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Published in:
[Host publication title missing]

2007

Link to publication

Citation for published version (APA):
Johansson, B. (2007). Pain Points Challenges for future Enterprise Resource Planning (ERP) systems. In *[Host publication title missing]* (pp. 1605-1609)

Total number of authors:
1

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Pain Points Challenges for future Enterprise Resource Planning (ERP) systems

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Abstract. The questions asked in this paper are for the first: what pain points challenges are there for future enterprise resource planning (ERP) systems, and second, what pain points challenges should the development of future ERPs solve. These questions are discussed by referring to findings from an interview study with executives in a major ERP vendor organization. In addition to the empirical findings a limited literature study was conducted and findings from the literature are used to analyze pain points given by the executives. From the analysis some conclusions are drawn and some future research areas are suggested. The aim of the paper is to build a foundation for what future development of ERPs should focus on and the paper does so by presenting pain points challenges for future ERPs. In that way the paper presents the first step in requirements gathering and requirements analyzing that could be used as input for the development of future ERPs and thereby manage the challenges that the pain points suggest.

Introduction

When developing future enterprise resource planning (ERPs) systems it is definitely of importance to have a grasp over existing products deficiencies, but also to have a grasp over what opinions that exist among persons highly involved in development of ERPs and what they see as the major problems with their existing products. There is also a need to have a vision of what the needs are in the future as well as what demands the customer have on future ERPs to be able to develop future ERPs. This paper reports from interviews with executives in a major ERP vendor organization, the aim of doing the interviews was to gain some knowledge about what the demands on future ERPs are. This study was part of the "third generation ERP" (3gERP) project, that is a large collaborative project between Copenhagen Business School, Computer Science at Copenhagen University and Microsoft. The purpose of the 3gERP project is to establish the academic and market foundation for developing a 'standard' flexible and configurable global ERP-system for Small and Medium sized Enterprises (SMEs), which can be implemented and maintained at a fraction of

the current costs. In the project a series of pain points interviews were conducted with the aim of discovering what the pain points are at the moment. Pain points is in this context defined as major obstacles that future ERPs could gain credits from if these were solved.

The rest of the paper is organized in the following way: First there is a description of the research method. This is then followed by a description of findings from the interviews regarding ERP pain points. The section after that presents, to some extent, what the literature says about pain points regarding ERPs. The final section then discusses the empirical findings from a literature point of view and presents some future research questions regarding ERP pain points that could be of interest.

Research Method

The interviews were made at the vendors place and during the interviews three to six researcher from the 3gERP project were present. The interviewees have different roles and their respectively working roles focus on the different ERP products that the vendor has in its portfolio. The interviews lasted between one and a half to two hours. The respondents were asked to give their respectively description of what they see as future pain points. From this following up question were asked but, in general there were no specific questions prepared beforehand. Notes from the participants were then collected and these notes acted as input to a summary of the expressed pain points. From the summary, which was broadly a collection of different participants' notes, an analysis was made. The analysis aimed at finding patterns in the notes and from the patterns identifies a number of pain points that the respondents raised during the interviews. The analysis was done by asking the questions: What problem or problems is it the respondents talks about? What was the problem the solution the respondents talked about aimed at solving? The reason for why this questions was used were that the respondents in their description of pain points often refereed to some problems or solutions on problems that never were totally completed. In addition two these questions the analysis also asked the question: What could we learn from the described problem as well as the described solution? From that analysis six areas were identified and this was described as a summary of the pain point interviews. From that summarization of the pain points this paper is then developed which means that this paper then analysis the results in the pain point summarization. To further extend the findings from the interviews a literature study was conducted. The literature s study started of be searching for relevant articles about challenges for future ERPs. The search was made in Google scholar and at ebsco. ERP was used as a basic search term and then this was combined with the following search words (phrases): future challenges, pain points, critical factors and future development. Since we look after future challenges (requirements) the search was limited to publications made in 2007. Table 1 below shows the number of hits on respectively combination.

