Reverse Business Innovations – The Impact of ERP Software Upgrades on Organizations

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Abstract. Vendors of enterprise software continue to evolve their products and offer user organizations the latest functionality in new releases and upgrades. But this means companies are faced with the challenge of selecting features that add value, and trying to assess how implementation would impact them. Not every new function impacts all employees in the same way. Depending on the specific organizational structure, implementation will affect a varying number of users. And depending on a company's system landscape, implementation of new functions might require a range of IT activities and affect many processes.

The authors have developed a concept that uses an organization's system usage data to deliver decision support. Various aspects of the upgrade can be assessed with the aid of software tools (analyses and evaluations of new functionality) to determine relevancy, benefits, profitability, strategic goals and impact. In this article we will present a portion of this concept: A model that can assess how new functionality would impact a business, if implemented.

Keywords: SAP ERP, upgrade, new release functions, decision support, usage analysis.

1   Research Topic

An enterprise system (ES) is defined as a standardized software package whose aim is to integrate the whole of an organization's data [1]. ES development can be described in two waves [2]: The first consists of procurement, configuration and implementation. The second, also commonly referred to as the post-implementation phase, focuses on achieving continuous improvement and driving value. Questions central to this phase include how to gain greater benefit from the investment, how to manage and enhance the ES and how the ES will impact the organization.

1.1   Current Research in the Post-implementation Phase

The first wave has been widely researched [3-8]. A number of surveys and case studies have been done on the implementation wave, with respect to strategic options,

failure avoidance, identification of alignment issues and improved implementation methodologies [9].

Recently, research has moved beyond implementation to the second wave [2]. Research topics include: the impact of ES implementation on financial performance [10] and [11]; standardization and trust relations [12]; legitimization of certain practices in the organization [13]; continuous changes in business processes [14]; potential impact of enterprise system implementation and its effects on the organization [15]; user acceptance and expectations [16]; the impact of ES implementation on job satisfaction [17] and on the organization [18], and how employees' social network structures affect post-implementation success of enterprise systems [19]. In short, they deal mainly with various aspects of implementation and how these affect organizations.

This paper also concerns the second wave, but is not devoted to the impacts of implementation. Its focus is on the variety of new functions regularly provided by enterprise software vendors in upgrades.

In this paper we will examine specific types of innovations that are characterized as follows:

- They are functional innovations
- and are included in an upgrade for enterprise software.

To set this specific type of innovation apart, we invented the term "upgrade innovation."

In this paper, the research question is: How can we help organizations evaluate the impact of upgrade innovations?

1.2   Research Methodology

The model was developed in the following steps:

1. The current situation and problem were analyzed (section 1)
2. A prototype was created (sections 2 and 3)
3. The model was validated (section 4)

An analysis of relevant literature revealed that next to no theory exists on upgrades. The subject of untapped potential in business upgrades has been neglected entirely.

We created a prototype and identified assessment criteria (relevancy, cost-benefit analysis, impact and strategic goals) according to which upgrade innovations were to be assessed. This paper will present the issue of impact assessment.

2   Description of Method

We identified a lack of research on evaluating the relevancy of new functions offered in upgrades, and on system-supported impact assessments prior to an upgrade.

A vast number of organizations that use enterprise systems are confronted with the same problem. This is why it makes sense to build an analysis tool for this purpose

rather than let each company review all innovations by itself. The authors of this paper are currently collaborating with SAP to create the technology and content necessary for this tool.

2.1   Reverse Business Innovations

Our goal was to develop a model that would help organizations assess the impact of upgrade innovations relevant for them. To this end, we looked for criteria that would enable objective inference of an upgrade innovation's impact. In other words, we posed the question: Under which conditions would this functionality have an effect on the company? We developed an approach we dubbed "Reverse Business Innovations."

