Thema:

Integrative reengineering of „best practice" business processes by international production plants based an existing and historically evolved process structures for introduction of a common process model

Diplomarbeit

Arbeitsgruppe Wirtschaftsinformatik

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Abbreviations

ABAP	Advanced Business Application Programming
AG	Aktiengesellschaft
AML	ARIS Modeling Language
APQC	American Productivity & Quality Centres
ARIS	Architecture of Integrated Information Systems
AS	Application System
BPE	Business Process Engineering
BPM	Business Process Management
BPR	Business Process Reengineering
cp.	Compare
CPI	Continuous Process Improvement
CPM	Continuous Process Management
CRM	Customer Relationship Management
CSE	Continuous System Engineering
DSAG	Deutschsprachige SAP Anwendergruppe
EPC	Event-driven Process Chain
eEPC	extended Event-driven Process Chain
ER	Entity Relationship
ERM	Entity Relationship Model
ERP	Enterprise Resource Planning
IFRS	International Financial Reporting Standards
IS	Information System
IT	Information Technology
J2EE	Java Enterprise Edition
KPI	Key Performance Index
n.d.	No date of publication given
n.p.	No place of publication/publisher given
RBE	Reverse Business Engineering
ROI	Return of Investment
SAP	Systems, Applications and Products in Data Processing
SAPJCO	SAP Java Connector
SCM	Supply Chain Management
SME	Small and medium-sized enterprises
SOA	Service Oriented Architecture
SOAP	Service Oriented Architecture Protocol
W/o a.	Without author
W/o v.	Without volume
WfMS	Workflow Management System
WSBPEL	Web Service Business Process Execution Language
WSDL	Web Service Description Language
XML	Extensible Markup Language

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1 Continuous alteration

Today customers, requirements, and markets are changing in continuously decreasing timeframes. That includes the serving company environment and their strategic business targets as well. Classical business objectives, like the realisation of profit or enhance of market shares, are faced with increased pressure of competition through a globalisation of markets. Faster innovation cycles, high quality, business flexibility, low cost production, and high stress of efficiency represent, therefore, the basic prerequisites to survive. One possible solution within this challenge provide a specialisation and focussing on areas of expertise. The other way is the inverse effect of diversification to spread the risk on different markets and product divisions. No matter what strategy is used, it always leads to a structural modification with change, growth, or reduction of the company environment. On the one hand, this pertains the operational area like formation of new or sale of old business divisions, and on the other hand, the organisational area through mergers or additional purchase or sale of assets (cp. Scheer et al. (2005), p. 152).

However, every modification has consequences for existing business processes and used Information Technology (IT). The corporate IT landscape and business processes fluctuate or vary in the same way a modification of the company environment is realised. In normal cases, it is in compliance and means that a growth creates more heterogeneous and complex structures. In this way, it is common that existing business applications within the IT landscape have to set up again, upgraded or extended similar to a software lifecycle model. Examples could be found with new locations, changed laws, updated media, or other motivations (cp. Hansen/Neumann (2001), p. 206). But not only business applications also business processes have to continuously designed, configured, executed, and monitored within a Business Process Management (BPM) lifecycle along the whole value added chain (cp. Scheer et al. (2005), p. 37).

Thereby a company can count them self lucky, when their usage of business applications are proper documented and within a business process-oriented way of thinking. In the literature it is now being recognised that IT supports business processes and the IT strategy should, therefore, be derived from the business strategy. Consequently, IT architectures have to analysed and optimised from the focus of a business process perspective. The target is to implement the idea of a flexible and customisable IT architecture within a continuously changing business environment (cp. Scheer et al. (2005), p. 20). However, it is necessary to have a companywide transparent and harmonised business process landscape (cp. IDS Scheer AG (2006a), p. II). This means, if the business processes are not proper documented, the IT system will not stay standardised or harmonised over time (cp. Scheer et al. (2005), p. 198 et seq.).

1.1 State of the situation

The recent years it was very easy for a company to achieve IT standardisation for the holistic support of the business processes. Therefore, a company introduced and accepted packaged software for their Enterprise Resource Planning (ERP) like the R/3 system of the SAP AG. This called an ERP system implementation project which was usually done by the help of a methodology for speeding up the duration of introduction. Therefore, the business process-oriented view was included with concepts like business process reference implementation, step-by-step proceeding, or Big-Bang implementation strategy (cp. Mauterer (2002), p. 28 et seq.). Within such introduction projects, it would be the ideal case to correctly identify, analyse, and document the business processes by holding them on a valid process model. In this way, the realisation of a permanent business process management can take part. However, in practise this was mostly not the case, because of terms like a fast Return on Investment (ROI) and the argument of the anyway orientation on the ERP system given reference processes (cp. Teufel et al. (2000), p. 113 et seq.).

Today and after years of usage, a new release should displace the outdated packaged software. Thereby the question about the current used business processes and their use within the ERP system arises again. In addition, the coming release architecture will be completely different from the original introduced application. The best example, today, is the discussion about the module based R/3 system architecture and the step into service oriented structures and the current release mySAP ERP 2005 of the SAP AG (cp. Frisch (2006), p. 9). Instead of cross functional and business process-oriented thinking, companies are now recognising that they are still addicted to act within functional areas related to their IT system world. Nevertheless, business processes affects cross sectional areas and go out of the packaged software and out of the company with still manual handled task and activities (cp. Bohr (2006), p. 19). Now, it will become necessary to re-document the existing business processes because they had changed in a similar way the related IT system was modified and updated since an implementation project. By the help of a project based proceeding, the result of a clear documentation in a model-driven way could provide the foundation for an IT standard and a concept for the continuous management of business processes. The documentation, thereby, must include a classical as-is situation recording up to the definition of the to-be processes. This means all internal, external, system supported and manual activities, all individual extensions, modifications, and third party application interfaces related to the existing packaged software. During the time of usage it was unfortunately normal behaviour to diversify an introduced standard despite of missing overall clear process management, monitoring, or control concept like the business process management provide (cp. Scheer et al. (2005), p. 36 et seq.).

1.2 Objective and thesis structure

Within the literature two common alternatives are established to reach typically a company-wide business process orientation. On the one hand, it is the radical redesign method or so called Business Process Reengineering (BPR). On the other hand, it is more the focus on incremental changes and the gradual improvement of functionalities or also called Continuously Process Improvement (CPI). Both methods are mutually exclusive but with the same target of continuation within a permanent institutional fixed and systematically process management (cp. Becker et al. (2005), p. 300). This thesis will represent an integrative way as compromise between BPR and CPI, to set up a long term continuous business process management with a common process model related to the usage of a standardised ERP system. Therefore, a general and detailed procedural model will be build up in this thesis, on a project based structure with a partition into step-by-step progress phases. In total, this procedure model should have the character of a common guideline to uncover high potential in the area of business processes and within the usage of packaged software.

To reach these objectives the chapter two starts with a theoretical introduction into issues and definitions of process management and process modelling. In addition important views, terms, and approaches of project management are required to clear the language confusion and bring the focus afterwards to next step of integration by a service orientation. Furthermore, the chapter three introduces the procedure model by a detailed reasoning, followed by typical situations in a business environment, a theoretical classification, and detailed statement for so called best practices. The common procedure model with the breakdown into phases will be presented in chapter four, including a detailed look at all phases which are required to perform an integrative best practice reengineering within an organisation. At the end of this thesis, the conclusion will sum up the main points of the procedure model and look at possible risks which lead to a discussion of open issues.

2 Process fundamentals

The following chapter describes the process specific background which is preliminary based on theoretical consideration and important definitions to understand the complex topic. Firstly, a detailed introduction into the field of process management and process modelling will be given. Thereby the presentations of two common concepts are in the foreground to reach a continuous process management in a business environment. Afterwards the Architecture of integrated Information Systems (ARIS) and corresponding modelling issues will be discussed. At the end of this chapter, a description of project management and the state-of-the-art topic of a service orientation will be explained with definitions, explanations, and classification.

2.1 Business process management

In the meanwhile, process orientation and management are a well established optimisation approach within the literature and practical realisation (cp. Gadatsch (2005), p. 1). What exactly this means and how the theoretical background is defined, will be part of this first sub chapter. The characteristics of business process orientation within a company, clear definitions, and concepts to reach and live a process-oriented view will be presented. Prerequisite issues which are necessary to achieve the conceptual changes within in an organisation[1] will close this sub chapter.

2.1.1 Process definition

Becker defines in common a process as a completely closed, timely, and logical sequence of activities which are required to work on a business oriented object (cp. Becker et al. (2005), p. 6). These activities can be run on a sequentially or parallel order to reach a clear target (cp. Hansen/Neumann (2001), p. 245 et seq.). The interface of a process is consequently not only one object or information. In general a process receives an input like a document, an information or material and creates a value added output. This means a process may have several basic parameters for input and output although the value added scope is within one business relevant object (cp. Becker et al. (2005), p. 6 et seq.).

Rautenstrauch/Schulze defines additionally the following characteristics for such process objects (cp. Rautenstrauch/Schulze (2003), p. 243):

[1] The term organisation will be used as synonym for company, firm or enterprise.

