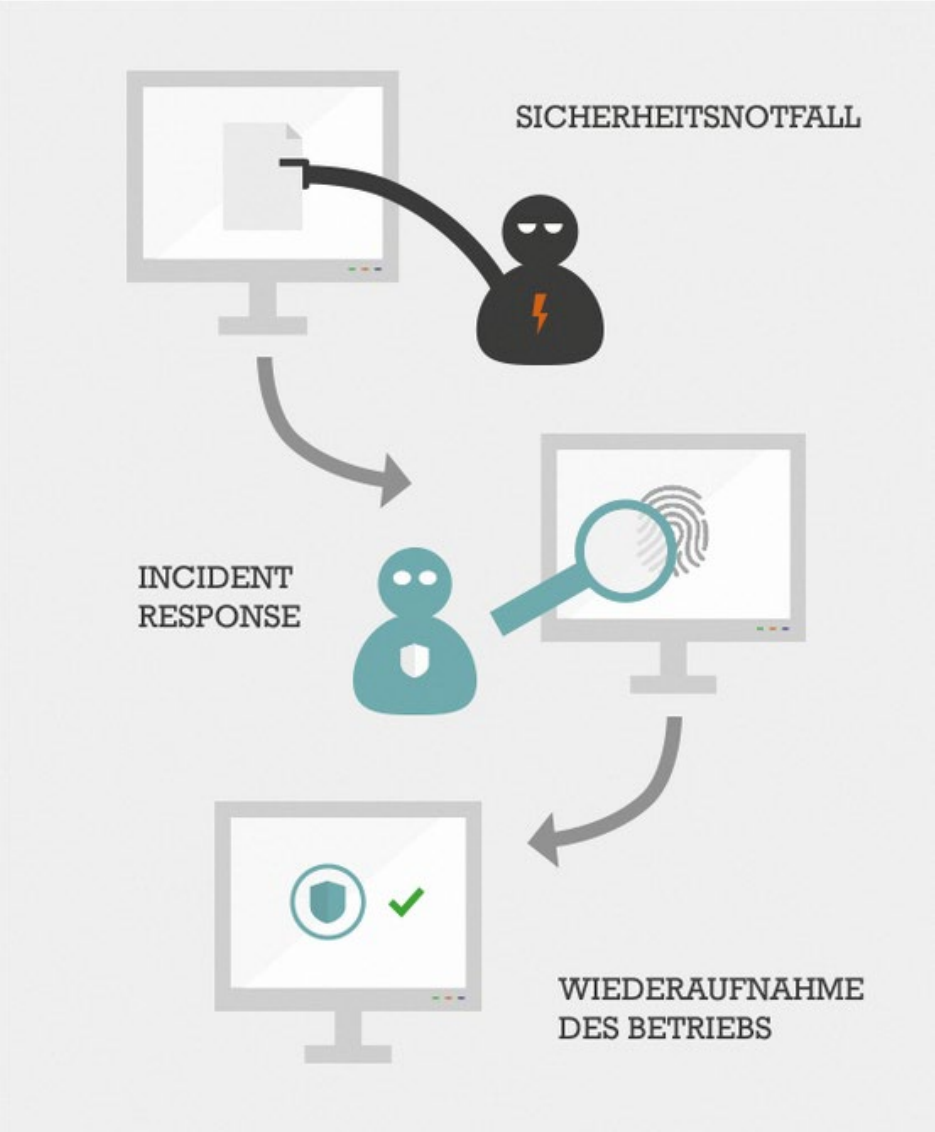
1 Was ist IT-Forensik

➔ 2 Arbeitsfelder der IT-Forensik

3 Ursachen für IT-Sicherheitsvorfälle

4 Aufklären eines IT-Sicherheitsvorfalls

Incident Response



Sofortige Reaktion auf IT-Sicherheitsvorfall

Bestandsaufnahme

- Welche System sind vorhanden
- Wer ist involviert
- Was ist bis jetzt bekannt

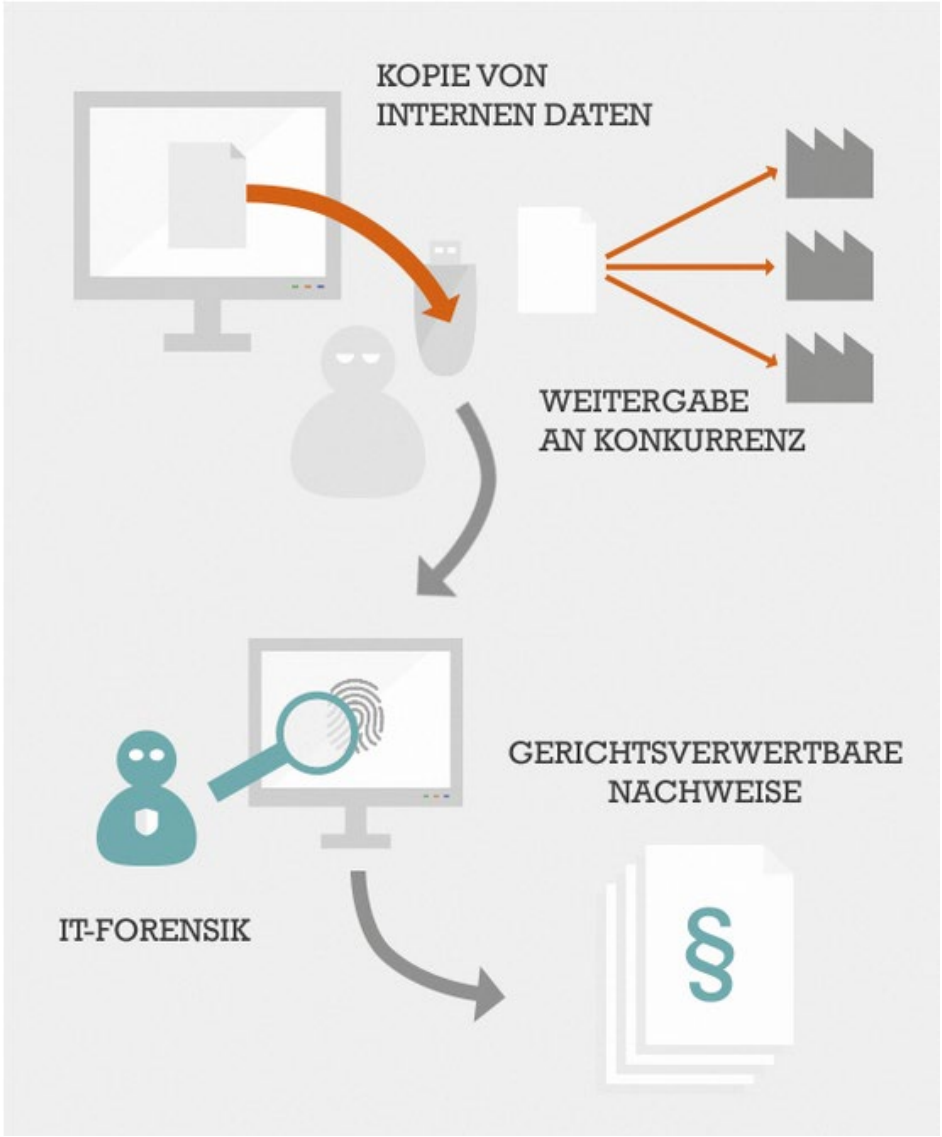
Entwicklung von Maßnahmen

- Isolation der Systeme
- Spurensuche
- Benachrichtigungen

Rekonstruktion des Vorfalls

Datendiebstahl

- Mitarbeiter kopiert vertrauliche Unternehmensinformationen
- Bewirbt sich bei der Konkurrenz
- Enormer wirtschaftlicher Schaden für Ihr Unternehmen
- IT-Forensiker ermitteln den Täter
- Spuren werden gerichtsfest gesichert, analysiert und dokumentiert
- Ggf. Verwendung für ein späteres Verfahren



Weitere Felder der IT-Forensik

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- Mobile Forensik: Tablets & Smartphones
- Netzwerkforensik
- Malware Analysen
- Workstation und Server
- Aktuelle Entwicklungen
  - Internet of Things
  - Car Forensik
  - Smart Home / Smart Devices
  - Drohnen Forensik

Grundlagen

1 Was ist IT-Forensik

2 Arbeitsfelder der IT-Forensik

➔ 3 Ursachen für IT-Sicherheitsvorfälle

4 Aufklären eines IT-Sicherheitsvorfalls

Beispiel Buchbinder

- 10 Terabyte
- Backup-Server falsch konfiguriert (SMB)
- Kein Passwort notwendig
- Ähnliches Beispiel:
  - Arztpraxen in der Vergangenheit
  - Fehler in der Firmware des Telekomrouters „Digitalisierungsbox Premium“

Digitalisierungsbox Premium

Perfekt für den Umstieg auf den IP-basierten Anschluss: Business Router und integrierte Business Telefonanlage.
Dieses Kommunikationssystem bündelt Business-Telefonie, VPN-Router, VDSL-Vectoring-Modem und WLAN-Access-Point in einer Box. Damit läuft Ihre komplette Sprach- und Datenkommunikation über ein Gerät – und Ihre vorhandenen Telefone können weiter genutzt werden.

