Joona Tasanen

CUSTOMISATION AS A SOLUTION TO MISALIGNMENT BETWEEN ERP SYSTEM AND BUSINESS PROCESSES IN SME CONTEXT

UNIVERSITY OF JYVÄSKYLÄ
FACULTY OF INFORMATION TECHNOLOGY
2018

TABLE OF CONTENTS

ABSTRACT

Tasanen, Joona Samuel
Customisation as a solution to misalignment between ERP system and business processes in SME context
Jyväskylä: University of Jyväskylä, 2017, 10 pp.
Computer Science, Bachelor Thesis
Supervisor: Kollanus, Sami

Enterprise resource planning (ERP) systems are defined as off-the-shelf software packages, which are made as standardised solution for managing the business processes in many enterprises. These ERP software packages however don't always fit the business processes of the implementing enterprise which leads to misalignment. Enterprises implementing ERP are encouraged to re-engineer their business processes to fit the ERP system, though business processes are considered as unique and important in small and medium-sized enterprises (SMEs).

ERP systems provide many benefits for the SMEs, but while fitting the business processes to match the ERP system is generally considered as a critical success factor, in the case of the SMEs customisation of the ERP system was found to be a better solution for misalignment between business processes and ERP system as unique business processes were described to be important or even part of the competitive edge for the SMEs.

Keywords: ERP, enterprise resource planning, toiminnanohjausjärjestelmä, customisation, SME, software package, business process,

TIIVISTELMÄ

Tasanen, Joona Samuel
Kustomointi ratkaisuna liiketoiminta prosessien ja ERP-järjestelmän väliseen epäyhteensopivuuteen pienissä ja keskisuurissa yrityksissä
Jyväskylä: Jyväskylän yliopisto, 2017, 10 s.
Tietojärjestelmätiede, kandidaatintutkielma
Ohjaaja: Kollanus, Sami

Toiminnanohjausjärjestelmät (ERP järjestelmät) luokitellaan ohjelmistopaketeiksi, jotka on tehty standardoiduksi järjestelmiksi yrityksien toiminnan ohjaamiseen. Ne eivät kuitenkaan aina vastaa täydellisesti yrityksien tarpeita ja siten johtavat epäyhteensopivuuteen yrityksen prosessien ja ERP järjestelmän kanssa. Ratkaisuksi tähän epäyhteensopivuuteen on usein esitetty yrityksen prosessien muokkaamista vastaamaan toiminnanohjausjärjestelmää. Nämä samat prosessit ja niiden erilaisuus on kuitenkin todettu olevan tärkeitä ominaisuuksia pienissä ja keskisuurissa yrityksissä.

ERP järjestelmät ovat monella tapaa hyödyksi pienille ja keskisuurille yrityksille. Yleisesti todetaan, että yrityksien prosessien muuttaminen vastaamaan ERP järjestelmää on elintärkeää ERP järjestelmän käyttöönoton kannalta, mutta pienien ja keskisuurien yrityksien tapauksessa ERP järjestelmän muokkaaminen vastaaminen yrityksen prosesseja todettiin olevan parempi vaihtoehto ERP järjestelmän ja yrityksen välisen epäyhteensopivuuden korjaamiseksi. Tämä erityisesti sen vuoksi, että nämä yritys prosessit ovat tärkeä osa pienien ja keskisuurien yrityksien kilpailukykyä ja menestystä.

Asiasanat: ERP, enterprise resource planning, toiminnanohjausjärjestelmät, customisation, SME, software package, business process,

FIGURES

TABLES

1 Introduction

Enterprise resource planning (ERP) systems are used in almost all large enterprises (LEs). They provide tools for management of the companies' major operations, which include accounting, human resources, production control and many other crucial everyday functions of the enterprises. Typically, ERP adopters have been LEs mostly because of high costs and risks of implementation, but due to saturation of the ERP market in LEs, ERP adoption in SMEs has started to catch up with LEs (Van Everdingen, Van Hillegersbreg, and Waarts, 2000; Mabert, Soni & Venkataramanan, 2003).

Increase in ERP adopters among SMEs has resulted to interest in studying the SME context of implementing ERP systems. As mentioned by many studies that despite the strategic importance of ERP systems, failures in ERP implementation projects are common (Hidayanto, Hasibuan, Handayani, & Sucahyo, 2013; Hong & Kim, 2002; Quiescenti, 2006).

