

Adopting Information Systems in a Small Company: A Longitudinal Study

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Abstract

For some time there has been an increase in adoption of enterprise systems by small companies. With well-documented potential benefits, there are a lot of reasons to adopt them. In this study however the choice to adopt smaller pieces of information systems by a small organization is investigated to provide a counter example to the integrated-solution literature. With the intention to adopt an enterprise system at the beginning, the case provides a dynamic story of a small organization and how various factors impacted on the intention and resulted in an assemblage of information systems instead. By adoption the technology-organisation-environment framework and a single case study design, the case indicates that in addition to the oft-cited factors such as organisational size and IT readiness, social norms and the characteristics of a central individual, such as the owner, play a prominent role in information systems adoption, and highlights how these factors are connected to each other.

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1. Introduction

For some time, it has been argued that small and medium-sized enterprises (SMEs) can use information technologies (IT) as a tool for competitive advantage. One development in this area is the adoption of enterprise systems - such as enterprise resource planning (ERP) systems - by the SMEs. Once a domain of large enterprises, today enterprise systems are used by SMEs as well. This move to some extent has been the result of saturation of the large-enterprise market, as well as the changing technology that enabled the vendors to offer solutions to SMEs.

The ERP systems literature argues that there are various benefits for adopting such systems: cost reduction, productivity improvement, quality improvement, customer service improvement, better resource management, improved decision-making and planning, and

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organizational empowerment (Shang & Seddon 2000). Based on these benefits (e.g. Karimi, Somers, and Bhattacharjee 2007; Morton and Hu 2008; Uwizeyemungu and Raymond 2012) it might be expected that many organization adopted an ERP-like information system? However, many organizations do not adopt ERP-like systems. Then the question arises: why do not some organization adopt such systems?

In this paper, the decisions of a small organization regarding their information systems (IS) choices to adopt small off-the-shelf ISs are investigated. By focusing on identifying which factors influence IS adoption in a small organisation context and how they interact with each other, this paper aims to answer the research question “how does a small organization adopt an IS?”

A small company is chosen for this study for several reasons: while the ERP literature began to include SMEs, the differences between small- and medium-sized companies are often missing (Laukkanen et al. 2007; Iskanius et al. 2009). By focusing only on a small company then the study would add to the literature by providing a perspective to balance out the medium-sized enterprise perspective. Similarly, by focusing on a small company, the study would also reveal how the often taken for granted assumptions that govern SMEs in general – resource deficiency, short-term focus² – play in IS adoption. Thus the main objective of this study is to contribute to the information systems adoption literature by studying a small business’ IS adoption process.

As noted by Jha and Bose (2016), IS adoption studies often assume a European or American setting, and do not assume a longitudinal perspective. This skewed representation means that social and behavioural differences in other settings are not investigated, thus eroding the generalizability of the findings of research outside the specific geographies of developed countries. The case for this paper, Kitchen Co., is a manufacturing company in South America that builds kitchens for both private individuals – more of a bespoke design – and supplies kitchens for housing projects. The study adopts the technology-organization-environment framework (TOE) (DePietro et al. 1990). With its explicit emphasis on environmental context, TOE provides a useful lens to analyse a non- American or Europe setting . .

The case provides a glimpse of interrelated IS decisions: the owner of the company had experience with ERP systems before setting the company up and had the intention to use one. However 4 years down the road, the company has no ERP system in the pipeline, even though recent talks with the owner revealed that the idea of adopting an ERP system is still in his vision of the company. The company, on the other hand adopted smaller standard-off-the-shelf systems to create their IS. The adoption of IS that helps in running the company during these 4 years still has to satisfy various stakeholders and play various roles within the organization. The case has been followed over this time and such a longitudinal view and similar to Cho and Mathiassen (2007) and Kietzmann (2008) contributes by exploring the stages that the organization has passed in adopting.

After this introduction the next sections provides a brief literature review on ERP adoption and discusses the theoretical framework. The research approach is detailed next, followed by the case description and analysis, with the paper closing with a discussion and conclusions.

2. Enterprise systems in SMEs

² Needless to say, as Zammuto et al. (2007, 752) argues, a resource-poor organisation might have a different experience than a leading edge manufacturing organisation. However, as research on born –global organisations shows resource-constrained organisations can still leverage their capabilities and achieve success, e.g. by using network relationships (Sullivan Mort & Weerawardena 2006).

ERP systems have originally been geared towards large enterprises, and have been associated with various benefits over the years (Davenport 1998; Shang & Seddon 2000; Yusuf et al. 2004; Uwizeyemungu & Raymond 2012; Nwankpa 2015). However in recent years, as Sedara (2009) argues, the market became saturated and the vendors shifted their focus towards SMEs, and as a result –the ERP literature began to include SMEs (Laukkanen et al. 2007; Iskanius et al. 2009).

Similar to large organisations, the strategic value of ERP systems have been investigated for SMEs, and Yen and Sheu (2004) argues that they are as strategic for SMEs. Buonanno et al. (2005) claims that structural and organizational reasons were cited as the main reasons for not adopting an ERP system among SMEs – not financial ones as assumed in the previous literature. Similarly Federici (2009) has cautioned against considering an SME-ERP implementation as a scaled down implementation. ERP systems' potential benefits often arise from efficiency and legitimacy gains (Son & Benbasat 2007), and it has been argued that SMEs can level the playing field against large enterprises by employing enterprise systems (Awa et al. 2016), and use them for competitive advantage (Koh & Simpson 2007).