Downloads

Bezahlmodell : Kaufen

Mieten | Kaufen

249,95 €
einmalig (netto)

Daten-Leak bei Autovermietung Buchbinder: 3 Millionen Kundendaten offen im Netz

Bild: Albert Hulm / c't

Christian Wölbert, Hartmut Gieselmann, Joerg Heidrich, Ronald Eikenberg 22.01.2020

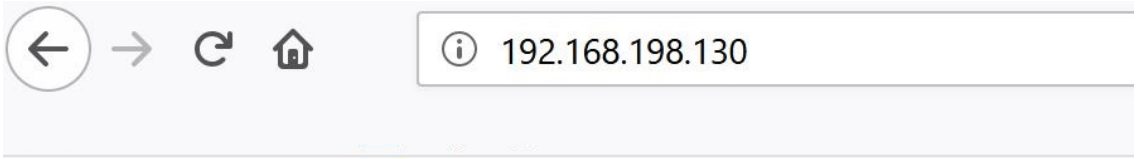
Autovermietung, Buchbinder, cyberscan.io, Datenleck, Datenschutz, DSGVO, SMB

10 Terabyte sensibler Kundendaten der Autovermietung Buchbinder waren wochenlang für jedermann im Netz zugänglich. Betroffen sind auch Kunden anderer Mietportale.

Fehlerquellen

- Fehlkonfiguration
  - Software
  - Firewall
- Sicherheitslücken in Softwareprodukten
- Benutzerverwaltung
  - Rechte zu großzügig verteilt
  - Schwache Passwörter und schlecht gesicherte Zugänge
- Schlechtes Netzwerkdesign
  - Backups aus dem Internet erreichbar
  - Keine Trennung von Netzwerken

Fehlkonfiguration: Webdirectory



Index of /

Name	Last modified	Size	Description
Backup/	2020-01-17 12:39	-	
Finanzen/	2020-01-17 12:39	-	
Fotos/	2020-01-17 12:39	-	
Personal/	2020-01-17 12:39	-	

Apache/2.4.29 (Ubuntu) Server at 192.168.198.130 Port 80

Index of /Backup

Name	Last modified	Size	Description
Parent Directory		-	
Datenbanken/	2020-01-17 12:39	-	
Windows_Server/	2020-01-17 12:39	-	

Apache/2.4.29 (Ubuntu) Server at 192.168.198.130 Port 80

Grundlagen

1 Was ist IT-Forensik

2 Arbeitsfelder der IT-Forensik

3 Ursachen für IT-Sicherheitsvorfälle

➔ 4 Aufklären eines IT-Sicherheitsvorfalls

Beispiele

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Ransomware

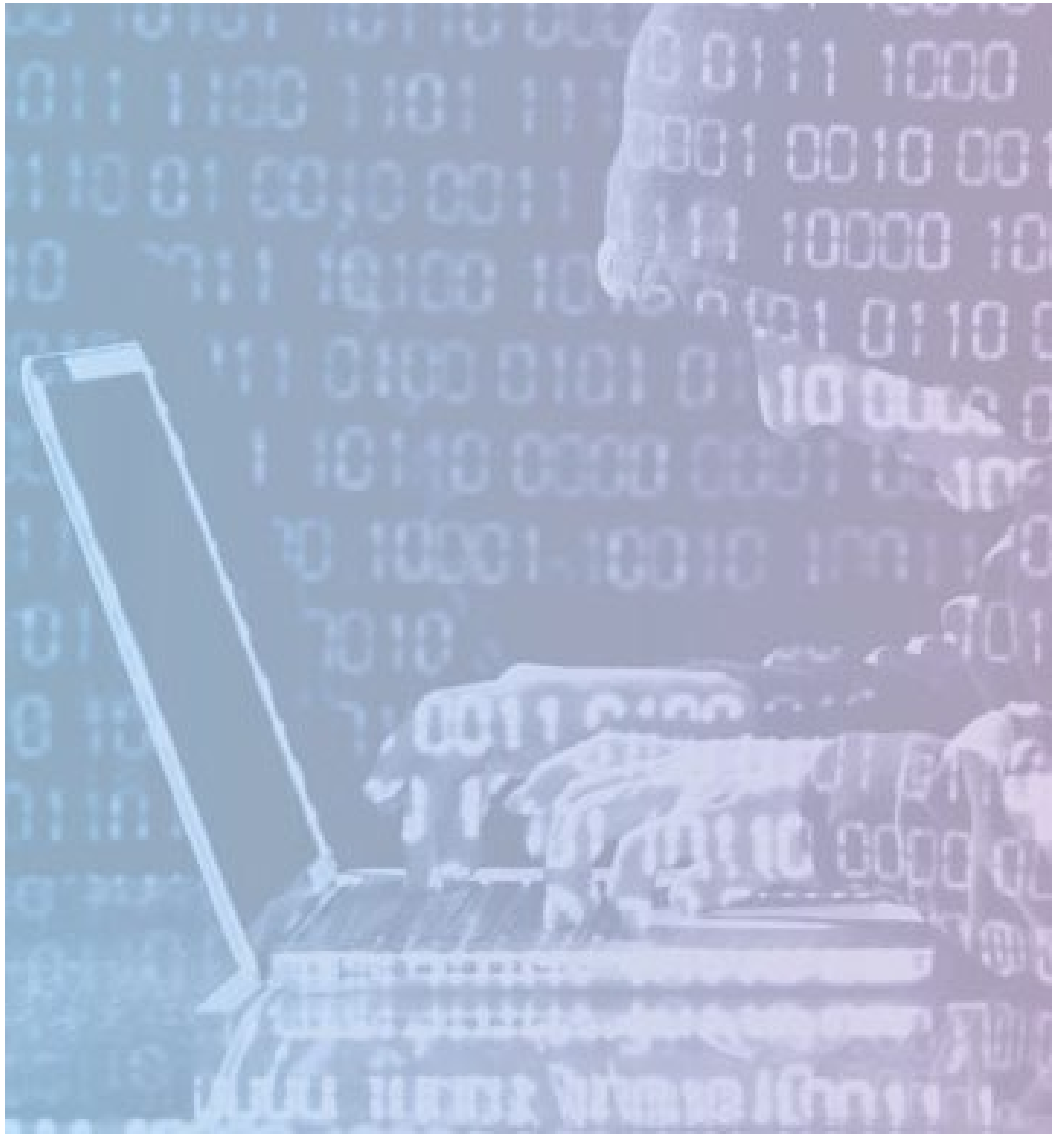
- Emotet bzw. Ryuk
- Verbreitung auch meist via Mail

Remote Desktop Protokoll

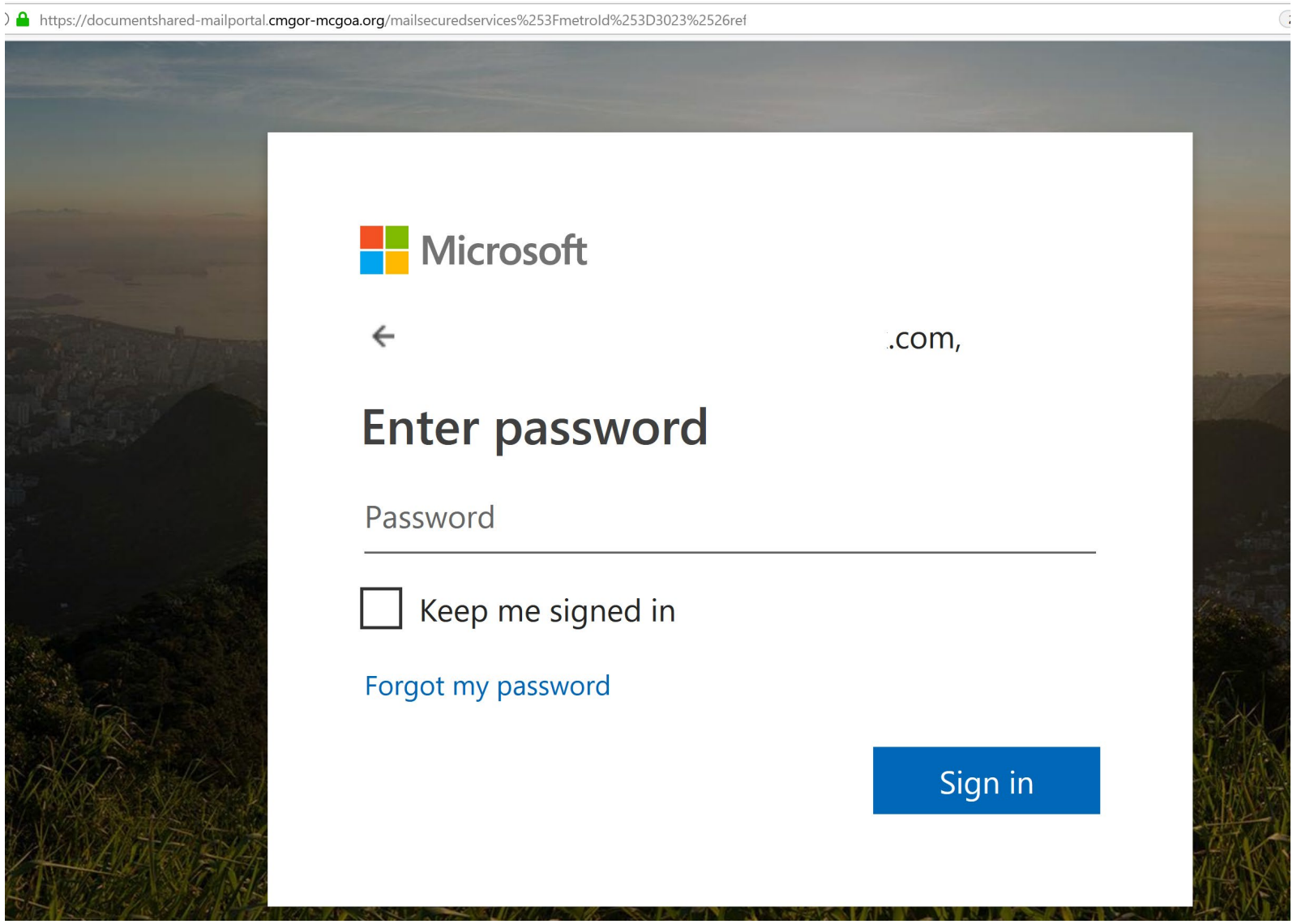
- Aus dem Internet erreichbar
- Brute-Force Angriff