Common view of ERP packages is that they should be implemented with as little customisation as possible and business processes should be re-engineered to fit the needs of the package as was concluded in the literary review about critical success factors in ERP implementation by Blerta, Agron and Zamir (2016). This might not be the case in the context of an SMEs as mentioned by Zach, Munkvold and Olsen (2014) and thus research more specific to SME context is needed. There have been also multiple studies implying that the ERP research done in the LEs cannot be transferred to SMEs (Van Everdingen et al., 2000, Zach & Munkvold, 2012).

SMEs typically have more limited resources and adopting an ERP system might have multiple risks for the enterprise (Spanos, Prastacos and Papadakis, 2001; Hidayanto, Hasibuan, Handayani and Sucahyo, 2013). Seethamraju (2015) mentions that typically SMEs are sceptical about ERP implantation with such a significant investment. He defines ERPs as standardised off-the-shelf packages which until recently have required a lot of resource commitment which has kept many SMEs from acquiring one. Therefore, he continues that typical ERP adopters have been larger companies and concludes that recently ERP vendors such as SAP and Oracle have started to offer scaled down versions or System as a Service (SaaS) versions of their packages.

Fit between business processes and ERP system has been mentioned as critical success factor by many studies (Brehm, Heinzl and Markus, 2001; Van Everdingen et al., 2000). Lack of this fit may cause misalignment of the business processes and the system, leading to negative effects (Sia & Soh, 2007). Buonanno et al. (2005) mentioned that fit between business processes and ERP system is achieved by either re-engineering the processes to fit the ERP system or customising the ERP system. By current literature re-engineering of the business processes is encouraged, though unique business processes have been described to be crucial for the success of the SMEs (Bingi, Sharma and Godla, 1999; Van Everdingen et al., 2000). Thus, research about misalignment between business processes and ERP system in SMEs is needed.

This paper aims to answer to following research question:

- Can customisation be a solution to a misalignment between ERP system and business processes in SME context?

The main goals of this paper are:

- To define what is customisation and how it is connected to ERP systems
- Provide an overview of risks and difficulties SMEs might have while adopting ERP systems
- Find out the main differences between LEs and SMEs in the context of implementing ERP systems
- Introduce solutions available for adopting ERP systems in SMEs.

In the first chapter, what customisation is and why it is done is explained. Following with chapter two about the SME context and how it affects the ERP implementation. In the last chapter, unique needs of the SMEs, benefits for implementing ERP system and how to solve the misalignment between business processes and ERP system is explained.

2 What is customisation of ERP systems

Customisation is done to the software packages which are not custom-built, to match the exact needs of the customers. In this chapter, we briefly go through the history of software packages, which have created the need for the customisation, as vendors of the software packages create the package according to their assumptions about the needs of the customer. We describe a few different definitions for the customisation as it seems that there are quite a few of them in the field. In the last section, we explain how customisation is used in the context of ERP systems.

2.1 History of software packages

Hong and Kim (2002) mentioned that from early 1990s many firms shifted from development in-house to purchasing software packages such as ERP. These software packages which are created by third-party vendors instead of being built in-house have history starting from early 1980s as mentioned by Poba-Nzaou and Raymond (2013). Software packages consist up to 80% of the IT systems, the rest being custom-developed (Light, 2001). The software packages are easy to distribute and set up for a new customer, but they might cause problems for enterprises adopting them. These problems were firstly pointed out by Gross and Ginzberg (1984). Problems they included were hidden costs, poor quality and lack of vendor support. Most importantly they pointed out misalignment between the package's functionalities and the requirements of the adopting enterprise.

Nevertheless, software packages give multiple benefits over custom-built software. Packaged software were adopted as a main stream solution to the shortcomings of the custom-built systems, which included cost and schedule overruns as mentioned by Lucas, Walton and Ginzberg (1988). Software packages provide benefits like reduced-cost, rapid development and high system quality as described by Lucas, Walton and Ginzberg (1988). They also mentioned that "the customer should expect the need to make modifications in ded-

icated packages, though he/she should also consider the alternative of changing existing procedures to avoid the high costs and delays of changing the package (Lucas, Walton & Ginzberg, 1988)". Thus, while clearly stating that software packages create a need for customisation there is also alternative solution, which is to change the business processes to meet the demands of the system.

