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Farjam Eshraghian

University of Edinburgh, farjam.eshraghian@ed.ac.uk

Ashley Lloyd

University of Edinburgh, ashley.lloyd@ed.ac.uk

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Opening the blackbox of ‘fitness for use’: the role of IT implementation in perceiving information quality

Farjam Eshraghian

PhD Candidate, University of Edinburgh, Edinburgh, UK

Email: Farjam.Eshraghian@ed.ac.uk

Ashley D. Lloyd

Senior Lecturer, University of Edinburgh, Edinburgh, UK

Email: Ashley.Lloyd@ed.ac.uk

Abstract

This article explains the role of adoption and adaptation of information technology in shaping and constructing the perception of information quality by information consumers. A qualitative and interpretive study has been conducted among Iranian organizations that faced problems in implementing Western developed software applications in Iran’s institutional context. We have been exploring how the lack of institutional linkage between the technology developers and technology users which already made implementation process a challenging one for the users may affect their perception of information quality. Drawing on Social Studies of Technology and the theory of social learning, we have provided more insight into the mentioned dynamics. We conceptualize the impact of implementation of information technology on the dynamics of shaping perception of information quality by suggesting the following mechanisms: adapting and domesticating a generic type of information technology from other institutional contexts, experiencing context-specific information quality issues by using the appropriated information technology, and constituting the perception of information and its fitness to the context of use.

Keywords: information/data quality, sociology of information system, technology implementation, fitness for use, perception, Iran

1. Introduction

There is quite insightful and still growing literature on Information Quality. The scholars’ focus on the notion of information quality started by outlining the challenges that different organizations may be forced to deal with. The typical executive is already besieged by too many problems, low customer satisfaction, high costs, a data warehouse project that is late, and so forth. Redman (1998) enumerates some of the effects and damages to a normal organization such as decline in customer satisfaction, amplification of operational costs, decrease in the rate of successful decision-making,

harms in employees satisfaction and trust in the organization and decline in the rate of successful implementation of corporate strategies.

At the beginning of the 1990, the dominant view, among the scholars in the field of information quality, was inherited from the contemporary studies of Information system and was prone to the intrinsic view. The second wave of studies (Wand and Wang, 1996, Wang and Strong, 1996, Strong et al., 1997, Ballou et al., 1998, Wang, 1998, Wang et al., 1998) which started in the middle of the 1990s criticised this purely intrinsic view to the concept of information quality and emphasised on interpretive aspect of information. They highlighted that information must be fitted to the use.

Although since then different scholars have taken the notion of ‘fitness for use’ granted, they have considered it very situated and did not try to open this social black box significantly. The question about how information consumers’ perception of information quality and of its fitness for use is being shaped has left unanswered yet. With a few exceptions such as the study by Lee (2004) that provides insights into how organizational practitioners solve information deficiencies by contextual solutions and the one by Fehrenbacher and Helfert (2012) that suggests resources, information consumers’ organizational position and type of information technology they use may affect the perception of information quality, this literature generally lacks studies which provide description of dynamics which make and change information consumers’ perception of information quality.

Drawing on social studies on technology, we argue that social aspect of technology has usually been neglected in the literature of Information Quality. For example, technology can have collective affordances (Leonardi, 2011) or different interpreted meaning for users. Considering this fact, the following question seems valid. If information technology can be interpreted with different meanings, is it possible these different interpretations imply different perception of information quality.

2. Literature Review

The dependence of quality of information on the context, in which it is being used, is now widely accepted among researchers and practitioners and consequently its fitness to a specific use and context is measured (Wang and Strong, 1996, Strong et al., 1997, Pipino et al., 2002, Lee, 2004, Lee et al., 2007, Watts et al., 2009). Lee (2004) explains the different approaches that practitioners

use to solve the problems of information quality and argues that they mainly employ their own companies' contextual knowledge. Eshraghian et al. (2014) argue that the technology provider's knowledge, about the context in which the technology is used for the purpose of information production, may have important role. The complex process of information production includes three different data roles, data collector; data custodian; data consumer, who apply three different modes of knowledge to have the quality of produced information significantly improved (Lee and Strong, 2003). The first mode of knowledge comprises the general and factual aspects about the nature and different processes of information production focusing on dynamics and connection. The second mode of knowledge refers to the sequence and arrangements of these processes and finally the third mode concerns the knowledge about context, reasons and rationales behind different information production processes.

Lee (2004, p.96) stressing on the role of the contextual knowledge in solving information quality problem, notes the importance of “various natures and implications of information technologies” besides different processes and dynamics of organizations due to direct engagement of information technology in the process of information production. Orlikowski and Iacono (2001) in their process of 'IT artifact' conceptualization, show that 'tool view' of information technology is the dominant one in Information Systems research and considering this technology as a tool for 'information processing' is the most important aspect of this view. This view shows the importance of more depth insight into the role of information technology and its sociology in the process of information production and the concept of information quality.

The literature suggests that Information Technology is not “just object; ... [it is] always and already implicated in action and effect” (Grint and Woolgar, 1995, p.292) and it is not by any means “natural, neutral, universal, or given” (Orlikowski and Iacono, 2001, p.131). This type of technologies is integrated into time, context and instance of use and their materiality (Orlikowski and Scott, 2008, Faraj and Azad, 2012) depends fully on different features of culture, history, economics and society of developing and using sites (Williams and Edge, 1996, Orlikowski and Iacono, 2001, Sørensen and Williams, 2002). Its nature is dynamic which implies that its development, appropriation and adaptation to the local context are on-going processes that include variety of actors and may be repeated frequently (Fleck, 1994, Fleck, 1999, Williams et al., 2005, Pozzebon and Van Heck, 2006, Sørensen and Williams, 2002).