- Process objects act as activity enabler.
- Process objects can appear within several processes.
- The number of objects and types can fluctuate within the process.
- Process objects can change within their type.
- Process objects can be either material or information based.

A process oneself represent in common the link between a strategy and an Information System (IS) (cp. Österle (1995), p. 48). Thereby the IS consists of people and respectively or machines which are linked through a communication relationship and who creates or use information (cp. Hansen/Neumann (2001), p. 133). Another descriptive term for an Information System which is mostly used as synonym in this context is Application System (AS). This classification is traced back to the fact of using application software within several areas of appliance. Thereby the applicable software is a part, module, component, or functionality of a whole system with computer hardware, an operation system, and organisational environment (cp. Krcmar/Schwarzer (1999), p. 12).

The mentioned activities or functions within the common context of process understanding are defined by Hansen/Neumann. They are a necessary sequence description of logical steps in a process execution by a person or another resource. For the case that a process execution is complete or partly automated in the business area, Hansen/Neumann speaks about workflows (cp. Hansen/Neumann (2001), p. 246).

The special characteristics of a business related process indicate a direct company objective and location within a business environment. Therefore, a business process has interfaces to internal and external business partners, similar to the common process[2] definition of input and output (cp. Hansen/Neumann (2001), p. 245).

The course and current way of thinking within business processes instead of efficient execution of individual functions are linked to the recent decades of a modified economic environment. A faster change of customer behaviour, market structures, and stress of competition has led an impact to an organisation. Within this external view the terms of market, the product line, the quality of service, and the customer satisfaction are included. In addition, the internal focus of a company like the efficient and innovative execution of activities and cost reduction also increases (cp. Becker et al. (2005), p. 3).

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[2] In the following, the term process is used as synonym for business process.

The earlier direction of functional areas has led to a local optimisation and perfection. Achieved improvements of technologies or organisational structures were just implemented within these areas. In this way, it causes for example a large increase of productivity and quality in the area of production, logistics, or accounting through the use of information and communication technologies such as standardised software or even organisational concepts like the outsourcing of not company related core competences (cp. Becker et al. (2005), p. 4 et seq.).

However, this local improvement disregarded the relationship between the operational business functions and the connection to external company input and output. Inside a global market and with high stress of competition this tight view was economically not justifiable anymore. Even if the use of packaged software reduces the duration of coordination, the increased costs to coordinate the individual areas could not be balanced with such application. The structural problem was not solved yet (cp. Becker et al. (2005), p. 5).

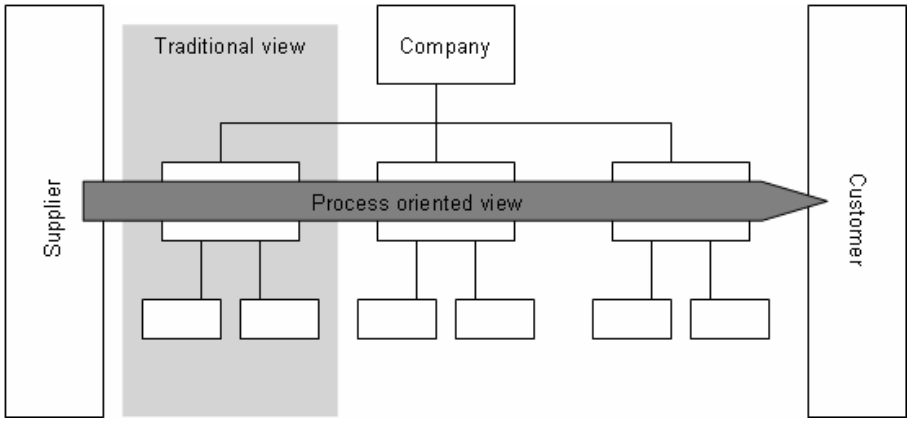
2.1.2 Process orientation

The topic of business processes orientation is for several years an important instrument for corporate governance. To strengthen a company as a whole towards the preliminary mention market problems, there is no other way than focusing on cross functional business processes with an overall customer orientation. Furthermore, it helps to reduce existing interfaces and strongly support the initially referred survival basics. Interfaces mean in common three possible interactions between humans, human and machines, and between machines. Therefore, the originated implementation concepts are continuously enhanced and adapted to the general changing frameworks. As already discussed in chapter 2.1.1, a business process is the essential point of a process-oriented company view and deals with the execution and coordination of internal and external activities within the features of correct time, owner, resource, and way of doing (cp. Becker et al. (2005), p. 5 et seq.).

Within this orientation the IT is taking an ambivalent roll. On the one hand, it is the implementation factor and helps with flexibility and process efficiency by innovations. Furthermore, the interface between IT and cross company processes has also generated universal concepts like the Supply Chain Management (SCM), Customer Relationship Management (CRM), approaches of Business Integration (BI), or Collaborative Business (C-Business). On the other hand, it hinders through their complexity by modifications in details. In this way, complexity means a technical advance within the IT to have a consideration of hardware and software as a commodity and their

interaction between many independent IT systems has to be controlled (cp. Scheer et al. (2005), p. 2 et seq.).

In addition to this conceptual development of a view where IT supports a business process, ideas of design, optimisation, and general management were achieved. Not until the 1990's an inclusion along the company based value added chain takes part about all processes which have an internal or external output. This cross company process-oriented thinking in comparison to the traditional view is illustrated in figure 2.1, based on Brenner/Keller.



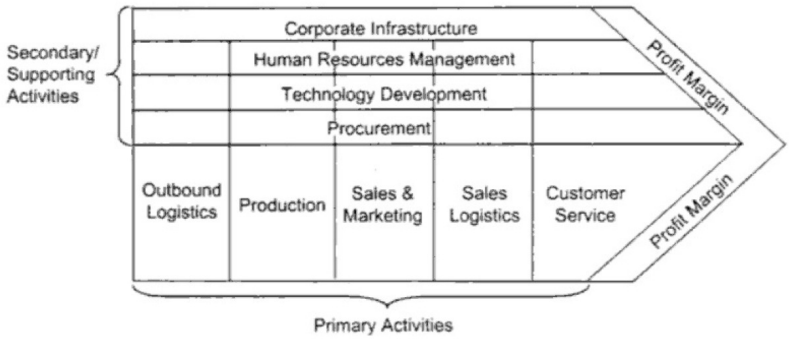
Source: Based on Brenner/Keller (1994), p. 20

Fig. 2.1: Process-oriented view on a hierarchical company structure

Beside common approaches about the management of business processes, tangible concepts like Business Process Reengineering (BPR) and Continuous Process Improvement (CPI) occur (cp. Scheer et al. (2005), p. 3). Within the literature several catchwords for both ideas exists like business reengineering, process reengineering, or process innovation. All have in common to realise the same idea of a process-oriented company structure design (cp. Becker et al. (2005), p. 5). Details of these concepts will be discussed later on from chapter 2.1.5.

To get an understanding and first classification about business processes and their relationship to a company based value chain, the model of Porter helps to categorise corporate activities into primary and supporting activities. According to figure 2.2, all activities which are directly related and value added for the manufactured product or service are categorised as primary activities. They have a close impact on the economic output of a company. Common examples are task within the production, sales or procurement. In contrast, the supporting activities are not linked and not value added to the product or service. But without these activities like human resource, accounting, data processing, or strategy management a product could not be executed. Becker,

furthermore, speaks enhanced about core processes for primary activities which create or utilise the value in a company and support processes whose activities do not create value but which are still necessary for a company. Supporting does not mean unimportant because they provide the framework for the execution of core processes and just have no direct contact to the product or service. Another name for this type of activities is the so called enabling process. To define where a core process ends and a support process begins is depending on the company and the different context of their view on the business processes (cp. Becker et al. (2005), p. 5 et seq.; Brenner/Keller (1997), p. 18 et seq.).



Source: Porter (1992), p. 62

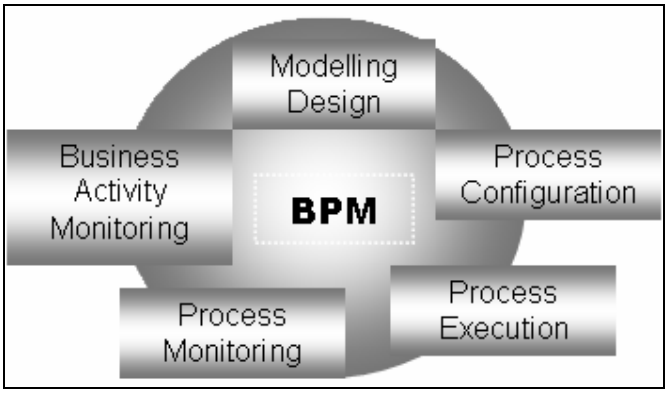
Fig. 2.2: The generic value chain of a company according to Porter

With such a framework it is possible to define and understand the necessity of business related process management, also called Business Process Management (BPM).

