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DIGITAL TRUST– ASYSTEMATIC LITERATURE REVIEW

PIOTR PIETRZAK, JOSU TAKALA

ABSTRACT

Digital technologies, such as social networks, smartphones, blockchain data, have become an indispensable part of our lives in recent years. They have a significant impact on our daily lives, even in crucial areas such as health, finance, and education. Recognising this, organisations presently face a difficult challenge – to create consumer digital trust. It should be noted that most studies have focused on the establishment of digital trust without identifying and considering the basic definition of "digital trust". The purpose of this article is to provide insights regarding the state of the art of digital trust, and to suggest areas for future research. Using a systematic literature review, this paper provides an overview of the literature. The most important conclusion to be derived from this study is that there is no single generally accepted definition of digital trust. Although the early research on "digital trust" can be traced back to 1996, it was only after 2016 that the number of papers on this topic increased substantially.

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Introduction

Over the years, trust has been analysed alongside many different disciplines and fields of study including economics, philosophy, technology and sociology (AL-Dwairi et al., 2009). Within management research in particular, there have also been numerous academic studies that have investigated trust (e.g. Young and Wilkinson, 1989; Smith and Barclay, 1997; Geyskens et al., 1998). It is worth mentioning that there is no single, official definition of trust (Walter and Smallbone, 2006). In terms of business behaviour, trust is founded on a belief in the likelihood that other agents would behave in a predictable manner (Gambetta, 1998).

While there are many different interpretations of the concept of trust (e.g. Fukuyama, 1995; Mayer et al., 1995; Mollering, 2006), they all focus on the following components that need to be present for trust to occur (Wang and Emurian, 2005; Cook et al., 2009;

Bachmann and Inkpen, 2001; Dietz, 2011): (1) two actors must exist: the trustor and the trustee; (2) vulnerability must be displayed (trust exists only in a hazardous or uncertain situation); (3) trust leads to actions, mostly risk-taking behaviours; (4) trust is a highly subjective issue (trust is influenced by numerous subjective individual and environmental circumstances, and as such is dependent on the context of the situation).

Some recent studies have examined the concept of trust in the context of consumer marketing, that is, in the relationships between organisations and their end customers. This is especially true of research that looks at aspects such as satisfaction, brand image, and customer loyalty that influence customer purchasing behaviour (Valdani and Busacca, 1992; Berry, 1995; Fletcher and Peters, 1997; Miyamoto and Rexha, 2004).

Studies of inter-organisational relationships, and hence the field of business-to-business marketing, have made the most significant contributions to the conception and assessment of the trust construct (Blois 1999). Sales management (in the industry and service sector) and channel management (where the purpose is to understand how trust develops between the seller and the buyer) are two fields of business-to-business marketing that have fuelled the study of trust (Raimondo, 2000).

In the era of the digital economy, contact between customers and sellers takes place via the Internet. Therefore, the concept of digital trust is increasingly used in the literature. But it should be noted that the digital space, in addition to its many benefits, has also introduced divisions, barriers, and exclusions (Parente and Prescott, 1994; Zeira, 1998; Pohjola, 2003; Okoli et al., 2010). The Internet is seen by customers as a world of chaos - the degree of uncertainty of economic transactions is higher than in traditional settings (Grabner-Kräuter and Kaluscha, 2008).

A buyer, as a trustor, is put in a risky situation when she or he utilises the Internet to convey her or his needs to an e-vendor and enters confidential information about herself or himself. She or he selects a payment method and expects the website to be a secure platform for the transaction and the seller to fulfil the purchase request honestly and competently (Bauman and Bachmann, 2017). Buyers frequently hesitate to deal with e-vendors, according to McKnight et al. (2002), due to ambiguity regarding the behaviour of e-vendors or the perceived risk of hackers acquiring their personal data. Therefore, e-vendors need to create higher trustworthiness in the minds of customers who exhibit high levels of uncertainty avoidance in order to overcome said hazards.