Table 1 Number of hits when searching Google Scholar

Search words	Number of hits
ERP and future challenges	35
ERP and pain points	5
ERP and critical factors (A lot of references on critical factors and ERP implementation)	133
ERP and critical factors (excluding the word implementation)	24
ERP and future development	70

From the results of the search some paper was pointed out from the titles of the papers. These papers was then studied and related to the pain point areas earlier defined. The next section starts the discussion about pain points by referring to the results from the interviews done with the vendor executives.

Identified Pain Points from the Vendor perspective

During the interviews the executive described what they from their specific point of view experience as pain points of the existing ERP products that the vendor has in its portfolio. Table 2 presents in the second column some of the statements received from the notes made by participating researcher in the interview. These statements were categorized into six pain point areas. When the analyses was made one interesting finding were made and that was that despite the fact that the respondents comes from different working areas in the vendor organization the pain points show similarities to a high extent. There are also some overlaps in statements resulting in that some of these are connected to more than one pain point area.

Table 2 Identified pain point area and related statements

Pain point areas	Statements derived from interviews with executives at the ERP vendor
Pain point area 1: Deficiency in the process for requirements management	• Slow speed of new releases • To long development time • Communication of demands from customers • Inadequate process for capture business requirements • There is a need to have a clear view over the total picture from customer to vendor in the development • Challenges in communication between developer and domain expert • Development of non-relevant requirements • Difficulty in scoping projects • Fixed price expectations from customers • Partners don't have project management expertise • Many applications are not used • MS SQLServer does not support SumIndexField Technology (SIFT) • Problem with how to consolidate requirements from different countries • A huge amount of changes in the product

Pain point area 2: Deficiency in the implementation process	• To long development time • Simship problem increases the complexity of the development • Difficulties in how to make configuration • There are an unclear view on how to customize • The system needs to make live maintenance possible • To long implementation time • Partners don't have project management expertise • High complexity in the implementation • To high TCO • Debugging of metadata is difficult • Conflict between customization and new delivery model • There is a need to decide on the future hosting solution • Existing ERPs is to restricted when it comes to make graphical user interfaces (GUIs) • Our partners wants/needs an in-the-app IDE (development environment) • The huge variation in requirements make for instance payroll hard to develop
Pain point area 3: Unclear view of customization/configuration and the relation to upgrades	• Keeping the code consistency is hard • The quality of the code needs to be high • High customizations efforts necessary versus configuration • There is a need to have a clear view over the total picture from customer to vendor in the development • There are an unclear view on how to customize • There is a need to more clearly develop predefined building blocks • Reduction of code is necessary • Functionality are not used • Configuration of the system so that it deals with localization • Unnecessary customizations • To high TCO • Trade-off between configuration and customization • High grade of complexity with mass customization • Customizations is expensive • Customization makes upgrading difficult • Specific modules are hard to develop as a standard module

Pain point area 4: Inadequate architecture that does not support scalability and flexibility	• To long development time • Keeping the code consistency is hard • A more complete core • Keeping up flexibility and scalability is necessary • There is a need to develop for integration • There is a need to develop more autonomous modules • There is a need to more clearly develop predefined building blocks • Error messages does not support the user • A major concern is response time/latency • The system needs to make live maintenance possible • Unnecessary customizations • High grade of complexity with mass customization • Code is modified to suit customers need • Our partners wants/needs an in-the-app IDE (development environment) • The layer structure in our ERP is to restrictive • Problem with how to consolidate requirements from different countries
Pain point area 5: Insufficient representation of the organizations business process	• A more complete core • The quality of the code needs to be high • There is a need to have a clear view over the total picture from customer to vendor in the development • There is a need to develop for integration • Development of non-relevant requirements • There is a need to develop more autonomous modules • The software is to integrated • A major concern is response time/latency • Lack of a consolidate view • Lack of transparency • Unnecessary customizations • Conflict between customization and new delivery model • Business Processes are only represented indirectly • Specific modules are hard to develop as a standard module