Microsoft Office 365 Account

- Zugangsdaten via Phishing abhandengekommen
- Ausspionieren des Mailverkehrs
- Letztendlich kommt eine Zahlungsaufforderung



Phishing Website



Nachweis im Browserverlauf

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ÜBEREINSTIMMENDE ERGEBNISSE (13 von)

Spaltenansicht

URL	Zuletzt besu...	Titel	Besu...	Geti...	Quelle
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Account Verified	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Account Verified	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	3	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	3	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	3	0	
https://messages-outlook-held.ademayem.co.id/hel...		Sign in to your Microsoft account	1	0	
https://messages-outlook-held.ademayem.co.id/hel...		Account Verified	3	0	
https://messages-outlook-held.ademayem.co.id/hel...		Account Verified	1	0	

https://messages-outlook-held.ademayem.c...

DETAILS

ARTEFAKTINFORMATIONEN

URL **https://messages-outlook-held.ademayem.co.id/held_messagessecured_release%25253Fmetrold%25253D3023%252526ref%25253D9472%252526cmpid%25253Dem_Email2019%**

Zuletzt besucht – Datum/Zeit

Titel **Sign in to your Microsoft account**

Besuchsanzahl **1**

Getippte Anzahl **0**

Spuren auf Windows Systemen

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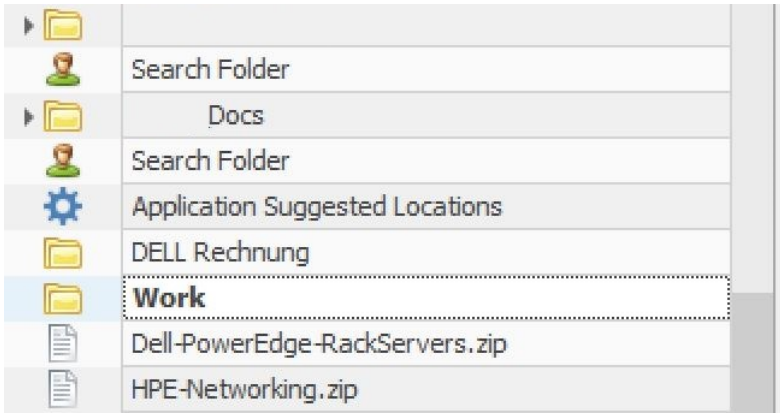
Quellen:

- Zentrale Registrierungsdatenbank „Registry“
- Dateisystem
- Systembedingte Datenbanken

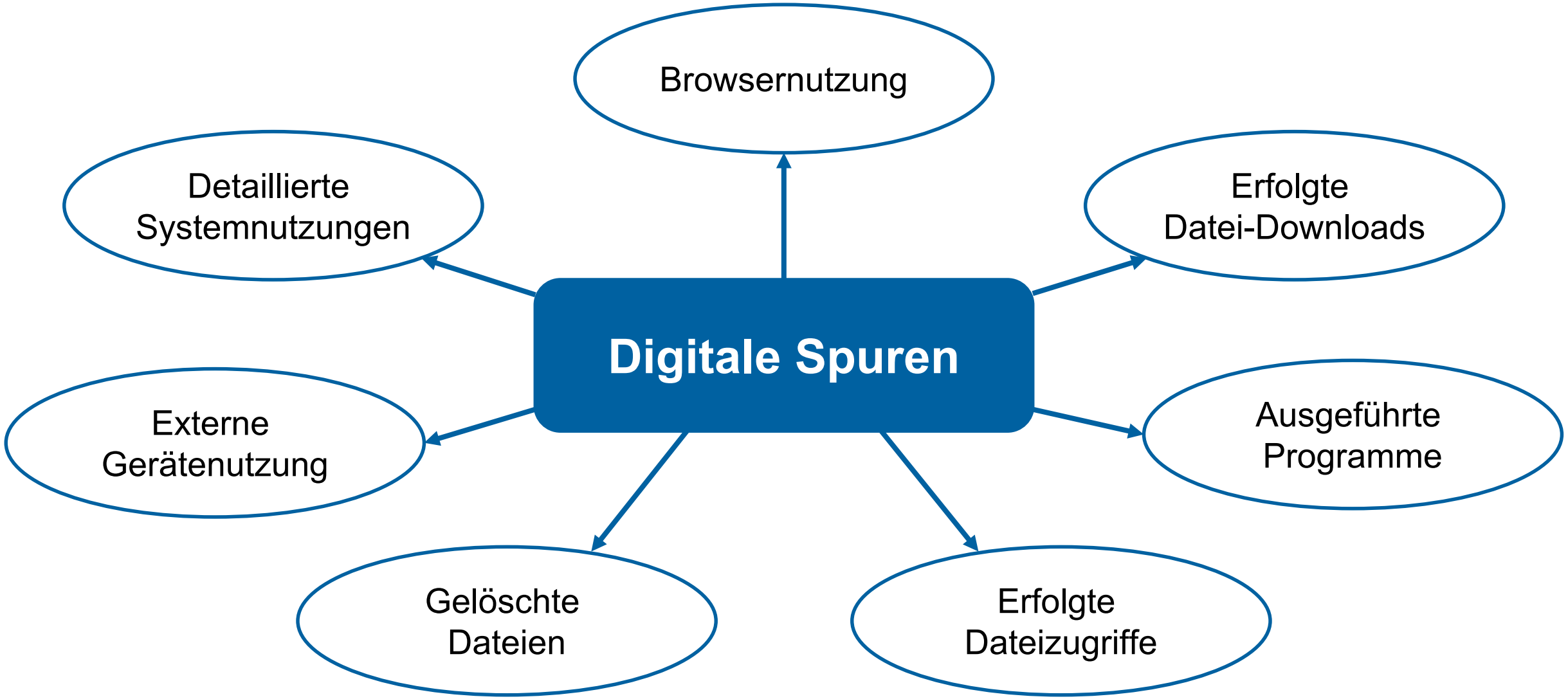


Name: Work
Absolute path: Desktop\Work
Key-Value name path: BagMRU-24

Target timestamps
Created on: 2018-06-04 11:41:18.000
Modified on: 2018-06-04 11:41:30.000
Last accessed on: 2018-06-04 11:41:30.000

Extension	Value Name	Mru Position	Absolute Path	Opened On
*	1	0	My Computer\C:\Users\ \Desktop\ubuntu-mate-18.04.1-desktop-amd64.iso	2019-01-22 08:55:59
iso	0	0	My Computer\C:\Users\ \Desktop\ubuntu-mate-18.04.1-desktop-amd64.iso	2019-01-22 08:55:59
vmx	0	0	My Computer\C:\VMWare-Machines\ \ se.vmx	2019-01-14 09:08:52

Nachweis digitaler Spuren



Tätigkeiten der Forensiker

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- Sichern von Beweisen
- Auswerten der Spuren
- Erstellen von Zeitleisten
- Verknüpfung der einzelnen Spuren zu realen Handlungen des Täters
- Darstellen der Ergebnisse
- Handlungsvorschläge erarbeiten

Fragen?

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Vielen Dank für Ihre Aufmerksamkeit.

Gern stehen wir Ihnen für Fragen zur Verfügung.