Of course, one must also bear in mind the impact of computers and digital architecture on purchasing behaviour and the formation of trust. Fogg (2003) focused on the aspects of interaction with technology intended to change people's attitudes, behaviours, or both, coining the term "captiveology" to describe "computers as persuasive technologies". Computer systems provide a number of advantages over more "conventional" persuaders. Computers, unlike broadcast or print media, allow for interactivity: they may alter their actions in response to user inputs, wants, and conditions. Unlike human persuaders, computers can be mercilessly persistent, provide anonymity to other users, and cope with vast volumes of data.

It is worth noting that the prominence of conceptual and illustrative case studies demonstrates the lack of maturity of the concept of digital trust. Future study, according to Reis et al. (2018), should focus more on establishing the theoretical foundation for this issue. For this reason, our study makes several contributions. Firstly, it contributes to the literature on digital trust (articles and conference proceedings) by demonstrating a comprehensive knowledge of its underpinnings in light of recent advances. Secondly, the article may be a first step in terms of research in the field of digital trust that uses a systematic literature review (in management articles, a systematic literature review is still rarely indicated as a research method).

The remainder of the article is structured as follows. The next section provides a brief description of the methodological approach (an explanation of how the systematic literature review was undertaken) and is followed by the research findings (both quantitative and qualitative). This is followed by a discussion (explaining what the contribution of the article to management science is, and pointing out what the

limitations of the research carried out are). The article ends with some concluding remarks.

1. Methodology

“A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed” (Webster and Watson, 2002, xiii). Frank and Hatak (2014) refer to a literature review as a “knowledge map”. Of course, there are several types of literature reviews. This paper follows a systematic literature review method. Systematic review, defined by Petrosino et al. (2001, 20) as “the most reliable and comprehensive statement about what works”, entails detecting, synthesising, and evaluating all available evidence, both quantita-

tive and qualitative, in order to generate a solid, empirically derived answer to a specific research question(s) (here: “What is digital trust?”, “What are its characteristics?”). “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” (Mallet et al., 2012, 445), it has now spread to a wide range of disciplines including “advertising, agriculture, archaeology, astronomy, biology, chemistry, criminology, ecology, education, entomology, law, manufacturing, parapsychology, psychology, public policy, and zoology” (Petticrew, 2001, 99).

Systematic reviews differ from traditional narrative reviews by “adopting a replicable, scientific and transparent process” (Tranfield et al., 2003, 209). Table 1 shows the characteristics of narrative and systematic reviews.

Table 1. Characteristics of narrative and systematic reviews

| Criterion | Systematic review | Narrative |
|-------------------------------|-------------------------|-----------------------------------|
| Research questions | “Strictly formulated” | “Broadly formulated” |
| Methodology | “Clearly defined” | “Not or insufficiently described” |
| Search strategy | “Clearly defined” | “Not described” |
| Selection of the studies | “Clearly defined” | “Not described” |
| Ranking of the studies | “By levels of evidence” | “Not performer” |
| Analysis of the studies | “Clearly described” | “Not described” |
| Interpretation of the results | “Objective” | “Subjective” |

Source: Impellizzeri and Bizzini, 2012.

The key characteristics of a systematic review are (Liberati et al., 2009):

- “a clearly stated set of objectives with an explicit, reproducible methodology;
- a systematic search that attempts to identify all studies that would meet the eligibility criteria;
- an assessment of the validity of the findings of the included studies, for example through the assessment of risk of bias;

- and systematic presentation, and synthesis, of the characteristics and findings of the included studies”.

Despite all the advantages of this method, its use has not been overly prevalent in business research, albeit it is increasing (Coombes and Nicholson, 2013; Snyder et al., 2016; Witell et al., 2016; Reis et al., 2018).

To reduce potential bias, two different approaches were adopted in this article (Reis et al., 2018, 412):

- “a qualitative approach based on a bibliometric analysis;
- a qualitative approach centred on a content analysis of the literature”.

It is important to remember that these two approaches should be viewed as being “complementary” in “acknowledging the structure of the field of study” (Acedo and Casillas, 2005, 623). Table 2 summarises the research methodology.