The literature on information quality provides useful insight into the technical role of Information Technology and its influence on the process of information production and its quality. It merely explains the influence of the dynamic nature and the continuing processes of development and use on the perception of quality of information and the consequence of the interplay between different actors in the iterative process of technology design and implementation. The notion of 'design-actuality' (Heeks, 2002) clearly refers to the gap which usually exists between the process of design and the process of implementation as the link between technical aspects and social practices is crucial for the implementation phase while there is usually discrepancy between the initial design of a generic system and what an organization needs regarding to its local and societal context (Pozzebon and Van Heck, 2006). Fehrenbacher and Helfert (2012) show the significant association between information consumers' perception of Information quality and available type of Information and Communication Technologies (ICT). Although this piece of research made the role of ICT in information production process clearer than before, it doesn't help to understand how the long-term process of technology appropriation, adoption and adaptation impacts the perception of information quality.

We argue that this is an area which needs researchers' attention. The mutual interaction and influence of technological development and social context, consequently organizational context, have been accentuated significantly in the literature of Social Studies on Technology (SST). The reciprocal effect among wide range of technical components and socially constructed elements which are in "constant mutual tension" (Williams and Edge, 1996, p.876) makes the adoption and implementation a non-linear process (Fleck, 1994, Fleck, 1999). Technology is not one-time process as the interplay between technical and social factors leads to introduction of new versions of technology (Williams and Edge, 1996). This perspective rejects the idea of a general and standard solution for multiple social and organizational contexts while it also doesn't imply that technology is shaped and configured according to every specific context, thus, exchanging knowledge and know-how is crucial between different actors in the process development, appropriation and adoption (Pozzebon and Van Heck, 2006) especially in the case of 'configurational technologies' (Williams et al., 2005). Therefore, there is a need to construct an understanding of interplay between socio-organizational context and technological context, which reflects on technology adoption and implementation process, may have impact on the perception of Information Quality.

Fleck (1994) emphasizes on the importance of proper communication and negotiation between the technology vendor and the technology user. He implies if this communication is not significant, the implementation of the technology in the context of the user's organization will be prone to failure or incomplete implementation. This apparent relationship between communication and implementation interested us to study organizations which have experienced incomplete technology implementation or had problems using the technology. The consequence of the mentioned conditions on organizational users' perception of information quality is worth to be investigated.

There are world regions and countries in which local organizations always prefer to use updated versions of information technology but they can't properly communicate with technology vendors for different reasons and technology vendors don't have "local practical knowledge" (Fleck, 1994, p.641) significantly. We argue that organizations from these countries are very interesting to explore the effect of the aforementioned dynamics on the perception of information quality. Iranian organizations are among the best cases for this study. Being at the "unique corner of the IT world" (Sipples, 2014), they haven't had proper communications with the famous information technology vendors from the western countries such as the United States while these vendors' IT products are widely being used by Iranian organizations.

Most western information technology suppliers, especially American ones, haven't had any representatives in Iran since the early years of the Islamic Revolution. Consequently, Iranian organizations could not communicate with them directly and the suppliers' lack of sufficient knowledge about local practices has been one the major origin of the issues these organizations have had. For example, Microsoft's misinterpretation of Farsi, the official language of Iran, as a version of Arabic language was the reason that Iranian users and organizations haven't had the same experience of others from using its operating systems and applications while its products have been the most popular ones in Iran: "[S]upport in Microsoft products was not perfect [...] the Persian language [Farsi] has unfortunately merely been considered a variant of the Arabic language [... it has] affected the common practice and user experience of some finer details of Persian computing" (Esfahbod, 2004, pp.1-3). Tough US sanctions isolated Iran more and closed the official communication channels between Iranian user organizations and many western IT vendors.

3. Theoretical Framework

The objective of this section is to outline the theoretical frameworks and to define the concepts on which our analysis draws in order to have more insight in the role of technology appropriation and adaptation dynamics in constructing perception of Information Quality.

Wand and Wang (1996) claim that, in the context of information system, a user's perception of the real world is constructed by systems, thus, the flaw in information is recognized by the user when the system does not provide accurate representation of the real world. This positivist and intrinsic view was challenged as it was argued while information might not accurately represent the real world it can be fit for the specific use (Wang and Strong, 1996, Strong et al., 1997, Lee, 2004, Lee et al., 2007). Since then it has been taken into granted that quality should be measured against how information and its quality is perceived by information consumers. Most information quality dimensions should be adapted and determined according to information consumers' perception (Wang, 1998, Wang et al., 1998). Davenport and Prusak (2000) argue as information is received by information consumers and supposed to provide insight for them the important point is how a piece of information is perceived by them. “[D]ifferent customers will perceive the quality differently” (Ballou et al., 1998, p.474), thus, understanding the mechanisms which construct or have impact on the information consumers' perception seems necessary.

Due to the interpretive nature of information quality perception, Pipino et al. (2002) refer to the role of information users' experience and requirements in the process of perceiving. Johns and Saks (2013) emphasize on the impact of experience on human perception in general while Shankaranarayanan and Cai (2006) believe that the requirement or purpose for which information is produced and the nature of task such as decision making has major impact on perception of quality. Fisher and Kingma (2001, p.111) also note the role of experience or “feel for the data” in perceiving the quality of information for specific task but they argue some factors such as time pressure may limit the understanding of the need or the task's context for which information is produced to have significant impact on quality perception by information consumers. Fehrenbacher and Helfert (2012) also believe that limit resources has important role in how quality of information is perceived. Thus, we consider past experience and context of in-hand task as the factors mainly affect the perception of information quality by information consumers.

Fehrenbacher and Helfert (2012) assert that the type of information technology which is used by data consumers impacts on the perception of information quality. Although their argument is valid, it lacks explanation. Accordingly it can be argued how information technology is perceived by users can affect how they perceive information quality. Firstly, Information technology has the one of the main roles in information production process while data and information which represent the real world are provided by information technology (Wand and Wang, 1996). Secondly, Orlikowski and Iacano (2001, p.124) note that being “information processing tool” as the dominant view of information technology. Finally, Strong and Volkoff (2010) consider information quality issues (data misfit) one of the important factors of information technology misfit into organizational context.

This literature usefully emphasizes on the role of Information Technology in affecting how information quality is perceived. We want to step further and to describe the dynamic of this influence. We argue that information consumers’ perception of information quality and their experience are constructed according to how Information Technology, which is highly configurable, has been appropriated, implemented and incorporated into information consumers’ institutional context. Appropriation of technology is the process of localizing and adapting generic functionalities and features of a particular technology then incorporating them into the local practices and specific social and cultural systems (Williams et al., 2005).

