Migration as a Promising Approach for Designing Innovative Services

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ABSTRACT

It seems advantageous to use existing resources as well as available know-how for designing, creating, launching, and establishing innovative ICT-supported services being. Here, target-oriented migration provides effective procedures for designing innovative services. Thus, this article addresses some of the most important characteristics of migration, which is illustrated as a methodical approach for the development of new ICT-supported offers.

Key Words: electronic services; migration; strategies for the creation of services.

1. Introduction

Against the background of a dynamic global market, this article aims to visualize migration as a method for the extension and enrichment of existing services for designing and creating new services. The aim is to position migration as an instrument of methodically established customization between the aspects of modernization and conservation in the design of innovative services.

Concerning their entrepreneurial acting it becomes necessary for suppliers of services to continually adapt their strategies to the changing conditions. The driving force here is the technological development. For example, new forms of ICT-supported services, so called e-services, have arisen because of the Internet since the 1990s. These services usually provide added value for the users and have a high degree of acceptance. An arising and already significant extension of appropriated services is the mobile use of so far purely "stationary" e-services, which are used with a regular Internet access by cable modem [1]. The emerging mobile services (m-services) not only facilitate the development of new areas of application but also the use of a series of new capabilities and possibilities [2]. Notwithstanding these respectable capabilities, there is a gap between the uses of e- and m-services [3]. This fact can be partially explained by the fact that m-services are currently provided either by providers of telecommunication services or by e-service suppliers. Thus, some of the already successful e-services are additionally offered as m-services while others are new creations. The situation is characterized by mobilized e-services neither tapping the full potential of m-services nor conforming to the accepted consumer habits or user requirements. This is where approaches to a migration come in. Migration can support a purposive further development of existing services and therefore will be discussed below.

2. Migration: Concepts and Motivation

Economic and societal processes of change initiated by technological change and/or changed demands as well as strategic reorientation require a special management of these transformation processes [4]. Successful modification processes will be possible, if corporate and technical processes as well as all the other basic parameters are coordinated systematically.

In this connection, the concept of migration provides powerful tools for the harmonization of these requirements.

The term of migration is subject to a variety of definitions and thus is used in different contexts. In the discipline of information systems migration refers to the replacement or upgrade of applications and/or software systems with potentially better ones [5]. In this context Moore and Rugaber define migration on basis of a taxonomy established by Chikofsky and Cross [6] as the "activity of moving software from its original environment, including hardware platform, operating environment, or implementation language to a new environment."[7]. They also delineate migration from reengineering approaches, which focus on improving existing systems by applying new technologies, and porting approaches, focussed on the movement of programms from one environment to antoher one with only marginal syntax and interface changes.

Migration can also be defined as a management task where technical and organizational questions play essential roles. In this context, migration characterizes the change from existing application systems to such systems with extended or new functionalities and innovative possibilities to use already known functions or modified efficiency factors. Furthermore, migration links existing items with new ones while adding innovative components and technologies to the legacy system. This can lead to functionally upgraded and economically balanced solutions [8]. In this article migration is defined as a provider-orientated, planned, and controlled procedure, which changes the basic conditions of services and leads to a legally, economically, technologically, and socially modified, balanced status of ICT-based services [9].

Innovation management, technology management, the management of organizational and technological change as well as complexity management are related to disciplines of the management of migration. In contrast to innovation management which is, at least partly, based on "radical change", migration is a method of modernization, which simultaneously aims at retaining established methods and know-how. By contrast, the related approach of change management focuses on the extremes of "maintenance" or "total innovation", especially in the context of ICT supporting economical and administrative processes [10]. The following figure 1 clarifies these distinctions.

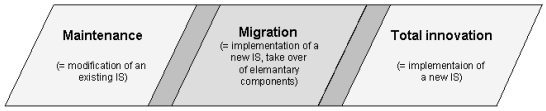

Figure 1 Definition of Migration

Maintenance renounces the implementation of necessary innovative elements; total innovation devaluates investments made especially in qualification and process organization [11]. Migration, on the other hand, describes a third path for accomplishing projected technological and organizational processes of change.