More recently Luo and Strong (2004) mentions that "An important characteristic of ERP systems is that they are packaged software solutions rather than customized systems." They have built in assumptions about what kind of business processes implementing organisation might have (Luo & Strong, 2004). Brehm, Heinzl and Markus (2001) say that these assumptions seldom match the business processes what organisations have and leave need for the customisation to match the organisation's business processes with the ERP systems.

2.2 Definition of the customisation

The primary goal of the customisation is to match the business processes of the enterprise to fit the ERP system (Luo & Strong, 2004). Luo and Strong (2004) divided customisation to three different types module selection, table configuration and code modification. In module selection customer chooses modules from the ERP vendor for implementation then configuring the modules to try to fit them to business processes. Lastly if ERP system still won't fit, the source code of the ERP system is modified.

There are multiple terms for customisation. Brehm, Heinzl and Markus (2001) wrote about tailoring of the ERP systems. They defined eight different types of tailoring, including configuration and package code modification and described configuring of the ERP system as "to setting parameters in the package to reflect organizational features" and modification as referring "to changing package code to perform unique business processes". Also, they mentioned that modification may lead to lose of vendor support as opposed to configuration of the ERP package which is offered by the vendor.

Hong and Kim (2002) also described modification as that it changes the package source code and customisation as not changing the basic ERP identity. In their study about success factors in ERP implementation they used term ERP adaptation when they described the eight tailoring types by Brehm, Heinzl and Markus (2001) and customisation, extension and modification mentioned by Glass (1998).

In table 1 different terms for customisation are shortly explained. In later research, e.g. (Luo & Strong, 2004; Light, 2005; Rothenberger & Srite, 2009; Zach & Munkvold, 2012; Poba-Nzaou & Raymond, 2013) term customisation has often been used to include all the terms mentioned in table 1 and many others. In this paper term customisation is used when referring to these terms. If it appears to be necessary for clarification another term will be used to clarify the topic in discussion.

Table 1 Different types of customisation in previous research.

	(Luo and Strong, 2004)	(Brehm, Heinzl and Markus, 2001)	(Glass, 1998)	(Hong and Kim, 2002)
Configuring	Configuring ERP modules to fit to the business processes	Setting parameters in the package to reflect organizational features	–	To choose among the reference processes and set the parameters in ERP
Modification	Source code of ERP system is modified	Changing package code to perform unique business processes	Users changing the ERP code	Changes the package source code
Tailoring	–	Included configuring and modification	Synonym for customisation	–
Customisation	Included configuring and modification in customisation	Used customisation as a synonym for configuring	Setting table values and choosing business processes given by the ERP system	Doesn't change the ERP identity (also synonym to configuring)
Extension/user exits	–	Programming of additional software code in an open interface.	Implementing local solutions.	Fill the gap between ERP functionality and organizational requirements.

2.3 Reasons for customisation

Some customisation is always necessary in ERP installations as Rothenberger and Srite (2009) mentions. He continues that keeping this customisation at the minimum might be critical success factor for the ERP system implementation. ERP system packages are designed to work in multiple organisations regardless of their structure. Though as mentioned some degree of customisation is always necessary for implementing the ERP system to the target organisation. This customisation might include customising different parts of the package to fit the implementing organisation or designing a whole new tool for the organisation (Rothenberg & Srite, 2009).

Customisation is used to solve the misalignment of the business processes and software package. To make ERP system fit the needs of the enterprise. Sia and Soh (2007) concluded that "Despite the embedded 'best practice' processes and the large number of configurable parameters, many organisations still find

there are important needs or expectations that are not met by these packages." Thus, creating the need for customisation of the ERP package.

Light (2005) concludes that ERP packages are adopted based on that they give significant contribution to solving the problems in existing information systems. He also mentions that even though pre-built and tested ERP packages supposedly give ready-made benefits, customisation often occurs.

Hong and Kim (2002) describe customisation as improving the fit between ERP and adopting enterprise. Bingi, Sharma and Godla (1999) mentions that customisation results to lower resistance, reduced training needs and less changes to the business processes of the enterprise. Also, saying that "sometimes business processes are so unique that they need to be preserved". This is achieved by customising the ERP system to fit the business processes and not adapting the organisation to fit the ERP system.

3 How SME context affects ERP implementation

SMEs are obviously different from LEs in regarding to the size of an enterprise but there are also differences in business structure and environment. In this chapter definition for SMEs is explained. Factors affecting ERP implementation in SMEs are brought out and unique characteristics of SMEs are explained.