This process is the result of long-term learning engagement which includes different variety of expertise (Kallinikos, 2011). It highly depends on local culture and context as “different cultures will engage differently with local adaptation” to guarantee that the outcome is compatible with local practices and needs (Pozzebon and Van Heck, 2006, p.76). Although the appropriation of technology is necessary for a generic and configurational technology to work in the context of technology adopters, it is essential to give meaning to the technology. A technology acquires its meaning when it is incorporated into a set of practices (Williams et al., 2005). Every social system has its own set of meanings and when an artifact is appropriated by any social group, it needs to be meaningful and significant in the new social settings (Bijker and Pinch, 1987). Williams et al. (2005) argue this process of assign meaning to a technological artifact has two different aspects in the case of information technology due to its nature. Its soft technological aspect should acquire meaning as well as its hard technological aspect. Due to information processing (Orlikowski and

Iacono, 2001) and conveying nature of Information Technology, its soft aspect of the meaning is inscribed into content and information (Law, 1987).

Sørensen (1996) introduces the concept of social learning as “a combined act of discovery and analysis of understanding and meaning, and of tinkering and the development of routines”. Williams et al. (2005) develop this concept into a framework which provides insight into the dynamic of developing and appropriating technology. This framework also helps understanding the act of meaning acquisition in the process of technology appropriation in a particular socio-institutional context. The notion of learning in this framework is not associated with purpose of education while it opens the black-box of interaction between social and technical elements of a technology and how interplay between different actors involved and their exercise of power can affect these elements during the process of appropriation (Williams et al., 2005). It is arguable that technology appropriation process should be conducted significantly by people from the socio-institutional context for which the technology is appropriated as having the knowledge of local practices is necessary while experts’ consultation seems inevitable (Avgerou and Walsham, 2000, Pozzebon and Van Heck, 2006).

Social learning framework (Williams et al., 2005) drawing upon domestication framework (Silverstone et al., 1992, Lie and Sørensen, 1996) suggests that the complete appropriation process has four interconnected and undivided stages: initial appropriation, objectification or configuration (Harwood, 2011), incorporation, and conversion. Initial appropriation represents the time at which a technology is acquired. Silverstone et al. (1992, p.19) theorize this stage as a sale point when a technology or object is being sold to and acquired by its consumers.

The second stage is configuration (Harwood, 2011). At this stage the technology consumer tries his first attempt to configure the acquired technology in his domestic or internal domain. This domain can be either physical or symbolic domain. Kallinikos (2011) notes the appropriated technology can get to work and function properly after extensive configuration. He expresses that this process includes embodying technology agency into different functions and technical elements.

The third stage is incorporation. It is possible that the technology functions differently than what technology vendors and designers originally intended to (Silverstone et al., 1992). It is highly probable that unintended functionalities and technology affordance (Leonardi, 2011) to be used by

technology consumers to “serve other cultural purposes in appropriation” (Silverstone et al., 1992, p.21). Thus, the meaning which is constructed and interpreted by technology consumers is highly dependent on the configured elements and the cultural and institutional domain in which the technology functions.

The fourth and final stage is conversion. When the technology is fully domesticated into the technology consumers’ domain and context, it can convert their relations between the domain to which the technology has been appropriated and the domain from which the technology has been adopted (Silverstone et al., 1992). This conversion is important as technology consumers need to “signal to others their participation in consumption and innovation” (Silverstone and Haddon, 1996, p.46). This appropriation does not concern other players outside of technology consumers’ domain unless the consumers start speaking out about the symbolic meaning they have constructed (Silverstone et al., 1992). This conversation and negotiation can inform technology developers of consumers’ interests which can be inscribed into the new versions of technology. This negotiation is necessary part of innovation especially in the case Information and Communication Technologies, a configurational type of technology, as the development of these technologies is not a linear process. Fleck (1988) introduced the term ‘innofusion’ which is the combination of innovation and diffusion terms. This notion implies that the process of innovation does not end when a technology is diffused and appropriated to consumers’ domain while extensive work should be done to implement it into the context of use, therefore, a retrospective approach of negotiation is essential (Fleck, 1988, Fleck, 1994, Fleck, 1999).

Social learning framework drawing on the concept of economic learning (Andersen and Lundvall, 1988, Freeman and Soete, 1997) highlights the role institutionalizing the communication channel between technology vendors and technology users for higher chance of successful appropriation and implementation (Williams et al., 2005).

4. Research Methodology

To fulfil the aim of this research which is to study the role of adopted and institutionally appropriated technology in constructing information users’ perception of information quality, we have chosen abuctive research strategy (Blaikie, 2007) and interpretive research method (Walsham, 2006).

4.1. Data Collection

To understand how organizations in Iran institutional context appropriate and implement western developed information technologies and accordingly how this process may shape and reconstruct their users' perception of information quality, especially those who are main actors in their information production process, we decided to contact companies from multiple industries to make our results analytically generalizable (Becker, 1990, Yin, 2009) at the societal and institutional level instead of at an industry level.

The following table provides the details about our interviewees and their companies:

Organizations	Type of the organization (business)	Industry	Size of the organization	Interviewees
Organization A	Online website	Online retailer	Small	Co-founders (2) Search Engine Optimization (SEO) experts (2)
Organization B	University	Education	Large university	Developers & researchers (who published university data on Linked open data cloud) (2)
Organization C	Online Publishing (App)	Publishing	Small	Founders (2), Developers (2)
Organization D	Private bank	Finance and Monetary	Large	CRM head, CRM expert, CRM developer
Organization E	Manufacturing	Automotive	Large	IT department head, System administrator, Developer Finance department head
Organization F	Retailer	Food industry	Medium	IT department head, System expert ,Finance department head

Table 1. The companies' profile

These organizations are all in Iran and the lack of institutional linkage between Iranian organizational users and famous IT suppliers in Western countries has made Iranian organizations interesting cases for this piece of research. One to one open-ended and semi-structured interview was the main method of data collection. Negotiating and getting access to these organizations have been done by one the researchers who had already been working in Iran IT market and have been in personal contact with some of these organizations.

