Towards a Concept for Integrating IT Innovation Management into Business IT Management

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ABSTRACT

Recognizing and utilizing IT innovations are essential activities to maintain and strengthen the competitiveness of companies. The IT in companies has the opportunity to change its own role towards a business enabler and driver by establishing a systematic IT innovation management. Existing frameworks and models for IT governance and IT management do not adequately describe how a systematic IT innovation management should be structured and integrated with other tasks and processes. We conducted a qualitative empirical study, which shows that this requirement is also seen as important in practice. Based on the results of this study and by drawing on relevant findings from the literature, we developed a concept for integrating IT innovation management into business IT management. This new function is described along the dimensions of its role, tasks, processes, methods and its integration with other areas such as enterprise architecture management, IT strategy and project portfolio management.

Keywords

IT Innovation Management, Business IT Management, EAM, COBIT, Tasks, Role, Processes, IT Strategy, IT Governance

INTRODUCTION

Recognizing and utilizing innovations are essential activities to maintain and strengthen the competitiveness of companies (Cantwell, 2005; Clark and Guy, 1998; Swanson, 1994). During the last years, information technology innovations (IT innovations) led to dramatic changes in many industries. The adoption and use of e-commerce platforms, eBook hard- and software, and electronic reservation systems had significant impact on the competitive situation in the according industries (retail, publishing, travel). Therefore, companies need to face the challenge of permanently observing the development and diffusion of IT innovations. Furthermore, they also need to assess the impact on their own business and to launch appropriate projects that evaluate and explore the potential of new technologies. Some of those technologies might later be implemented in successive projects.

Today, the role of IT departments in companies changes. Beyond service orientation, IT is to an increasing degree seen as a driver, business enabler or even as a strategic weapon (Weiss et al., 2006). The IT departments are expected to test new technologies quickly and to realize benefits together with business departments by making use of these technologies. Beyond the role of being a business enabler, the IT is sought to be involved in the development of new business models or even to actively develop new business models on their own. We use the term IT in a general meaning which subsumes all the structures, processes, people, data, and technology which are affected by the processing of information (Mocker, 2007; ISACA, 2013). In most of the cases, the term only refers to the IT function, the used technology and the processes used by the IT managers. But especially in the context of innovation management the usage of technology in the whole enterprise is of interest.

With this paper, we aim to contribute to the discussion of defining proper models for organizing the management of IT innovations. This is done in three steps: First, we present the results of a qualitative empirical study we conducted on the need for establishing IT innovation management in practice. Second, we discuss the concepts of three models for IT Governance and Business IT Management regarding their current state of including the management of IT innovations. As the integration of the IT innovation management with other processes is considered to be a major success factor for generating impact, we then present a first draft of a concept for integrating IT innovation management into the business IT Management framework.

Our work is based on the design science research paradigm and research process (Hevner, March and Park, 2004; Peffers, Tuunanen, Gengler, Rossi, Hui, Virtanen and Bragge, 2006). In the following section we describe the results of a qualitative

empirical study to identify relevant problems in the current situation in practice regarding the implementation of IT innovation management. By analyzing existing frameworks which cover certain aspects of IT innovation management, we draw on the existing theoretical basis as a first step towards designing a new concept. In the fourth part, we present a concept for organizing the IT innovation management with a focus on the IT innovation management role, the according tasks and processes, methods needed to conduct the tasks and the interfaces with other process domains. We evaluate the result on the basis of an informed argument and conclude that the early stage concept addresses some of the issues in practice which are not yet covered by existing frameworks.

EXPLORING THE SITUATION IN PRATICE: A QUALITATIVE EMPIRICAL STUDY

In a qualitative and empirical study, we investigated the current status of IT innovation management in practice and identified problems companies face when they establish this function. For this purpose, 14 semi-structured expert interviews (Myers and Newman, 2007) were conducted in Germany. The interview guideline is divided into five sections: introduction / entry questions, organizational structure, innovation process, management, finish / reflection. It comprises a total of 40 questions, which are partly personalized to the interviewees' role (provider, user, and consultant). The interviews were recorded, fully transcribed and analyzed with regard to the categories used in the guidelines according to the method of qualitative content analysis with the application of deductive categories (Mayring, 2000).