3. Basic parameters of migration

The basic principle for the design of migration processes is the intention to design and implement (migration-specific) services in a user-friendly way considering resources and know-how. This comprises investments in hardware, software, and netware to be used further, rather to be added to than be written off [12]. Also significant and economically more explosive is to retain as much as possible of investments made in processes, organizations, and in the know-how of the users or to gently adapt them. Such a procedure can stabilize the success of the process of change effectively. It can also energize the process of change and ultimately ensure the economical success. This makes it clear that to describe migration processes it is not sufficient to consider technical aspects [13]. In fact,

migration, besides technological aspects, refers to organizational and economical questions similarly. Accordingly, migration processes must be contemplated and accomplished on various levels. Figure 2 shows the three levels of migration in their relation to each other: the system level, the process level, and the organization level.

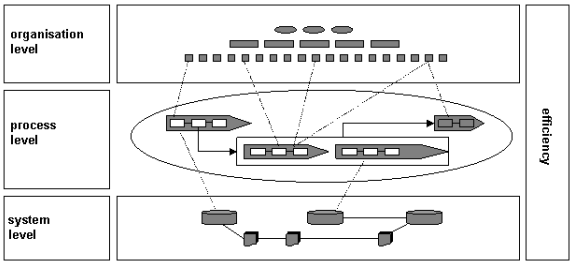

Figure 2 Framework of Migration

The system level forms the first level. Various kinds of migration, like for instance data, code, system, and concept migration, are merged in that level. Complex migrations of services, which are normally accompanied by such particular types of migration, are of special interest to the presented framework. In this context migrations can proceed in two major ways. While software migration characterizes the adoption of a new system and the transfer of elementary software or parts of legacy systems, data migration is a precisely planned one-time job.

At this level the effective use of existing data is important within systematic approaches of migration. Proven procedures and instruments exist for data migration [14]. The responsibility for the quality and completeness of data to be migrated, and also the special risk connected with the conversion of productive systems, require the processes of data migration to be organized as a project. This means that it is necessary to define responsibilities, to have competent personnel as well as to have the migration project carefully planned, completed, and controlled [15].

Beside the software systems and the underlying ICT, organizational models and processes have to be considered in a broadened view on the migration topic. Thus they have to be adapted and varied as well. In this case, two different approaches are conceivable. On the one hand new technologies enable a more effective and, in the ideal case, a more efficient organization. On the other hand modified basic conditions, which affect the organization and the processes, can demand new or extended application systems. Therefore, holistic migration concepts must involve not only technologies but also competencies, organizational structures, and business plans. Viewing migration on the organizational level two relevant aspects can be identified: the organizational aspects of the migration as well as its being carried out as a project. When analyzing the organizational aspects, the organization can be viewed from a static or a dynamic point of view. The static view, then, refers to the organization itself and not to the activities/processes and is viewed from a system-oriented perspective. The system of the organization is divided into the subsystems of strategy, technology, personnel, structure, and processes [16]. The decision to migrate is then positioned on the management level and depends on the strategy of the particular enterprise and its resources [17]. The dynamic view on the organization shows ICT as a driving force, giving an impulse for the organizational change. The combination of the two aspects leads to different reasons for the migration classified in the following.

The wish for a change of conditions can be identified as a central motive for migration, which can be based on different reasons. However, the main goal is always to improve the whole situation. According to the reasons given, the reasons for migration can be distinguished in external and internal factors and several kinds of pressure. Pressure can occur due to functional and technological problems. So migration can be activated by internal functional causes, above all, when old systems do not fulfill the required functionalities any longer. Bad maintenance of the old system, the

potential capacity overload, or other internal technological causes can lead to difficulties [18]. External functional causes are particularly based on the economic competition. A migration might be necessary in order to remain competitive. External technological causes can also be based on external products used in the enterprise, especially if they are not supported anymore or if they are taken out of the market. In this context cost saving potentials have to be considered which are connected directly with the employment of new technologies [19].

Furthermore, the migration should be regarded as a project on the organizational level. The large complexity compared to the approach of maintenance is characteristic for this. This complexity is suggested by incomplete knowledge of the legacy system or the multitude of relations between the elements to be inherited from the legacy system. The following activities exert influence on the success of migration projects in this order: initiation management, analysis of the basic conditions, technical content-wise project management and initial segmenting of the old system as well as determination of the procedural models, definition of the migration types, quality assurance, project co-ordination, and project marketing [20].