However, achieving these benefits is not straightforward. Peculiarities of SMEs – e.g. family owned, single person owned, tight budgets – might necessitate further research to evaluate how SME setting impacts ERP implementations. The literature documented the impact of several organizational and context factors on SMEs information system preferences. For example Federici (2009) found that some factors such as size were not significant, however SMEs preferred local ERP companies. Cereola, Wier, and Norman (2012) identified importance of top management support. Buonanno et al.'s (2005) study showed that organizational complexity is not a significant factor in SME ERP adoptions.

3. Technology-Organization-Environment (TOE) framework and IS adoption

There are a myriad of ways to explain how and why an IS is adopted. There are some specific theories that directly address the issue – such as technology acceptance model (TAM) (Davis 1989) unified theory of acceptance and use of technology (Venkatesh et al. 2003), diffusion of innovations (DOI) (Rogers 1983) and TOE (DePietro et al. 1990) which this study adopts.

In this paper the TOE framework is adopted. The TOE framework is a widely used IS adoption frameworks that has empirical support and has been used in various IS adoption decisions. It has been claimed as a generic IS adoption/diffusion theory that only suggests different sources of influence without specifying variables of each (Zhu & Kraemer 2005).

In TOE framework, decisions are influenced by three contexts³. Organisational context denotes descriptive measures about the organizational characteristics such as top management support, size, organizational readiness and employees' IT expertise (Awa et al. 2015; Jeyaraj et al. 2006; Zhu & Kraemer 2005; Iacovou et al. 1995; DePietro et al. 1990). Technological context refers to existing technologies in use and new technologies relevant to the firm. In this context research has shown that characteristics such as complexity, compatibility, relative advantage, ease of use, IT infrastructure play a role in the decision to adopt IS. (Rogers 1983; DePietro et al. 1990; Jeyaraj et al. 2006; Oliveira & Martins 2011; Oliveira & Martins 2010).

Environmental context on the other hand refers to the arena in which the firm conducts its business—its industry, competitors, and dealings with the government. While the technology and organization contexts of TOE closely follow the characteristics investigated in DOI of Rogers (1983), this environmental context adds extra explanatory power to the TOE framework

³ See Jha and Bose (2016), Oliveira and Martins (2011) and Jeyaraj, Rottman, and Lacity (2006) for a review of the constructs within these contexts.

(Hsu et al. 2006). Research has focused on how government regulations, competitive pressures supplier support impact on IS decisions. (DePietro et al. 1990; Zhu & Kraemer 2005; Jeyaraj et al. 2006; Oliveira & Martins 2011; Alshamaila et al. 2013; Awa et al. 2015).

While TOE has been recognized as a versatile tool of inquiry, one criticism against it has been raised by Thong (1999) that it might not be the most suitable to be used in small organisations. Claiming that in small organizations the CEO is the owner/manager of the organization and has a role in determining the innovativeness of the organization, Thong (1999) has argued that CEO characteristics should be considered as a fourth context in TOE framework, and were found significant (Jeon et al. 2006; Shiau et al. 2009). In most IS adoption literature however, Thong's (1999) CEO characteristics is missing even though there is a strong emphasis on the effect of size and top management support in the organizational context.

Several reviews (Jha & Bose 2016; Oliveira & Martins 2011; Jeyaraj et al. 2006) highlight the predominance of quantitative methods in IS adoption research, which might be one of the reasons why similar constructs have been validated as significant in IS adoptions. However TOE has been adopted in qualitative research that also seems to validate the same constructs (e.g. Alshamaila, Papagiannidis, and Li 2013; Bradford, Earp, and Grabski 2014).

Also, as Jha and Bose (2016) argues, there is a lack of non-American and European adoption research. Adopting TOE, with its emphasis on environment, would highlight how a South American setting would effect the IS adoption. Similarly, they argue that there is a technological determinism in some theories used within the field. As TOE doesn't assume prevalence of any contexts, it can help in providing a more balanced understanding of IS adoptions when compared with other frameworks.

While Thong (1999) has argued adaptation to the TOE model, the model he proposed did not account for the interaction between the different contexts – even though he cautioned that indirect effects might occur. In this paper, the TOE framework is adapted to include the insight from Thong (1999), with the most commonly cited factors are included in their respective contexts – Technology, organization, environment and CEO – provided in figure 1. The mentioned reviews highlight a tilt towards positivistic philosophy in IS adoption research. In this study, the TOE framework is used as a sensitizing device⁴ to analyse the case and highlight how the building blocks of the TOE framework impact the IS adoption and use. By using TOE framework in such a way, the case material then can be used to reveal some other building blocks and linkages among them that might be overlooked due to the design of previous studies, which mostly accounted for direct impact of the factors whereas leaving interaction among factors unattended.

⁴ In his work, Blumer (1954, 7) uses the terms definitive- and sensitizing concepts, with the definitive concept defined as “refers precisely to what is common to a class of objects, by the aid of a clear definition in terms of attributes or fixed bench marks”.