The interviewed experts cover several industries: three were from large consulting and analyst firms, three from consulting firms with expertise in IT innovation management, three from IT service companies, four from large industrial companies, and one from a large telecommunications company (see table 1). This selection allows us to analyze the topic of IT innovation management from three main perspectives: IT using firms, IT service providers and consultants. The consultants were an important source as they are experienced and have an overview of the situation in different industries and companies through many projects in this field. The following paragraphs briefly summarize the results from the interviews.

	Industry	**Position**
Interviewee A	IT research and advisory (analyst)	Analyst
Interviewee B	IT service provider	CIO
Interviewee C	IT service provider	Head of IT
Interviewee D	IT consulting	VP IT Innovation Center
Interviewee E	IT service provider	Innovation Manager
Interviewee F	IT consulting / IT innovation management	CEO
Interviewee G	IT consulting / IT innovation management	CEO
Interviewee H	IT consulting	Partner / Head of IT strategy consulting
Interviewee I	IT consulting / IT innovation management	Member of the board of directors
Interviewee J	Automobile	Manager IT innovation management
Interviewee K	Metals and mining	CIO
Interviewee L	Engineering and electronics	Sales manager internal IT service provider
Interviewee M	Telecommunication	Vice president
Interviewee N	Manufacturing	Vice president

Table 1. Interviewees, industries and positions

The interviews clearly demonstrate a different understanding of the concept of 'IT innovation'. Thus, the term is used inconsistently with different objectives. However, all interviewees emphasized that the importance of IT innovation increases the success of the company and therefore has to be enacted throughout the organization. Limiting the subject to the management level is not seen as an appropriate solution. Establishing a culture of innovation is seen as a prerequisite for successfully conducting IT innovation management. The as-is situation in practice is considered as rather heterogeneous regarding the efforts and success in establishing such a culture. The current status is characterized by a large variety ranging from isolated initiatives to the establishment of innovation bodies. Only a few companies already have defined specific roles for the management of (IT) innovations. All interviewees considered a structurally anchored position in the company explicitly dealing with innovations as mandatory for sustainable success of IT innovation management.

In addition to the inconsistent understanding on the subject of IT innovation, many organizations face two challenges: First, they need to structure the innovation process and thus define clear process steps (e.g., brainstorming, idea evaluation and implementation of ideas). Second, they also aim at allowing flexibility and informal work to support the creative parts in these processes. Some interviewees affirm that only portfolio management, market monitoring processes and product management processes can be structured, while innovation management as a creative discipline does not have typical process flows. Therefore, an innovation process should be partially formalized. But it should also allow for acting outside of predefined structures. Furthermore, the interviews showed a heterogeneous status regarding the innovations budgets. The approaches range from the extremes of exclusive budget responsibility by the business departments to decision taking authority by the IT itself. However, it is emphasized that greater innovation budgets are needed and that innovations should be tackled in a structured way. This allows for better supporting innovation processes and leads, according to the interviewees, to a broader and more successful basis of ideas. To support these activities, a proper set of methods (like scouting, forecasting, idea management, etc.) has to be applied. In practice, these methods are often unknown or not applied.

In particular, globalization leads to an increasing need for linking the IT innovation management with other functional areas. Six interview partners explicitly argued for establishing trans-organizational and trans-functional know how processes to foster the cooperation with other companies and universities. The internal and external exchange of ideas and the discussion of activities in the innovation management were also seen as success factors which have not yet been realized by many companies. Due to a lack of knowledge about possible cooperation partners (customers, suppliers, partners and competitors) companies miss the chance to consider worthwhile ideas.