Pain point area 6: Huge variations in customer requirements	• A more complete core • Variations in user requirements • There is a need to develop more autonomous modules • Configuration of the system so that it deals with localization • Difficulty in scoping projects • Problems with how to customize an internet/browser based solution. • Solution to mass customization is problematic since vertical variations are huge • Problems with how to customize an internet/browser based solution. • High grade of complexity with mass customization • Code is modified to suit customers need • Specific modules are hard to develop as a standard module • The huge variation in requirements make for instance payroll hard to develop • A huge amount of changes in the product • Huge variations in tax objects

Pain Point area 1: Deficiency in the process for requirements management

The interviews indicate that a major concern is the time from feature identification to implementation. This pain point area indicates that there is a need for an improved process for requirements management. This process should deal with the entire chain from identification of "new" requirements by the end-users and how to gather these and present them to the developers in a way these can be implemented shortly after identification. This has a clear connection to scalability and flexibility of the ERP system.

It can be concluded that the basic problem is that the process from identification to the time it is implemented takes too long time. It can also be concluded that the problem described in this area is a question whether implemented requirements are the "correct" requirements.

Pain Point area 2: Deficiency in the implementation process

In the interviews the trade-off between a standard product and a product that are possible to customize is to a great extent discussed. This can be related to questions regarding implementation and the need for an improved process for implementation. An improved implementation process should emphasis on the fact that customization is expensive and makes future upgrades harder to make.

An important issue for the future is to be clearer about the relation between customization and the costs for maintenance of ERPs that are highly customized. This

means also that it is important to clearly describe how customization should be done, if it is done, so that new upgrades can be implemented without being forced to do the customization work once again.

As in the pain point area describing the requirement process also in this pain point area is the basic problem that it takes to long time. It can be suggested that one reason for that is that ERPs are to complex to implement. Another possible reason is that the implementing partners lack project management expertise. This means that if future ERPs could be easier to implement both the problem with time as well as the problem with lack of project management expertise maybe could be solved.

Pain Point area 3: Unclear view of customization/configuration and the relation to upgrades

This pain point area can be described as that there is a need for a more clear view over customization/configuration and the relation these have to upgrades and new versions. This area has to some extent already been discussed in the two above areas. However, the areas above talks about them basically from the perspective of time. In this area the basic problem is that there is lack of knowledge on how these ways of changing the system should be done. It is also a question of the basic architecture and how the basic architecture makes it possible to customize and configure the system in different ways. This is also strongly related to a question of how different ways of adjusting ERPs to the business processes the organisations works with. It is also a question of how customization versus configuration influences future costs of usage of ERPs. However, a basic question to ask is whether the organization should adjust the ERP after its business processes or if the organization should adjust its business processes after the suggested business processes inherited in ERPs.

Pain Point area 4: Inadequate architecture that does not support scalability and flexibility

In the interviews the respondents emphasises on the need for a future ERP architecture that supports scalability and flexibility. One reason suggested for why scalability and flexibility needs to be strongly supported in future ERPs is that it thereby should support for instance, new business models and new demands from end-users without disturbing the end-users ongoing businesses. This means that there is a need for improvement of the architecture so that it supports scalability and flexibility. It can be suggested that the basic problem with existing ERPs is that these act as closed boxes. This implies that ERPs not easily support interoperability which indicates that it is very hard to connect other systems to ERPs. The question asked could be how to deal with this problem and one suggested way to go could be to develop the future ERPs more as autonomous entities. If doing so it is of importance that the relations between the different autonomous entities are clearly defined.

Pain Point area 5: Insufficient representation of the organizations business process

It can be stated from the pain point interviews that there are insufficient representation of business processes at the moment. The existing ERP products do not explicit describe the business process that it supports. The future ERP should more clearly be built on a business process notation. The basic problem that comes from the fact that ERPs not builds enough on business processes is that ERPs does not easily are adjustable to changes in business processes. It can be assumed that it will be even of more importance in the future to develop ERPs that builds on the business process notation since organization more and more lives in an environment that changes a lot all the time and it will be of importance to be able to quickly adjust a business process to new demands. One suggested reason for why it is hard to adjust ERPs to a change in a business process can be that ERPs are to much a “black box”. This means that it is hard to know what to change and how to change ERPs when adjusting to a change in a business process.