3.1 Introduction to small and medium-sized enterprises

According to classification of European union SMEs (small and medium-sized enterprises) are enterprises with less than 250 employees (medium-sized) or less than 50 employees (small enterprises) and LEs (large enterprises) are enterprises with more than 250 employees ("European commission," 2009). Some papers were using different definition including only enterprises with more than 500 employees to LEs and less than 500 to SMEs e.g. (Hsin & Chin-Fang, 2005).

Business structure in SMEs differ to that in LEs: "SMEs do not have formal structures, and their management teams are usually small and focus on what seems best for an organization" (Hasheela, 2015). And their decisions are usually done by the owners compared to much more complex decision making in LEs (Spanos, Prastacos & Papadakis, 2001).

Hsin and Chin-Fang (2005) found that enterprises with different size have different ways of managing ERP systems. LEs might have 200-member IT-team for managing the same ERP system in contrast to SMEs where less than 20 people team might manage it (Hsin & Chin-Fang, 2005). Hasheela (2015) mentioned that some SMEs could have just one person responsible for managing ERP system.

Spanos, Prastacos and Papadakis, (2001) found that size is important factor in ICT adoption, ERP systems were included as a part of ICT in the study. They concluded that LEs in comparison to SMEs have more resources to adopt new technologies and that results may imply that LEs are generally in better position to gain advantage from advanced information technologies. Jutras

(2010) mentioned that SMEs have more limited resources for implementing or maintaining ERP systems than LEs. Thus, SMEs are generally less ready to implement ERP system.

3.2 ERP implementation in SMEs

Laukkanen, Sarpola and Hallikainen (2007) found that there are differences in ERP implementation among SMEs and LEs. Hidayanto, Hasibuan, Handayani and Sucahyo (2013) mentioned that SMEs are not as eager as LEs to implement ERP systems, because of their limited budget and lack of resources. This was confirmed by Zach, Munkvold and Olsen (2014) who concluded that SMEs invest less resources to training employees, usually lack capacity to develop and manage ERP systems and rely on vendors and consultants. They also mentioned that SMEs are characterised by environmental uncertainty which is likely to significantly affect ERP implementation in SMEs. ERP implementation decision might also be affected by major customers or suppliers related to SME, which might force or influence SMEs to implement solutions compatible with theirs (Zach, Munkvold & Olsen, 2014).

To define when SMEs are ready to implement ERP system Hidayanto, Hasibuan, Handayani and Sucahyo (2013) combined a framework about ERP implementation readiness assessment. They tested the framework with a case study where they studied a SME engaged in software development in which they found out that the company was not ready to implement ERP system due to multiple low scores in readiness assessment e.g. lack of sufficient structures and enterprise culture which wasn't ready for ERP implementation. In the framework, there were five major factors which we looked on to: Project, Vision and Goals, Systems and Processes, Culture and Structures and Human Resources. This framework helps SMEs to self-asses their ability to implement an ERP system, describing the factors which affect the readiness of an SME to implement an ERP system.

In their case study about ERP system implementation in SMEs Zach, Munkvold and Olsen (2014) found out that SMEs are not constrained by lack of IS knowledge or limited experience with ERP systems. Thus, concluding that "the findings illustrate that many SMEs are quite competent in this respect". They mentioned that this was different from earlier studies. Buonanno et al. (2005) concluded that financial constraints were not the reasons for SMEs to not to implement an ERP system. They suggested organisational and structural reasons to be more likely cause.

There is also difference in risks of an ERP implementation as Poba-Nzaou and Raymond (2011) mentioned that SMEs compared to LEs would have greater difficulty at surmounting a failed ERP implementation possibly affecting implementation decision.

3.3 Characteristics of SMEs

Zach, Munkvold and Olsen (2014) concluded that SMEs compared to LEs in general have more flexible business structure, because they have less of hierarchical structures. They also mentioned that unified business culture in SMEs provide them with a strong foundation for change as employees are more closely connected to the enterprise compared to LEs. Laukkanen, Sarpola and Hallikainen (2007) also mentioned that more formal business structures and inertia in LEs restricted their ability to accommodate the changes imposed by ERP implementation.

Ahmad and Cuenca (2013) pointed out that organisational simplicity is one of the advantages of SMEs. (McCartan-Quinn & Carson, 2003) described SMEs as they are close to their markets and have a great flexibility. They further continued that SMEs have an edge over LEs in flexibility, innovation and overhead costs but are more limited in the amount of market power and capital. They also describe flexibility as a vital competitive strength as SMEs can respond more quickly to changing market requirements than LEs.