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www.datenschutzbeauftragter-info.de/newsletter

When presents meets past

How we managed in Paraguay to participate as a valuable partner in an international research

01

OUR COOPERATION

02

KEY NUMBERS

03

CHALLENGES

04

ACCOMPLISHMENT

01

OUR COOPERATION

OUR COOPERATION

THE COOPERATION PARTNERS

	Research Experiance X>5years	Intern. Coop. Experiance	Profs.with reserach skills	Publishing background	Research goals
UCA	X	X	X	-	-
University AMERICANA	-	X	X	-	-

Nat

Nat

OUR COOPERATION

What we do together

Current and past activites:

- Building up a international relationships
- Opening our network to national interested participants
- Coordination the first inter-institutional cooperation in international research in Intuition
- Providing free of charge capacitacions for students and interested academics

OUR COOPERATION

What we aim to accomplish

Excelence in execution

We aim to acomplish an international level of excelence in our execution

Academic working

Establishing the academic way of working as a well representeted way of working

Quality standards

By the end of 2021 we want to set standards for the quality in academic research for Paraguay

Founding a research Center

By 2022 we want to build the frist indipendend research center in Paraguay

02

KEY NUMBERS

KEY NUMBERS

First hand impression on our basic work

23%

Return rate of
questionairs and surveys

52

TOTAL
Usable returns

22%

Graduation studentes who are interested in an carrer as a Reseracher

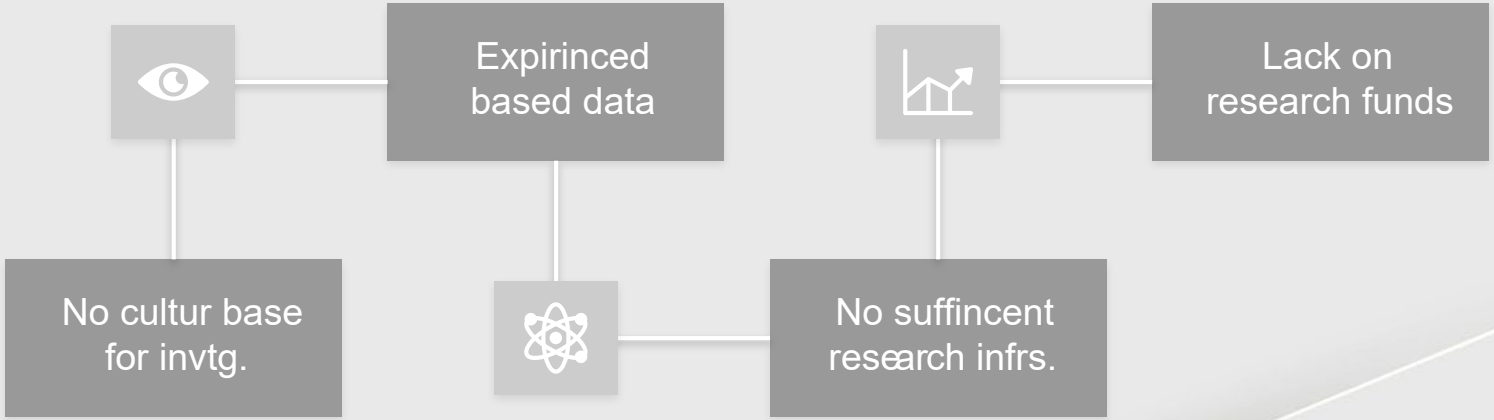
UCA 2019

03

CHALLENGES

CHALLENGES

The main obstacals are deep in the roots



04

ACCOMPLISHMENT

ACCOMPLISHMENT

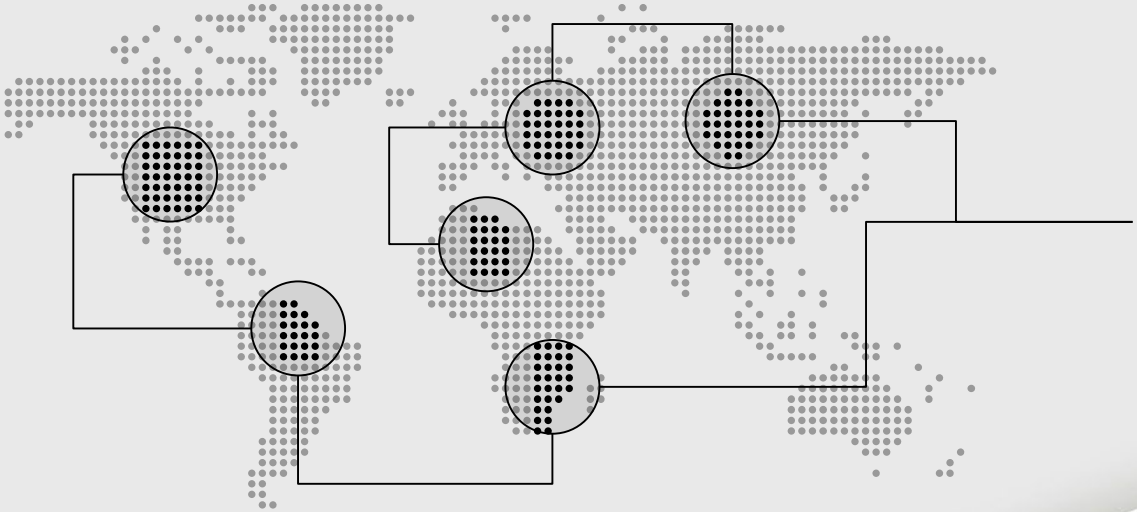
Proud of little steps

90%

We reached all presetted goals and just wait for the final analisis

ACCOMPLISHMENT

Network for a better future



Partnering Countries

We have gained access to established Universities and we are looking forward to get into partnerships with them in the next step.

THANKS

Do you have any questions?

Simon Zalimben
Thorben Stemme

Deine Intuition und Du ein unschlagbares Team

Vortrag Sabine Hoffmann, 12. November 2020

Intuition ist angeboren

Die Intuition ist ein unsichtbares, kraftvolles Werkzeug und wird manchmal auch als 7. Sinn oder Bauchgefühl bezeichnet.

Sie zu beschreiben ist schwierig, da Intuition etwas sehr Subtiles ist.

Intuition ist angeboren

Mit der Intuition verhält es sich wie mit der Kunst oder der Sprache. Manchen fällt es leicht zu malen oder Sprachen zu lernen. Andere wiederum brauchen viel Geduld und kommen trotzdem nicht voran.

Da Frauen im allgemeinen stärker in der Gefühlswelt unterwegs sind, fällt es ihnen oft leichter ein intuitives Leben zu führen. Männer hingegen brauchen eher eine Erklärung und Nahrung für den Verstand um Entscheidungen treffen zu können.

Intuition ist angeboren

Die Intuition ist ein wertvolles Hilfsmittel auf dem Lebensweg. Oft ohne sie zu spüren oder von ihr zu wissen, schlummert sie verborgen in den Tiefen der Seele. Unentdeckt wartet sie darauf, im Leben eingesetzt zu werden.

Manchmal spürt man diese geballte Kraft des menschlichen Urwissens innerhalb Sekunden. Die meisten Menschen müssen aber das bewusste Spüren erst erlernen. Es benötigt Zeit und Fleiß, um dieses „Organ“ zu entwickeln.

Intuition als Entscheidungshilfe

Wer kennt das nicht? Wir haben eine Vorahnung auf etwas das geschehen wird, doch hören wir nicht darauf…

Wir können es förmlich spüren, dass wir mit dem Auto gleich falsch abbiegen werden und doch tun wir es, weil uns der Ratio im Wege steht und uns das Vertrauen auf die innere Stimme fehlt. Und doch ist sie da. Wir müssen nur auf sie hören…

Intuitive Erfolgserlebnisse

Je mehr wir unsere Intuition trainieren, je mehr Erfolgserlebnisse wir haben wenn wir auf unsere Vorahnungen hören, um so mehr vertrauen wir auf sie…unsere Innere Stimme, ja unseren Kompass der uns den richtigen Weg zeigt.

Intuitive Erfolgserlebnisse

Ist die Intuition erst einmal erwacht und vertraut, kann man sie in vielen Situationen einsetzen. Entscheidungen können richtig gefällt werden, wenn sie durch intuitives Spüren und gründliches Überlegen analysiert sind. Es geht darum Hand in Hand, mit der Intuition und mit dem Kopf zu entscheiden.

Das höchste Potenzial wird erreicht, wenn Intuition und Gehirn in natürlichem Einklang zusammen arbeiten. Fehlt es dem rationalen Denken an Sicherheit, so kann die Intuition unterstützend zur Seite stehen und umgekehrt.

Intuitive Erfolgserlebnisse

Hören wir immer wieder bewusst auf unsere Intuition und erleben mehrere Erfolgserlebnisse, wird das emotionale, positive Empfinden im Unterbewusstsein abgespeichert.

Das wiederum sorgt für ein größeres Vertrauen in die eigene Intuition und den inneren Wegweiser und Entscheidungshelfer. Die intuitive Intelligenz ist nicht zu unterschätzen und was zunächst spielerisch geübt werden kann, wird später zu einem starken Partner…

Die intuitive Intelligenz

Egal ob in der Familie, im Beruf oder in der Freizeit– die Intuition kann ein zuverlässiger Begleiter in allen Lebenssituationen sein. Man stelle sich vor, man wacht auf und weiß, was der Tag für einem bereithält.