In addition, many companies lack a clear and demonstrable innovation strategy and a definition of related tasks. Requirements are sometimes very general, so that the complex environment (e. g. competitors, legal or regulatory requirements) is captured insufficiently. Many interviewees were not sure, how influences from the corporate environment can be considered in a structured and sustainable manner. All interviewees said that they wish to professionalize the innovation management or they would even recommend establishing an integrated innovation management for the whole company. Table 2 provides an overview of the problems identified in practice regarding the implementation of IT innovation management. In the following we focus on the problem P3, P4, P7, P8, P10 and P11. These problems require a common structure for the interdependent set of concepts which can be described as processes/tasks, methods, roles and integration with other tasks.

P1	different understanding of what an IT Innovation is
P2	heterogeneous situation regarding the culture of innovation
P3	unclear role definitions for performing IT innovation management
P4	IT innovation management processes: missing overview on needed processes
P5	IT innovation management processes: structure vs. flexibility
P6	IT innovation budget: responsibility and amount
P7	methods of innovation management are not known or not used
P8	lack of integration with other tasks and processes (internal and external actors)
P9	missing (IT) innovation strategy
P10	need to professionalize IT innovation management (missing structures)
P11	missing integration of IT innovation management with general innovation management

Table 2. Obstacles to the implementation of IT innovation management in practice

IT INNOVATION MANAGEMENT IN EXISTING MODELS AND FRAMEWORKS

Several authors point out the relationship between a professional IT and the ability of a company to be innovative and competitive (Karanja and Ganesh, 2011; Tarafdar and Gordon, 2005). In order to realize the positive effects, firms require processes for managing innovations in the IT (Jeyaraj, Rottman and Lacity, 2006; van de Ven, 1986). Several authors refer to certain aspects of IT innovation management as a part of enterprise architecture management (EAM) (Fischer, 2008; Zimmermann, Morisse, Brettschneider, and Schirmer 2011a; Zimmermann, Morisse and Schirmer 2011b). Rohloff (2011) argues for integrating approaches from innovation research into EAM as well. He especially points out the usefulness of concepts like open innovation. EAM approaches appear to be particularly useful, as all areas of the business which are

relevant for innovations and affected by innovations such as business models and processes, organizational structure and information technology can be considered together (ibid.). EAM also offers methods for the systematic development and design of organizations. The provision of a holistic picture of an enterprise might be a key for the successful interplay of IT and innovation management. The IT Governance Institute (ITGI) integrates an entire process area for dealing with innovation (APO 4 - Manage Innovation) in version 5 of the COBIT framework (ISACA, 2013). In the following sub-sections we outline the innovation management concepts in three models according to the dimensions tasks/processes, methods, roles and integration. COBIT is widely used in practice, while the Business IT Management (BIM) is an empirically based process model from academia and the work from Fischer is a deductive model based on literature analysis. These are surrogates for the vast number of approaches in the field of IT management or IT governance (Holm Larsen, Pedersen and Andersen, 2006). The were selected because of

(1) their consideration of IT innovation management and enterprise architecture,

(2) their process-orientation and

(3) their relevance for practice and research.

Fisher's EAM approach was selected as it defines (unlike the TOGAF and the Zachman frameworks) an explicit task of technology observation which is close to the idea of IT innovation management. ITIL has not been considered as it does not provide explicit tasks and processes for IT innovation management. In ITIL, new technologies may reach the IT via the demand management from the customer's side (Canon, 2011). Other processes like Service Portfolio Management or IT Architecture Management can be considered as a consumer for input from IT innovation management processes (Canon, 2011; Hunnebeck, 2011). However, ITIL does not cover the issue of IT innovation management as a core part of its process landscape.