2.1.3 Process management

BPM means handle, plan, monitor, and control core and support processes with an internal and external view on the business processes (cp. Becker et al. (2005), p. 8). That includes lifecycle phases like identification, analysis, optimisation, realisation, implementation in software, execution, control, and performance measured quantifying of a business processes. First and foremost such closed circuit representation offers a continuous adjustment on the changing market terms which are initially mentioned (cp. Scheer et al. (2005), p. 36). In other words, the design or modelling, configuration, automated execution, to the point of technical and business monitoring should reflect an integrated view on business processes, illustrated in the BPM lifecycle figure 2.3. A closed circuit also means that it has to be a continuous method with clear and transparent documentation of the business process content and their configuration. Furthermore, a transfer of knowledge has to be considered including an appropriate way

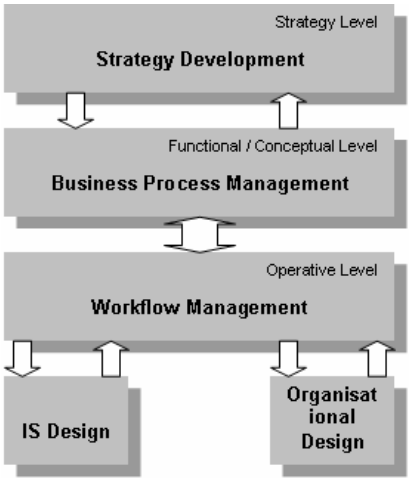
for the execution of business processes. In addition the monitoring must include the control of business critical events and an efficiency analysis based on Key Performance Indicators (KPI) which represents predefined characteristics to measure the benefits for a business process (cp. Scheer et al. (2005), p. 36).



Source: Scheer et al. (2005), p. 37

Fig. 2.3: Business Process Management Lifecycle

The BPM lifecycle is embedded as central element within an integrated company concept for the business process and workflow management, illustrated in figure 2.4. This structure encompasses on several levels the development of a business strategy, the functional and conceptual business process management, an operative workflow management as well as the design of organisation and application system (cp. Gadatsch (2005), p. 1).



Source: Based on Gadatsch (2005), p. 2

Fig. 2.4: Business process and workflow management

The strategy level implicates a look to the business segments of a company comprising the potential critical factors of success. From this view it is possible to derive the functional processes in the frame of a conceptual process management. This provides the link to the corporate planning on the strategy level in contrast to the workflow management as operative implementation level (cp. Gadatsch (2005), p. 1 et seq.). Workflow management means workflow modelling, execution, and process monitoring (cp. Gadatsch (2005), p. 3). Thereby a workflow represents as already explained a sequence of actions in a business process. Through a systematically description with and a processing logic it is possible to automate processes by the help of so called Workflow Management System (WfMS) (cp. Hansen/Neumann (2001), p. 444).

In definition to Hansen/Neumann, they support the implementation of business processes by automated forwarding of documents, information, or tasks to the respective person in charge on predefined rules, related to the relevant processing step. Thereby the necessary data and application is given, including respites or exceptional circumstances (cp. Hansen/Neumann (2001), p. 445). Prerequisite for the use of a workflow management is the mentioned workflow modelling. This is followed by a previous created process model. In this way, the modelled business process is extended with specifications for the automated process execution in a workflow management system. At this stage a workflow execution follows and means the generation of process objects and the throughput along the designated handling station under monitoring of the WfMS. Thereby monitoring is the up-to-date control of correct process behaviour with a related benchmarking for possible changes (cp. Gadatsch (2005), p. 3).

To realise a BPM within a company, three prerequisites are needed (cp. Scheer et al. (2005), p. 37):

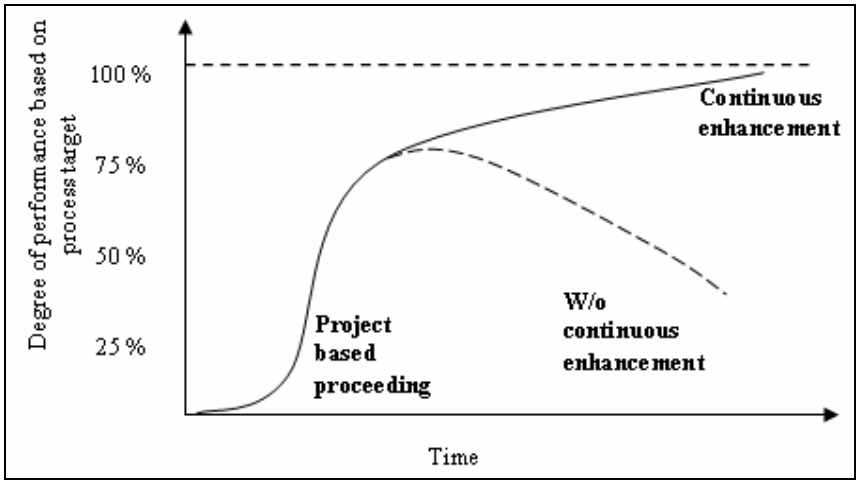
- An organisational framework for such a concept within a company.
- An efficient management process regarding decisions.
- The involvement of all target groups.

These fundamentals, the lifecycle, and the orientation on continuity ensure sustainable and permanent advantage in competition (cp. Scheer et al. (2005), p. 38). A possible method to reach a BPM is characterised within the literature in two ways (cp. Brenner/Keller (1994), p. 33).

- A project based proceeding.
- With continuous enhancement.

The target of a project based proceeding is the achievement of all changes inside a business process within one project. For a successful approach of a project it is necessary to organise, plan, execute, and control the used resources through a project management. This issue will be discussed on chapter 2.3 (cp. Becker et al. (2005), p. 17). A concrete appliance of the project based realisation of BPM will be discussed in the Business Process Reengineering chapter 2.1.5.

Continuous enhancement is the result of not complete and immediately reachable business process targets through a project (cp. Becker/Keller (1994), p. 35). This means it is necessary to work continuously on the business process targets. The figure 2.5 shows the relation of business process targets and how to reach them with the use of continuous enhancement. Becker/Keller explains within this illustration a loss of positive effects shortly after the close of a project unless there will be no implementation of the worked out results. The dashed line explains a decline of the degree of project target performance after a project. Continuous enhancement, furthermore, means to ensure the project reached and realise of the process targets (cp. Becker/Keller (1994), p. 36). Once the process targets are accomplished it is required to use this as basis for a permanent continuously process improvement. This concept will be discussed in detail at chapter 2.1.6.



Source: Based on Brenner/Keller (1994), p. 36

Fig. 2.5: Stepwise reaching of process performance targets

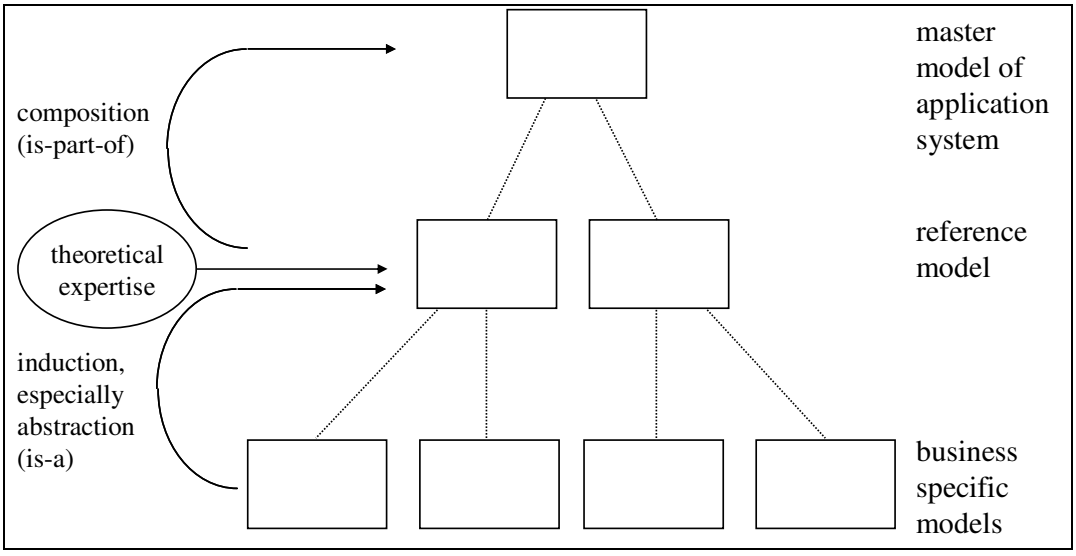
2.1.4 Process reference models

The planning or design of business processes within the BPM lifecycle can be done by the help of valid and generally accepted reference models. A model is defined as an abstract and immaterial image of real structures and their behaviour for the purpose of the subject. Thereby the subject is the client and receiver of the model respectively here mainly the company (cp. Rautenstrauch/Schulze (2003), p. 225). Each reference model contain a to-be situation or ideal case of a process in an organisation, based on special objectives, application systems, or business areas (cp. Rautenstrauch/Schulze (2003), p. 230). For the individual usage or orientation on these reference models, it is necessary to adjust the included business processes to a company. In this way, the used reference model gets evolved into a company specific model. Case studies engage that the use of reference models reduces the time factor and cost by more than 30 percent within any process-oriented project (cp. Scheer/Nüttgens (2000), p. 370)

The reference models are developed by real world situations as best practices or theoretically on a green field to document process know-how which can be utilised for modelling. This means that the included processes based either on an abstraction of company depending processes or on own from the scratch developed of processes. The advantages of using reference models are the mentioned reduction of expenditure instead of own development, the possible use as benchmark or comparison for a business process optimisation, and the application as universal basis for development and customising of packaged software. Additionally, the language is reduced to a common denominator based on the reference model. Contrariwise a disadvantage can be the loss of individuality (cp. Brenner/Keller (1994), p. 50).