Man würde im Voraus die Einstellungen der Menschen fühlen und die richtigen Schritte unternehmen. Spüren des Nicht-Sichtbaren. Kennst Du das auch? Du denkst an jemand und schon ruft er an?

Personen und Situationen durchschauen

Ist die Intuition erstmal richtig entwickelt, kann uns niemand mehr etwas vormachen. Es ist, als würden wir uns mit unserem Gegenüber über die Aura oder das Energiefeld verbinden und wir spüren intuitiv, ob unser Gegenüber die Wahrheit spricht oder eben nicht. Intuitiv spüren wir bei einem Bewerbungsgespräch ob wir gut ankommen oder unerwünscht sind.

Oder wir wissen es schon direkt nach dem Gespräch, wie die Entscheidung ausfallen wird. Möglicherweise fühlen wir aber auch, dass wir nicht zu dem Team und der Umgebung passen und lehnen dankend ab. Dies ist nur eines von ganz vielen Beispielen und Lebenssituationen bei denen wir unsere Intuition gewinnbringend einsetzen können.

Maximierung unserer Lebens- und Erfolgspotentiale

Es ist ja bekannt, dass wir weniger als zehn Prozent unseres Potenzials einsetzen. Die Kraft der Intuition gehört bei den Meisten zu den ungenutzten 90 Prozent!
Ich bin mir zu 100% sicher, dass die erfolgreichsten Unternehmer auch gleichzeitig die höchste Intuition besitzen und auf sie vertrauen. Denn sie treffen Tag täglich wichtige Entscheidungen und tragen dabei viel Verantwortung. Oftmals müssen Entscheidungen auch schnell getroffen werden.

Verbinden Führungspersonen oder wir alle die Kraft unserer Gedanken, Erfahrungen, Emotionen und der Kraft der Intuition werden wir unschlagbar erfolgreich, gesund und glücklich in unserem Leben.

Übung

Schließe Deine Augen, atme ein paar Mal tief ein und aus, komme ganz bei Dir an.

Auf einer Skala von 1-10…zu wie viel Prozent bist du gerade mit Deinem Leben zufrieden?

Die erste Antwort die auftaucht ist die Richtige.

Nächste Frage: Auf einer Skala von 1-10…zu wie viel Prozent fühlst Du Dich in deinem Körper wohl?

Die erste Antwort die auftaucht ist die Richtige.

Letze Frage: auf einer Skala von 1-100..zu wieviel Prozent vertraust Du auf deine Inuition? Die erste Antwort die auftaucht ist die Richtige.

Intuition ist sehr schnell

Warum ist die erste Antwort die Auftaucht die Richtige?

Nun…unser höheres Selbst kennt alle Antworten. IMMER!!! Es braucht nicht lange um uns mit der richtigen Antwort zu erreichen. Deshalb besteht ja auch die Gefahr unsere innere Stimme zu überhören. Schaltet sich erstmal der Kopf ein oder unsere Fantasie, verfärbt sich die Antwort auf die Frage und das Ergebnis ist oftmals ein schlechter Ratgeber.

Niemand kennt die persönlichen Lebensaufgaben und Themen besser als unser höheres Selbst, sprich…wir selbst.

Das höhere Selbst

Die wirkliche menschliche Intelligenz hängt nicht von akademischen Titeln ab, sondern von der eigenen Kreativität. Und die wohl höchste Intelligenz menschlicher Existenz ist das höhere Selbst. Es beinhaltet unendliches Wissen und konzentriert sich auf seinen höheren Plan, unabhängig von Zeit und Raum. Intuition und Medialität in ihrem höchsten Ausdruck ist die Perfektion der menschlichen und geistigen Entwicklung!

Hören wir auf unsere innere Stimme, hören wir automatisch was uns das höhere Selbst zum aktuellen Lebensweg und den damit verbundenen Entscheidungen zu sagen hat. Ein tiefes Gefühl von Vertrauen in unseren Lebensweg ist die positive Nebenwirkung davon.

Intuition und Medialität

Medialität ist eine stark ausgeprägte Intuition, sie kann trainiert werden und ist in unterschiedlichem Ausmaß in jedem Menschen vorhanden. Aber wie in allen Bereichen gibt es auch hier Menschen, die von Natur aus talentierter sind und andere weniger.

Medialität ist in ihrer ursprünglichen Form eines der einflussreichsten Instrumente der Menschheit. Mit ihr spürt man den Einfluss des Umfeldes und man kann sie als Radar für Zukunftspläne einsetzen.

Intuition und Medialität

Während man die Intuition verstärkt als Gefühl und innere Stimme wahrnimmt, kann man mediale Informationen mit dem inneren Auge als Bilder, Zahlen oder Worte sehen, manche können sie sogar riechen, hören oder schmecken.

Auch wärme- oder Kälteempfindungen sowie starke Gänsehaut sind sowohl bei der Intuition, als auch bei der Medialität als Richtungsweiser möglich.

Die Intuition trainieren

Die Grundbedingung für die intuitive und mediale Eingebungen ist die Öffnung und Erweiterung des inneren Auges, auch genannt das dritte Auge.

Wir benötigen eine Art spirituelle Hygiene unserer Zirbeldrüse um das 3. Auge auszubilden. Genussgifte wie Alkohol, zu viel Süßigkeiten, zu wenig Sport, Entspannung, Freude und Spaß wirken kontraproduktiv und hemmend.

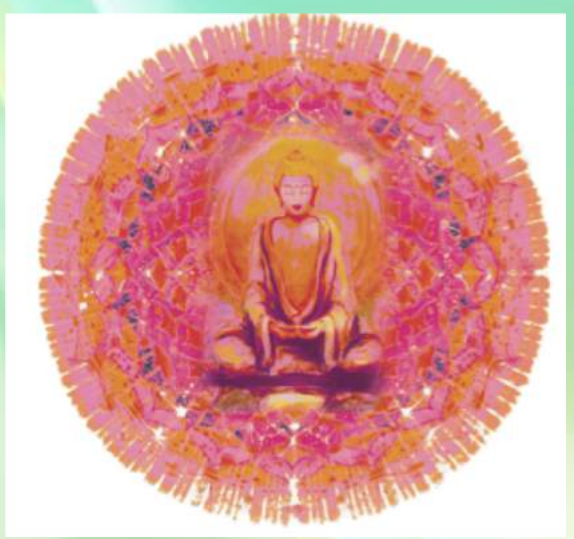
Die Intuition trainieren

Seher die sich beispielweise ganz gesund und klar ernähren, verfügen meist über eine enorme übersinnliche Wahrnehmung, die sogar zu einer Sinnes- und Informationsüberflutung führen und zu einer gesteigerten Hochsensibilität führen kann.

Das Leben wird so zu einer echten Herausforderung und die Gabe des Sehens wird so zum Fluch und Segen zu gleich.