The data search was conducted on 14 April 2021, and the selected peer-reviewed

database was the Institute for Scientific Information – Web of Science (ISI). We started with the inclusion criteria by using the term “digital trust” in the topic (title, abstract or keywords). The “topic” category was chosen above the “text” category to limit the search results to publications that focused solely on investigating trust rather than other areas of the digital economy or e-commerce that might only indirectly impact online customer trust.

Table 2. Approaches adopted in the study

| | Quantitative Approach | Qualitative Approach |
|-------------|--|---|
| Description | <ul style="list-style-type: none"> • A bibliometric analysis of the selected journal papers and conference proceedings. | <ul style="list-style-type: none"> • Content analysis of the selected journal papers and conference proceedings. |
| Content | <ul style="list-style-type: none"> • Articles and proceedings distributed between 1996 and 2020; • Most frequently cited journal papers and proceedings; • Research area of journal papers and proceedings. | <ul style="list-style-type: none"> • The concept of digital trust (e.g. definitions, features). |

Source: Own elaboration based on Reis et al., 2018.

As in many studies in which a systematic literature review was used, “the search for articles was conducted regardless of the time limitations” (Reis et al., 2018, 413) in this paper as well, but it was limited to conference proceedings and journal papers. To avoid any misunderstanding, the selected documents had to be written only in English. The exclusion process resulted in a total of 34 journal papers and proceedings from the ISI database. Based on these articles, we will attempt to answer the following research questions: “What is digital trust?” and “What are its characteristics?”

2. Research findings

2.1. Quantitative approach

Although the early research on “digital trust” can be traced back to 1996, it was only after 2016 that the number of papers on this topic increased substantially. In 2020, 82% of the total number of publications are journal articles and 18% are

conference proceedings (Figure 1). The countries that most contributed to these publications are (1) the United States of America, and (2) Russia, with 13% and 10% of the total respectively.

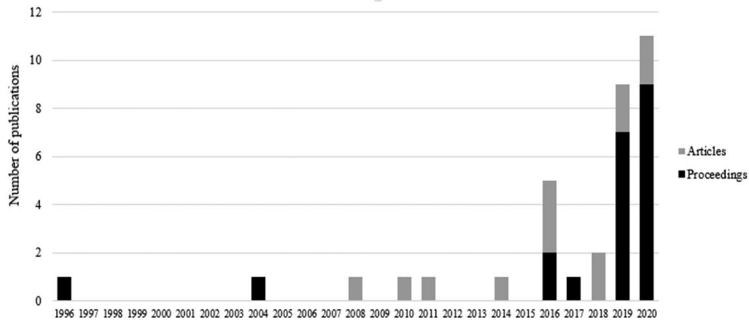
Table 3 presents the most frequently cited papers. The article cited most often (25 times) was a publication prepared by Bapna et al. (2017) entitled “Trust and the Strength of Ties in Online Social Networks: An Exploratory Field Experiment”, which appeared in 2017 in “Management Information Systems (MIS) Quarterly”.

The topics of the publications included in Table 4 are varied. They focus on tools (such as ADAM – “Autonomic Distributed Authorisation Middleware”) that recognise and assess trust-warranting properties of other entities (Seleznyov et al., 2004). Several publications also outline the evolving features of the Internet of Things (IoT) and define key security and privacy requirements from the consumer’s standpoint (e.g. Khan et al., 2016; Shepherd et

al., 2016). After all, some of them explain “how social ties are linked to an economic measure of trust” (Bapna et al., 2017, 115). Thus, considering the research area, the

highest number of publications concerned computer sciences (14 publications) and engineering (ninepublications), as shown in Table 4.

Figure 1. Distribution of publications



Source: Own elaboration.