McCartan-Quinn and Carson (2003) described SMEs as highly personalised business entities. They concluded that owner or manager had much higher control over the business, which lead to their education or skills to have much higher effect on the decision and prospect of the enterprise. This was also characterised as success factor because owners' ability to manage growing business effectively and attitude towards growth might be impacting the business of an SME (McCartan-Quinn & Carson, 2003). McCartan-Quinn and Carson (2003) also mentioned that employees of SMEs are more motivated and carry out wider range of tasks in the organisation.

Malhotra and Temponi (2010) described SMEs as usually having specialized product in a relatively small market as opposed to a variety of products and more diverse market in LEs. They continued that SMEs can deliver product or service as quickly as possible to the market and if necessary in expense of standardised business processes leading to a proliferation of unique business processes. Quiescenti et al. (2006) mentioned that management of these unique business process is particularly critical in a dynamic and diversified environment as in SMEs.

4 Unique needs of SMEs in ERP implementation

As mentioned in previous chapters SMEs have many advantages and disadvantages at implementing ERP systems and number of SMEs doing so has been increasing. Thus, it is obvious that SMEs are implementing ERP systems because they are getting benefits for doing so, illustrated in figure 1 below. In this chapter benefits and how to gain them by solving the misalignment between business processes and ERP system is explained.

4.1 Reasons for SMEs to adopt ERP system

Seethamraju (2015) summarized few generic benefits of ERP systems to SMEs. These benefits included efficient business processes, real-time access, visibility and accuracy of information, and effective information management.

Beheshti and Beheshti (2010) included ERP systems' "ability to generate timely and accurate information throughout the enterprise and its supply chain". Further continuing that successful ERP implementation can lead to reduced product development cycle, lower inventories, improved customer service and enhanced coordination of global operations. They also included that ERP implementation if done correctly should increase the productivity and improve profitability of the firm.

In their study about challenges and benefits for management control in SME context Teittinen, Pellinen and Järvenpää (2013) summarized their findings about main benefits of ERP in management control as 1) enabling the strategic vision, 2) implementing standards worldwide in the company, and 3) enabling transparency in controlling subsidiaries.

As mentioned in the second chapter ERP systems are software packages, which are designed "to meet the general needs of a class organisations, rather than unique needs of a particular organisation" (Brehm, Heinzl and Markus, 2001). Brehm, Heinzl and Markus (2001) concluded that by adopting software packages enterprises can reduce the costs, risks and delays associated with cus-

tom-built software. They continued that enterprises can also benefit from ongoing support services provided by vendors.

These ERP software packages adopted by many SMEs currently provide many benefits as mentioned above. As mentioned in the second chapter software packages might have misalignment between SMEs business processes and the ERP package. Therefore, to harness the benefits, this misalignment between the ERP system and business processes of an implementing SME must be solved.