Managing Innovation in COBIT 5

In the latest version of the popular IT governance frameworks COBIT, a new process of "manage innovation" (APO04) has been added to the process area "Align, Plan and Organize" (APO). The goal of this process is described as follows: "Maintain an awareness of information technology and related service trends, identify innovation opportunities, and plan how to benefit from innovation in relation to business needs. Analyze what opportunities for business innovation or improvement can be created by emerging technologies, services or IT-enabled business innovations, as well as through existing established technologies and by business and IT process innovation. Influence strategic planning and enterprise architecture decisions" (ISACA, 2013). Since this process is very new, it can be seen as a guideline for setting up a project for IT innovation management as it is very much focused on the IT.

Processes/Tasks: The authors provide six sub-processes, which are subdivided into the following activities: (1) create an environment conducive to innovation, (2) maintain an understanding of the enterprise environment, (3) monitor and scan the technology environment, (4) assess the potential of emerging technologies and innovation ideas, (5) recommend appropriate further initiatives, (6) monitor the implementation and use of innovation. COBIT only defines the processes which should be carried out. However, it does not provide any further details on how these processes should be conducted. Nevertheless, the list of activities is a good starting point for anchoring an innovation management in the processes of IT management (or IT governance).

Methods: The COBIT framework demonstrates its strengths in the coherent description of processes, their linkage to defined IT objectives and by providing related metrics. Here, the description again provides information on what should be measured or linked but no information is given on how this can be achieved in detail. Nevertheless, COBIT mentions methods which can be used in these processes like proof of concepts, workshops, and SWOT analyzes.

Roles: The COBIT model does not include a dedicated role for dealing with innovations. Instead, the tasks are assigned to existing roles in IT management. In particular, the roles CIO, chief architect, people responsible for the development department and responsible people from the business departments are in charge for executing these tasks.

Integration: The process is associated with defined input / output interfaces to other processes in COBIT. Interfaces are described to other planning processes of the APO process area. These include: strategy, enterprise architecture and project portfolio management, as well as the area BAI (build, acquire and implement). Again, the way of execution is not specified in detail.

Technology observation according to Fischer

Fischer (2008) describes the process "technology observation" in his approach for enterprise architecture management as a part of the "strategic dialogue". He designs a concept for using and maintaining an enterprise architecture based on a

literature review. The outcome of the "technology observation" process is a technology report, which is used as a part of the strategic development of the company.

Processes/Tasks: The process consists of the tasks "observe existing ICT", "explore new information and communication technologies", "review the development of information and communication technology", "analyze strategic implications" and "create the technology report".

Methods: Fischer does not provide detailed information on appropriate methods. However, the execution of tasks is largely based on the methods of enterprise architecture management. Thus, reviews and impact analyzes can only be carried out by comparing different scenarios based on the as-is and the to-be architecture.

Roles: Fischer defines a specific role in this process, which is responsible for the IT innovation management in cooperation with the head of the enterprise architecture team. It is called the "IT explorer". In addition to the responsibility for tasks mentioned above no more requirements are mentioned for this role.

Integration: The contribution of technology observation is limited to the systematic evaluation and preparation of information on existing and new IT as a part of the strategy development of the company.

Technology and environment analysis in business IT management

Zimmermann et al. (2011a, b) describe the process of "technology and environment analysis" as a part of the business IT management (BIM). The model is based on a qualitative-empirical cross-sectional study on 17 companies in Germany and Switzerland. The study analyzed the processes and activities in the areas of IT strategy, IT multi projects and enterprise architecture. It especially focused on the links between these three process areas.

Processes/Tasks: The process is divided into the analysis of various factors such as general technology development, the direct environment (e. g. competitors) and the IT strategy. Each analysis is carried out by considering the individual background of the focal organization. Furthermore, experts are consulted on specific issues and archived factors are steadily evaluated. After the analysis phase, the technology and environment report is made available. It is used in the IT strategy development. Furthermore, pilot and analytical projects are jointly launched with the departments in order to gain experience and assess the impact of new technologies. After reviewing these projects, the other processes in the model are triggered.

Methods: The process model suggests only a few concrete methods. In addition to strategy analysis and the implementation of pilot projects and analysis, especially the use of enterprise architecture for reviews and impact analysis is used.