Table 3. Distribution of publications per author

| Author(s) | Journal title | Year of publication | Times cited |
|------------------|--|---------------------|-------------|
| Bapna et al. | “Management Information Systems (MIS) Quarterly” | 2017 | 25 |
| Shepherd et al. | “2016 IEEE TRUSTCOM/BIGDATA/ISPA (Proceedings Paper)” | 2016 | 16 |
| Khan et al. | “Advanced Multimedia and Ubiquitous Engineering. Lecture Notes in Electrical Engineering (Proceedings Paper)” | 2016 | 11 |
| Wong | “Journal of the American Medical Informatics Association” | 1996 | 11 |
| Akram and Ko | “2014 IEEE 13th International Conference on Trust, Security and Privacy in Computing and Communications (Proceedings Paper)” | 2014 | 3 |
| Selke et al. | “Proceedings of the 8th European Conference On E-Government (Proceedings Paper)” | 2008 | 3 |
| Seleznyov et al. | “BT Technology Journal” | 2004 | 3 |

Source: Own elaboration.

Table 4. Research area of publications

| Research areas | Number of publications | % of 34 |
|---------------------------------------|------------------------|---------|
| Computer Sciences | 14 | 41.176 |
| Engineering | 9 | 26.471 |
| Business Economics | 5 | 14.706 |
| Education / Educational Research | 4 | 11.765 |
| Information Science / Library Science | 4 | 11.765 |
| Telecommunications | 4 | 11.765 |
| Communications | 2 | 5.882 |
| Public Administration | 2 | 5.882 |
| Social Sciences / Other Topics | 2 | 5.882 |
| Area Studies | 1 | 2.941 |
| Government Law | 1 | 2.941 |

| | | |
|-------------------------------------|---|-------|
| Health Care Sciences Services | 1 | 2.941 |
| Mathematics | 1 | 2.941 |
| Medical Informatics | 1 | 2.941 |
| Science / Technology / Other Topics | 1 | 2.941 |
| Social Issues | 1 | 2.941 |
| Transportation | 1 | 2.941 |

Source: Own elaboration.

Furthermore, it is difficult to identify the journal containing the largest number of publications on “digital trust”. In recent years, an increased number of articles have been published as conference proceedings. The majority of them were conceptual in nature. This is a clear sign of the lack of maturity of this phenomenon. As a result, future study should concentrate on establishing the theoretical foundations of the field, based on existing ideas and theories or the development of new ones. Therefore, we believe it is important to provide a definition of digital trust, point out the differences between digital and non-digital trust, and indicate how digital trust affects organisational culture.

2.2. Qualitative approach

In most cases, trust is employed in human society to deal with high-risk situations in which the people involved in the interaction have little or no information about each other (Seleznyov et al., 2004). Trust is frequently misunderstood and used interchangeably with terms such as cooperation,

faith, competence, dependence, and credibility (Aljazzaf et al., 2010). Because trust is so important, it has been examined extensively in a variety of social science areas (Golembiewski and McConkie, 1975; Kramer and Tyler, 1996), including management and economics (Kacperska and Łukasiewicz, 2020).

Many authors (e.g. Bailey et al., 1998; Akram and Ko, 2014; Mattila and Seppälä, 2016; Marcial and Launer, 2018) attempted to define and discuss the exact notion of digital trust or cyber trust (see Table 5). This argument emphasises the need to define “digital trust”. Therefore, the authors of this article hope that the systematic literature review will make a valuable contribution to the development of management theory.

For the purposes of this paper, digital trust is assumed to be the measure of confidence which workers, consumers/buyers, partners and other stakeholders have in the ability of an organisation to protect data and the privacy of individuals. For this reason, organisations should focus on reliability, credibility, and security.