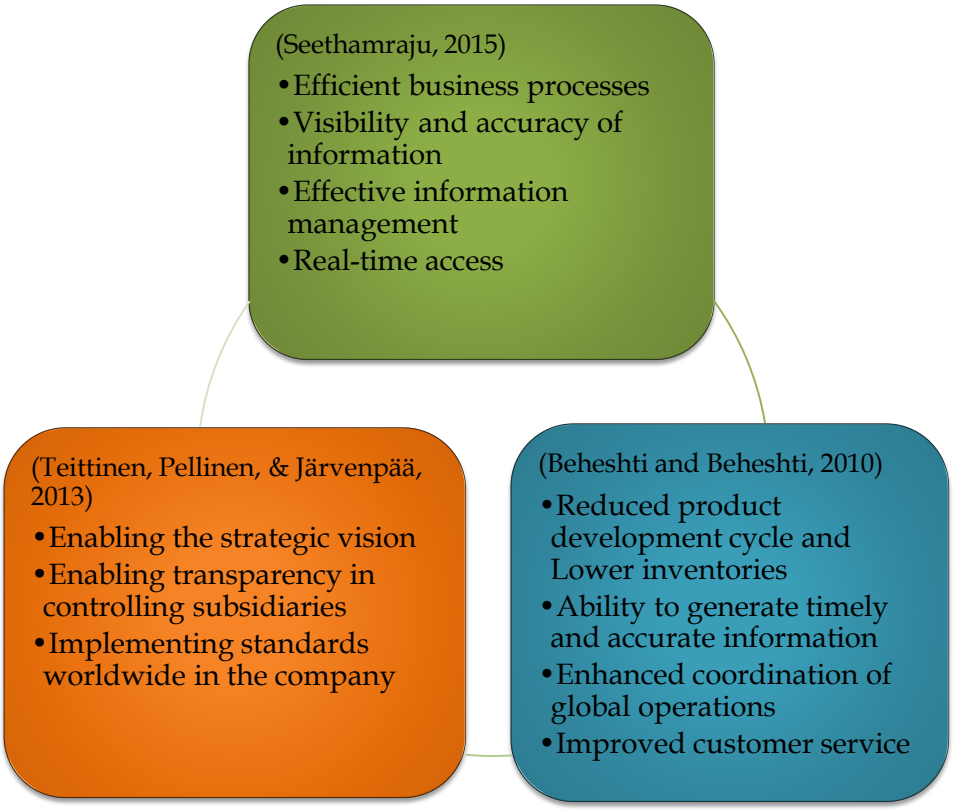

Figure 1 Benefits of ERP systems listed by three studies

4.2 Importance of fitting ERP to business processes

Buonanno et al. (2005) concluded that when the features of an ERP do not correctly with the business processes of an enterprise there are two strategies which are used, to change the business processes to fit the ERP system or customise the ERP system to fit the business processes. One of the latest literary reviews about critical success factors (CSFs) in ERP implementation done by Blerta, Agron and Zamir (2016) concludes that re-engineering the business processes to fit the ERP system is one of the critical success factors in ERP implementation. This is in contrast with Zach, Munkvold and Olsen (2014) who argued that findings about ERP implementation done in LEs cannot be transferred to SMEs due to a fundamentally different environment.

Snider, da Silveira, and Balakrishnan (2009) reported high level of ERP system customisation in SMEs and Mabert, Soni, and Venkataramanan (2003) concluded that more than 22% of the SMEs had done major or significant customisation to their ERP systems. Bingi, Sharma and Godla (1999) mentioned in their study about critical issues affecting an ERP implementation that sometimes business processes are so unique that they need to be preserved.

Van Everdingen, Van Hillegersbreg, and Waarts (2000) concluded that SMEs are looking for ERP systems that fit their business processes strengthening the argument that SMEs are looking for customising the system rather than changing their business processes. This was also confirmed by Quiescenti et al. (2006) who argued that "it has to be considered that unique and specific business processes often make the strength of the small firms, and changing or removing them could threaten its survival and flexibility features."

So, with this evidence it seems clear that SMEs are looking for ERP system which gives best possible fit to their business processes as mentioned by Van Everdingen, Van Hillegersbreg, and Waarts (2000). To provide this fit for SMEs there might be a need for the customisation during the implementation if regular ERP system is implemented (Zach & Munkvold, 2012).

4.3 Different solutions to misalignment of ERP package

As mentioned earlier by Buonanno et al. (2005) for successfully implementing ERP system there must be a fit between business processes and ERP system. This fit was achievable with two ways, changing the processes or customising the ERP system.

For solving the misalignment, SMEs have also sought for other options for traditional ERP systems like option for adopting an ERP system as System as a Service (SaaS) solution. Seethamraju (2015) made a case study in few SME companies about SaaS solutions. He concluded that important factor for SMEs to accept SaaS solutions were vendor's reputation in the market and willingness to support the customer throughout the product life-cycle, further continuing that SaaS ERP might be more customisable than traditional ERP system packages, though SMEs implementing them must carefully evaluate the "fit" between their business processes and SaaS solution. So, though SaaS ERP systems are offering better customisation they might not offer solution to every SME.

To provide more customisable alternative for ERP system packages Brehm, Heinzl and Markus (2001) mentioned that one solution provided by ERP market to the lack of fit between business processes and ERP system is to provide bolt-on ERP systems. They defined bolt-on systems as having extensive modifications developed by third-party independent software vendor with a licence from the original vendor. They continued that with bolt-on ERP system adopter can achieve greater fit between business processes and ERP system, included

with benefits of lower configuration effort and support from the third-party vendor.

So, as described above there are few responses from the market to the misalignment of the business processes and ERP system. These solutions relate to the aim of providing SMEs with more greater customisability. Thus, allowing them to preserve their business processes and connect them fit ERP system.