Roles: The BIM model does not provide a dedicated role for dealing with innovations, but sees these tasks anchored in the EAM team. The pilot and analytical projects are carried out in collaboration with the business departments.

Integration: The "technology and environment analysis" is closely linked to the other processes of the BIM model. The interaction with the IT strategy development is ensured by the technology and environment report and the monitoring of potential strategic factors. Furthermore, the results of pilot and analytical projects can trigger the revision of the IT strategy. Likewise, there are interfaces to the standards and guidelines of the enterprise architecture and to the multi-project management, e. g. as a part of the knowledge transfer between analytical projects and successive projects.

Summary

The analysis of the approaches shows first steps towards an integration of IT innovation management and IT management. Some basic tasks and processes are mentioned and results are outlined. The interplay of the IT innovation management processes with IT management processes is also considered. Especially the role executing the tasks needs a more distinct description. Also, the methods used can be expanded by the rich method toolbox of innovation management. However, the tasks/processes, methods, roles and the integration with other processes need to be described in greater detail. This is required to utilize this additional cross-sectional task in order to cover the needs in practice and deliver a true competitive advantage.

Existing models and frameworks for managing IT - such as COBIT (ISACA, 2013) or the business IT management model (BIM) (Zimmermann et al. 2011a, 2011b) - present first ideas for integrating the IT innovation management as a new cross-sectional task of IT and to integrate it into existing management structures. None of the approaches mentions the integration to the overall innovation management or research & development processes.

In the following, we focus on three shortcomings in these models regarding the integration of IT innovation management:

- Until now, it is unclear, which tasks and processes have to be carried out by an IT innovation management.

- By drawing on the experiences gained by companies in introducing process management and enterprise architecture management, we conclude that the introduction of a new function requires the intertwinement with other processes and

tasks (e. g. business departments, IT strategy, and project portfolio management). To realize benefits, there needs to be impact on other activities.

- A key task for the IT innovation management is to conduct a technology and environment analysis. Until now, well-grounded concepts for defining and bordering the environment are missing (Pittaway, Robertson, Munir, Denyer and Neely, 2004). Furthermore a set of methods which supports the tasks of the IT innovation management is needed.

TOWARDS A CONCEPT FOR INTEGRATING IT INNOVATION MANAGEMENT INTO BUSINESS IT MANAGEMENT

To demonstrate the benefits of embedding innovation management in the processes of IT management, we extended one of the existing models mentioned above. We decided to use the BIM model, because it provides the following advantages compared to the other models: Firstly, it provides a process (technology and environment analysis) which can be used as starting point. Secondly, this model provides detailed process descriptions for other processes (e.g. IT strategy development) which can be used to show the outcome of innovation management. Thirdly, the BIM model describes the mutual dependencies of process domains. Some of these domains can benefit from integrating innovation management processes (IT Strategy & IT multi-projects). Vice versa, other processes (IT multi projects & enterprise architecture) can provide useful input for the innovation management process. Extending and enriching the COBIT framework is another possibility we do not follow in this paper. The reason for this decision is that the BIM model is developed on the basis of existing processes in practice using academic research methods and because it is used in practice. Therefore, using the BIM model should also enable a direct use and evaluation of the proposed extensions in practice. Furthermore, the demand we discovered in our empirical study supports the idea of developing a concept which can also be used in practice. The acceptance of COBIT 5 and especially the process "manage innovation" in practice cannot be assumed. Nevertheless, the integration of the functions and methods described below is not limited to the BIM model, but can also be used in other models.