Die Intuition trainieren

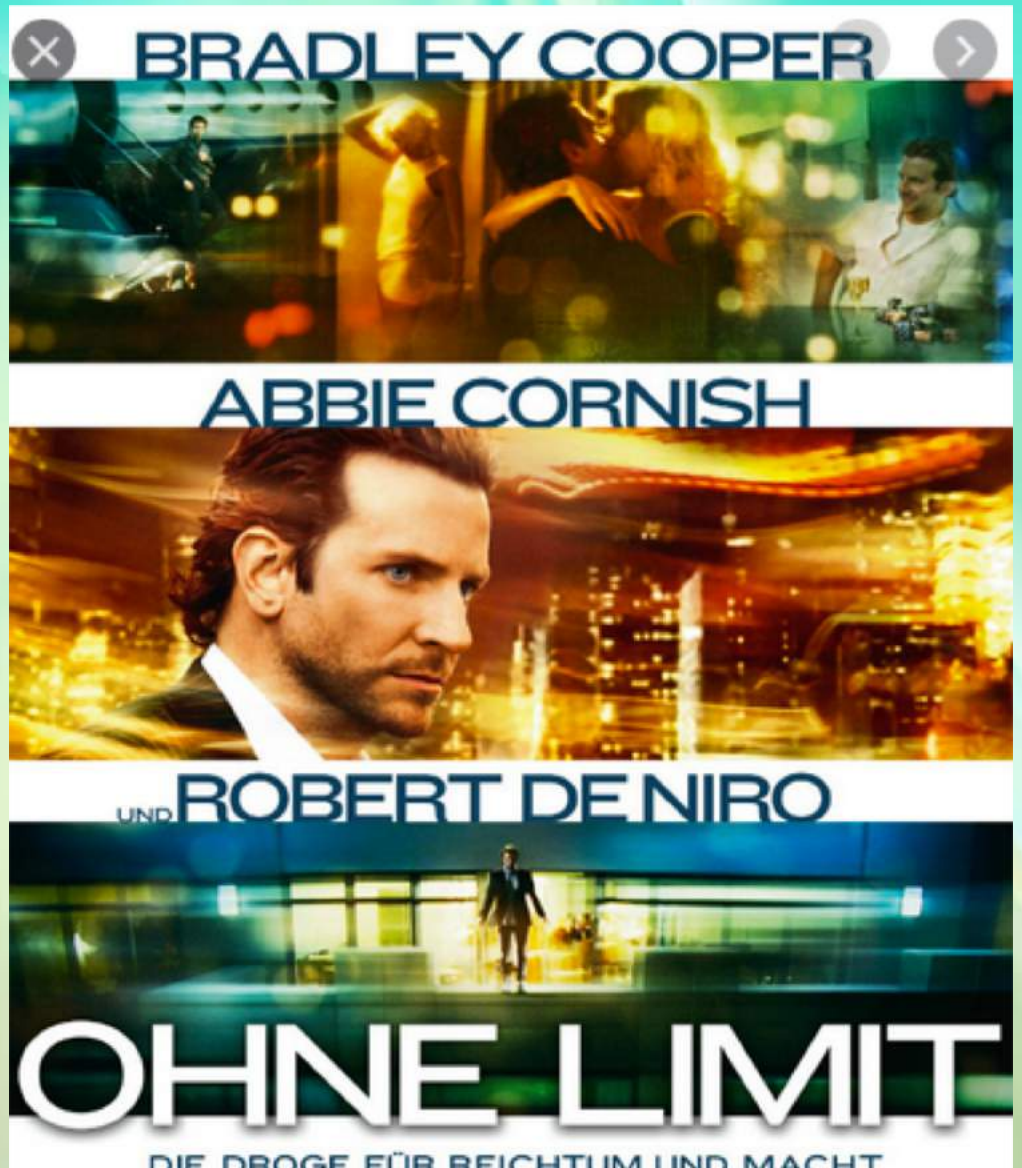
Eine ganz einfache Weise die Intuition zu entwickeln ist vor allem die Meditation und wenig künstliche Ablenkung wie TV, Arbeit und alles was uns von uns selbst zu stark ablenkt. Die innere Stimme ist zwar schnell, aber sie ist auch leise…also müssen wir dafür sorgen, dass wir sie gut hören können.



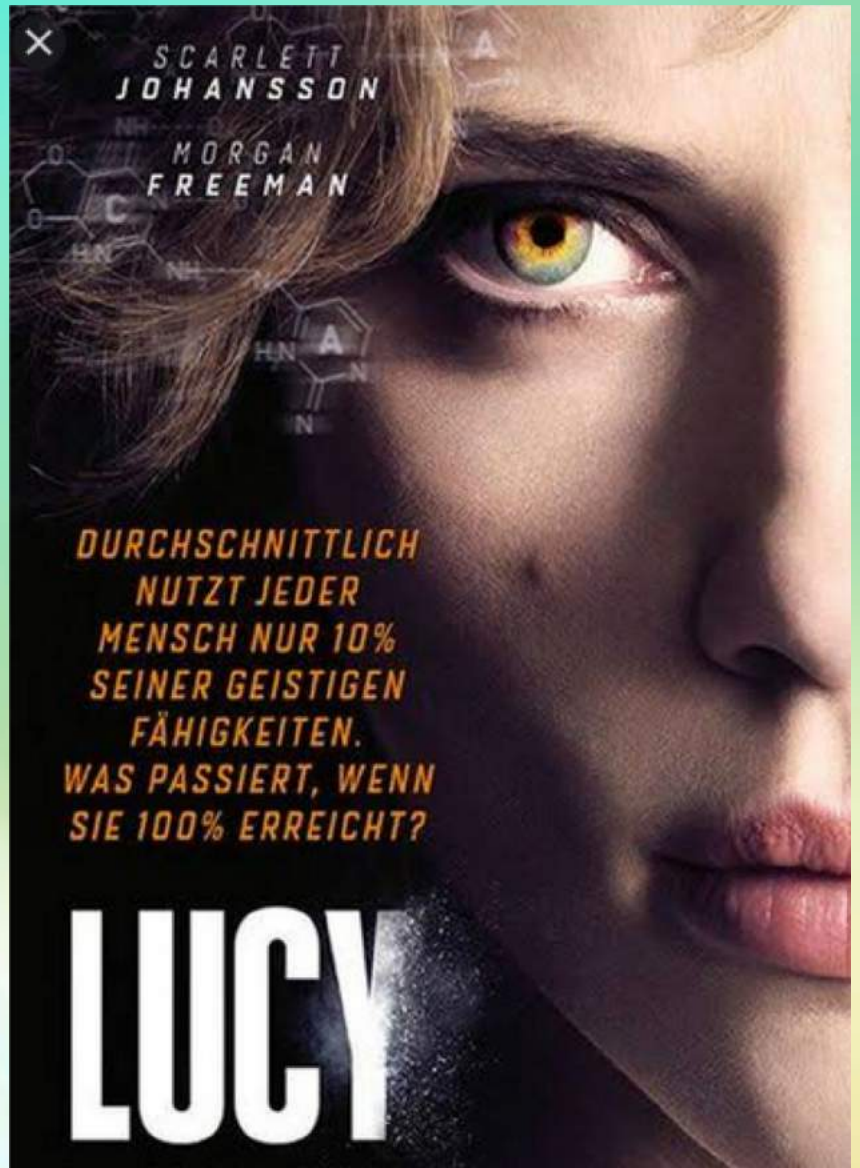
Die Intuition trainieren

Viele Naturvölker und Schamanen nutzten schon vor Hunderten von Jahren das Sehen als Entscheidungshilfe für Kriege oder zum Bestellen einer ertragreicheren Ernte. Sie unterstützen ihre Sehkraft mit halluzinogene Drogen oder tanzten sich in Trance um besser sehen zu können.

Da erscheint eine regelmäßige Meditation für die heutige Gesellschaft als einfacher umzusetzendes Training um seine eigene Intuition zu entwickeln.


BRADLEY COOPER
ABBIE CORNISH
UND ROBERT DE NIRO
OHNE LIMIT

FILMTIP


SCARLETT JOHANSSON
MORGAN FREEMAN
DURCHSCHNITTLICH NUTZT JEDER MENSCH NUR 10% SEINER GEISTIGEN FÄHIGKEITEN. WAS PASSIERT, WENN SIE 100% ERREICHT?
LUCY

DANKE

Vielen Dank für Deine Aufmerksamkeit

und viel Freude beim Vertrauen auf die eigene Intuition

Ostfalia
Hochschule für angewandte Wissenschaften

Research at Ostfalia

Knowledge- and Technology Transfer at the interface between Science, Economy and Society

Ostfalia University of Applied Sciences
– Hochschule Braunschweig/Wolfenbüttel
Salzdahlumer Str. 46/48 · 38302 Wolfenbüttel