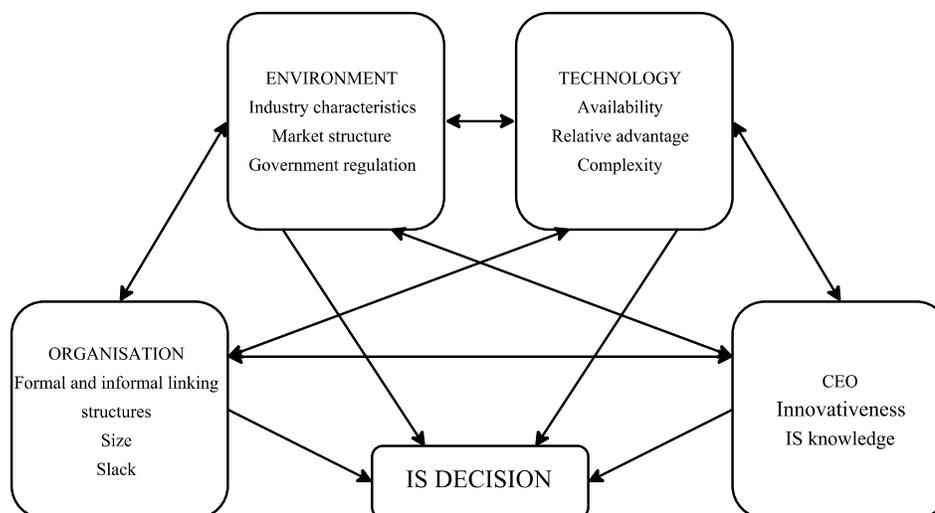


Figure 1. The adapted TOE framework (adapted from DePietro, Wiarda, and Fleischer (1990) and Thong (1999))

4. Setting and approach

In this study a qualitative and interpretative single case study design was adopted (Walsham 2006; Eisenhardt 1989; Benbasat et al. 1987). A single case study design was selected for this research, as the contact with the owner of the case organization about various issues was kept from late 2012 to early 2016, providing longitudinal aspects that make a single case study design appropriate (Yin 2009). As Siggelkow (2007) and Flyvbjerg (2006) argues adopting such a design can be valuable to highlight dynamic processes by getting closer to the constructs under study which might be harder with large-sample empirical works.

The study is further informed by the principles laid out by Klein and Myers (1999). During the time period that the author kept in contact with the owner of Kitchen Co. there were instances that changed the understanding of both parties. The author's research project was about integrated systems, e.g. ERP systems, and Hugo, the owner of Kitchen Co was undergoing SAP training. This mutual interest resulted in discussions around why an ERP system can be useful for a company, what kind of options there might be for a start-up. This instance is akin to Klein and Myers' (1999) idea that facts are produced with the interaction among the researcher and the participants. This stance was later adapted as Kitchen Co. was established and no ERP decisions were made, resulting in the "research project" with Kitchen Co to cool down. However, as time went by, the choices made in Kitchen Co to adopt smaller systems became interesting phenomena, an option to highlight an alternative of an assemblage of systems in contrast to a fully integrated system such as an ERP. Thus the passage of time and addition of new data has changed the perspective of the researcher, which might fit with Klein and Myers' (1999) ideas of iterative thinking.

Data gathering has been done in semi-structured interviews. The author has met Hugo, the owner of Kitchen Co., in Sweden, so the first few instances of interaction was on a face-to-face basis. Later contact was kept via video conferencing tools – Skype and Facetime - and was later broadened to include 2 members from the engineering team, the accountant, and an external consultant. Notes were taken during the interviews, and used as reference points when summarizing the interviews and examining the data.

5. Kitchen Co.

In this section, the case organization is presented, followed by three subsections corresponding to the three contexts of TOE framework used to analyse the IS adoption decisions within the case company. During the analysis the CEO (Hugo) emerged as a central figure. To highlight this predominance of CEO and show how interconnected these contexts are, the fourth context, CEO characteristics, is used in these three subsections rather than presented as a fourth context.

5.1. Initial Contact with Kitchen Co.

The case company for this study is situated in South America. Kitchen Co., designs manufactures and installs kitchen, though their projects so far has mainly focused on the capital and surrounding cities. Their projects have ranged from bespoke kitchens to providing kitchens for housing projects.

The first contact with Kitchen Co was made before it was officially established. The owner of Kitchen Co, Hugo, was a master student that took a course on ERP systems from the division where the author is employed, and through a mutual friend was introduced in 2012. At that time Hugo was thinking of establishing a company in Sweden, but decided to return to his home country, and established a company for digging wells for water provision, Water Co. Two years later that company was sold and Kitchen Co was established.

Before establishing Water Co. Hugo has attended an industry conference in Germany, which SAP, a major ERP vendor, was a sponsor. Coupled with the ERP course he was taking in Sweden, this industry conference resulted in an initial idea of using an ERP – or ERP-like – system for his future company. However, neither in Water Co., nor in Kitchen Co. such a system is used, thus providing a story that highlights the contrast between initial ideas and the actual organization.

5.2. Organisation

Kitchen Co. is a small organization, employing less than 30 people. Most of the employed people work in the workshop to create the kitchens – fashioning the cupboards, cutting the kitchen top etc. – and then going to the project sites to install these kitchens. Most of the production is manual, due to the capital costs involved with automated machinery. The workers receive the blueprints that are designed by a CAD tool used by the engineers and manufacture the kitchen according to the specific requirements from the blueprint. After the parts are manufactured they are checked against the requirements list provided in the blueprint, and they are checked once again during the installation.

