INFORMATION SYSTEMS INFRASTRUCTURE DEVELOPMENT – ROAD AHEAD

Seppo J. Sirkemaa

University of Turku, P.O. Box 170, 20101 Pori, Finland

ABSTRACT

Information systems is the basis of business activities and processes in organizations. Technology has an increasingly critical role and therefore the reliability of information systems becomes a key element in successful operations. In this article we look at information systems infrastructure development. It is the mortar and basis for any other systems and operations in modern organization. Therefore, it needs to be reliable and robust. However, as environment, needs and requirements can change rapidly, the infrastructure should also be flexible. Infrastructure development is about making incremental changes to existing infrastructure. It is rare that technology can be chosen freely, new systems become part of existing infrastructure rather than replace it. Compatibility and standards are essential elements in development of a reliable, smoothly operating infrastructure. They make interoperability of different systems and technologies possible, increasing the flexibility of infrastructure.

1. INTRODUCTION

In this article we look at development of information systems in organization (Xu & Quaddus, 2013). The emphasis is on information systems infrastructure. It consists of systems and technologies, which need to be compatible with existing systems, and at the same time robust and open for future changes.

Information systems infrastructure is here considered as the basis of processes and activities in companies and organizations. Infrastructure functions as a mortar for a wide variety of operations, such as manufacturing and sales activities. Therefore, reliability is one of the most important requirements for infrastructure. Infrastructure should be robust and functionable, even in situations when there are lot of users and processes going on simultaneously. This is referred to as trustworthiness of infrastructure (Sirkemaa, 2018).

Reliability, robustness and trustworthiness are not the only elements that are needed in information systems. Information systems infrastructures should also provide flexibility. In any organization there are constantly changes within the organization and goals, and in the outside environment. For example, rapid changes can be necessary in business when there are changes in competitive environment.

Information systems development is not a purely technical process that could be carried out in isolation from other organizational functions and processes (Laudon & Laudon, 2015). There are several perspectives and goals that should be considered in the process. Strategic information systems planning is about identifying potential areas and opportunities so that information systems can provide greater competitiveness (Doherty et al., 1999; Peppard & Ward, 2004).

2. SUCCESSFULNESS

Generally, development is a process where a development area is identified, and thereafter a plan to is being prepared so that the issues or development needs could be solved. Information systems are often critical for organizational processes and functions, therefore they should be developed and managed as resources (Kearns, 2006; Johnson & Lederer, 2010). Implementing the plan is a vital part of successful development process. (Checkland & Scholes, 1999; Cram & Brohman, 2013).

It is often noted that management support is important for projects. Clearly, management support is a critical element also in information systems infrastructure development (Gibson et al., 1984). Development activities need to be accepted, understood and supported by managers, otherwise the odds of success will be low. Managers play an important role in organizing resources, and therefore their role is important. Furthermore, management can encourage developers in the development work. Management also helps in implementing technology and new systems.

Information systems and infrastructure development is not only a technological challenge, as understanding organization, organizational processes, and people in the organization are needed as well. Information systems and infrastructures have a wide impact on the organization; therefore technologies and infrastructures should fit to the organization (Schein, 1986; Markus, 1991, Pearlson et al., 2016). Here management's role is very important, as managers facilitate change and make new organizational practices possible. In information systems development, the question is how to use technology to bring added value to operations and activities. This involves also mapping the future potential of information systems and technologies, as solutions should be feasible, robust and flexible in the long run (Sirkemaa, 2019).

Information systems development involves several persons from different organizations. There are plenty of skills and expertise needed in the process. It is evident that technology and systems are complex. They change, partly because of technological change, but also because they may be used differently, and for purposes they were not originally designed. People involved in infrastructure development should have expertise in technologies, but also understand needs of users and business so that technology enables processes and brings added value to operations and business. Having a combination of experts in different technologies and systems, together with key persons with business understanding and experience is an important success factor. Often development relies on systems providers and their expertise in planning and developing infrastructure. They have best expertise in technologies and systems, but they may not know the organization, the processes and goals where this are being planned. It is therefore vital to have business knowledge and experience so that technologies can be chosen not because of technological sophistication, but in a way, they provide business value and make it possible to pursuit new businesses. They also need to fit existing systems, run reliably and remain flexible for possible changes in the future (Sirkemaa, 2019).

The developers of information systems infrastructure have a major impact on the successfulness of development work (Markus, 1991). The involvement of key persons, especially from management, IT department and information systems users are a critical factor in information systems infrastructure development (Schein, 1986; Henderson, 1990; Sirkemaa, 2019). Successful development is not about having extensive technical expertise available or most sophisticated technology. There is also need for persons who understand organizational processes and who can recognize processes and needs in a way that developers can provide solutions to these needs on both strategic and operative level (Dos Santos & Sussman, 2000). Understanding development goals is important, so that it would be possible to provide resources for the development process. Furthermore, development methods and timeline for development work need to be mutually agreed.

It is important to pay attention to key elements of project management. These include managing the development process with (Railing & Housel, 1990).
- Understanding requirements and keeping them in mind throughout the process.
- Managing changes during the project and at the same time adherence to plans.
- Assigning responsibilities clearly at each stage of the development work.
- Having different experts in the development team and using external expertise when needed.
- Managing and integrating external partners during the process (such as systems providers).

Information systems development calls for project management. The role of project management is critical. Furthermore, interaction in the development team, between experts and key persons from has a vital impact on the successfulness of the development work. The results rely also on technology and it's fit to organization. (Orlikowski & Robey, 1991; Orlikowski, 1992)

Interaction is a key element in any project. In information systems development everything relies on communication between people involved in the project, IT-people and users of technology, as well as internal and external experts coming from different companies. Interaction is recognized as one of the most important elements of successful projects, implementation and change process (King, 1978; Cram et al., 2016). It should still be noticed that even though interaction and discussion are important, but they will not automatically ensure desired results (King, 1978). Successful information systems development depends ultimately on "the human factor" (Orlikowski, 1992; Laudon, 1995; Sirkemaa 2019). As a result, managing interaction is a critical part of successful information systems development.

3. CONCLUSION

Information systems infrastructure is referred to as the basic information infrastructure which is a backbone for other business systems and processes. The role of infrastructure is critical as all other systems rely on it. Therefore, reliability and robustness are important elements in infrastructure. However, infrastructure should also be open for changes. Developing an infrastructure that operates as a robust backbone for daily operations and can be changed should there be changes in business needs, is a challenge for the developers of information systems infrastructure. It is important to develop a system that can be modified if there are needs to make changes. This is referred to as flexibility, which is needed in creating an information systems infrastructure.

Information systems infrastructure development involves various stages and careful project management. Information systems developers need to provide technical solutions, but also understand feasibility of the systems. The lifecycle of systems and technologies in infrastructure is long, making choices that are optimal on short-term are not necessarily best in longer run. Planned technologies and systems need to be implemented to the organization. Here we also highlight the importance of changes. Timetables, technical factors and similar factors require changes during the development process. Changes are also needed later when for example, there are changes in business environment. Technological changes impact also organizational culture, individuals and groups. In this process the role of management is important (Schein, 1986). Information systems development impacts organization in many ways, bringing also results that may not be directly measurable (Segars & Grover, 1998).

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