The first approach, we followed to overcome the researchers' bias and also to validate the interviewees' comments, was to interview six independent practitioners who have been in Iran IT market for long time. Some of them after working for different companies have established their own consulting business in implementing information technologies in the context of Iran. They are called **Expert (A-F)** in this article. The second approach, we followed for the purpose of the researchers' biased reduction and interviewees' comments validation has been document analysis. Document analysis is one of the major resources for reducing of being biased challenge for the researcher. A couple of documents about the companies' profile whose employees were interviewed by the authors were collected for the analysis purpose.

4.2. Data Analysis

As interviews were conducted in Farsi, after transcription of each interview, it was translated to English and coded into NVivo software in order to conduct thematic analysis. We analysed each case separately for unique themes and themes which emerged across all cases. To interpret data and unanticipated implication of appropriation of technology on perception of information quality at institutional and societal level, interpretive method (Lee, 1991, Walsham, 2006) was employed.

The following emerging themes are the result of our analysis:

1. Adapting and domesticating a generic type of information technology from other institutional contexts
2. Experiencing context-specific information quality issues using appropriated information technology
3. Affecting the perception of information and its fitness to the context of use

5. Findings

This section includes the empirical findings and the key themes which have been emerged from our extensive data analysis.

5.1. Adapting and domesticating a generic type of information technology from other institutional contexts

The data we have collected clearly confirms that changing institutional logics (Friedland and Alford, 1991) in Iran in 1979 and blocking institutional linkage between technology developers and users is one of the main sources have impacted significantly on the technology meaning interpreted by Iranian organisations. These institutions could not benefit from developer-user interactions which make technology developers aware of their interests and also profit them of technology developers' help in implementing the technology. They may encounter the same issue upgrading to the new versions of the same technology. Expert B, who implemented Microsoft CRM for some Iranian organizations, comments about this issue:

“First of all the copy of Microsoft CRM which is being used here is not provided any support by Microsoft...Literally, everyone who chooses to use Microsoft CRM here doesn't get any support... How can Microsoft work in Iran while the country is under sanctions?... Here most [local] companies who provide support for this kind of software such as Microsoft CRM are very small ones. They can't provide the support at the level, which Microsoft partners who are authorized by Microsoft provide”

It can also be argued that famous IT developers have many different ways to hear their users' voice and consequently inscribe their interests into the next version of their products such as adding new features etc. For example, Microsoft has a website which is called 'user voice'. While this kind of practices can inform technology developers about users' requests, they can't replace direct involvement and negotiation with users to get know users' institutional context significantly. Another example is Google and the increasing number digital entrepreneurs in Iran (Hafezieh et al., 2011) and their dependence on Google services. The quote, from the head of SEO team of Organization A, illustrates the importance of IT developers' interpretation of users' institutional context for the successful implementation of technology:

“Today after 6 years of experience, I can tell you... [about the] difficulties of searching a Farsi text. I think that search engines have not been designed for Farsi I don't know about others languages but I think the [SEO] tricks...work much better for English websites rather than Farsi websites”

Absence of this link has two serious consequences: technology developers may misinterpret users' requirements and institutional characteristics. Another consequence is that, being deprived from the developer's help, users may construct different meaning of the technology other than what the technology vendor initially intends as technology can have multiple affordances. Expert A exemplifies the aforementioned problem in his own words:

“[everyone] involved in [...] implementing Electronic Correspondence System in Iran is familiar with this problem [disorder of correspondences’ identification number]...A correspondence identification number is usually combination of figures, signs, Farsi characters, mmm and in a very rare cases some English characters....the more common problem is with hyphen [e.g.] instead of placing at the right side of a character it is shown at its left side. [The worst case is viewing] number in different environments such as reports, Windows applications,[...] SQL Server Management Studio... different [Iranian] developers use different methods to solve this issue, but honestly these are not permanent solutions. Just a solution on the top layer not a systematic one not at all”

Farsi is the official language in Iran and is written from right to left unlike English and Romance like language. Therefore, its combination with English scripts is complicated and messy. The problems originating from Iranian institutional characteristics have institutionalized a fear among Iranian organizational users that adopting and incorporating these applications are associated with challenges and risk. Even, there is no guarantee that they work properly after high investments. This fear is amplified due to the lack of institutional direct communication link to famous technology developers. While some organizations succeed to implement and use these applications, they resist upgrading their applications to the new versions till to the critical point at which they feel the risk of using outdated one is more than the risk of this perceived challenge. The head CRM of Organization D refers implicitly to this fear:

“[W]e started with Microsoft CRM 4 then migrated to CRM 2011... [Migration] was a challenge although we have had a good team of experts in the bank, even some of them got Microsoft Certificates from other countries¹...we are still new comers and don’t have all resources they have... Microsoft has released 2013 version [...] but we don’t have plan to upgrade. [it] has changed [the] database structure and interface, thus, we have waited for next version to see Microsoft roadmap and to the point we really gain something by upgrading”

Expert B believes the reason for the main challenges of implementing and upgrading Microsoft Packages is:

“... Microsoft accounting because accounting principles in Iran are completely different [...] companies who want to use Microsoft Enterprise have to use a domestic application for their accounting system...”

¹ Getting Microsoft Certificate isn’t possible inside Iran

Being deprived from institutional linkage, the difference between the carried logic by a type of technology and the Iran institutional logics has been the main theme of our analysis as these two logics cannot easily be accommodated.