The CAD is used to create the list of requirements of the projects, and the list is printed out as an Excel file, which is then put into an inventory management software. This job is mostly done automatically, however an administrative assistant first manually has to edit the Excel file and check that the requirement list and the inventory list are the same after the file is fed to the inventory system. Hugo has done that task along with the engineers from time to time to ascertain that the lists are the same. Such close contact with the data allows Hugo and the engineers to have a feeling about how the company is doing by keeping track of the projects and people involved with the projects.

Hugo has a small team of engineers that design the kitchens and also work as a sales team. Hugo himself has a background in industrial engineering and manufacturing management, thus has experience from both the engineering and management perspective to help with the daily run of the business. He takes an active role in running the company and spends time both at the office and the workshop. The first housing project they have received was due to his personal involvement and using his network, and in his words “being there at the right time”. As the sole

owner he has the official power to make decisions, and is mostly involved with the day-to-day running of the company.

Hugo is coming from an entrepreneurial family, and has used some of the resources available from having such connections in both Water Co. and Kitchen Co. One main resource is the accountant, who also takes care of the family owned Rice Co. Jose works part time with Kitchen Co as he has more responsibilities with the Rice Co., and was influential in the accounting software selection, the same that they use in Rice Co. Hugo handles the issues related to human resources himself, and the costs and expenses are reported to the accountant by using simple Excel sheets accompanied with the receipts and order forms, and the accountant has not raised any difficulties in deciphering such documentation.

There is an understanding that a close integration within IS can help to reduce some of the costs and help streamline the manufacturing process. The inventory management system can use barcodes to read the data and keep track of the stocks, which was identified as a future option. However, as of yet Kitchen Co. hasn't felt a need to use barcodes to keep track of inventory and merchandise due to relatively low volumes of production and consistent communication with suppliers. Such a gap, as Hugo admits makes the work a bit tedious. However, it has also provided him an opportunity to check on the actual status of the stocks, as well as having a grasp of what is going on with the company. By managing the payrolls individually he is better able to realize who is working on which days and compare it with the projects they are assigned. He argues that it provides a more personal feeling when talking with the workers rather than relying on a fully integrated system.

At this moment, a fully integrated system is not fully realizable. The company still operates on short-to-medium term survival and doesn't have the financial resources for an ERP system. When the option of an open source ERP as an alternative was raised by the author, Hugo commented that they don't have the in-house IT knowledge to operate the system so it wouldn't be "free anyway". The workers at the workshop are not trained to use a computer system to assist them in their work – which still relies on manual work processes. As a result, the engineering team and Hugo have a closer interaction with the workshop, visiting them regularly to see the progress of the projects in person. The existing communication channels – sending the blueprints, the list of requirements, calling the foreman among others – are not deemed as problematic even though it not an integrated solution. However respondents suggested that as long as no problem occurs – or they grow exponentially – there is little advantage to complicate the work-system by changing the IS set up.

5.3. Technology

As already mentioned, there are several systems that are in use at Kitchen Co. This is a deviation from the ERP-like system idea Hugo had at the beginning. While there are various ERP systems that will serve most of their needs, Hugo has decided against such a system.

The engineering team uses a CAD software to design the kitchens and plan the production with the system. It also keeps track of the required material that is needed to produce the kitchen. For standard kitchens, the system derives the materials requirements automatically. For more specialized products, the engineers manually input some of the requirements to the list in the software. One person in the engineering team was familiar with the system from a previous job and has recommended to the team, and the software was adopted rather quickly. There are modules that can be used to integrate such CAD software to an ERP system, however the interviews suggest that at this moment such integration is not needed.

A free inventory management system is used by Kitchen Co. Using a free software has helped in reducing the costs, especially at the kick-off stage of the Kitchen Co. Hugo wanted to have a versatile system to cover any future growth, and decided that keeping everything in

an Excel sheet will not work in the long run. One chief reason for choosing the system was that it was created for small and medium-sized organizations, and was easy to set up. The system also offers easy upgrade options if the in-built options do not support the organization, while necessitating minimal support from the vendor, highlighting issues of complexity as well as external support.

One overarching issue in IS selections was the need to be able to operate in Spanish, and being able to work with the country regulations. While the engineering team has English language skills, for any other personnel the IS needs to be in Spanish. Similar to this constraint, issues related to the tax system was the main reason why the accountant's idea to use the familiar accounting system was accepted. Whereas other options were also investigated – such as QuickBooks, which Hugo wanted – they were discarded due to incompatibility with the tax system, and language issues. Whereas the accounting system used does not have modern tools – e.g. cloud applications and being able to generate quotes and invoices from a smart phone – the accountant's experience in using the system has offset some of these issues. Hugo's experience with such mobile apps was broadened while studying in Sweden and he encountered various payment systems. He remembers using applications like Swish and iZettle, and he argues that while he would like to use such applications, they are not widely spread in South America. As most of the customers and suppliers would not use these systems, they will not be able to use these applications with full potential..

Having an education and experience of using such systems in Sweden also provides another point of contrast. Hugo recalls the wide use of mobile internet, and expecting to have wireless connection in most public places in Sweden, However in his country, such technologies can still be problematic. This became apparent while having a Skype interview with the author, which had to be postponed twice due to low quality of internet connection. Such failures in connection makes on-spot quote calculations more difficult. However the sales team is comfortable with using their laptops and giving rough estimates on the spot, and more firm quotes within a few days of initial contact with potential customers. Such a time gap also allows them to discuss what can be offered to the customer rather than relying on set-rules written to the system. Rules such as a discount to a returning or premium customer could be decided together before putting into the system. However having a discussion on what the project entails and then deciding upon a cost projection and preparing an offer for the customer – with Hugo and a project responsible from the workshop – seems to be a workable solution for Kitchen Co.