Figure 1 shows how the system-based usage analysis and the rule-based impact assessment are interrelated.
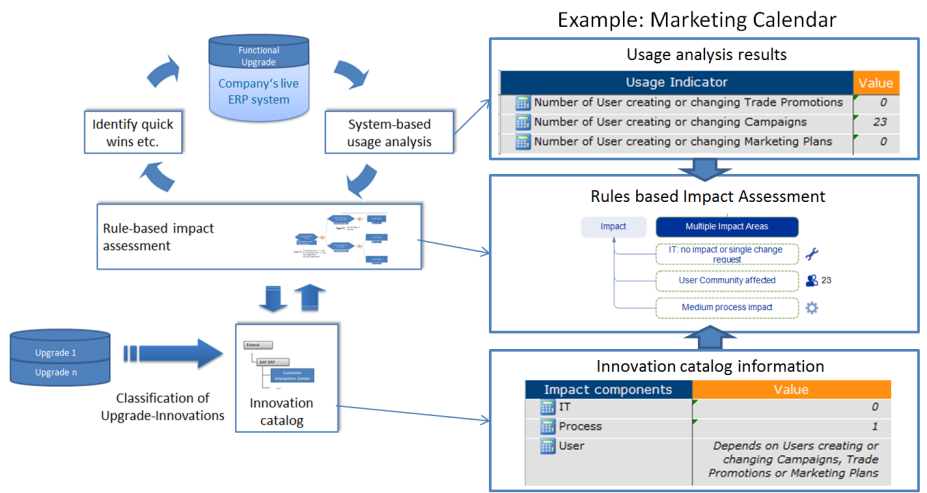

Fig. 1. RBI model

In preparation for the analysis, we examined and classified the upgrade innovations to gain insight into the new functionality offered. For each innovation, we identified criteria that enabled us to infer the impact of the innovation, i.e. what technical requirements an organization would have to fulfill to enable us to conclude how the innovation would impact it. We then filed away this information in the "innovation catalog," a reference for determining, for example, which indicators need to be mined from an organization's system usage data.

When the analysis is conducted for an organization, the usage indicators are extracted from the company's live ERP system. They help determine impact based on the innovation catalog. The results enable us to assess the impact an upgrade innovation has on an organization and so, immediately identify quick wins.

2.2   Impact Assessment

In their maintenance model, NG et al. indicate that a gap analysis must be conducted between the new upgrade and the existing software version in order to identify the impact on an organization, and finally, to create a budget, a schedule and a plan for employees [6].

Organizations are often short of resources [20], so an impact assessment can help them identify upgrade innovations that require only very few resources.

We defined three distinct aspects of the term "impact":

- Effect on users: The number of employees who will use the new functionality,
- Effect on IT: This can include anything from a simple change request to new hardware or software,
- Effect on processes: This considers the range of processes for the organization

Employees

An upgrade always entails change, so it is essential to incorporate routine change management activities, such as risk management assessments, training, and knowledge transfer [21] and [3]. In a qualitative study, Zhao found a correlation between engaging employees in the upgrade and offering them training, and an upgrade's success [22]. So we can conclude that it is essential to consider the impact on the employees of an organization when contemplating an upgrade.

This means it is important to conduct an assessment of the number of people impacted by the upgrade innovation. We defined three categories for impact on users:

- Few users affected
- (Individual) user communities affected
- Many users affected

IT

According to Brose, the extent of the risk posed by an innovation can be determined by the following two factors [23]:

1. The degree of technical difficulty, because it is a measure of the ability to solve a problem that occurs, especially during the required development time.
2. The technical complexity, because it is a measure of the diversity and number of individual activities that must be coordinated.

Since upgrade innovations are not products or services the company itself has developed, but software tested and supplied by a vendor of a business-related information system, we can disregard the first factor when assessing upgrade innovations. But the second factor involves the number of technical measures that must be implemented and how complex these are, and so, must be included in the impact assessment.

We defined three categories for technical measures:

1. A single change request
2. The IT resources required (developers, project managers) for a change project
3. New hardware or software required

Normally this value is set by the manufacturer of enterprise software, because it is not dependent on the specifics of any one organization.

Processes

Companies are predominantly organized by processes. And these might range across several user departments or even across companies. Organization by processes also enables problems to be solved across functions [24].

Therefore, when examining impact, it is important to look at the effects of upgrade innovations on the specific process in question. We defined three categories for impact on processes:

1. Affecting isolated processes
2. Affecting several processes
3. Affecting a large number of processes

Normally this value is set by the manufacturer of enterprise software, because it is not dependent on the specifics of any one organization.

3   Validation

We will conclude our paper with a validation of the model based on a concrete upgrade innovation from SAP CRM.