The reasons for migration as well as the organizational changes in companies can affect the organization of the business processes. The stress of competition in particular and the necessary increase of efficiency can force enterprises to optimize their business processes. On the process level, migration can thus be viewed especially in consideration of the process changes within the individual company. Modern ICT play an important role in this because with their help it is possible to design business processes anew [21]. In this connection companies intend to harmonize the potentials of new technologies with the requirements of their business processes in the context of a business process reengineering (BPR). BPR aims at the transformation of business processes with the purpose of achieving substantial improvements concerning the business structure and the organization of processes. Thus, on the process level, migration offers various potentials for designing innovative services. But first of all it is necessary to identify the existing use of ICT in the value chain [22]. The main potentials in the adoption of ICT as well as in the migration do not lie in the support of old processes with new technologies, they rather exist in the possibility of developing and arranging processes in a new way.

The three mentioned levels are considered with regard to efficiency. In this scope migration preserves economic developments corresponding to social requirements, keeps successful business processes and business models and at the same time offers chances for further developments. Regarding the economical view, the value of the current system must be compared with the necessary changes towards a newly developed system. Thus, the protection of investment comes to the fore. Migration from an old to a new system will be worthwhile, if the new system promises a clear increase in added value. This will also be true, if, for instance, the operating and maintenance costs of the old system are too high and/or at the same time a high risk for a total innovation exists [23]. Migrated services provide a set of economical potentials, like, for instance, time saving and quality potentials. Cost saving potentials, for example, can be obtained by better and multiple uses of resources and by an increased price transparency. Furthermore, well-migrated services provide a set of time saving potentials by using intelligent optimization systems. Moreover, various quality potentials can be realized, e.g. improving the performance by using already accepted account systems.

The aspects described above make it clear that decisions for a migration in general as well as for concrete migration projects have to be made from a common point of view.

4. Advantages of migration as a method

In the given context, migration intends to keep elements with future potential by re-using again and adapting proven components/procedures. For migrations not only the technical systems like applications, architecture, concept, drafts and interfaces but also the organizational structures, personal qualification (human capital), processes and tasks need to be taken into account as well as the provision of strategies to prevent conflicts and to solve them. Consequently, migrations require a balanced design of a multitude of elements. The bunch of positive migration effects cannot be realized by focusing single dimensions. Migration then can

- retain the acceptance and motivation of users who are affected by the system's changing. Knowledge, experiences, and know-how keep their value as far as possible.
- accelerate the system development and implementation. A subset of system components will not be developed anew but will be "merely" integrated.
- advance the stability of migrated applications and decrease to the risk of failure. To some extend, users can revert to their experience/know-how which then contributes to avoiding mistakes.
- offer chances to reduce costs and also increase performance quality by using/reusing existing qualifications and components, strategies of error avoidance and process knowledge. Existing business processes and business logics can then be used further according to their purpose.

These migration effects are not only expected for users (employees, customers, suppliers etc) but also for developers (due to multiple use and reuse) and integrators (e.g. due to the internal and external cross-linking of application systems and processes). Regarding the establishment of innovative services, such a procedure can boost the use of the services through the integration of accepted elements.

The extension of established services of private and business everyday life with further components constitutes a challenge for the users and providers of these services. This change of basic communication types and interaction forms applies on the side of the supplier of innovative services to serve the needs of the users by using planning mechanisms and control mechanisms as well as instruments of migration. In this context technical and organizational as well as social factors are classified as influencing factors but also as controlling variables in the change process. A comprehensive migration concept for designing the transition of innovative services is indispensable, especially according to the complex subject of ICT-supported services. It is needed to save investments in the system on the one hand and on the other hand to be able to use approved application systems furthermore. With such complex migration approaches it is also possible to predict the required modifications of the underlying application systems, of the (hidden) consumer's habits, as well as the changes on the provider's side.

5. Conclusions

The presented elements and approaches of migration emphasize how different approaches of migration can be developed depending on the chosen perspective. Nevertheless they follow common aims and combined they serve to develop migration competence. This development of migration competence means more than acquiring the possibilities for the professional technical transfer of data to new systems. In fact, it is a great challenge to discover interactions in the parallel use of different approaches. To consider them alternately has potentials to also harmonize partly conflicting interests and thus achieve an interdisciplinary optimum solution. Possible effects of the multiple uses of concepts, infrastructures,

application systems and (media-) competences are implicated in the evaluation of migration processes. The economic efficiency seems worth considering in detail.

The results of this article show that migration as a strategy-driven continuous improvement process of ICT-support in economical settings, in areas of civil service, and in the private sector is a relevant and important alternative for the design of ICT-supported services and of organizational conditions. The application of several approaches for the optimization of migration processes aims to and thus also connects change processes, and it enables the successful transfer of existing services in innovative, novel services.

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