Ostfalia
Hochschule für angewandte Wissenschaften

Locations and Faculties

Salzgitter

- Transport-Sports-Tourism-Media

Suderburg

- Civil and Environmental Engineering
- Trade and Social Work

Wolfsburg

- Automotive Engineering
- Public Health Services
- Business

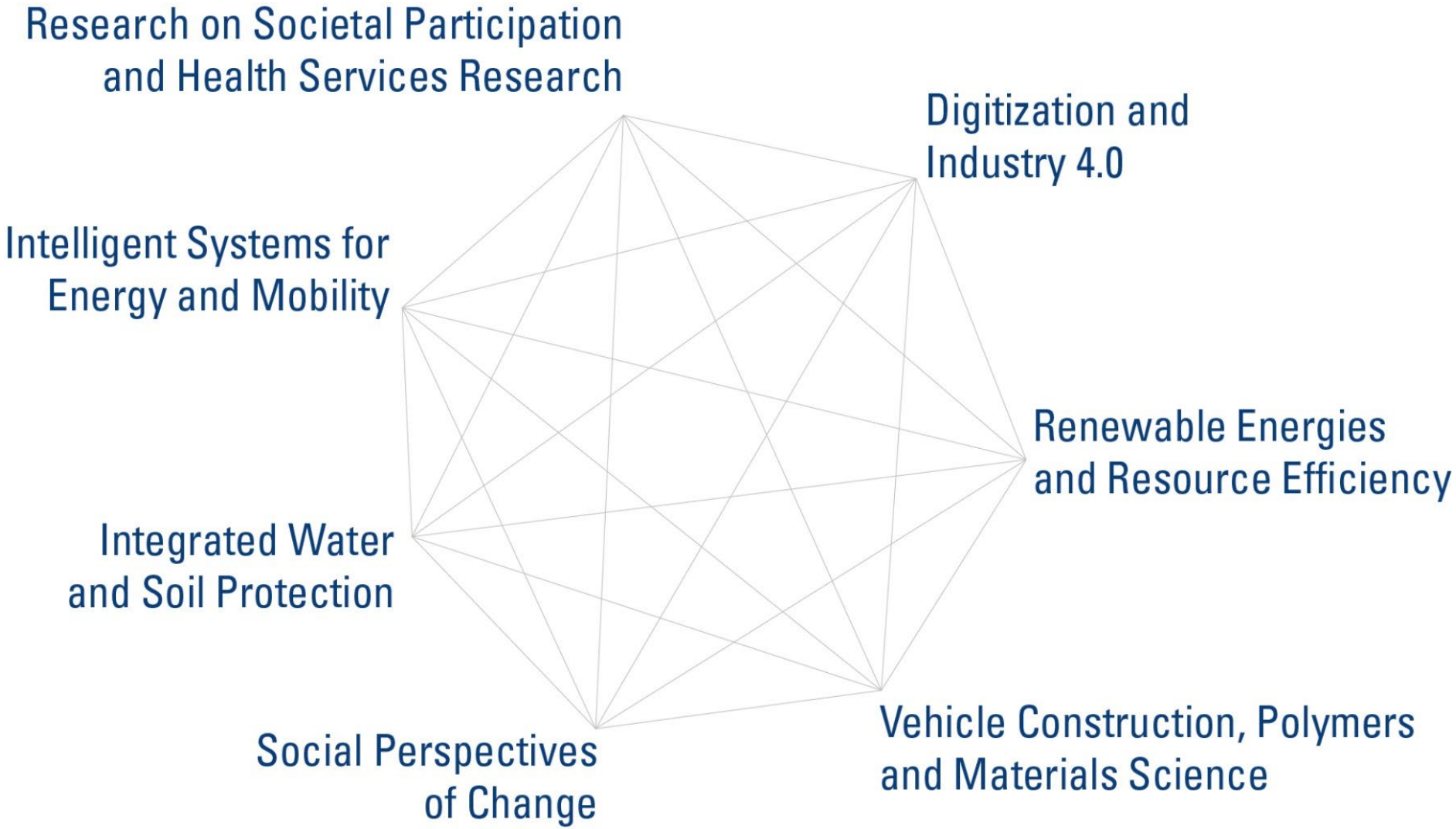
Wolfenbüttel

- Electrical Engineering
- Computer Science/IT
- Mechanical Engineering
- Law (BELS)
- Social Work
- Supply Engineering

Ostfalia
Hochschule für angewandte Wissenschaften

Ostfalia in Figures

- 4 locations
- 12 faculties, around 80 degree programmes (incl. postgraduate study courses)
- 12.751 students in WS 2018/19 (SZ 2.325, SUD 1.481, WOB 3.025, WF 5.920, reference date: 15th of November 2018)
- 1.024 employees, of which 220 are professors (reference date: 1st of Dezember 2018)


Research on Societal Participation
and Health Services Research
Digitization and
Industry 4.0
Intelligent Systems for
Energy and Mobility
Renewable Energies
and Resource Efficiency
Integrated Water
and Soil Protection
Social Perspectives
of Change
Vehicle Construction, Polymers
and Materials Science

Ostfalia
Hochschule für angewandte Wissenschaften

Research Centres at Ostfalia

CEMO Centre for Electromobility

ZaF Centre for Additive Manufacturing

ZEGI Centre for Social Innovation

ZWIRN Centre for Scientific, Interdisciplinary Risk Management and Sustainability

The goal of the research centres is the support of (applied) inter- and transdisciplinary research, development and transfer and the support of cooperations between faculties.

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Knowledge and Technology Transfer offers

- Providing support for **collaborative ventures** in the context of contract and grant-funded research
- Providing information about the **research priorities and projects**
- **Arranging contacts** to Ostfalia's professors
- Providing advice on **funding possibilities**
- Providing advice on **invention disclosures, patents and property rights**
- Organising **events** with a view to exchanging ideas and knowledge

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Hochschule für angewandte Wissenschaften

Knowledge and Technology Transfer – Team

wtt@ostfalia.de www.ostfalia.de/forschung/kontakt/

Prof. Dr.-Ing. Gert Bikker
Vice President for Research, Development and Technology Transfer

Dr.-Ing., Dipl.-Biol. Martina Lange
Head of Knowledge and Technology Transfer
Vice Head of the International Relations Office

Dipl.-Biol. Kai Hillebrecht
Vice Head of Knowledge and Technology Transfer
Head of the International Relations Office

Angelina Capelle, M.A.
Transfer Officer

Ostfalia
Hochschule für angewandte Wissenschaften

Knowledge and Technology Transfer – Projects and Team

Theresa Joost, M. A.

Gabriele Stiller, M. A.

Dipl.-Ing. Katrin Beyer

Kathrin Weiß, M. Sc.

Dennis Haarmeyer, M. Eng.

Norman Peitz, M. A.

Angelina Capelle, M. A.

Yannick Waselkowski, B. A.

GrowIn 4.0 – Growing into Industry 4.0

TransferHub 38

Introduction of the Research Information System FIS

ingenieurregion.de

Innovation Consultancy

Prospective Vehicle Technologies in the Open Region Lab

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Hochschule für angewandte Wissenschaften

Wissen.schafft.Kommunikation. (Science.Communicating.) – A Pilot Project of the Knowledge and Technology Transfer

- Professional and internal know-how – with an experienced project management team
- Short and flexible decision processes, fast conceptualisation
- Multimedia, audiovisual content, web and social media presence, tailored to specific requirements (in consideration of Ostfalia CD)
- Obligations of the projects will be covered: communication, public relations, research marketing in German and English
- Achievable by using resources of third-party projects (hourly rates, lump sum)

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GrowIn 4.0 – Growing into Industry 4.0 – Accelerating Growth in Manufacturing SMEs

Duration

01/08/2017 – 31/10/2021

Project volume 255.524 €

Funding

Interreg North Sea Region GrowIn 4.0
European Regional Development Fund

EUROPEAN UNION

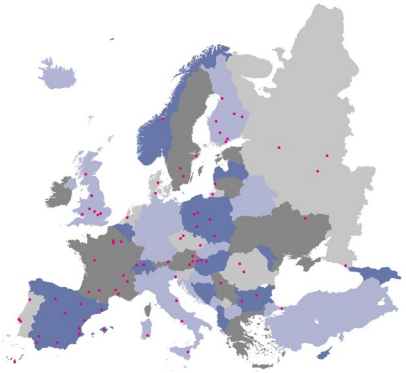
Project leader

Prof. Dr. Diederich Wermser
Faculty of Electrical Engineering

Prof. Dr. Gert Bikker
Faculty of Computer Science / IT
Vice-President for Research, Development and Technology Transfer

Ostfalia
Hochschule für angewandte Wissenschaften

EU-Strategie-FH – Increasing the Visibility of Ostfalia in Europe



Duration

01.02.2015 - 30.09.2020

(Catalogue of measures and offers of services continue to be available and will be integrated into future projects)

Project volume 300.000 €

Funding

Bundesministerium für Bildung und Forschung

Projekt leader

Prof. Dr.-Ing. Gert Bikker
Vice President for Research, Development and Technology Transfer

Ostfalia
Hochschule für angewandte Wissenschaften

TransferHub38: Interconnecting Knowledge – Shaping Innovation

TRANSFERHUB

Duration

01.07.2019 -
30.06.2024

Project volume ca. 1,5 million €

Funding

Niedersachsen

VolkswagenStiftung

Project leaders

Dr. Martina Lange
Head of Knowledge and Technology Transfer

Dipl.-Ing. Jörg Saathoff
Head of Technology Transfer at TU Braunschweig

UNLOCK YOUR POTENTIAL – OUR KNOWLEDGE IS THE KEY

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Forschung an der Ostfalia

Wissens- und Technologietransfer an der Schnittstelle zwischen Wissenschaft, Wirtschaft und Gesellschaft

Ostfalia Hochschule für angewandte Wissenschaften
– Hochschule Braunschweig/Wolfenbüttel
Salzdahlumer Str. 46/48 · 38302 Wolfenbüttel

Ostfalia
Hochschule für angewandte Wissenschaften

Standorte und Fakultäten

Salzgitter

- Verkehr-Sport-Tourismus-Medien

Suderburg

- Bau-Wasser-Boden
- Handel und Soziale Arbeit

Wolfsburg

- Fahrzeugtechnik
- Gesundheitswesen
- Wirtschaft

Wolfenbüttel

- Elektrotechnik
- Informatik
- Maschinenbau
- Recht
- Soziale Arbeit
- Versorgungstechnik