The IT innovation management role (P3)

The IT innovation manager is responsible for the IT innovation management (Zimmermann et al., 2011a). This role leads the innovation management, and represents it both inside and outside the company. In order to fulfill this task, it requires extensive skills and abilities. First, the IT innovation manager has the obligation to communicate to get connected within and outside the company. These connections are needed to permanently place the topic of IT innovation in the company and to make it visible. Employees should be encouraged to report and discuss ideas with the innovation manager. The network to the outside of the company (and especially to competitors) is needed for detecting new ideas and trends early. These ideas have to be sorted and categorized by the IT innovation manager. In a next step, they need to be evaluated and prioritized. To explore these ideas, the IT innovation managers should have the permission to start pilot projects without being limited by the (IT) strategy. These pilot projects should be funded through a separate innovation budget. They may also be supported partly or completely by sponsors (e. g. business departments). The projects do not need to match the plans for the to-be architecture in a first stage. However, the results should be communicated to the EAM team as early as impacts of those technologies occur which may have an impact on the future EA. If a discovered IT innovation proves to be strategically important for the company, the IT innovation manager has the competence to escalate ongoing IT projects that run contrary to this innovation to a joint committee.

Tasks and processes of IT innovation management (P4)

As discussed in the innovation research literature, organizations are embedded in systems of innovations (Edquist, 2005). Despite the traditional developer-customer relationship, many additional actors influence the innovation processes of an enterprise. Therefore, a system of innovation has to be seen from different perspectives. On the one hand, the scope of a system of innovation can be defined by its developers' organizations (e.g. their industry). On the other hand, an innovation system can be delimited by the participating customer firms. Other defining boundaries of an innovation system can be regional or national coverage. Thus, the scope of analyzing the environment and innovation system can differ by the size of the organization and relevant target markets. As a result, global enterprises have to include a greater innovation system into their environmental analysis than regional small companies. Choosing the size of the considered system of innovation is strongly intertwined with the extent of related effort an organization has to be made. Therefore, the first task is to define the innovation systems' scope as well as actors to be monitored within this system.

One of the most important success factors for innovations is their interdisciplinary evaluation during the different stages of the innovation process. In each stage, different experts need to be consulted, thus the inclusion of experts has to be resource and time efficient. In the early phases, in which strategic or operational innovation ideas are discussed, an interdisciplinary team from business and IT needs to be set up in order to evaluate the potential of ideas for the whole organization. During this initial evaluation, the experts which have to be consulted are discussed and approved.

It is obvious, that the implementation of innovations and new technologies have a huge impact on the organization, both positive and negative. In order to evaluate the potential as well as the risks of an innovation, incubator projects should be set up. These incubator projects generate knowledge about the new technology in an early stage. We see three positive effects using incubator projects: Organizational learning and assessment of the technologies' maturity, identification of organizational needs and an improved benefits-/risks-/costs-evaluation. Also, these incubator projects should include mixed teams with strategic, functional and technical experts. From the results of the evaluation process and the incubator project, a project sketch can be derived. This sketch can be used in the demand management process. Interdependencies can be considered and the potential of new technologies and innovations can be linked to organizational needs.

Methods for supporting IT innovation management (P7)

All tasks in the IT innovation management can be supported by appropriate methods. Methods for the evaluation of innovations like checklists, value benefit analysis, net present value (von Ahsen, 2009), compliance checks of business strategies for future innovations (corporate foresight) (Burmeister, Neef and Beyers, 2004; Daheim and Uerz, 2008; Rohrbeck, 2010) and the integration of customers into the innovation process (open innovation) (Chesbrough, 2003; von Hippel, 1988, 2005; Reichwald, Seifert, Walcher and Piller, 2004) can be used. The following two examples illustrate the usage of methods for supporting IT innovation management: We first describe the execution of environment analysis based on sectoral systems of innovation (Malerba, 2004). Second, we illustrate the establishing of an internal idea management and its relevance for IT innovation management.

After defining the innovation systems' scope and identifying relevant actors, the IT innovation management has to analyze the organization's environment and filter relevant information for the innovation processes in the organization. Therefore, appropriate information channels (like newsletters, professional journals, fairs, conferences, analyst reports and websites of competitors, benchmarks, etc.) have to be identified. The information gained needs to be evaluated and filtered. It has to be stored, summarized and sent to the innovation experts. In addition to that, proactive reports can be generated which summarize specific trends or activities of competitors or IT providers.