5 Conclusion

To provide answer to the research question and to achieve goals set for this paper literary review was done. In the literary review, we aimed to gather information as systematically as possible. With support of Google Scholar and Jykdok (search engine provided by University of Jyväskylä) which were used to search for papers. Search terms were: "ERP system customisation in SMEs", "implementation of ERP systems in SMEs", "critical success factors of ERP implementation in SMEs", "Small and medium-sized enterprises enterprise resource planning systems", "Tailoring of ERP systems in SMEs".

By reading couple of the first papers it became clear that the research in this area is a bit scarce as mentioned by e.g. (Zach & Munkvold, 2012). So, in this literary review we included most of the papers which were published in academically respected journals, had been cited often and included specific SME context. Also, a few other papers were included which can be regarded as having general authority in research of ERP system implementation.

In this paper definition of customisation was described and what it means and why it is done. Customisation was configuring or modifying of a software package. Software packages had been generally created by the vendor for a wide range of different businesses providing benefits as reduced costs and vendor support. ERP systems were also found to be software package solutions made for a general audience rather than being a custom-built for a particular organisation. This however lead to a misalignment between the ERP software package and a business processes in SMEs. Two solutions for this misalignment were found, either adapt the business processes to fit to the ERP package or customising the package.

It was found out that implementing an ERP system provides benefits for SMEs and it became clear that SMEs were looking for ERP solutions which are matching their business processes to harness those benefits. Also, in multiple studies it was found out that unique business processes might be a part of a competitive edge to many SMEs. Thus, changing the business processes to match the needs of the ERP was not an option in SME context as it was in LEs. Therefore, for achieving compatibility with ERP system, the misalignment between the business processes and ERP system needed to be fixed by customis-

ing the ERP system to match the business processes. Thus, customisation can be a solution for misalignment between the business processes and ERP system in SMEs. For achieving this customisability some possible solutions were presented.

LIST OF REFERENCES

Ahmad, M. M., & Cuenca, R. P. (2013). Critical success factors for ERP implementation in SMEs. *Robotics and Computer Integrated Manufacturing, 29*(3), 104. doi:10.1016/j.rcim.2012.04.019

Beheshti, H. M., & Beheshti, C. M. (2010). Improving productivity and firm performance with enterprise resource planning. *Enterprise Information Systems, 4*(4), 445-472. doi:10.1080/17517575.2010.511276

Bingi, P., Sharma, M. K., & Godla, J. K. (1999). Critical issues affecting an ERP implementation. *Information Systems Management, 16*(3), 7-14. doi:10.1201/1078/43197.16.3.19990601/31310.2

Blerta, A. C., Agron, C., & Zamir, D. (2016). Critical success factors in ERP implementation. *Academic Journal of Business, 2*(3), 19-30. Retrieved from https://doaj.org/article/5f73b52b64e24821b237dc8fe702ab25

Buonanno, G., Faverio, P., Pigni, F., Ravarini, A., Sciuto, D., & Tagliavini, M. (2005). Factors affecting ERP system adoption. *Journal of Enterprise Information Management, 18*(4), 384-426. doi:10.1108/17410390510609572

European commission website: Commission Staff Working Document. Collected 26.11.2017 from address http://ec.europa.eu/DocsRoom/documents/10033/attachments/1/translations

Glass, R. (1998). Enterprise resource planning--breakthrough and/or term problem? *ACM SIGMIS Database: The DATABASE for Advances in Information Systems, 29*(2), 13-16. doi:10.1145/298752.298755

Gross, P. H. B., & Ginzberg, M. J. (1984). Barriers to the adoption of application software packages. *Systems, Objectives and Solutions, 4*, 211-216.

Hasheela, V. (2015). On-premise ERP Organizational Post-implementation Practices-Comparison between Large Enterprises and Small and Medium-Sized Enterprises. In *ICEIS (1)* (pp. 243-250).

Hidayanto, A. N., Hasibuan, M. A., Handayani, P. W., & Sucahyo, Y. G. (2013). Framework for measuring ERP implementation readiness in small and medium enterprise (SME): A case study in software developer company.*Journal of Computers, 8*(7), 1777. doi:10.4304/jcp.8.7.1777-1782

Hsin, C., Ching-Fang, W., 2005. A Comparative analysis between SMEs and large companies in realtion to integration technologies adoption, in: Proceedings of the Fifth International Conference on Electronic Business. Hong Kong, pp. 839 – 848.