In most cases, reference model means a graphical illustration which is useful for a clear arranged, explicit, and holistic view on optimisation issues of business processes. Particularly, the representation of complex procedural and organisational tasks helps to realise concepts of integrated information processing. Another intended goal thereby is to raise the transparency in the planning or documentation of a business process. On the one hand, this only can be done if the information and comprehensibility is in balance for the viewer (cp. Brenner/Keller (1994), p. 50). On the other hand, graphical reference models of today can be quite comprehensive and consists on thousands of model objects to the use for various levels of aggregation. One example is the R/3 reference model with approximately 800 process models (cp. Becker et al. (2005), p. 331). Within the SAP terminology, the current mySAP ERP reference model release is called business process repository, as a high specialised ERP master model for the vertical integration market (cp. Rautenstrauch/Schulze (2003), p. 230).

Master model means a harmonised grouping of several areas of activities or branch of industries related reference models together to one model as pictured in figure 2.6. Especially business neutral software, like an ERP system, is using such a master model as basis for a project based and process-oriented approach (cp. Rautenstrauch/Schulze (2001), p. 229 et seq.).



Source: Based on Rautenstrauch/Schulze (2001), p. 229

Fig. 2.6: Master model

2.1.5 Business process reengineering

The term reengineering describes in a common sense a special method for an ex post documentation of interfaces and single components of a legacy system. Thereby a legacy system is an existing software system which should be used and integrated from the view of a new software system. Furthermore, a component based system represents a software system where the functionalities are allocated in clear definable components with part functions. In distinction, a monolithic system represents a frame of one system without a component structure where functionality and data management is intrinsically tied (cp. Hansen/Neumann (2001), p. 154 et seq.; Rautenstrauch/Schulze (2003), p. 256 et seq.).

The mentioned reengineering catchwords in the area of business processes mean in contrast a total and new design of business processes including the organisational company structure. The overall concept aims at a sustainable value enhancement with a radical and completely new draw of business processes on a green field (cp. Teufel et al.

(2000), p. 17). This original definition of reengineering in the area of business processes was developed by Hammer/Champy with the statement that business reengineering means the overall start and the start from the scratch (cp. Hammer/Champy (1994), p. 2). An alternative description can be found at Davenport's concept of Process Innovation which describes the similar same idea as fundamental redesign of work (cp. Davenport (1993), p. 1).

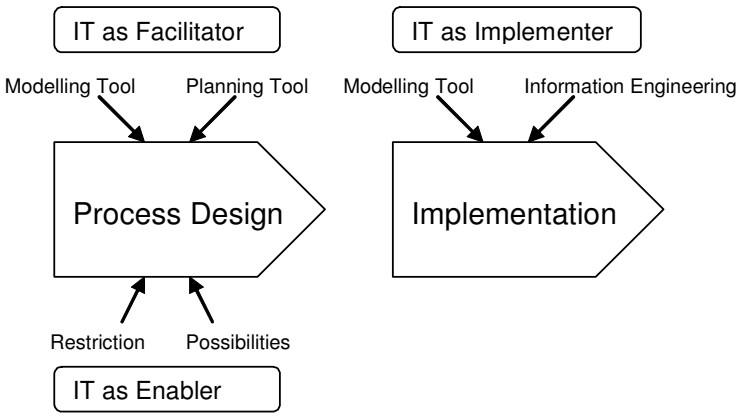
Both description and also further actual literature have in common that the business processes and not the localised functions, division or product lines should be within the scope of any improvement. The other idea of splitting work into the smallest practicable units to achieve the highest efficiency was outdated and the reason for such an extreme need of change for the authors (cp. Hammer/Champy (1994), p. 32). Four keywords are always named within this reengineering scheme (cp. Teufel et al. (2000), p. 18).

- Radical, in the meaning of a complete redesign without respect for existing things.
- Fundamental, with questions and inclusion of elemental things like who is doing what and why in this way.
- Drastic, within the improved result of this concept regarded to cost, quality or time.
- Process, in the meaning about reunifying of functional tasks to a coherent view.

To sum up, a Business Process Reengineering (BPR) is defined as a project based approach with a radical change of existing organisations and business processes on a green field. During the realisation of a business process reengineering the role of the Information Technology is within different perspectives as discussed in chapter 2.1.2. Today, it is clear that IT supports business processes and implements the process-oriented view through interfaces (cp. Scheer et al. (2005), p. 2). Hammer/Champy classified the IT in 1994 only as enabler and argument that BPR can be done regardless of existing application software (cp. Hammer/Champy (1994), p. 83). Another view was that the identified business processes causes trouble because they can not or only with an enormous amount of rework be realised on an afterwards implemented ERP system (cp. Teufel et al. (2000), p. 18). Thome/Hufgard declared this problem in a more extreme way by the statement that BPR do not optimise the aspired improvement of business processes (cp. Thome/Hufgard (1996), p. 61).

Krcmar consolidated the roles of IT into three supporting roles as illustrated in figure 2.7. Firstly, IT can be the facilitator and implicates the methodical and operative support of process design. Furthermore, the already mentioned enabler role from Hammer/Champy means the content related possibility of new process design. For

example through SAP R/3 or a scanner technology. In most cases IT is the driven force as implementer with the introduction and development of information systems.



Source: Based on Seidlmeier (2006), p. 5

Fig. 2.7: Roles of information technology

Indeed is the situation that the most BPR projects are realised with the introduction on an ERP system. Thereby the literature tends toward the conclusion that BPR is linked with an ERP system implementation (cp. Teufel et al. (2000), p. 18). Especially the R/3 or in common a SAP system and their implementation projects provide a consequent process orientation for a company. In which quality or form it is realised, depends on the company. Teufel et al. are saying that at least an ERP system should be called enabler for a BPR with regards to Hammer/Champy, but it also can represent the driven force for such projects (cp. Teufel et al. (2000), p. 18).

Independent from an ERP system implementation describes Becker et al. a modelling supported method with the target of a process-oriented reorganisation (cp. Becker et al. (2005), p. 22). Their project based proceeding is equivalent to the Hammer/Champy definition of the reengineering term related to the target of setting up a permanent business process management. The appendix figure A.1 shows the detailed phases within such a project proceeding. A first phase is to clarify the modelling objective, way, and basic conditions. A second step deduces from a company strategy the regulation framework for first classification of the models. This navigation helps to record and analyses in the third step the as-is situation with models. The modelling is important to show weaknesses or optimisation potential and to bring the project team with the relevant departments together. After this identification the forth step is the key for a to-be modelling. Therefore, the potentials and weaknesses will be removed through new or changed activities. As a time consuming phase mostly a differentiation will be done between a to-be model and the ideal case because of the initial regulation

framework in phase two. The most explosive step is the fifth phase with the deduction of the organisational structure from the to-be business process models. It is a must to reorganise the company structure, nevertheless, this means a change within the balance of power. The last step of realisation is the conversion of the process-oriented improvements. This means within an organisational project a change of activities and their organisational structure. Within a software development project it is the introduction by coding or customising of the related software respectively within a workflow management project or an establishment of a workflow management system (cp. Becker et al. (2005), p. 20 et seq.). To monitor the realisation of the improvements it is common to use a change management, which will be explained at chapter 2.1.7. Also should be here the chapter 2.2 and 2.3 referred for the definition of the used terminology about modelling and project management.

2.1.6 Continuous process improvement and system engineering

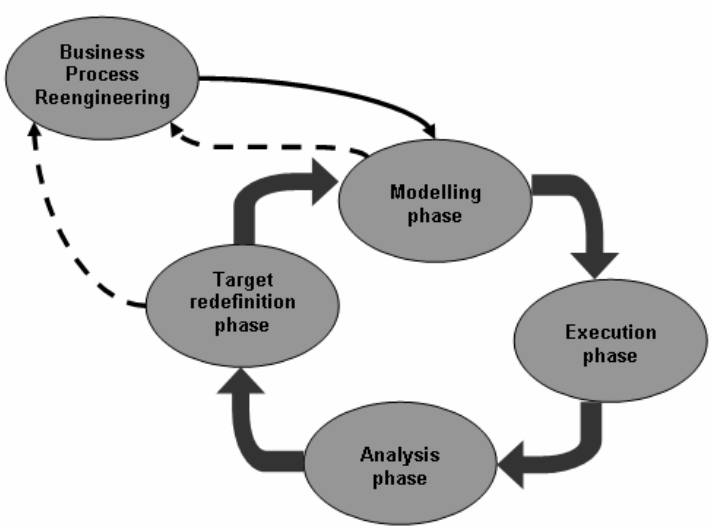
The opposite of the radical business process reengineering method with top-down proceeding is a continuous way of an optimised business process reaching. The so called Continuous Process Improvement (CPI) is the task of permanent, incremental improvement of the organisational structures and business processes besides the attending of the process execution (cp. Becker et al. (2005), p. 299).