5.2. Experiencing context-specific information quality issues using appropriated information technology

Our data shows when information technology appropriation and implementation in users' institutional context is challenging for various reasons such as technology developers' misinterpretation of users' institutional context, lack of institutional linkage to technology developers, hardship of accommodating technology logics to users' societal and institutional logics, it is very likely that users face significant deficiencies in quality of information initially or continuously when the technology is part of information production process. Expert A outlines different issues in Electronic Correspondence Systems in Iran:

“Since we live in a bidirectional environment, there is still some ambiguity in ordering these characters in a right way... users enter [the] numbers in systems [such as SQL Server Management Studio] but when they retrieve them, they are not shown in the right order”

He clarifies it by providing more insights. Although Farsi does not share any character with English, the signs, punctuations and numbers have some similarities and this is the origin of the problem. He explains during data entry if a record starts with a number or a sign, Iranian users don't usually change the keyboard settings to Farsi in many cases and when they want to enter Farsi characters their keyboard setting is shifted to Farsi. So, the data field contains Farsi and non-Farsi characters. When data is retrieved non-Farsi characters and signs are sorted left-to-right while Farsi characters are sorted right-to-left. This character disorder issue leads to information representation deficiency. When it comes to organizational and legal documents as in Iran a document's hard copy is still officially important and any representational issue in correspondence identification number may have a serious consequence. According to him, solution is simple but these systems are closed-source, therefore, any local solution isn't systematic and very reliable.

Despite of sanctions, implementation challenges and the government policies, Iranian organizations prefer to use foreign developed applications. This logic has been accepted among them unless they are institutionally forced to use internally developed applications. Some of

organizations even try to integrate these applications. Making this link is sometimes the source of information quality issue as Expert B comments:

“[C]ompanies who want to use Microsoft Enterprise [Package] have to use a domestic application for their accounting system and integrate [them]. Most of the internal companies cannot integrate these applications very well.....I was involved in data cleansing project in which we understood the problem was not the quality of data the problem was how these applications were working [together]”

The head CRM of Organization D refers to the ill-implementation link between previous version of Microsoft CRM and their core banking:

“Sometimes, it gave analysts here buggy results”

The role of technology developers' interpretation of users' institutional context is more important if the type of information technology affords less extent of adaptation by users. Google services are offered in the form of Software as a Service (SaaS), thus, users have less ability to domesticate them.

Expert E believes if it doesn't understand semantics and structures of users' language, the ranking result includes dirty information such as a couple of spam websites which are ranked at the top of the list. There is a conflict between Google and spammers in all languages but it was much more successful in English web comparing to Farsi web. Google regularly updates its algorithm to make harder for spammers to get good ranking in the results. Expert E notes:

“Google doesn't have enough knowledge about the Farsi web and put some sites with yellow content [spam websites] at the top of ranking.....there was a case that Google released an update ... [which] affected the English web but in the Farsi web yellow pages' ranking increased significantly”

5.3. Affecting the perception of information and its fitness to the context of use

Our analysis reveals that information quality issues which may be identified and experienced after the process of technology domestication and incorporation into the context of use by users have direct impact on reshaping information users' perception of information quality and how it fits to the context. In this study, technology users have been assumed to be information consumers as well. For example, Expert A, who raised the issue of character disorder in the case of Electronic Correspondence Exchange, based on his experience, explained that:

“I have been in IT market for long time [20 years], this problem made managers very sensitive about correspondence identification number. I

usually see that they get their secretaries double-check these numbers after printing correspondences before sending them out”

Information quality deficiencies which Iranian organizational users have experienced regarding to Electronic Correspondence Exchange systems that have been result of appropriating and implementing a piece of technology which carries different logic than the users’ institutional logics.

As this data representational issue has repeated using different applications which have been employed to support correspondence exchange practices, Iranian users have devised a practical solution in different organizations. They get employees double-check identification numbers wherever it’s necessary. This has become a rule in dominant logics of many Iranian organizations. In other words, they perceive that this practice should be done to avoid any further consequence this issue may bring. Expert A explains although using Open Source applications solve this problem and some organizations have started using them, this embedded rule in the dominant logic of many organizations has not been changed yet.

it can be argued that experiencing of information quality deficiency in Electronic Correspondence Exchange systems which had already been adopted and domesticated and using the practical solution to solve the quality issue by different organizations have shaped these organizational users’ perception about the fitness of information from these applications to the context of use. Although some of the organizations have adopted different types such as open source ones, this perception has not changed significantly and it may need more time to be reconstructed.

Iran is a country with high extent of bureaucracy and its government controls most part of the economy and market. Therefore, the state can dominate its logics by having control over infrastructure or by enforcing these logics via different laws. Expert D explains the implication of these logics on technology appropriation and implementation by Iranian public and semi-public banks:

“[A]s many banks in Iran are public [or semi-public] they want to have the source code of their core banking. They should know who developed the system, what kinds of benefits they [developers] had....If they don’t have the source, they think the data would not be secure or there would be unauthorized access to it...I remember one of these public banks negotiated with Company X [anonymized] and could acquire a modified version of their source spending a lot money.”

The government authorities' approach imposes on the banks that they must oversee the process of compiling of the codes of core banking. Although there are quite number of reputable international developers who provide core banking solution, the mistrust, which has been existed between Iran and Western countries for a long time, rationalises this policy. Data safety and securing it from unauthorised access (accessibility dimension) is perceived by having the code by the banks while it is arguable that if the code is compiled and implemented by the developers who know it very well, it may provide more security for the banks' data.

6. Discussion and Implications

Considering the emerged themes from our empirical data and analysis, we plan to open the black box of how the perception of information quality and its fitness-for-use is affected by the way information technology is adopted and implemented by information consumers. The role of technology can be more highlighted while it has been designed and developed in an institutional context other than adopters' institutional context. Finally, drawing on the current literature, we contribute theoretically to the literature considering the implication of our findings and linking them to the prevailing literature.

The first part of our analysis shows despite the state dominant logic which has been promoted since the Islamic revolution, Iranian organizations have never lost their interest to adopt Western designed and developed applications. Although the state policy was to develop local versions of these applications, organizations try to acquire the western versions unless they are limited by the law. They can acquire these technologies although there is no institutional linkage and official communication channel with technology developers. Due to the sanctions imposed by the United State government on Iran after the revolution, American companies are forbidden to present at the Iran market or to provide service for Iran based organizations. This limitation has not restricted the user organizations from acquiring a copy of Western developed applications using different ways such as establish subsidiary branches in other countries. Although acquisition of technology has not been a challenge, domestication and incorporation into societal and institutional context of these organizations are the main challenges. Without the developers' help and resources, organizations exploit internal resource and knowledge to implement the appropriated technology. Even though these resources can be beneficial and valuable, lack of having two way communications with the developers is considered a significant disadvantage. This channel could be employed to use developers' knowledge and resources for implementation in a specific institutional context while users could let developers know about their feedbacks and specific requirements which drive by their institutional logics.

