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BUSINESS PROCESS MANAGEMENT SOFTWARE IN THE FIELD OF SERVICE ENGINEERING

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A***bstract:*** *Service Engineering is an effective and proper method in creating business services. Due to the fact of the use of strongly marketing influenced methods during the process of the creation of a new service the results of the service model are ineffectively to monitor in their process costs and in their process efficiently. BPM is a possible approach in improving the service engineering process in selected phases.*
Key words: *Service Engineering, Business process management, SOA*

1. INTRODUCTION

The ongoing transformation of market structures, especially the service sector market, made an improvement in developing and designing of services necessary.
Several approaches for service designing were made since the seventies and eighties which were published under the term *new service development* in anglo-american literature. Finally the term Service Engineering was established in Germany and Israel in the mid-nineties: Service engineering was defined as a technical discipline and unlike new service development, which is strongly marketing-oriented, service engineering was stated as an engineering-like and systematic development approach in using suitable models, methods and tools to generate professional services [Bullinger et al. 2003].
In generally there are three models of engineering proceedings described in literature when designing new products or services [Schneider et al. 2003]:

- Model of linear proceeding
- Model of iterative proceeding and
- Model of prototyping proceeding.

2. SERVICE ENGINEERING

A common used service engineering model is the following phases model which was established as a result of the research project *Initiative for the 21. Century* by the german government in 1997. This model uses linear proceedings in the main phases of the development and in every main phase an iterative step improves the results of the development (Fig. 1) [Hohm et al. 2004].

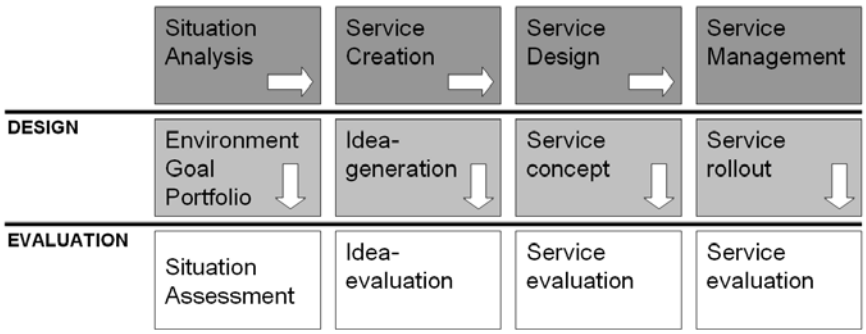

Fig. 1. *Service Engineering model [Hohm et al. 2004]*

The approach of *CAMPUS* 02 to Service Engineering is based on this model but expands the 4-phase model in combining all three proceeding models in the Service Engineering phases by integrating the prototype phase (fig.2).

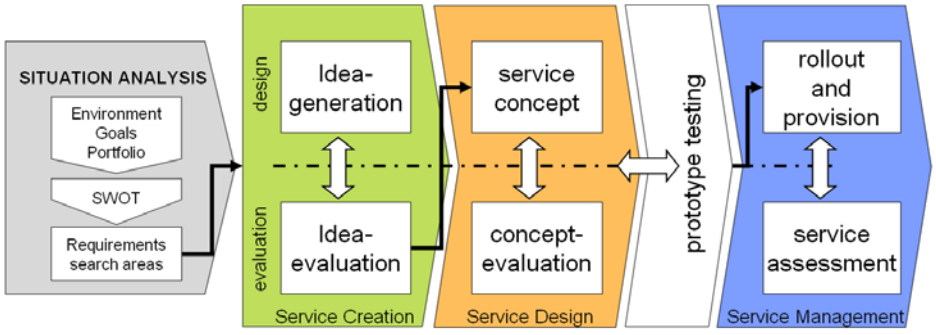

Fig. 2. *CAMPUS 02 Service Engineering approach*

The *linear proceeding* is defined through the main phases which are called

- situation analysis,
- service creation,
- service design,
- prototype testing and
- service management.

Within the phases of service creation, service design and service management *iterative proceedings* improve the results of the sub processes.

The *prototype testing* phase, situated after the service design phase and before the phase of service management, guarantees a field testing of the developed services under market near conditions. The prototype testing phase facilitates a reengineering of the service.