5.4. Environment

In previous studies, one major part of the environmental context was the external threat and the adoption of the innovation by the competitors. In Kitchen Co. the respondents did not provide any indication that the competitors' choice was influential in selection of IS. As already mentioned, the CAD software was suggested by an engineering team member which can indicate that the software is used by others. Similarly the accounting software is suggested by a senior accountant, demonstrating that already existent software are used without much change in new organizations.

As Kitchen Co. is still a small company, Hugo is able to manage the company with the limited IS tools adopted. As mentioned Hugo had the idea to adopt an ERP system early on, however that is not realized yet. In the recent years ERP vendors have shifted some of their services to cloud, and began to offer “reasonably priced” packages. While the external consultant and Hugo seem to be enthusiastic about the idea, they are not sure as not having the right infrastructure can cause problems. Though there is a trend for increasing speed, South American countries lack the internet speed found in North America or Western Europe (Akamai Technologies 2016). This necessitates IS that can work without [stable] internet connection,

thus eliminating some of the cloud options that can be adapted to the existing IS in Kitchen Co. Such lack of stable connection necessitated, as mentioned, an interview with the researcher to be postponed twice, and around that period, Kitchen Co. was not able to order supplies as they usually do, but had to phone their suppliers. Similar to the infrastructure problems, all the ISs that have been supplied from the vendors that Kitchen Co. is able to access with minimal effort. This coupled with the familiarity of the employees with the systems used before Kitchen Co. highlights the importance of external support and employees' experience.

Another environmental factor was hinted at previously, being at the right place at the right time. Hugo argues that compared with his experiences in Sweden, USA and Germany, in his country people are more willing to work with personal contacts and back-of-the-envelope calculations. Having an ERP-type system where everything is connected and adheres to a set of rules can be problematic. Kitchen Co. has customers that prefer to use back-of-the-envelope type calculations from time to time. As all respondents have argued, there is a tendency to use paper invoices and paying with cash in the country, thus having such a tightly integrated system might become problematic. Such norms and transactions were contrasted heavily by Hugo, who remarked how in Sweden every cashier was directly connected to Skatteverket, the Swedish Tax Agency.

In Kitchen Co. none of the informants argued that their choices are influenced by competitive pressure. This is counter to most of the literature where competitive pressure plays a significant role. Hugo argued that they are not in a stage where they are "that concerned" about competition, but are trying to survive on short and middle term. Similar arguments were raised by others, however one issue of interest is the choice of the CAD. As two of the engineers have argued they have used the system in their education – and one worked with it – there might be elements of normative pressures in this choice. When asked about their knowledge about competitors that might be using an ERP system, while there were no definite answers, there was a basic understanding that similar organisations are not using one whereas bigger organizations might have ERPs.

6. Discussion

This paper has the aim of investigating how a small organization adopted ISs, and has employed the TOE framework to identify the factors that affect the adoption. In this part of the paper how these factors worked in tandem to afford and impede some IS choices for Kitchen Co.

Hugo, as the owner of Kitchen Co. has proven to be a central figure in decisions regarding IS adoption in Kitchen Co, similar to Thong (1999). Having education in ERP systems, he has expressly argued for an ERP system and has thought about a cloud-ERP option. However this was countered by *organizational realities* such as constrained financial resources and non-existing in-house IT capabilities needed for an ERP implementation. In this clash of CEO vs organizational context, several members of the organization has countered Hugo's ideas and was able to influence him to their chosen IS systems. Whereas the idea of an ERP was more predominant in the early talks with Hugo, after Kitchen Co. was set up and production began the prevalence of the idea of an ERP system diminished. To most extent this can be characterised as a result of low need-pull within the organisation: the current set up of the system seems to satisfy the organisational needs, thus the perception of a lower relative advantage of an ERP system. This satisficing is similar to what Teece, Pisano, and Shuen (1997) and Bensaou and Earl (1997) discuss as a Japanese style approach to IT management.

Also of notice is the use of Hugo's network to to secure services of the accountant and external consultant, once again highlighting the importance of CEO's capabilities. This need and ability of the CEO to network is well recognised (Kotter 1982), however in the reviewed

TOE-based literature that ability of the CEO is not highlighted. In Kitchen Co. the external consultant was identified by Hugo while studying in Sweden, whereas some of the customers were found when he was attending various expos in Bolivia. Just as attending an SAP sponsored expo has affected Hugo's ideas, the networks that the CEO is a part of should be considered more thoroughly.

The ISs that were adopted in Kitchen Co. have also shown the importance of compatibility. While some parts of the work-system needs manual assistance, the chosen IS systems complement each other. The inventory management system provides the actual stocks the warehouse has, whereas CAD is used to plan the manufacturing of the kitchens. The blueprints produced by CAD is used at the work-shop to manufacture the kitchen as well as used to check the inventory. An administrative assistant – as well as the engineers and Hugo from time to time – manually check the systems are working well, and transfer the reports created to the accounting software. This rather basic set up, while lacking the potential benefits offered by ERP systems – automation, standardization - allows Hugo to keep track of the company with ease. This is similar to what Orlikowski and Hofman (1997) suggested, that such issues can result in improvisation and can be turned into advantages. Diverging from the ERP idea that Hugo had – that implied automation and meetings to check the progress of projects – the current set up necessitates him and the engineers to work closely with the shop floor. This bridges the “division of labour” by having both planned and unplanned meetings to discuss the issue. The current set up has thus spurned a more “flat” hierarchy.