Table 5. Definitions of digital trust

| Author(s)/Institution(s) (year of publication) | Definition |
|---|--|
| Bailey et al. (1998) | “Trust plays a critical role when a user assesses the believability of online information content or when selecting an exchange site to purchase a product from (...). When a design team develops an informational or exchange site, they are responsible for ensuring that a user perceives that site as trustworthy.” |
| Akram and Ko (2014) | “(…) a trust based either on past experience or evidence that an entity has behaved and/or will behave in accordance with the self-stated behaviour.” |
| Accenture (2015) | “(…) the confidence placed in an organisation to collect, store, and use the digital information of others in a manner that benefits and protects those to whom the information pertains.” |
| Mattila and Seppälä (2016) | “Digital trust stems from a combination of different factors (...): security, identifiability, and traceability. Quite often, however, the presence of these features can be too difficult for an individual to evaluate - and especially so in a digital environment.” |

| | |
|---------------------------|--|
| Marcial and Launer (2018) | "It refers to the level of confidence in people, processes, and technology to build a secure digital world." |
|---------------------------|--|

Source: Own elaboration.

Digital trust shares similar characteristics to those of non-digital/offline trust (Jarvenpaa and Rao, 2003; Taddeo, 2009), but there are some important distinctions that are unique in an online environment (Wang and Emurian, 2005). These distinctions can be used as a starting point for learning more about the nature of trust in an exceedingly digital context. The following are the features of digital trust:

- a trustee is an e-commerce web site, or more specifically, the merchant whom the web site represents, and a trustor is a consumer who browses an e-commerce Internet site. Marcella (1999) indicated that sometimes the technology itself is an object of trust;
- consumer trust in online merchants leads to two distinct behaviours: (1) making an online purchase from the merchant, presumably including the provision of credit card and personal information, and (2) "window-shopping" at the merchant's site (Dietz, 2011);
- the consumer is vulnerable to certain violations of trust in online commercial transactions: money and privacy are both at risk (Friedman et al., 2000);
- digital trust, like non-digital trust, is inherently a subjective matter based on individual characteristics and situational conditions (Grabner-Kräuter, 2002). Every individual's level of trust required to conduct online transactions is different.

In the available literature on the subject, very often the authors not only indicate the characteristics of digital trust, but also attempt to answer the question of how digital trust drives (organisational) cultural change.

As Uzelac (2008, 10) noted, "the claim that technology impacts different aspects of our culture is over-simplified and too deterministic, but it is not completely wrong". People are aware of the changes that have occurred in modern societies as a result of the introduction of ICT (information and communication technology) into our lives, much like electricity did previously (Uzelac, 2008). Changes have taken place both within and outside of organisations, especially when it comes to organisational culture.

Digital trust has become one of the core values of modern organisations. Organisational cultures that promote it are referred to in the literature as "cyber-security" (CS) (e.g. van Niekerk and von Solms, 2010; Reid and van Niekerk, 2014; Gcaza and von Solms, 2017) or "digital" (Uzelac, 2008).

It is not possible to understand digital culture unless one can recognise the heterogeneous elements of which it is composed (Gere, 2002). Rab (2015) draws attention to the following characteristics: copiability (digital information is straightforward to copy, and once connected to a network, the possibilities for this are infinite), digital literacy (using the new communication media to evaluate and sort out information), insecurity (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 (constant access and contact), multitasking (several tasks can be managed at the same time), and permanence (everything we do in our digital world leaves a trace).

A more detailed typology of digital culture was presented by Abraham et al. (2019), who discovered four organisational

cultures on a digital trust continuum, ranging from ignorance and neglect to defiance, compliance, and integrity.

The culture of ignorance and neglect is a tragic case (Sausser, 2008): organisations fail to comply with clear requirements for building digital trust (for example, data use notification under data privacy laws and violation of notification standards). Lack of motivation, lack of awareness, inaccurate beliefs about behaviours or hazards, risky behaviour, and the inadequate use of technology are among the five factors highlighted by Metalidou et al. (2014) as having a significant impact on how people behave in terms of information security.

In turn, companies with a culture of defiance resist crucial aspects of building digital trust (for example, refusing to obey data privacy and violating the laws on activity notification). Organisations with a culture of compliance may disagree with legal or regulatory features that are crucial to digital trust, but they nonetheless comply with the laws or standards. Companies with a culture of integrity commit to achieving the minimum requirements mandated by regulation, and demonstrate ethical behaviour, such as consumer education on credit security or granting financial compensation to customers harmed, for example, by unauthorised private data use. It should be noted that companies transitioning away from a culture of ignorance and neglect toward one of honesty should begin by examining the underlying group practices and the organisation's patterns of knowledge exchange. Those behaviours and habits often point to the root cause of failures in digital trust (Abraham et al., 2019).