The design of a service concept is in fact the main step in the development of a service during the whole service engineering process. All the outcomes of the pre-phases of the service creations process result in a so called service prototype. Several methods in the phase of the service conception are used to design and develop the service concept.

The main approach in creating a service concept is in designing [Schneider et al. 2003] (Fig. 3)

- a *product model*,
- a *process model* and
- a *resource model.*

After the creation of the three models they will be combined to one concept (the service prototype) and this service prototype can be tested under market near situations. It is important to coordinate the creation of the prototype with the organizational structures within the company. In every step the designer of the service prototype has to consider whether the new designed service causes a change in the organization model of the company or not.

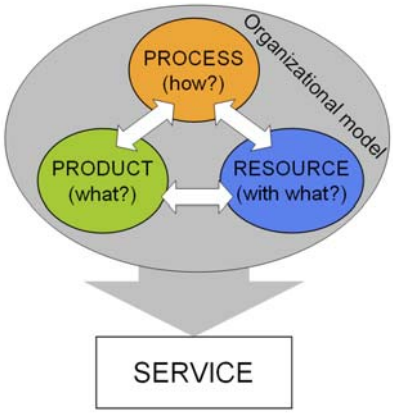

Fig. 3. *Design Concept*

The main focus in modelling the **product model** is the question what the outcome of the new service is all about. The product model contains the description of all characteristically attributes and facts of a service for the whole service life cycle [Schneider et al. 2003].

The goal of the design of a **process model** is to sample the whole process into single activities to get an exact view of the single actions in the service procedure [Hohm et al. 2004]. The identification and description of the process model delivers the basis for process measurement and improvement.

The **resource model** specifies and describes the assignment of technical, material and human resources during the several phases of the service process. It also describes the quantity, the quality and the temporally use of the resources [Schneider et al. 2003].
In literature the common used tools during the creation of the service concept phase are strongly influenced and oriented by marketing and quality management methods: For the creation of a product model a combination of the technique of the *KANO analysis* and the technique of *QFD* (*quality function deployment)* are commonly used [Hohm 2004].
The KANO model of customer satisfaction [Kano 1984] classifies the attributes of a product or a service. The classifications are useful for decisions concerning service design. A competitive innovative service meets basic attributes, maximizes performance attributes and includes as many excitement characteristics as possible at a cost the specific market can accept.
QFD, invented in the seventies by the Japanese Professor Mr. Akao, is a method of improving quality by bringing together the conclusions of the KANO analyses ("the voice of the customer") and the "voice of the service development team" in one chart to identify the feasibility of the service. The method ensures that only service attributes strictly control the development and the selection of service production tools, service methods and service control mechanisms [Herzwurm 2007].

3. BUSINESS PROCESS MANAGEMENT IN THE PHASE OF SERVICE DESIGN

In literature the common approach in designing a service process is the "blue printing" method [Hohm et al. 2003, Kotler et al. 2001]. The "blue printing" is a very fast and easy to implement methodical approach to visualize service events and service actions in a flow chart. The main goal in designing of a service blue print is to identify weakness points in the service procedure (fig. 4) [Kotler 2001]. This approach is a strongly marketing influenced method. Based on the service blue print the resource model will be deduced [Hohm et al. 2003].
There are several problems in defining the process and the resource model by using marketing oriented tools like service blue printing:

1. A service blue print is a *not standardized* proceeding. The quality management is unable to deduce a process handbook on the basis of a service blue print model.
2. Due to the fact of lack standardization the *description of single process steps is poor*. There are no common and standardized rules in describing single process steps. This may lead to the misinterpretation of single process steps or whole process functions.
3. The connection between the organizational chart of the company and the designed service blue print is very hard to handle: the exact *integration of resources into the service process* flow is in succession of the poor process description *nearly impossible*.

4. Finally the exact *description of process costs* and *process ownerships* are *impossible* due to all of the listed reasons.