Missing this institutional linkage to technology developers, the process of appropriating and implementing the acquired technology does not necessarily go as the developer intended to. It may also start performing to some extent differently than the functions for which it has been designed, thus, the perceived meaning of the technology by the users from the specific institutional context is not exactly the same one which has made the developers' perception of the technology. As technology, especially information technology which is a configurational one, can have several affordances, it's not surprising if different meanings can be encultured and interpreted at the same time. The way that a type of information technology is adopted, appropriated, domesticated and integrated into the processes of an organization can be highly impacted by the logics of different institutions which have shaped the society. For example, if the state enforces specific financial practices which are not necessarily compatible with best practices, organizations will have some concern implementing Western enterprise package systems. While the organization does not any other choice except using domestic applications for its financial system, the market logic stimulates it not to deprive itself from other systems of the enterprise package which has been developed by a reputable Western company. Integration between these two applications is what the developer of enterprise package doesn't suggest.

Configuring and incorporation into the context of use by adopter organizations, information technology may not fit very well to the organizational context. One of its implications is experiencing some data deficiencies using the technology. Our analysis shows that this type of misfit can be amplified if the technology developer does not have significant knowledge of adopters' institutional context. Official channels and two way communications between developers and users can improve this knowledge. The information quality issues that Iranian organizations encountered were from different categories such as representational, contextual and accessibility issues. Although organizations who implement the technology this way are expected to turn to another one, the dominant market logic encourages them to continue using it. For example, Microsoft Enterprise is the package which is being used by many progressive companies around the world. Knowing this fact in addition to having technology deterministic and optimistic view to the Western developed software applications by Iranian organizations, they seek to find a practical solution to keep the technology rather than replace it with another one especially a domesticated developed one. For example, double-checking the correspondence identification number after printing the letter to see whether the unique number is represented correctly is one of these practical solutions. This type of practical solutions can

be incorporated as rules into dominant logics of these organizations. It means that if after a while they migrate to new application which doesn't have the same problem, they are likely to repeat this practice, e.g. double-checking, while it's not necessary anymore.

Experiencing of these quality deficiencies of information and incorporating practical solutions into the dominant logics of organizations gradually affect the perception of users about information quality and its fitness to the context of use and to the tasks in hand. Today, it's almost impossible to separate information technology from different organizational processes. The implication of entanglement of technology and organizations these days is that many organizational users see different organizational processes and operations through the information which is provided by the systems. This piece of research confirms that it's high likely that the way that a system, i.e. information technology, has been appropriated and implemented to function in the institutional context can shape or reconstruct the technology users' perception of information quality.

Our thematic analysis reveals that the approach of technology configuration and incorporation by organizations has indirect impact on users' perception of information quality. Its impact is mostly embodied into the information quality issues that the users encounter and experience and the practical solutions which are devised and incorporated into the dominant logic of the organization. This study demonstrates that when the users' perception of information quality is reconstructed, it takes long-time to change it. Adoption of new technology which does not have the problems that the previous technology had such as information quality issues, cannot change their perception in short-term. The following diagram illustrates our theoretical conceptualization and contribution:

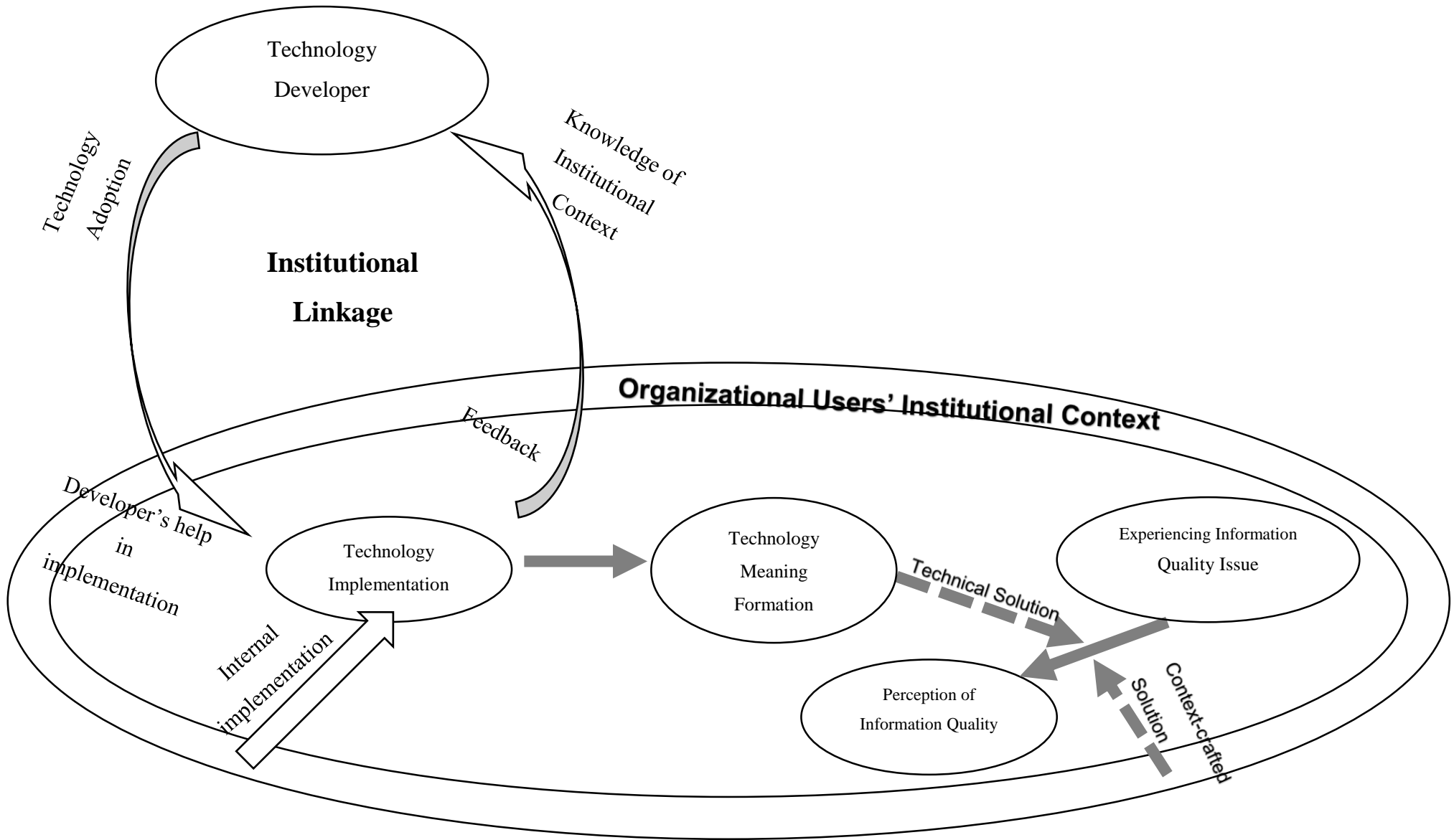


Figure 1. Conceptualization of the impact of technology implementation on perceiving information quality

7. Conclusion

Our paper provides more insights into the role of information technology appropriation and implementation in affecting the perception of information quality when the practice of appropriation occurs across different societal and institutional contexts. After conducting this in-depth study across the six Iranian organizations, we argue that the institutional linkage between the technology developer and the technology user which directly impacts how the technology user constructs the meaning of technology, also indirectly impacts how the perception of information quality is shaped. This study discusses despite the state logic that promotes Iranian organizations to use locally developed IT applications, Iranian organizations have not lost their interests to appropriate and implement the ones which have been developed by the famous and reputable companies. It is noticeable that these organizations use local consultants and developers who don't necessarily have the original developer's resources and knowledge. The case of Iranian organizations shows us that this dynamic of adoption and adaptation may lead the users to interpret the meaning of technology in the way which deviates from the original meaning intended by the technology developer. Its isochronism of this event with information deficiencies that occur because of it, may reshape and affect the users' perception of information quality.

This piece of research has recognised three stages which the mechanism of technology appropriation and implementation can affect the construction of information quality perception. These stages are as follows: 1. Adapting and domesticating a generic type of information technology from other institutional contexts; 2. Experiencing context-specific information quality issues using appropriated information technology; 3. Affecting and reshaping perception of information and its fitness to the context of use. Upon completion of this study, we have provided the conceptualization of interplay between technology appropriation, technology meaning and perception of information quality. This research suggests the affordances of technology can indirectly shape and reconstruct how information consumers perceive information fitness for use.

8. References

- ANDERSEN, E. S. and LUNDEVALL, B.-Å. (1988) *Small national systems of innovation facing technological revolutions: an analytical framework*. Small countries facing the technological revolution, Pinter, London, pp. 9-36.
- AVGEROU, C. and WALSHAM, G. (2000) *Information technology in context*. Studies from the perspective of developing countries, Ashgate, England.

- BALLOU, D., WANG, R., PAZER, H. and TAYI, G. K. (1998) *Modeling information manufacturing systems to determine information product quality*. *Management Science*, 44 462-484.
- BECKER, H. S. (1990) *Generalizing from case studies*. *Qualitative inquiry in education: The continuing debate*, pp. 233-242.
- BIJKER, W. E. and PINCH, T. (1987) *The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other*. In *The Social Construction of Technological Systems* (Eds. BIJKER, W. E., HUGHES, T. P. and PINCH, T.), The MIT Press, Cambridge.
- BLAIKIE, N. (2007) *Approaches to Social Enquiry: Advancing Knowledge*, Wiley.
- DAVENPORT, T. H. and PRUZAK, L. (2000) *Working knowledge: How organizations manage what they know*, Harvard Business Press, Cambridge, MA.
- ESFAHBOD, B. (2004) *Persian computing with unicode. 25th Internationalization and Unicode Conference*, 2004 Washington, DC.
- ESHRAIGHIAN, F., LLOYD, A. D. & HARWOOD, S. A. (2014) *Biography of Data: A Societal Level Perspective On Data Quality*. In *Proceedings of 19th International Conference on Information Quality (ICIQ)*, Xi'an, China. 128-140.
- FARAJ, S. and AZAD, B. (2012) *The materiality of technology: An affordance perspective*, In *Materiality and organizing: Social interaction in a technological world* (Eds. LEONARDI, P. M., NARDI, B. A. and KALLINIKOS, J.), Oxford University Press, Oxford.
- FEHRENBACHER, D. D. and HELFERT, M. (2012) *Contextual factors influencing perceived importance and trade-offs of information quality*. *Communications of the Association for Information Systems*, 30 111-126.
- FISHER, C. W. and KINGMA, B. R. (2001) *Criticality of data quality as exemplified in two disasters*. *Information and Management*, 39 109-116.
- FLECK, J. (1988) *Innofusion or diffusion?: The nature of technological development in robotics*, Research Centre for Social Sciences, University of Edinburgh.
- FLECK, J. (1994) *Learning by trying: the implementation of configurational technology*. *Research policy*, 23 637-652.
- FLECK, J. (1999) *Learning by trying: the implementation of configural technology*, In *the Social Shaping of Technology* (Eds. MACKENZIE, D. and WAJCMAN, J.). 2nd ed, Open University Press, Berkshire.
- FRIEDLAND, R. and ALFORD, R. R. (1991) *Bringing Society Back In: Symbols, Practices, and Institutional Contradictions*, In *The New Institutionalism in Organizational Analysis* (Eds. POWELL, W. W. & DIMAGGIO, P. J.), The University of Chicago Press, Chicago.
- FREEMAN, C. and SOETE, L. (1997) *The economics of industrial innovation*, Psychology Press, Oxon.
- GRINT, K. and WOOLGAR, S. (1995) *On some failures of nerve in constructivist and feminist analyses of technology*. *Science, technology & human values*, 20 286-310.
- HAFEZIEH, N., AKHAVAN, P. & ESHRAIGHIAN, F. (2011) *Exploration of process and competitive factors of entrepreneurship in digital space*. *Education, Business and Society: Contemporary Middle Eastern Issues*, 4 267-279.
- HARWOOD, S. A. (2011) *The domestication of online technologies by smaller businesses and the 'busy day'*. *Information and Organization*, 21 84-106.
- HEEKS, R. (2002) *Information systems and developing countries: Failure, success, and local improvisations*. *The information society*, 18 101-112.
- JOHNS, G. and SAKS, A. M. (2013) *Organizational Behaviour: Understanding and Managing Life at Work*, Pearson Education, Canada.