Government "fiscal measures and methods for data monetisation would be required to incentivise digital trust in ways that drive entire social and corporate ecosystems toward a culture of honesty" (Abraham et al., 2019, 4). For example, through the "Health

Information Technology for Economic and Clinical Health (HITECH) Act of 2009", the government fined hospitals for not meeting baseline metrics in digitising medical data, which impelled organisational cultures of compliance.

3. Discussion

From a theoretical standpoint, we looked into the phenomenon of "digital trust". Our findings show that this idea is underappreciated in the scholarly literature. The term "digital trust" appears in the topic, title, abstract, or keywords of just 34 peer-reviewed papers (articles and conference proceedings). The predominance of conceptual and illustrative papers demonstrates that this concept is still in its infancy.

3.1. Contributions

Our study makes several contributions. Firstly, our study contributes to the literature on digital trust by offering a comprehensive grasp of its underpinnings in light of recent advances. To support the above thesis, a number of authors (Kim et al., 2008; Reis et al., 2018; Marcial and Launer, 2019) concluded that further research on digital trust is needed to better understand how it is changing existing organisational cultures. Secondly, our article may be the first step in research in the field of digital trust that uses a systematic literature review. As noted earlier, this method is still poorly recognised in the field of management science.

3.2. Limitations and future research

Despite these contributions, our study has several drawbacks. Firstly, the way we selected the search term had an impact on which papers were included in the research; when we used the term "digital trust", many papers that used synonyms were omitted. On the other hand, we must understand that there is a hierarchy of

evidence when performing systematic reviews, and that what can be experimentally said about the world comes from studies with a rigorous and explicit design (Gebayew et al., 2018).

Secondly, while most systematic reviews employ many databases to be more complete in their article selection, we chose only one – the Institute for Scientific Information – Web of Science (ISI). Using other repositories (e.g. Scopus) could result in other publications being included in the analysis. Finally, we only included English-language papers and excluded all other publications (in particular, there was a lack of publications in Russian).

The results provide an interesting starting point for future research. A systematic literature review can be conducted for other concepts related to the digital economy, e.g. “digital culture”, “digitalisation”. In addition, other repositories can be used to identify the scale of interest in digital trust, including consideration of works in languages other than English. Moreover, based on existing theories related to digital trust, researchers should create measurement models by which to evaluate it (the question that needs to be answered is what affects digital trust?). Finally, the ISI database is updated on a regular basis to include new peer-reviewed articles. Therefore, important studies that were made prior to the publication of this research may have been omitted.

Conclusions

In this article, we undertook a systematic literature review on digital trust, based on the research area, distribution of publications per author or types of articles in the last two decades (1996-2020). The most important conclusion to be derived from this study is that there is no single generally accepted definition of digital trust. For this reason, we prepared our own definition.

Thus, in general, digital trust is the measure of confidence which workers, consumers/buyers, partners and other stakeholders have in an organisation’s ability to protect data and the privacy of individuals.

Furthermore, while digital trust shares many of the same features as non-digital trust, there are several key differences that are unique to the digital world. Actors, produced actions, vulnerability, and subjective matter are all examples of these contrasts.

What is more, maintaining the digital trust of stakeholders (both internal and external) is a crucial component of a responsible organisational culture. As a result, organisations bear some of the responsibility for digital trust; they must be proactive in evaluating their internal behaviours and knowledge ecosystems, not just in terms of how and where data is transferred, but also in terms of how these vectors are valued within the firm.

Understanding what promotes online digital trust is, therefore, critical for business executives. This paper intends to serve as a foundation and starting point for academic discussion. Thus, our final conclusion is that issues of digital trust require extensive research, both empirical and theoretical.

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