Thereby it is a must that the measures of improvements have to conform to the company strategy with the existing organisation as basis for the bottom-up proceeding. Furthermore, an inclusion of all process participants is required. The CPI or the similar Japanese pendant Kaizen is a foundation for an overall quality management as never ending circular flow. Therewith, it means the separation from the process-oriented reorganisation methods which are defined as a one time procedure with special reason like the introduction of an ERP system (cp. Becker et al. (2005), p. 299).

The incremental process improvement concepts CPI can be used as stand alone method. But it is common to implement CPI after a finished primarily reorganisation of a company structure through process-oriented reorganisation methods like BPR. In this way, it is a concrete realisation of the continuous enhancement as shown in Figure 2.5 from Brenner/Keller. Regardless in which way this concept is understood it will become necessary to set up a BPM.

As already mentioned in chapter 2.1.3, BPM means handle, plan, monitor, and control business processes not considering if they are new designed or improved. The continuity factor from the characteristic of CPI now adds to the BPM the permanent

quality view on the business processes. This merge is represented in figure 2.8 by the so called Continuous Process Management (CPM) cycle (cp. Becker et al. (2005), p. 309).



Source: Based on Becker et al. (2005), p. 310

Fig. 2.8: Cycle of the Continuous Process Management

The execution phase thereby is may be wrongly named. There is no natural start or end point within a business process. It is a continuous execution of the business processes. The important function inside this step is the monitoring and record of process data. This means supervising of all tasks or activities within the to-be values. In general an example of such a parameter could be the customer response time on a special event. Hereby is the record of process data necessary and must include two types of information. On the one hand, these are process characteristics like duration, location, or former parameter values. On the other hand, it represents the so called exception data for the case of an incident. Usually workflow management systems support this process data recording (cp. Becker et al. (2005), p. 310 et seq.).

Based on the input of the to-be modelling from a BPR project and the data from the execution phase a benchmarking and analysis of business processes will be done in the analysis phase. Benchmarking means the systematically comparison and learning from other organisations. The target is the adaptation of best practices for a sustainable improvement of the own position (cp. Camp (1989), p. 10 et seqq.; Watson (1993), p. 2 et seq.). This definition includes the search for best practices and orientation on a performance standard based on leading companies. Robert Camp, as initiator of the benchmarking idea, describes this search as a finding of processes and solutions out of the own world (cp. Camp (1989), p. 12). The chapter three will discuss these terms

thereinafter. To sum up, this phase includes the preparation, consolidation, and benchmarking of the input data. Tools like the Process Performance Manger from IDS Scheer AG provides a consistent support of this cycle (cp. Becker et al. (2005), p. 312 et seq.).

The target redefinition phase validates the set objectives continuously and if required do an adjustment based on the results of the analysis phase. The results for example can explain that relevant environmental conditions have changed. If the targets have changed in a fundamental way, it is advisable to leave the CPM, and do a complete Business Process Reengineering again (cp. Becker et al. (2005), p. 314).

Subsequent to the new target definition or a BPR the modelling phase realise the need for changes within the model. This can be small changes like the adding of documents or bigger modification which requires a specialised project team again. Thereon is the closure of the CPM cycle with the design of to-be business processes. Afterwards the implemented changes are lived and during the execution the data will be recorded again (cp. Becker et al. (2005), p. 314 et seq.).

In total, this method represents a common method for the usage within several areas. However, it is required for a further understanding to look at another more IT based continuous improvement way of Thome/Hufgard.

Another more technical oriented continuous improvement concept from Thome/Hufgard is called Continuous System Engineering (CSE). This tends to adjust continuously the used business processes, organisational structure of IT, and corporation (cp. Thome/Hufgard (1996), p .78). The idea is based on the thinking of an ever changing market, a high stress of competition and short cycles of IT innovations with an impact on the organisational activities. The target of the CSE is also a realisation of a business process orientation but with more evolutionary development by the focus on IT instead of a radical change. Key of this method is the integrated view of a business environment as continuously type of specification for the IT. Thereby a fast running IT system can be achieved and optimised within continuous following steps. The central part at this point is the so called software library as a representation of a software part repository for the support of business processes or functions within a company. Such fast introduction of a software library avoids an extensive and long analysis or redesign of the existing business processes which can be useless before the first realisation in IT can happen (cp. Thome/Hufgard (1996), p .78).

The CSE is realistic within two prerequisites (cp. Thome/Hufgard (1996), p .78):

- An organisational change should not be need an extensive software development or modification of the packaged software.

- The description of the organisational necessities must take place in a fast and useful form regarded to the implementation process.

Furthermore, this software library must have a wide spread potential of business methods, a dynamic adaptation possibility and a specification navigator for the detailed description of the company within an individual library (cp. Thome/Hufgard (1996), p .88). The advantages of using CSE for a process-oriented company and software development instead of methods like the BPR are the following (cp. Thome/Hufgard (1996), p .84):

- The IT system is running on a productive way with support of the business processes after a short adaptation and installation time.

- Through the usage of software libraries it is possible to change or extend the business processes within a company.

A consequent and every time available up-to-date description about the last settings and condition of the IT system is offered in this way. This means the level of information and type of business processes respectively organisational structures is still within the IT system. Thereby it provides a solid basis for further considerations of improvement and the use of a BPM (cp. Teufel et al. (2000), p .24).

2.1.7 Change management

Regardless which method will be used for a process-oriented way it is necessary to override non-IT barriers with every change of the normal business. Such obstacles are a missing acceptance of the employees, absence of qualification at employees, or unequal communication which leads to misunderstandings (cp. Brenner/Keller (1994), p. 39). Therefore, the so called change management is defined as term of all activities and task which are required to place any modification on an efficient way within an organisation, an Information System (IS), or an operative IS (cp. Hansen/Neumann (2001), p. 273).

For Becker et al. change management means a process with all planned, manageable, controlled, and organisational activities of cultural and socioeconomic strategies, business processes, or structural systems. This should be consciously controlled with a long term orientation including the phases planning, realisation, and monitoring (cp. Becker et al. (2005), p. 269).

In common, a change management has not only the radical reorganisation or the continuous improvement of processes in the manner of focus. Hansen/Neumann mentioned the following events as catalyst (cp. Hansen/Neumann (2001), p. 273):

- The change of markets through competitors or customers could require an adjustment of the affected information system.

- Changing laws and other frameworks requires also a modification on a running system. Examples can be found within the area of ergonomics, security directives or the operational business like the changed of the value added tax at Germany in 2007.

- Changes within maintenance tasks for an information system like a typical repair of existing failures or the replacement of inefficient system components.

- The purchase of a new system component like hardware or software requires also a modification of the existing system structure and qualification profile of the affected users.

The referred events with the required adjustments to them, furthermore, are divided by the literature into continuous and discontinuous change management. A radical reengineering of business processes with the introduction of an ERP system represent a discontinuous modification with a large scale of organisational change (cp. Davenport (1993), p. 167). In contrast, a following process improvement under the CPM characterises a small size continuous change management.

In total, the change management requires for such a large field of different tasks organisational and social skills as well. In addition, it collects a lot of activities where technical know-how and understanding is in dispensable needed (cp. Hansen/Neumann (2001), p. 273). Teufel et al. signifies the following tasks for a successful change management within an organisation (cp. Teufel et al. (2000), p. 26):

- The active involvement of the management is required to top-down correspond, the importance of the changes. This means an adequate prioritising whether it is a CPI approach or a BPR project.

- The correct communication to the involved or concerned people with the two main issues of why is what change necessary and in which way is it explained. Such a clear understanding is helpful to avoid the already mentioned problem of a rejection of changes.

- An understanding of the roles and organisational structure is also necessary. This is a very critical point because especially the BPR produces in most cases an enormous change within the organisational structure. Even if there is no target for downsizing, business operating areas were build up new, cease to exist, or changes in their complexity. It is mandatory to compare the new organisational structures, process content, and employee skills with the existing one to derive the related roles.

- The training of the concerned people is an essential part of the change management. Without a soon education of the related people there were no changes applicable within a company. Prerequisite for such an instruction is the clear role structure and role understanding.

- Performance control, furthermore, is necessary to measure the predefined project targets with the reached objectives. Therefore, a direct connection of employee activities, the incentives, and the estimation has to be realised by the help of a KPI.