Pain Point area 6: Huge variations in customer requirements

It can be suggested that the “huge” variation among customers, industries, countries that exists is something that the future architecture needs to consider. This variation influences development to a high extent both when it comes to what requirement ERPs need to fulfil, but also what business processes it has to support. It can be stated the basic problem is that ERPs has to differ to a high extent since ERPs are supposed to support so many “business processes”. It can also be said that this to a great extent is a problem that exists with “all” standardized software. However, a basic question to ask is why the variations is more difficult to manage within ERPs than it is with for instance word package. One possible answer to that question is that ERPs are supposed to be involved more or less in the entire collection of business processes in an organisation. The difference with for instance a software application such as word is that in word the information that are directly used in another software application are specified. In ERPs the basic thoughts is that the information should be able to transfer between different software applications without involvement of a human. This can be descried as one reason for why the huge variations in ERPs are that hard to manage.

What does the literature say about pain points of ERPs

There is a great extent of ERP research such as Shehab, Sharp, Supramaniam, and Spedding (2004), Esteves and Pastor (2001) and Botta-Genoulaz, Millet and Grabot (2005). Reviewing these reports give the impression that a major part of the research is on implementation of ERP systems. It also shows that the main problem presented is the misfit between ERP functionality and business requirements. Soh, Kien and

Tay-Yap (2000) describe this as a common problem when adopting software package. The problem of "misfit" means that there is a gap between functionality offered by the package and functionality required from the adopting organisation. Askenäs and Westelius (2000) describe this in the following way: "Many people feel that the current ERP system has taken (or been given) a role that hinders or does not support the business processes to the extent desire" (Askenäs & Westelius, 2000, p. 433). Another way of describing this is as said by Bill Swanton, vice president at AMR research, saying that only 35 per cent of the organisations are satisfied with the ERP they use at the moment, and he says the reason for the dissatisfaction is that the software does not map well with the business goals (Sleeper, 2004).

There seems to be a discussion in the literature about misfits between business requirements and ERP functionality. According to Soh et al. (2000), the misfits could be related to the following three areas: architecture of the specific software, IT-architecture and business architecture. All these three areas can be closely related to the pain point areas described above. The same can be said about the relation between what is described as misfit between ERP functionality and business requirements in different ERP literature reviews and the identified pain point areas. Fub, Gmeiner, Schiereck and Strahringer (2007) describe future challenges for ERPs such as the usage of web technology and the transformation of ERPs into systems based on service-oriented architecture. Ignatiadis and Nandhakumar (2007) describe at least five problems with existing ERPs that future ERPs have to deal with. The problems can be described in the following way. The system has to be appropriately configured to be able to implement the control that is necessary. There are also some problems with training when it comes to ERPs and it can be said that ERPs demands an ongoing training. Another problematic area they identify is the helpdesk and what they say is that the helpdesk often not are used since it is described as taking to long time to get the needed help. Ignatiadis and Nandhakumar (2007) also suggest the problem with ERPs not closely enough related to the business process and they state it is problematic if ERPs not follow the business processes that are supposed to be supported. They also state that ERPs have problems with data consistency. The last and final problem area they describe is that ERPs are not enough restrictive with what the user can do and how the user does it. The statement they make is that ERPs has to be more restrictive in how things should be done.

Discussion and future research

The discussion and analysis so far gives the vendor perspective view of pain points for future ERPs. It also gives a short introduction to what existing literature says about the topic. However, what would be of interest is to further analyse what the existing literature says about this topic (the researchers view) It would also be of great interest to have both the partners view as well as the customers view of pain points for future ERP development. The partners are of special interest since partners at the moment plays an important part in the development chain of ERPs. Partners

have the role of having a relationship to both ERP vendors as well as to customers that uses ERPs. An important input to knowledge about pain points for future ERPs are probably the add-ons that partners develop and deliver to ERP users.

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