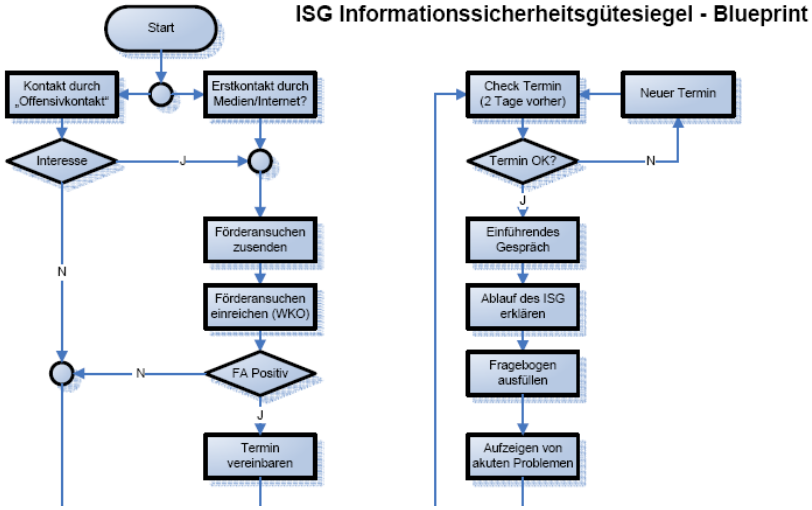

Fig. 4. *Service Blue Print [Aschbacher et al. 2006]*

USE OF BUSINESS PROCESS DESCRIPTION LANGUAGES

In order to optimize these weak points of an approximate and quick process design method, business process description languages (e.g. *EPC – Event-driven process chain, BPMN – Business process modelling notation*) offers a standardized possibility to define the service processes. It is necessary to descripe the services in different levels of detail. Due to the ongoing development of SOA methods, a well defined process model can be used as the base for an implementation of a webworkflow for service execution on an application server (Fig. 5).

Thereto the management-driver process modell has to be transfered in a technical modell descriped in the *Business Process Execution Language (BPEL).* A realization of a webbased workflow requires an orchestration of webservices (linkage of webservices with process steps). If the process modell is designed by a Business Process Management Software, a process monitoring with real data is possible and it is possible to realize a process optimization. Additionally the software enables the combination of organizational charts and systems with the processes.

5.CONCLUSION

One effective approach in improving the process of service designing is in using the supports of CAx tools. BPM software is able to improve this phase of the service development by using standardized process description languages like EPC or BPMN. These software applications also support the easy transformation of resource information (process owner information) into a resource model.

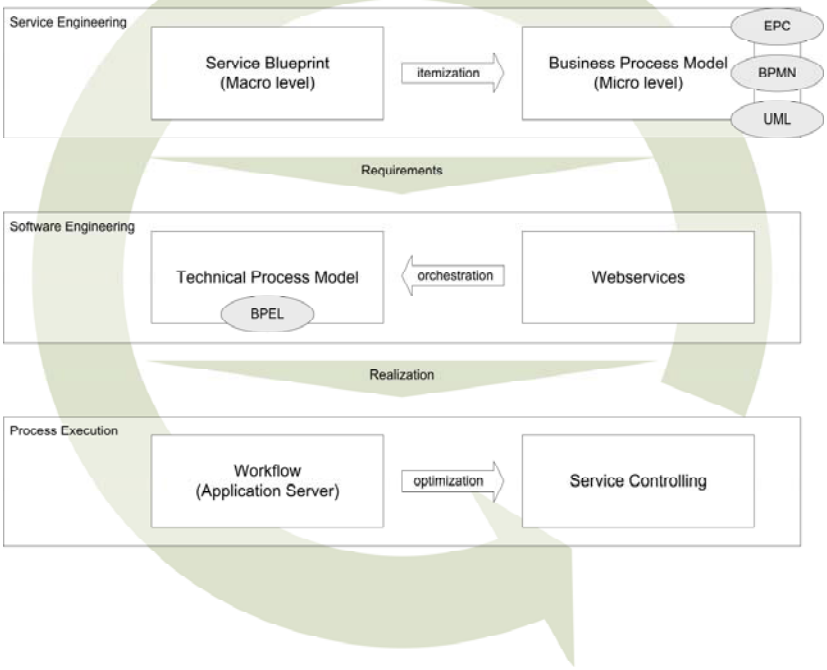

Fig. 5. *From a service process to a web-based workflow*

The potentials of a software supported process modelling are in the connection of organization and infrastructure resources with process steps and in an optimized software engineering process by the use of service oriented architecture techniques.

In future these service oriented architectures will reduce the complexity of adaptation from applications on the needs of agile processes, which are adapted on the dynamic market needs.

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