We created a prototype in a rule-based expert system specifically for the new upgrade functionality in SAP CRM added between Release 5.0 and 7.0 EHP 2. We then validated it on the system of a manufacturing company that operates worldwide. The CRM system examined is strategically crucial for this user organization. Approximately 4,000 users from Europe, Asia and North America actively work within it and it links three ERP systems.

The company currently uses Release SAP CRM 7.0 EHP 1. They last upgraded because of system consolidation with a subsidiary whose CRM system used EHP 1.

The pilot organization agreed to the analysis because decision-makers thought some of the necessary SAP CRM areas may not have been activated. In addition, they were interested in obtaining new functionality available in Release 7.0 EHP 2 without much added expense.

Usage analysis results showed that during the analysis period, 232 campaigns were used by 23 employees. Leads, trade promotions and marketing plans were not used at all. Trade promotions are used to depict marketing activities in collaboration with partners. Marketing plans track the activities in Marketing at a higher strategic level and for a longer period than trade promotions and campaigns.

The marketing calendar is an upgrade innovation that offers users a graphic overview of all marketing projects according to their duration. Projects can also be created directly on the graphic.

Under **impact** it shows that for IT, the marketing calendar has very little impact (see Figure 2), because only one function (i.e. the business function) has to be

activated. The users affected are the employees that create the marketing projects (campaigns, trade promotions and marketing plans). They total 23. The marketing calendar's impact on processes has been rated medium, because processes concerning trade promotions and marketing plans might also be affected.
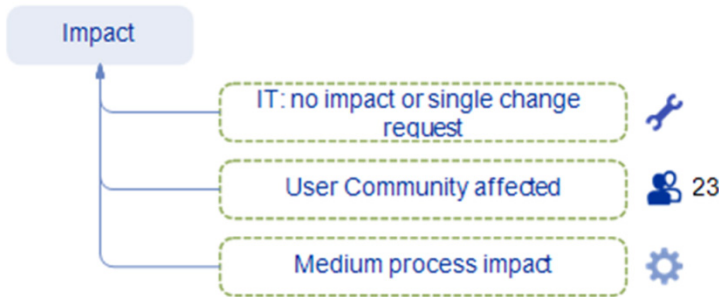

Fig. 2. Impact assessment for the marketing calendar

Overall, impact assessment reveals that several impact areas are affected: 23 users and a medium impact on processes.

4   Discussion of Results

The newly developed model delivers organization-wide decision support that determines the impact of an upgrade innovation – automatically and according to rules.

In sum, the new model offers a number of benefits to user organizations, and also to manufacturers of enterprise software.

User organizations benefit most by the use of automated assessment when comparing their as-is situation to their (potential) situation following an upgrade:

- They save time otherwise spent gathering and assessing information for an upgrade.
- They require less external consulting and so, reduce costs.
- Consultants' advice/recommendations are replaced by computer-based activities and so, reducing the number of errors made.
- Recommendations are easier to understand because detailed data and explanations are included in the results.
- The computer-based analysis is more thorough than an analysis conducted by human consultants. It also recommends upgrade innovations from earlier releases that may have become relevant under current company conditions.
- The tool can be used on local systems and so, is always available. It can also be employed in several user organizations simultaneously.
- The expert system delivers much faster results than human experts can.
- The tool contributes to long-term transparency, because it is very simple to document the results in detail.

The consequence of all above-mentioned points is that user organizations will begin upgrading sooner to higher releases and the upgrade innovations will be put to use and their potential tapped sooner. In some cases, the upgrade innovation can replace a customer-specific add-on with a standard function. All of these consequences would result in far lower costs for maintaining the enterprise software.

What is more, vendors of enterprise software would also benefit from the availability of this kind of tool:

- User organizations would no longer rely as much on the expensive maintenance of old releases if they had an incentive to upgrade.
- User organizations would require less consulting for the same or better service, and so, improve their cost structure (copying software costs nothing).
- Software vendors would enjoy improved customer loyalty because organizations would be able to benefit more from their enterprise software (and changing software would be more expensive and time-consuming).

In light of the prevalence of enterprise software, the wealth of practical applications for the model presented in this paper is clear. This tool could greatly reduce costs for both user organizations and manufacturers, and could improve the integration of upgrade innovations in organizations.

This same methodology can also be applied toward new products not included in an upgrade, but that require additional licensing costs.

In conclusion, it is essential to address the issue of how the analysis results can accelerate and prepare user organizations for the impending implementation and application of any given upgrade innovation.

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