In addition to analyzing the organization's environment, the collection and evaluation of internal innovative ideas are a long discussed topic in innovation research. An idea management allows members of the organization to submit ideas for improvement. The submission is often linked to financial or other incentives. IT innovation management has a supportive role, in which it filters relevant ideas and includes them into the IT innovation process.

Integrating IT innovation management into Business IT Management – extensions and interfaces (P8, P11)

In order to clarify the integration of described tasks and methods, we describe the extension of BIM and the interfaces to different processes of BIM in the following paragraphs. The numbers in figure 1 refer to the interfaces described below.

Extension: An additional process domain "IT innovation" is added to the BIM model. The processes "Identifying IT innovations", "Evaluating IT innovations" and "Exploring IT innovations" are assigned to the new process area to comply with the demand given above. The process "Technology and environment observation" is transferred from the process domain "enterprise architecture" to "IT innovation". The domain "IT innovation" has interfaces to all other process domains of the BIM model as well as to the organization's central innovation management.

Interfaces to the process domain "IT strategy": The strategic parameters given by the IT strategy framework and IT strategy catalog have a great impact on IT innovation management. On the one hand, the parameters provide guidance for observation, selection and evaluation of innovations (1). On the other hand, the parameters are influenced by innovations itself (2). The innovation report is a helpful instrument for developing and revising an IT strategy. In addition to that, a systematic definition of the innovation systems provides orientation for strategic alignment. The implementation of new IT innovations can contribute to the generation of new business models and new business strategies (12).

Interfaces to the process domain "IT multi projects": Projects are the essential instrument for implementing innovations in the organization. As mentioned before, incubator projects can be used to explore and evaluate new innovation and technologies with an emphasis on risk and potentials. The results of an incubator project can be used in several ways. Follow-up projects can be initiated and included into the project portfolio (3). Additionally, the results of incubator projects may be used to revise business and IT strategy (4). The incubator projects are able to realize the requirements of innovation management and enable new business ideas and models based on new technologies. The innovative potential of a project can be a helpful criterion for selecting and prioritizing projects from a portfolio (5). Furthermore, experiences gained in incubator projects can support regular IT projects (11).

Interfaces to the process domain "enterprise architecture": New technologies and innovations have to be considered during the development of an enterprise architecture (including business architecture (6) and technology architecture (7)).

During the development of a to-be architecture, domains with innovative technologies or procedures can be marked, in order to enable a greater flexibility in these domains. Therefore, the BIM domains "enterprise architecture" and "innovation management" have to be intertwined. For the evaluation and impact analysis of IT innovations, an up-to-date as-is and to-be enterprise architecture is essential (8 and 9). Interdependencies between innovations and processes, IT systems and IT infrastructure can be highlighted easily, experts can be identified and starting point for the integration of the innovation into the architecture can be evaluated. With different scenarios of enterprise architecture development, the impact of IT innovations can be analyzed quickly. In addition to that, architectural knowledge gained from the incubator projects can be used for architectural support and insertion of new ideas during the project run (10).
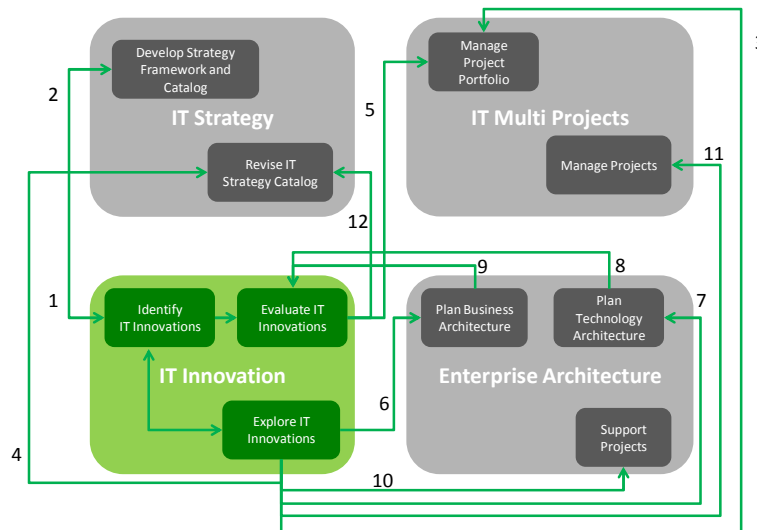
Figure 1 Process Interfaces from IT innovation management to other processes