2.2 Business process architecture

In the same breath with business processes and their implementation within an IS, one architectural framework is mostly mentioned to support the realisation of the aspired process-oriented view. The Architecture of Integrated Information Systems (ARIS) represents an integration concept that is deduced from the holistic view on business processes accordingly to chapter 2.1.5. This method of analysing business processes from an overall view is addicted from their high architectural complexity. ARIS is trying to reduce this complexity in a model-driven way with the help of two strategies (cp. Hansen/Neumann (2001), p. 197).

Firstly, all basic features for describing a business process are divided into individual views. Thus, it provides the possibility to use special methods for the description of the content suitable for every individual view. Another advantage is that it can be done regardless of the relationships and interrelationships to other views. Therefore, the views were linked and combined later on again. Secondly, a complexity reduction is done on the business process by different levels of abstraction or the so called layer architecture. In this way, a clear and consistent description of business or management related problems to their technical implementation can be ensured. Related to the software engineering life cycle model, the closeness to IT is a differentiation point for the various description methods of an information system, in the area of business process architecture (cp. Scheer (1995), p. 10).

In total, it is possible to develop, optimise and describe the implementation of integrated information systems by the help of the ARIS architecture. Therefore, a model for creating, analysing, and evaluating business management process chains is given through this framework with regards to the technical descriptive level. A modelling tool supported realisation, furthermore, assumes that special notations and conventions are regarded as well (cp. Scheer (1995), p. 10).

2.2.1 ARIS views and layer architecture

To reduce the complexity of a business process, the ARIS generic methodological framework distinguishes between the following five views on a business process (cp. Hansen/Neumann (2001), p. 197 et seqq.):

- The organisational view includes all administrative structures of a company like departments, units or persons as well as their relationship to each other. They are well defined in so called organisational units within organisational charts.

- The functional view describes the executable activities or tasks and their coherence in one common model. This includes the description of functions and sub functions with their relationship in a functional value chain related model like the function tree.

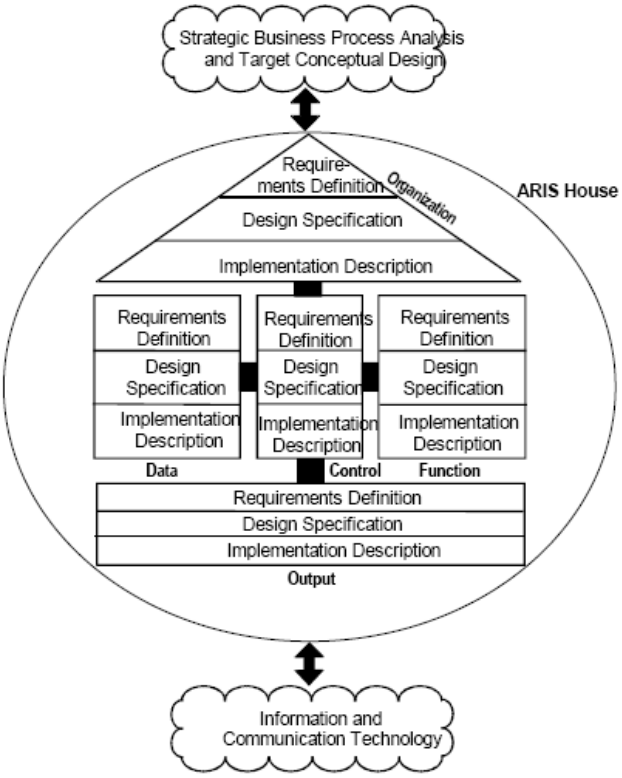
- The data view implicates conditions, messages and events to a business object which are related to the business process proceeding. Typical for this view are so called Entity Relationship Models (ERM).

- The output or also sometimes product and service view describes all material and immaterial input and output result which are related to a business process. This result of a business process is called a product within the ARIS terminology and can be model by various charts, like the product allocation diagram.

- The control view is the centre point in ARIS. A business process is now definitely reduced in complexity by the previous views. The major problem, hereafter, would be the completely lost of a contextual description. Therefore, the control view put this component connectivity back together in a logical sequence and by the help of arrow directed relationship symbols and a model representative like the Event-driven Process Chain (EPC) respectively the extended Event-driven Process Chain (eEPC).

As already mentioned, represents within ARIS the realisation of complex business or management related problems into IT, the described layer architecture. A typical three step proceeding for further complexity reduction is advised of Scheer. Point of origin is the business management issues, whereas firstly the problem has to be specified in a formalised description language like semantic models. This requirements definition is very near to the business problem, with a highly technical vocabulary and lack of details, and can be used as starting point for a consist implementation into IT. But it does not include any statement about the IT so that the next step is the design specification whereat terms and conditions of the requirement definition are assigned to the IT system. This stage is reached with the transfer of the conceptual content of the requirement definition to the design specification categories and the assignment of

modules or transactions that execute the functions. Both concepts are not separately but loosely linked because a design specification can be changed without affecting the requirements definition. The last level is the implementation description with concrete coding in hard or software components. This established link is figured out within figure 2.9, as illustration of the described structures in total (cp. Scheer (1995), p. 14 et seqq.).



Source: Scheer (1998), p. 17

Fig. 2.9: ARIS house of a conceptual framework

This layer architecture and views compose together the ARIS house or also common called ARIS concept. Within the ARIS concept all descriptive levels have different update cycles. Typically, the highest degree of change is located in the implementation level and the lowest in the requirement definition. For that reason, the requirement definition has the longest lifecycle also to document the general technical benefit of an information system (cp. Scheer (1995), p. 17 et seqq.).

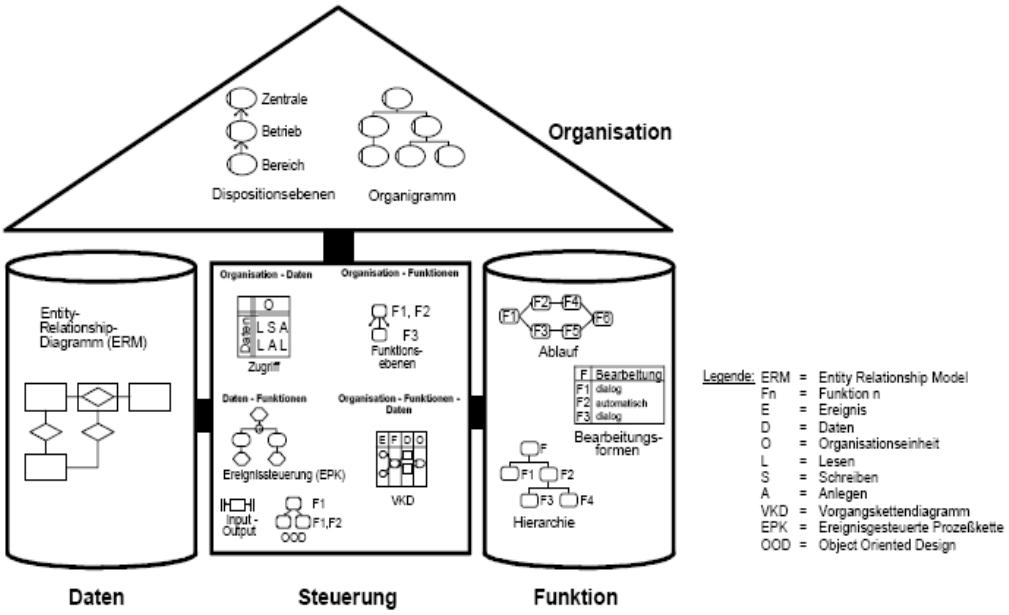
2.2.2 Business process modelling

The term modelling means a simple methodology by breaking up high complex information into manageable constructs to gain better overview and understanding. Modelling of today is a well established tool for structuring in the area of software engineering and business as well. To describe activities, improve and handle them in managing processes, they are important, especially in the context of BPR, CPI, WfMS or SCM (cp. Becker et al. (2000), p. 30 et seqq.). In general, process oriented models are used to continuously monitor a system performance with the possibility to restructure business applications and integrate new processes. Furthermore, under the business process management cycle they are stressing the requirement for a continuously identifying, analysing, reengineering and evaluating the process model to improve competitive advantages (cp. Becker et al. (2005), p. 51 et seqq.). Therefore, the literature tends toward the conclusion that for an easier usability and acceptance of business process management tools, they are mainly based on the related modelling languages with graphical notations. In this way, a graphical interface has to provide adequate possibilities to allow the description of all introduced view on a business process. Consequently, business process modelling has become the integrated and significant part for business process management (cp. Scheer/Nüttgens (2000), p. 368).

Although business process models can differ in their way and choice of graphical representation and modelling information, several facts are similar between the numerous modelling standards. All business models are defined by a diagram which allows a description of the organisational, control, functional, and data or product and service information domain (cp. Becker et al. (2000), p. 30 et seqq.). The modelling of these four general information domains is supported by a business process meta-model language. Typically, a modelling tool provides a graphical interface with choices of either select different types of diagram for each domain or to summarise them into one diagram (cp. Grief (2005), p. 5). Figure 2.10 are listing several types of diagrams in the context of the ARIS house.