Of notice is the effect of technological capabilities provided by the standard IS systems. These systems are standard solutions that have more or less compatibility to work with other systems inscribed to them (CAD can read an Excel sheet with some minor modifications as input for inventory). This allows organizations to assemble them to a work-system bypassing the problems related to non-compatible legacy systems.

Similarly, the chosen IS are not complex, a technology factor. However, this non-complexity factor is tightly coupled with organizational resources and readiness, as well as environmental factors. QuickBooks, which Hugo was thinking of for accounting purposes, was discarded for Accounts, a system that the accountant has been using for some years. They are of similar complexity in their set-up, however, Accounts is already adapted for the Bolivian regulations, and has readily available support⁵.

These factors have already been validated in other contexts as mentioned before. However, in Kitchen Co. the competitive pressure was not a factor that was taken up by any of the informants, which is against most of the literature, as well as for SME-IS adoption (Hoti 2015). The interviewed people argued that they are on “survival mode” and thus competition's decisions are not taken into consideration for IS choices. A similar non-significance was found in Kuan and Chau (2001) for EDI adoption in small organisations in Hong Kong, Jeon, Han, and Lee (2006) for e-business adoption in South Korean SMEs, Alshamaila, Papagiannidis, and Li (2013) for cloud system adoption in small organizations in South England. The existence of non-significance from different environmental setting for different IS can be interpreted in different ways. One way is to argue that small (and medium) sized enterprises are more prone to be affected by internal pressures. However this interpretation can be problematic: as evidenced by the mentioned reviews, competitive pressure is often significant. As the sources that argued that competitive pressure is a non-significant factor follow either a large-sample survey-based approach or a multiple case study design, they do not problemise why the factor was not significant, but only take it as a finding. In Kitchen Co. however, while competitive

⁵ As addressed in community support pages (Intuit 2016), QuickBooks might be missing some modules in international version of its products.

pressures were not cited, there may have been a normative pressure that stemmed from the educational and professional background of engineers. This might mean that how the factor is defined in previous research might lead to omissions. In this way, adopting a single case study was useful to identify such a divergence by being able to have possibility to ask the respondents what “doing business” means. After several iterations it became clear that these norms of “back-of-the-envelope calculations” were not Kitchen Co. specific, but rather social norms, that were not talked of as part of the “competitive pressure” discourse, but more as a taken for granted part of “doing business”.

Another interesting – and related – finding are the social norms that seem to be at play. While previous research has identified government regulations/support can be an important factor, “norms” have often been termed as “subjective norms” drawing from theory of planned behaviour (Ajzen 1991). These were used as an organizational factor. Rather than this type of treatment of norms, in Kitchen Co. social norms of dealing with customers and suppliers informally played a role that resulted in the organization shying away from a fully-integrated system. Such a decision might result in loss of efficiency in the long term, however it also allows the organization to be flexible in conducting business. This is similar to the Peter Pan syndrome (The Economist 2014) where organization choose to stay small in spite of benefits of growing. This is another example of how the gaps within the system can be turned into a strategic tool. While there are opportunity costs associated with the non-integrated systems, for short-term survival an integrated solution might not be an option.

6. Conclusion

This paper began with the aim of investigating a small manufacturing organization in South America. The intention behind was to identify the factors relevant to IS adoption by adopting the TOE framework, and highlight how they interact with each other to affect the IS decisions within the organization.

Similar to previous research, the main factors that were important in this case were related to CEO’s knowledge and attitude towards IS, organizational readiness, prior IT experience, top management support, size, IT infrastructure, compatibility, non complexity, interpersonal relations. Contrary to most of the existing research, competitive pressure was not significantly pertinent to Kitchen Co.’s IS decisions. This might be a result of the short-term survival focus of the organization which might lead to an internal focus rather than external.

Another interesting finding was the role played by social norms, that showed that having a non-integrated system might lead to improvisation (Orlikowski & Hofman 1997) that might be more beneficial in the short-run. While an ERP type system might bring efficiency, in Kitchen Co. the points where the ISs that do not integrate have been used are firstly to have insight/control over the organization and secondly to provide flexibility when handling customers and suppliers. The transparency, standardisation and high integration of an ERP system would erode the ability of Kitchen Co. to adapt their transactions to the specific situations at hand. By adopting an affordance lens (Zammuto et al. 2007; Leonardi 2011) future research can compare the affordances provided by an ERP and a set up similar to what Kitchen Co. has and provide a more nuanced understanding of the IS decisions.

There are several venues for future research based on these findings. This study has attempted to answer the calls for IS adoption research from non- American and European settings (Jha & Bose 2016) and provided a dynamic story that showed how organizational and individual factors can affect each other. The study relied on a single case study design with Skype conference as communication method in this attempt. A more ethnography based research design would be able to bring the dynamic elements, as well as how other elements

related to the specific setting – Bolivia, relatively young work-force, manufacturing industry, etc. – to the forefront by providing an in situ narrative.