Linking IT innovation management to organizational innovation management: For establishing an IT innovation management, the intertwinement with the other organizational units is essential. The most important interface exists with the organization-wide innovation management (Hauschildt and Salomo, 2011). According to Rogers (2003), innovation management can be separated into an "innovation development process" and an "innovation decision process". The first process describes the path from recognition of problem to their diffusion and adaption of an innovative solution. Consequences from the adaption can be foreseen. This process is used by organizations which develop innovations actively and want to commercialize them. The results of this process are products or services developed for future clients (Rogers, 2003; Vahs and Burmester, 2002). The second process describes the way organization use when they select an innovation and introduce it to their enterprise. The result of the second process is the application of an innovation which has been developed external.

A comprehensive innovation management should include both processes and interlink them with IT innovation management. For example, IT innovation management can support the "innovation decision process" by introducing new ideas for IT systems and technologies. Each idea has to be evaluated for its impact and possibilities of implementation. Beyond that, IT innovation management can provide ideas for new products and services during the "innovation development process". By using the IT scouting process, innovative IT systems can be found to offer new services to customers.

Besides being a spin doctor for innovation management, IT innovation management can be seen as central hub for the evaluation of bought or made innovations in respect of their impact on IT. The IT innovation management can mandate the other BIM domains IT strategy, IT multi projects and enterprise architecture to perform sub-tasks of the evaluation (e.g. check of strategy compliance or availability of resources).

Summary of the results (P10)

The approach described above targets the problems in practice and the flaws existing approaches have shown. The role, tasks and methods are defined on a broad level. The linkage between an IT innovation management and business IT management is shown by integrating the concepts into the business IT management process model. This enhanced model enables the IT to truly deliver competitive advantage for organizations by systematically discovering, evaluating and integrating IT innovations in the daily IT management routines. Analogical to the challenges of IT governance initiatives, managers have to complete three tasks (Peterson 2004): First, they need to establish the role of an IT innovation manager who is accountable for communication and continual improvement of the innovation processes. Second, he or she has to leverage existing organizational structures like the enterprise architecture board for supporting the IT innovation management its tasks. Third, the management has to solve the integration of IT innovation management in the existing IT management processes to make use of the results of IT innovation management.

CONCLUSION AND OUTLOOK

The necessity to establish a systematic management of IT innovations is widely accepted in practice and literature. Nevertheless, concepts to organize this function are lacking. In this paper, we have proposed an extension of the BIM model and integrated the process domain of IT innovation management. Essential tasks and the links to the different BIM process domains have been illustrated. In addition to that, the importance of analyzing the organization's environment to recognize vital innovations has been highlighted. At the moment, IT innovation management approaches with integration in other domains of IT Governance are needed in practice. The concept described in this paper is a first step to integrate an IT innovation management into the IT structure for providing sustainable IT innovation within organizations. The given approach is helpful to strengthen the acceptability of IT and to improve the business IT alignment. For future research, our proposed model needs to be elaborated in greater detail and evaluated in practice (e. g. in a case study). Furthermore, we want to identify and describe patterns of handling IT innovations and for organizing IT innovation management. These patterns can be different for certain types of organizations according to their IT strategy and depending on the role the IT has in the organization.

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