- KALLINIKOS, J. (2011) *Governing through technology: Information artefacts and social practice*, Palgrave Macmillan.
- LAW, J. (1987) *Technology and heterogeneous engineering: the case of Portuguese expansion*, In *The social construction of technological systems: New directions in the sociology and history of technology* (Eds. BIJKER, W. E., HUGHES, T. P. and PINCH, T. J.), MIT Press, Cambridge, MA.
- LEE, A. S. (1991) *Integrating positivist and interpretive approaches to organizational research*. *Organization Science*, 2 342-365.
- LEE, Y., CHASE, S., FISHER, J., LEINUNG, A., MCDOWELL, D., PARADISO, M., SIMONS, J. and YARSAWICH, C. (2007) *CEIP maps: context-embedded information product maps*.
- LEE, Y. W. (2004) *Crafting rules: context-reflective data quality problem solving*. *Journal of Management Information Systems*, 20 93-119.
- LEE, Y. W. and STRONG, D. M. (2003) *Knowing-why about data processes and data quality*. *Journal of Management Information Systems*, 20 13-39.
- LEONARDI, P. M. (2011) *When Flexible Routines Meet Flexible Technologies: Affordance, Constraint, and the Imbrication of Human and Material Agencies*. *MIS quarterly*, 35.
- LIE, M. and SØRENSEN, K. H. (Eds.) (1996) *Making Technology Our Own? Domesticating Technology into Everyday Life*, Scandinavian University Press, Oslo.
- ORLIKOWSKI, W. J. and IACONO, C. S. (2001) *Research commentary: Desperately seeking the "it" in it research—a call to theorizing the it artifact*. *Information systems research*, 12 121-134.
- ORLIKOWSKI, W. J. and SCOTT, S. V. (2008) *Sociomateriality: Challenging the Separation of Technology, Work and Organization*. *Annals of The academy of management*, 2 433-474.
- PIPINO, L. L., LEE, Y. W. and WANG, R. Y. (2002) *Data quality assessment*. *Communications of the ACM*, 45 211-218.
- POZZEBON, M. and VAN HECK, E. (2006) *Local adaptations of generic application systems: the case of Veiling Holambra in Brazil*. *Journal of Information Technology*, 21 73-85.
- REDMAN, T. C. (1998) *The impact of poor data quality on the typical enterprise*. *Communications of the ACM*, 41 79-82.
- SHANKARANARAYANAN, G. and CAI, Y. (2006) *Supporting data quality management in decision-making*. *Decision Support Systems*, 42 302-317.
- SILVERSTONE, R. and HADDON, L. (1996) *Design and the domestication of ICTs: technical change and everyday life*, In *Communicating by Design: The Politics of Information and Communication Technologies* (Eds. SILVERSTONE, R. and MANSELL, R.), Oxford University Press, Oxford.
- SILVERSTONE, R., HIRSCH, E. and MORLEY, D. (1992) *Information and communication technologies and the moral economy of the household*, In *Consuming technologies: Media and information in domestic spaces* (Eds. SILVERSTONE, R. and HIRSCH, E.), Routledge, London.
- SIPPLES, T. (2014) *Exploring Iran's IBM Mainframe Ecosystem* [Online]. *millennial mainframer*. Available: <http://www.millennialmainframer.com/2014/03/mainframes-in-iran/> [Accessed 20 November 2014].
- SØRENSEN, K. H. (1996) *Learning technology, constructing culture. Socio-technical change as social learning*. STS working paper no 18/96, University of Trondheim: Centre for technology and society.
- SØRENSEN, K. H. and WILLIAMS, R. (2002) *Shaping Technology, Guiding Policy: Concepts, Spaces and Tools*, E. Elgar.

- STRONG, D. M., LEE, Y. W. and WANG, R. Y. (1997) *Data quality in context*. Communications of the ACM, 40 103-110.
- STRONG, D. M. and VOLKOFF, O. (2010) *Understanding organization-enterprise system fit: a path to theorizing the information technology artifact*. MIS quarterly, 34 731-756.
- WALSHAM, G. (2006) *Doing interpretive research*. European journal of information systems, 15 320-330.
- WAND, Y. and WANG, R. Y. (1996) *Anchoring data quality dimensions in ontological foundations*. Communications of the ACM, 39 86-95.
- WANG, R. Y. (1998) *A product perspective on total data quality management*. Communications of the ACM, 41 58-65.
- WANG, R. Y., LEE, Y. W., PIPINO, L. L. and STRONG, D. M. (1998) *Manage your information as a product*. Sloan Management Review, 39 95-105.
- WANG, R. Y. and STRONG, D. M. (1996) *Beyond accuracy: What data quality means to data consumers*. Journal of Management Information Systems, 12 5-33.
- WATTS, S., SHANKARANARAYANAN, G. and EVEN, A. (2009) *Data quality assessment in context: A cognitive perspective*. Decision Support Systems, 48 202-211.
- WILLIAMS, R. and EDGE, D. (1996) *The social shaping of technology*. Research policy, 25 865-899.
- WILLIAMS, R., STEWART, J. K. and SLACK, R. S. (2005) *Social learning in technological innovation: Experimenting with information and communication technologies*, Edward Elgar Publishing, Cheltenham.
- YIN, R. K. (2009) *Case study research: Design and methods*, Sage.