Related to the choice of method, as mentioned previously most IS adoption research has adopted more or less positivistic philosophies. However, the finding of this research that social norms play an important role has not necessarily been taken up by researchers unless they follow institutional theory. As indicated in the discussion part, the competitive pressure was not relevant for this case whereas social norms played an important role. However, this might be a case of different factors affecting each other indirectly. By adopting TOE as a sensitizing device and using it in qualitative case studies - especially in light of how quickly the IS and organizations are changing – can help in identifying new factors as well as defining the existing factors. Whereas this research is a single case study and the investment process it depicts should not be generalized, it suggests factors that can be important also in other cases, and that other cases could reveal yet other factors of importance. The similarities of previous research might be a result of using existing definitions with established methods, calling for a different use of TOE than a strict set of predefined and exhaustive factors.

A final venue for future research is to compare the adoption of older systems with new systems. As argued, in this case the ISs had built in compatibility to some extent, which made it possible for Kitchen Co. to have an assemblage of systems rather than an integrated one. The strategic consequences of these new technologies and how they create new affordances contra old school integrated system can provide insight for would be adopters to realize their organizational goals.

References

- Ajzen, I., 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Akamai Technologies, 2016. *Akamai's State of the Internet*, Available at: <https://www.akamai.com/us/en/multimedia/documents/content/state-of-the-internet/q4-2015-state-of-the-internet-connectivity-report-us.pdf>.
- Alshamaila, Y., Papagiannidis, S. & Li, F., 2013. Cloud computing adoption by SMEs in the north east of England. *Journal of Enterprise Information Management*, 26:3, 250–275.
- Awa, H.O., Ojiabo, O.U. & Emecheta, B.C., 2015. Integrating TAM, TPB and TOE frameworks and expanding their characteristic constructs for e-commerce adoption by SMEs. *Journal of Science and Technology Policy Management*, 6:1, 76–94.
- Awa, H.O., Ukoha, O. & Emecheta, B.C., 2016. Using T-O-E theoretical framework to study the adoption of ERP solution. *Cogent Business & Management*, 3:1.
- Benbasat, I., Goldstein, D.K. & Mead, M., 1987. The Case Research Strategy in Studies of Information Systems Case Research. *MIS Quarterly*, 11:3, 369–386.
- Bensaou, M. & Earl, M., 1997. The right mind-set for managing information technology. *Harvard Business Review*, 76:5, 118–128.
- Bradford, M., Earp, J.B. & Grabski, S., 2014. Centralized end-to-end identity and access management and ERP systems: A multi-case analysis using the technology organization environment framework. *International Journal of Accounting Information Systems*, 15:2, 149–165.
- Buonanno, G. et al., 2005. Factors Affecting ERP System Adoption: A Comparative Analysis Between SMEs and Large Companies. *Journal of Enterprise Information Management*,

18:4, 384–426.

- Cereola, S.J., Wier, B. & Norman, C.S., 2012. Impact of top management team on firm performance in small and medium-sized enterprises adopting commercial open-source enterprise resource planning. *Behaviour & Information Technology*, 31:9, 889–907.
- Cho, S. & Mathiassen, L., 2007. The Role of Industry Infrastructure in Telehealth Innovations: a Multi-Level Analysis of a Telestroke Program. *European Journal of Information Systems*, 16:6, 738–750.
- Davenport, T.H., 1998. Putting the enterprise into the enterprise system. *Harvard Business Review*, 76:4, 121–31.
- Davis, F.D., 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of. *Information Technol MIS Quarterly*, 13:3, 319–340.
- DePietro, R., Wiarda, E. & Fleischer, M., 1990. The context for change: Organization, technology and environment. In L. G. Tornatzky & M. Fleischer, eds. *The processes of technological innovation*. Lexington, MA: Lexington Books, 151–175.
- Eisenhardt, K.M., 1989. Building Theories from Case Study Research. *The Academy of Management Review*, 14:4, 532–550.
- Federici, T., 2009. Factors influencing ERP outcomes in SMEs: a post-introduction assessment Y. K. Dwivedi, ed. *Journal of Enterprise Information Management*, 22:1/2, 81–98. Available at: <http://www.emeraldinsight.com/doi/abs/10.1108/17410390910922840>.
- Flyvbjerg, B., 2006. Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12:2, 219–245.
- Hoti, E., 2015. The technological, organizational and environmental framework of IS innovation adaption in small and medium enterprises. Evidence from research over the last 10 years. *International Journal of Business and Management*, III:4, 1–14.
- Hsu, P.-F., Kraemer, K.L. & Dunkle, D., 2006. Determinants of E-Business Use in U.S. Firms. *International Journal of Electronic Commerce*, 10:4, 9–45.
- Iacovou, C.L., Benbasat, I. & Dexter, A.S., 1995. Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology. *MIS Quarterly*, 19:4, 465–485.
- Intuit, 2016. Hi, I'm using a trial version of Global Quickbooks from Bolivia... Available at: <https://community.intuit.com/questions/1320858-hi-i-m-using-a-trial-version-of-global-quickbooks-from-bolivia-i-want-to-add-the-payroll-module-is-it-possible-i-want-to-pay-the-essential-subscription>.
- Iskanius, P., Halonen, R. & Mottonen, M., 2009. Experiences of ERP use in small enterprises. In *11th International Conference on Enterprise Information Systems, Milan, Italy*.
- Jeon, B.N., Han, K.S. & Lee, M.J., 2006. Determining factors for the adoption of e-business: the case of SMEs in Korea. *Applied Economics*, 38:16, 1905–1916.
- Jeyaraj, A., Rottman, J.W. & Lacity, M.C., 2006. A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21:1, 1–23.
- Jha, A.K. & Bose, I., 2016. Innovation Research in Information Systems: A Commentary on Contemporary Trends and Issues. *Information & Management*, 53:3, 297–306.