Because of a possible complex model on the one hand, or a wide range of different diagram types on the other hand, characterises a solid business process modelling language a balance in the number of diagram types by the quantity of information to convey. In this way, a business analyst has it easier to design business processes, which has to be equally understood and interpreted by business and IT. Considering that these business processes can serve as a semantic foundation for an implementation related formal system model, furthermore, the semantic of the modelling language have to conform to the business semantic. Target is to provide flexible and expressiveness content while being formal enough to allow diagram comparisons and to enable the later

on build-up of formal implementation specifications (cp. Becker et al. (2005), p. 45 et seqq.; cp. Scheer/Nüttgens (2000), p. 368 et seq.).



Source: Scheer (1996), p. 10

Fig. 2.10: Business modelling standards within the ARIS house

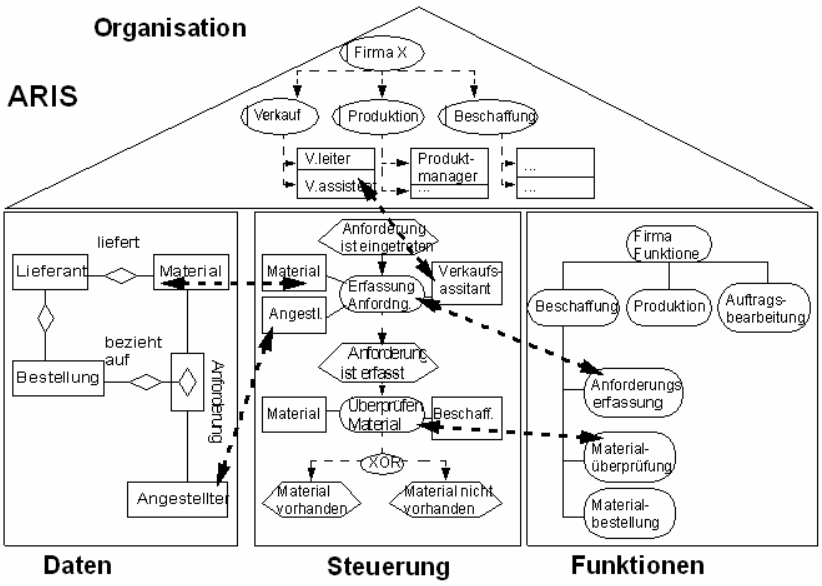
Currently, the ARIS concept and ARIS tool are frequently mentioned within the literature. In this thesis, the focus of evaluation should be limited to the current ARIS Platform 7.02 in a total view, to give an appropriate modelling standard tool example which is common within the literature. Nevertheless, there are still other possibilities on the market.

2.2.3 ARIS Platform

The ARIS Platform, in the current version 7.02, is a modelling tool that provides a graphical interface to design and work on visual models within the conceptual framework of the ARIS house. It supports a user with database supported modelling, analysing and navigation through modelled business processes which can rely on numerous different graphical notations and diagrams for description. Thus, ARIS models can provide the configuration files for several information systems, such as the mySAP ERP system. Moreover, the current ARIS Platform offers a business process repository with reference models for the mySAP business solution. That possibility integrates established best practice processes from the software vendor as well as it

integrates several modelling languages to develop own new process instances (cp. Brabänder/Schmidt (2006), p. 3 et seqq.).

Thereby, semantic definitions of a modelling language are not defined by ARIS respectively only the model specifications, by an integrated language to describe model instances, the so called ARIS Modelling Language (AML) (cp. Scheer (1998), p. 18 et seqq.). In this way, the designer is able to attach semantic descriptions to a model instance, which allows later ARIS to validate the semantic consistency, by checking the different, linked model types that belong to the common process model. This includes the possibility to automated transform a model into different model types (cp. Scheer (1998), p. 20 et seqq.). Figure 2.11, illustrates a general overview of different diagram types to describe a business process.



Source: Based on Scheer (1998), p. 37

Fig. 2.11: Business process modelling based on the ARIS house

Although the ARIS Platform 7.02 seems to be expressive and flexible in use, personal experiences with the ARIS Business Architect for SAP NetWeaver were different. They resulted in the conclusion that the large choice of different diagram types makes the tool complex and requires a long learning curve, also for already ARIS skilled designer. They still do not provide a strict guideline or wizard on how the individual modelling languages can be used, but rather they provide a structured catalogue of modelling languages for different purposes. Thus the designer is flexible in the choice of using certain modelling languages and level of descriptive details. This freedom depends on the idea that a formal language requires strict guidelines which are imposed by the day-

to-day usability of the potential end user which is likely to result in imperfect models (cp. Scheer (1998), p. 43 et seqq.).

Nevertheless, requires a missing common, formal semantic foundation, a specification of the attached semantic context to the individual models by the designer. In this way, a high technical burden rest on the designer to prepare the only basis for model comparison and clearly reach a technical level to satisfy, in the end, IT requirements and business process model needs.

However, an establishment of models in the AML language provides a powerful analysis tool to track performance and support business process initiatives for reaching a company process model. Although, ARIS represents a high complex tool, it still offer the vision of being generic and industry independent by support also specialised graphical notations. This includes the support of service-oriented languages which will be discussed in chapter 2.4. Furthermore, this vision is underlined by the point of already received world-wide recognition and holding a market leadership within software solutions for design and optimisation of business processes. An exact overview of the supported use cases are pictured in the appendix figure B.1.

2.3 Project management

The already used characterisation of a project based proceeding has the term project in the focus. Hansen/Neumann defines a project as a non-routinely task with clear targets and scheduling which requires the expenditure of resource assignments. Therefore, a temporarily organisation unit is build up to perform the separated but interrelated activities within the project. This project group or also called project team are coordinated by the project leader who is responsible for success or fail of the project (cp. Hansen/Neumann (2001), p. 202).

All tasks of managerial functions, organisations, techniques, and resources which are required to fulfil the project and reach a definite result are termed under project management (cp. Kessler/Winkelhofer (2004), p. 10). In general, the literature separates four typical areas within a project management (cp. Kessler/Winkelhofer (2004), p. 10 et seq.):

- Firstly, a problem solving, organisation and steering of work area with the requirement to pay attention to psychological effects in a group.

- The second part comprises the management of project content and targets related to the way of doing a process. This includes all the interactions and interrelationships.

- The third area describes the definition of organisational building blocks for a clear target, instruction, and decision responsibility.
- The last area explains the procedural way of proceeding with methods and appliances.

Beside the executive level of point one and two, the third and fourth point describes rather the conceptual level of a project which includes a procedure model as organisational process framework. The procedure model within the literature depends on the type of project which can have several classifications as well as repeating sub categorisations. IT projects, for example, uses phase models, prototyping, evolutionary project models, or situational approaches (cp. Rautenstrauch/Schulze (2003), p. 85; Winkelhofer (2005), p. 13).

To build up in chapter four a procedure model, the common characteristics of the phase based model should be in the centre of the view. Main feature of such a phase model is the existence of well defined steps, the phases, with clear described tasks, activities, and results. Furthermore, a linear approach is related to the element sequence and a delayed realisation or implementation part is usual for such a model. These procedures are strictly oriented on concepts from system engineering methods and provide the advantage of an exact planned and structured realisation as well as a reduced complexity (cp. Rautenstrauch/Schulze (2003), p. 85). In addition, an increased target focusing, controlling, interface management, and transparency for all involved participants is offered in this way (cp. Winkelhofer (2005), p. 14). A disadvantage for this model represents the fact that the degree of abstraction is typically changing between the phases. In this case the loss of information has to be considered to prevent mistakes. Furthermore, several levels of abstraction raises also special problems in case of required validation of intermediate results. The effect is noticeable if a mistake is found at a later phase and then require a high amount of expenditure to correct them (cp. Rautenstrauch/Schulze (2003), p. 86).

Considering the whole, a conceptual level of project management describes all required organisational and procedural activities within a project. Thereby a phase model explains in a sequential way how to reach the defined project goals. How a phase model is realised depend on the project goal and content which has direct influence on the number and kind of the phases as well as the duration and level of detailing of steps (cp. Hansen/Neumann (2001), p. 205).

2.3.1 Project goals

The factor of success for a project management is the fulfilment of defined project targets with compliance of planned resources, capacities, and dates (cp. Winkelhofer (2005), p. 11). Project goals are scales or to-be targets to measure future activities at a certain situation and time. On the one hand, they are required to find so called performance goals like structural options, ideas, problem solutions, motivation, creativity, and performance indicators. On the other hand, they are necessary to define formal goals for the project leader. He control and steer by a permanent target-performance comparison dimensions like time, expenses, or resources based on these objectives (cp. Winkelhofer (2005), p. 122 et seq.; Becker et al. (2005), p. 17; Walter (2006), p. 31). Thus a project goal must have two facets. At first sight, a positive and concrete formulation which expresses that the target is reachable. Secondly the formulation has to be open to find a possible solution method respectively the way how to reach the target should not be included (cp. Walter (2006), p. 30).