Hong, K., & Kim, Y. (2002). The critical success factors for ERP implementation: An organizational fit perspective. *Information & Management, 40*(1), 25-40. doi:10.1016/S0378-7206(01)00134-3

Jutras, C. (2010). *ERP in SME: Fueling growth and profits* Aberdeen Group. Retrieved from https://www.iia.nl/SiteFiles/enterprise-resource-planning.pdf

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. doi:10.1108/17410390710740763

Light, B. (2001). The maintenance implications of the customization of ERP software. *Journal of Software Maintenance and Evolution: Research and Practice, 13*(6), 415-429. doi:10.1002/smr.240

Light, B. (2005). Going beyond 'misfit' as a reason for ERP package customisation. *Computers in Industry, 56*(6), 606-619. doi:10.1016/j.compind.2005.02.008

Lucas, H. C., Walton, E. J., & Ginzberg, M. J. (1988). Implementing packaged software. *MIS Quarterly, 12*(4), 537-549. Retrieved from http://www.jstor.org/stable/249129

Luo, W., & Strong, D. M. (2004). A framework for evaluating ERP implementation choices. *IEEE Transactions on Engineering Management, 51*(3), 322-333. doi:10.1109/TEM.2004.830862

McCartan-Quinn, D., & Carson, D. (2003). Issues which impact upon marketing in the small firm. *Small Business Economics, 21*(2), 201-213. Retrieved from http://www.econis.eu/PPNSET?PPN=368279065

Mabert, V. A., Soni, A., & Venkataramanan, M. A. (2003). The impact of organization size on enterprise resource planning (ERP) implementations in the US manufacturing sector. *Omega, 31*(3), 235-246. doi:10.1016/S0305-0483(03)00022-7

Malhotra, R., & Temponi, C. (2010). Critical decisions for ERP integration: Small business issues. *International Journal of Information Management, 30*(1), 28-37. doi:10.1016/j.ijinfomgt.2009.03.001

Poba-Nzaou, P., & Raymond, L. (2011). Managing ERP system risk in SMEs: A multiple case study. *Journal of Information Technology, 26*(3), 170-192. doi:10.1057/jit.2010.34

Poba-Nzaou, P., & Raymond, L. (2013). Custom development as an alternative for ERP adoption by SMEs: An interpretive case study. *Information Systems Management, 30*(4), 319-335. doi:10.1080/10580530.2013.832963

Quiescenti, M., Bruccoleri, M., La Commare, U., Noto La Diega, S., & Perrone, G. (2006). Business process-oriented design of enterprise resource planning (ERP) systems for small and medium enterprises. *International Journal of Production Research, 44*(18-19), 3797-3811. doi:10.1080/00207540600688499

Rothenberger, M. A., & Srite, M. (2009). An investigation of customization in ERP system implementations. *IEEE Transactions on Engineering Management, 56*(4), 663-676. doi:10.1109/TEM.2009.2028319

Seethamraju, R. (2015). Adoption of software as a service (SaaS) enterprise resource planning (ERP) systems in small and medium sized enterprises (SMEs). *Information Systems Frontiers, 17*(3), 475-492. doi:10.1007/s10796-014-9506-5

Sia, S. K., & Soh, C. (2007). An assessment of package-organisation misalignment: Institutional and ontological structures. *European Journal of Information Systems, 16*(5), 568-583. doi:10.1057/palgrave.ejis.3000700

Spanos, Y., Prastacos, G., & Papadakis, V. (2001). Greek Firms and EMU:: Contrasting SMEs and Large-Sized Enterprises. *European Management Journal*, *19*(6), 638-648.

Teittinen, H., Pellinen, J., & Järvenpää, M. (2013). ERP in action - challenges and benefits for management control in SME context. *International Journal of Accounting Information Systems, 14*(4), 278-296. doi:10.1016/j.accinf.2012.03.004

Van Everdingen, Y., Van Hillegersbreg, J., & Waarts, E. (2000, Apr 1,). Erp adoption by european midsize companies. *Communications of the ACM, 43*, 27.

Zach, O., & Erik Munkvold, B. (2012). Identifying reasons for ERP system customization in SMEs: A multiple case study. *Journal of Enterprise Information Management, 25*(5), 462-478. doi:10.1108/17410391211265142

Zach, O., Munkvold, B. E., & Olsen, D. H. (2014). ERP system implementation in SMEs: Exploring the influences of the SME context. *Enterprise Information Systems, 8*(2), 309-335. doi:10.1080/17517575.2012.702358