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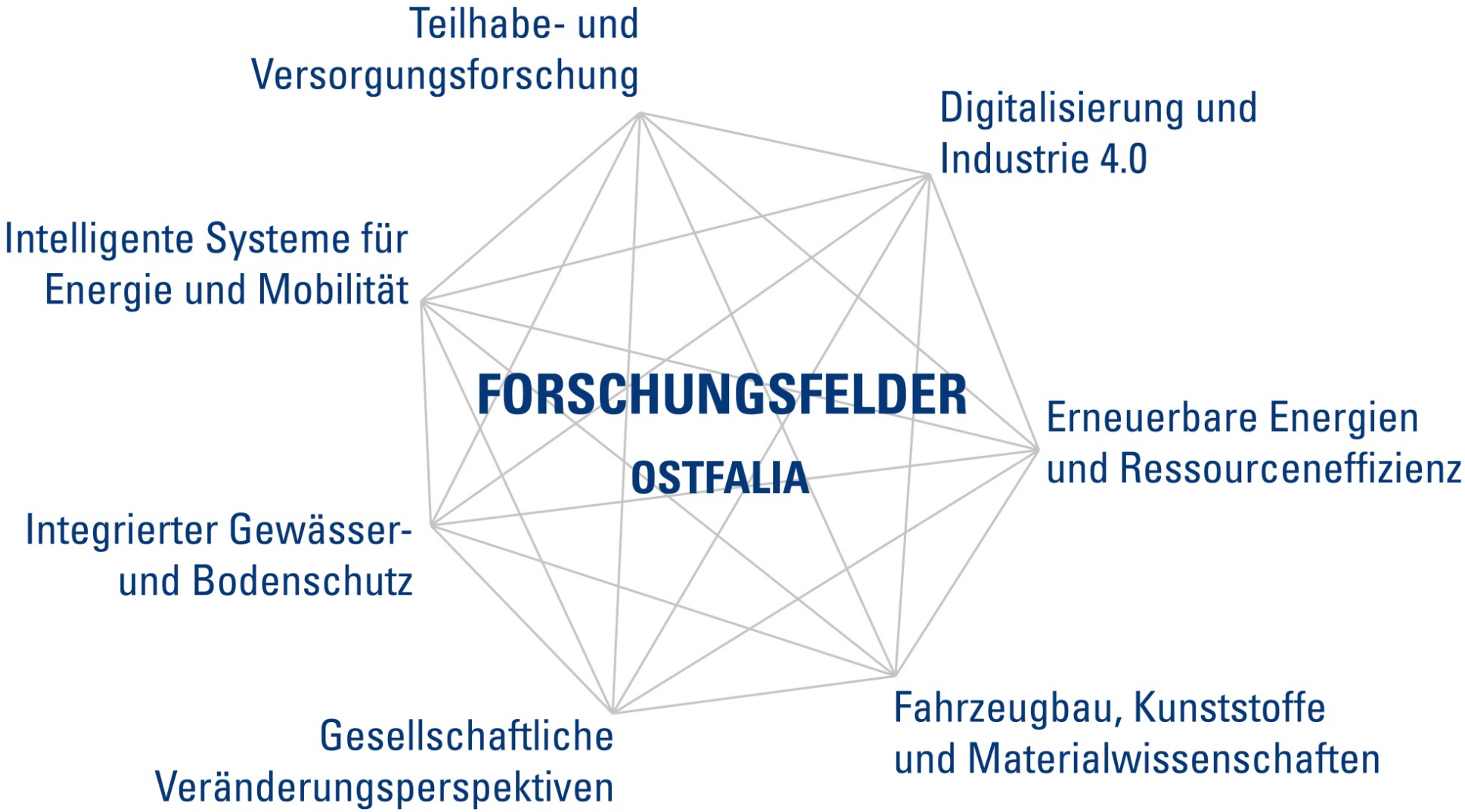
Zahlen

- 4 Standorte
- 12 Fakultäten, rund 80 Studienangebote (inkl. Weiterbildungsstudiengänge)
- 12.751 Studierende zum WS 2018/19 (SZ 2.325, SUD 1.481, WOB 3.025, WF 5.920, Stichtag 15. November 2018)
- 1.024 Beschäftigte, davon 230 Professorinnen und Professoren (Stand 01. Dezember 2018)


Teilhabe- und Versorgungsforschung
Digitalisierung und Industrie 4.0
Intelligente Systeme für Energie und Mobilität
FORSCHUNGSFELDER
OSTFALIA
Erneuerbare Energien und Ressourceneffizienz
Integrierter Gewässer- und Bodenschutz
Gesellschaftliche Veränderungsperspektiven
Fahrzeugbau, Kunststoffe und Materialwissenschaften

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Hochschule für angewandte Wissenschaften

Forschungszentren der Ostfalia

CEMO Centrum für Elektromobilität

ZaF Zentrum für additive Fertigung

ZEGI Zentrum für gesellschaftliche Innovation

ZWIRN Zentrum für wissenschaftliches, interdisziplinäres Risikomanagement und Nachhaltigkeit

Ziel der Forschungszentren ist die Förderung von (angewandter) inter- und transdisziplinärer Forschung, Entwicklung und Transfer und die Förderung der fakultätsübergreifenden Zusammenarbeit.

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Wissens- und Technologietransfer (WTT) bietet

- Unterstützung von **Forschungskooperationen** im Rahmen von Auftrags- und Antragsforschung
- Informationen zu **Forschungsschwerpunkten und -projekten**
- **Kontaktvermittlung** zu den Professorinnen und Professoren
- Beratung zu **finanziellen Fördermöglichkeiten**
- Beratung zu **Erfindungsmeldungen, Patenten und Schutzrechten**
- Organisation von **Veranstaltungen** zum Austausch von Ideen und Wissen

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Team Wissens- und Technologietransfer

wtt@ostfalia.de www.ostfalia.de/forschung/kontakt/

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Vizepräsident für Forschung, Entwicklung und Technologietransfer

Dr.-Ing., Dipl.-Biol. Martina Lange
Leiterin Wissens- und Technologietransfer
stellv. Leiterin des International Relations Office

Dipl.-Biol. Kai Hillebrecht
Stellv. Leiter Wissens- und Technologietransfer
Leiter des International Relations Office

Angelina Capelle, M.A.
Transfer-Referentin

Ostfalia
Hochschule für angewandte Wissenschaften

Projekte und Team Wissens- und Technologietransfer

Theresa Joost, M. A.

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GrowIn 4.0 – Growing into Industry 4.0

TransferHub 38

Einführung Forschungsinformationssystem FIS

ingenieurregion.de

Innovationsberatung

Zukünftige Fahrzeugtechnologien im Open Region Lab

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Wissen.schafft.Kommunikation. – Ein Pilotvorhaben des WTT

- Fachliches und internes Know-how – mit einem projekterfahrenen Team
- Kurze, flexible Entscheidungswege, schnelle Konzeptionierung
- Multimediale, audiovisuelle Inhalte, Web- und Social Media-Auftritte, zugeschnitten auf spezifische Anforderungen (unter Beachtung des Ostfalia CD)
- Pflichten der Projekte werden abgedeckt: Kommunikation, Öffentlichkeitsarbeit, Forschungsmarketing auf deutsch und englisch
- Realisierbar über Ressourcen aus Drittmittelprojekten (Stunden, Pauschalen)

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Hochschule für angewandte Wissenschaften

GrowIn 4.0 – Growing into Industry 4.0 – Accelerating growth in manufacturing SMEs

Laufzeit

01.08.2017 bis 31.10.2021

Projektvolumen 255.524 €

Drittmittelgeber

Interreg North Sea Region GrowIn 4.0
European Regional Development Fund

EUROPEAN UNION

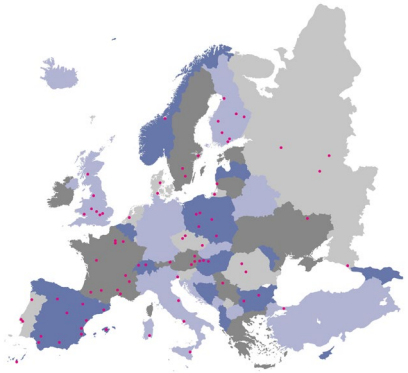
Projektleitung

Prof. Dr. Diederich Wermser
Fakultät Elektrotechnik

Prof. Dr.-Ing. Gert Bikker
Vizepräsident für Forschung, Entwicklung und Technologietransfer

Ostfalia
Hochschule für angewandte Wissenschaften

EU-Strategie-FH – Erhöhung der Sichtbarkeit der Ostfalia in Europa



Laufzeit

01.02.2015 bis 30.09.2020

(Maßnahmen und Angebote sind weiterhin verfügbar und werden in kommenden Projekten weitergeführt)

Projektvolumen 300.000 €

Drittmittelgeber

Bundesministerium für Bildung und Forschung

Projektleitung

Prof. Dr.-Ing. Gert Bikker
Vizepräsident für Forschung, Entwicklung und Technologietransfer

Ostfalia
Hochschule für angewandte Wissenschaften

TransferHub38: Wissen vernetzen – Innovationen gestalten

TRANSFERHUB

Laufzeit

01.07.2019 bis 30.06.2024

Projektvolumen ca. 1,5 Mio. €

Drittmittelgeber

Niedersachsen

VolkswagenStiftung

Projektleitung

Dr. Martina Lange
Leiterin Wissens- und Technologietransfer Ostfalia

Dipl.-Ing. Jörg Saathoff
Leiter Technologietransferstelle TU Braunschweig

Ostfalia
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WACHSEN SIE MIT UNSEREM WISSEN