- Karimi, J., Somers, T.M. & Bhattacharjee, A., 2007. The Role of Information Systems Resources in ERP Capability Building and Business Process Outcomes. *Journal of Management Information Systems*, 24:2, 221–260.
- Kietzmann, J., 2008. Interactive innovation of technology for mobile work. *European Journal of Information Systems*, 17:3, 305–320.
- Klein, H.K. & Myers, M.D., 1999. A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS quarterly*, 23:1, 67–93.
- Koh, S.C.L. & Simpson, M., 2007. Could enterprise resource planning create a competitive advantage for small businesses? *Benchmarking: An International Journal*, 14:1, 59–76. Available at: <http://www.emeraldinsight.com/10.1108/14635770710730937>
- Kotter, J.P., 1982. What effective general managers really do. *Harvard Business Review*, 60:6, 156–167.
- Kuan, K.K.Y. & Chau, P.Y.K., 2001. A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework. *Information and Management*, 38:8, 507–521.
- Laukkanen, S., Sarpola, S. & Hallikainen, P., 2007. Enterprise size matters: objectives and constraints of ERP adoption. *Journal of Enterprise Information Management*, 20:3, 319–334.
- Leonardi, P.M., 2011. When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS quarterly*, 35:1, 147–167.
- Morton, N. a. & Hu, Q., 2008. Implications of the fit between organizational structure and ERP: A structural contingency theory perspective. *International Journal of Information Management*, 28:5, 391–402.
- Nwankpa, J.K., 2015. ERP system usage and benefit: A model of antecedents and outcomes. *Computers in Human Behavior*, 45:2015, 335–344.
- Oliveira, T. & Martins, M.F., 2011. Literature Review of Information Technology Adoption Models at Firm Level. *The Electronic Journal Information Systems Evaluation*, 14:1, 110–121.
- Oliveira, T. & Martins, M.F., 2010. Understanding e-business adoption across industries in European countries. *Industrial Management & Data Systems*, 110:9, 1337–1354.
- Orlikowski, W.J. & Hofman, J.D., 1997. An Improvisational Model for Change Management: The Case of Groupware Technologies. *Sloan Management Review*, 38:1, 11–21.
- Rogers, E.M., 1983. *Diffusion of Innovations* 3rd ed., New York: The Free Press.
- Sedara, D., 2009. Size Matters! Enterprise System Success in Medium and Large Organizations. In J. N. D. Gupta, S. Sharma, & M. A. Rashid, eds. *Handbook of Research on Enterprise Systems*. Hershey, PA: Information Science Reference, 218–231.
- Shang, S. & Seddon, P.B., 2000. A Comprehensive Framework for Classifying the Benefits of ERP Systems. In *Americas Conference on Information Systems (AMCIS)*. 1–11. Available at: <http://aisel.aisnet.org/amcis2000> \n <http://aisel.aisnet.org/amcis2000/39>.
- Shiau, W., Hsu, P. & Wang, J., 2009. Development of measures to assess the ERP adoption of small and medium enterprises Y. K. Dwivedi, ed. *Journal of Enterprise Information*

- Management*, 22:1/2, 99–118.
- Siggelkow, N., 2007. Persuasion With Case Studies. *Academy of Management Journal*, 50:1, 20–24.
- Son, J.-Y. & Benbasat, I., 2007. Organizational Buyers' Adoption and Use of B2B Electronic Marketplaces: Efficiency- and Legitimacy-Oriented Perspectives. *Journal of Management Information Systems*, 24:1, 55–99.
- Sullivan Mort, G. & Weerawardena, J., 2006. Networking capability and international entrepreneurship: How networks function in Australian born global firms C. Styles, ed. *International Marketing Review*, 23:5, 549–572.
- Teece, D., Pisano, G. & Shuen, A., 1997. Dynamic capabilities and strategic management. *Strategic management journal*, 18:7, 509–533.
- The Economist, 2014. The Peter Pan syndrome. *The Economist*.
- Thong, J.Y.L., 1999. An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15:4, 187–214.
- Uwizeyemungu, S. & Raymond, L., 2012. Impact of an ERP system's capabilities upon the realisation of its business value: A resource-based perspective. *Information Technology and Management*, 13:2, 69–90.
- Venkatesh, V. et al., 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27:3, 425–478.
- Walsham, G., 2006. Doing Interpretive Research. *European Journal of Information Systems*, 15:3, 320–330.
- Yen, H. & Sheu, C., 2004. Aligning ERP implementation with competitive priorities of manufacturing firms: An exploratory study. *International Journal of Production Economics*, 92, 207–220.
- Yin, R.K., 2009. *Case Study Research: Design and Methods* 4th ed., Thousand Oaks, California: Sage Publications.
- Yusuf, Y., Gunasekaran, A. & Abthorpe, M.S., 2004. Enterprise information systems project implementation: A case study of ERP in Rolls-Royce. *International Journal of Production Economics*, 87:3, 251–266.
- Zammuto, R.F. et al., 2007. Information Technology and the Changing Fabric of Organization. *Organization Science*, 18:5, 749–762.
- Zhu, K. & Kraemer, K.L., 2005. Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry. *Information Systems Research*, 16:1, 61–84.