This high claim on the project goals can only be done in a whole directly definition from the project client respectively by the management and a further detailing by the project leader. Another way is the deduction from existing problems by the project team with a later on placement into the management or project client (cp. Winkelhofer (2005), p. 123 et seq.). After the project target is well established and generally accepted the project plan and organisation has to be discussed.

2.3.2 Project plan and organisation

Prerequisite to fulfil a defined project goal is the set up of the project organisation by name. This includes not only the project leader and the project team but rather the rules, values, and norms which are required to ensure an efficient teamwork (cp. Walter (2006), p. 43).

The main characteristic of a project organisation is their temporary orthogonal position to the existing organisational structure. Thus the short-term team is generally based on participants who have several roles and tasks to perform. First and foremost, they are usually recruited from internal functional departments for their in-house expertise. In addition also externals like consultants are feasible for a project team when special methodical know-how is required. Furthermore, a project team should be consists of a balanced number and mix of experts with know-how and motivation. If a group is too big or too small it will run into never ending discussions respectively important points can not be discussed. The general task of the project team is to perform the defined

tasks and do also the marketing within their department for a realisation of the project goal (cp. Becker et al. (2005), p. 24).

Responsible for the project team is the project leader. He is typically named by the project client or the higher management with the characteristics to be definitely not involved into or affected by the expected project content, task, or goal (cp. Becker et al. (2005), p. 23). His task is to prepare a project plan and hire the temporary team for the project organisation. In this way, the tasks, deadlines, and resources can be allocated to the project team. These planned items are based on the project goal, content and phase plan deduced from strategic requirements (cp. Becker et al. (2005), p. 20). Furthermore, the project leader communicates with and between the project team in an integrated way and under awareness of psychological effects. Another usual communication direction distinguish that the project leader reports not only to the client but rather to a steering committee by the help of decision templates (cp. Walter (2006), p. 43 et seqq.).

All elements of this project organisation represent the structural and procedural framework for all project internals and interrelated tasks as well as the definition of interfaces to the project client. The general definition within the literature for a project plan[3] is a foresighted determination of the project realisation. In addition to the project control and steering, it is convenient to have for the project guidance by the project leader (cp. Walter (2006), p. 89).

A project plan consists of multiple elements which results in a project guideline. On the one hand, this includes a written formulation of the project specific goals and frame condition for a possible tailoring into a phase model. On the other hand, the project plan describes formal characteristics of the project organisation, rough planning and detail planning with activities, expenses, milestones, deadlines, and human resources. To sum up, the target of the project plan is to guide the project team through the project and act as control mechanism for the project leader and steering committee as well.

2.3.3 Project controlling and critical success factors

During the performance of a project acts the separate overview function project within a project management. These project controlling is a well established tasks for the steering and guidance within a project. Thereby the main task is to avoid autonomous directions which were not planned. Becker et al. describe two major activities within a project controlling (cp. Becker et al. (2005), p. 32):

[3] The English literature uses the term project control rather than project plan (cp. Walter (2006), p. 90).

- The first one is a check for compliance of the regular project plan and organisational project framework related to realised ideas and conceivabilities. This includes a possible conformity to the corporate policy with organisational strategy and principles as well as value added chain integration with customer and supplier according to the interfaces.

- Secondly, the main task is to periodically verify deadlines and expenses of planned and predetermined desired values with the actual value. Which values are in the scope of the controlling has to be previously defined.

Within the literature it is common to propose the continuous use of project management software not only for the project controlling but rather for all project management activities. Thereby graphical, modelling, and calculating characteristics are widespread to ensure the integrated way of project steps. Major advantage of such software is the easier variances analysis and the continuous methodical usage (cp. Becker et al. (2005), p. 32). But the best planning and controlling is useless if the project leader is not aware about several mostly psychological effects which can have an impact on the expected results (cp. Becker et al. (2005), p. 39 et seqq.):

- The famous syndrome is related to every change of existing behaviour within organisations. It is the psychological human manner to be against new ideas when the existing one is working.

- Another well-known effect is the way of people to do not feel invented. This mainly appears if ideas are requested within a project group and the problem is wrongly linked to department oriented thinking.

- The worst problem represents a missing or less attention by the higher management or project client. A project do not need every time their focus but for frequently times and especially milestone decisions this is essential for the project and team.

- Typical for projects are a start without the complete workout of project plan or project guideline. This has to be avoided with the strong orientation on the used phase model and finalised project plan.

- The start-up syndrome is typical when project members want to see how far it can go. With clear deadlines, milestones, and controlling this has to be keep away.

- The last point focuses on analyses and improvement ideas within a project preparation phase. Too many analyses and ideas results in an impossible and imprecise project goal.

2.4 Service oriented paradigm

The current development has lead to a not finished paradigm change within the course of packaged software. The thinking within modules or components is changing to a Service oriented Architecture (SOA), not only in the field of ERP systems. The alternative way of design, realisation or implementation in a module or component oriented were, the deal for a single system only.

The service orientation concept has not been officially described by a standardisation group. SOA rather provide the possibility to outline a whole system landscape with the evolvement and development of introduced technologies for a service oriented communication (cp. Siedersleben (2007), p. 110). Components or modules still define the basic architecture of the upcoming systems but it comprises that they also restrict them. Everything what is not designated within the standard system is not possible or must be realise through expensive indirections. Examples can be found at every afterwards interface between systems with different technologies where in normal cases no link were intended. In perpetuity the ERP producers will not trust these third party component manufacturers (cp. Scheer et al. (2005), p. 29 et seq.).

As already mentioned, the scope of a SOA is the description of a system landscape in a whole. This has a lot in common with a single system development, but mainly three differences can be pointed out (cp. Siedersleben (2007), p. 110 et seq.):

- System landscapes are created in the course of time and not within one step. They are huge and can not be switched off or replaced like a single system.
- System landscapes have redundancies of data and functions because of different views of an included system or application. Some of this double data is planned but most of them were just developed. Target is here to eliminate redundant data or at least to control them if a clearance is not possible.
- System landscapes exist of several systems of different origins. This heterogeneous is based on the timely manner of every system. Thereby it is common to have business functional redundancies in such system landscapes. This is caused by the over and over installation of standard software products which do not consider other existing systems.

Furthermore, SOA basics implicates that elements of a system landscape communicate over services whether they are components, modules or sub systems. A service thereby is an abstract resource with the capability of performing a repeatable task within a business function (cp. High (2005), p. 8). This definition implicates that every system landscape, where business processes are supported, is SOA conform. Scenario based

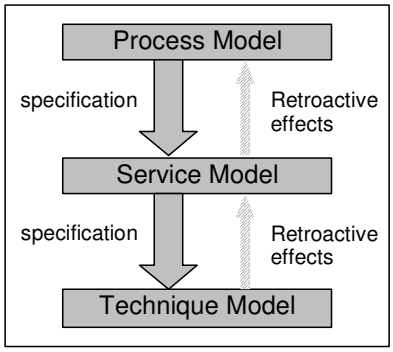
runs each business process through the involved systems and did any service. However, the historical evolved services are mostly in a circuitous technology, unsafe implemented or not documented. SOA provide, therefore, three methods to help in such cases (cp. Siedersleben (2007), p. 111 et seq.):

- All systems within a SOA communicate in a component oriented way and with clear defined and published service interfaces.
- By the help of SOA, the involved systems are connected through a loosely coupling of distributed services.
- Within an own workflow component for the sequence control, a SOA ensures that the single systems know as less as possible from each other system.

These three characteristics are the major points for a SOA. In the literature, it is common to mention in the same breath with the conception of a SOA technologies like the Extensible Markup Language (XML) or Web Services. However, a SOA conform landscape is not depending on a web link up or even XML as standardised data communication as the only option (cp. Liebhart et al. (2007), p. 261 et seq.).

2.4.1 Service oriented manifestations

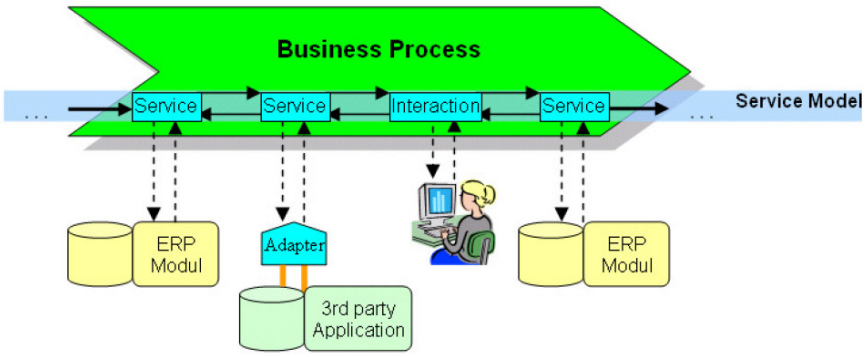
In total, a SOA stands for a component orientation with a loose coupling and out sourced sequence control. The concrete classification of SOA into the existing model-based process orientation is illustrated in figure 2.12. Therefore, three models are required for a SOA. Firstly, the process model of an organisation is needed. Common ways to reach them are already discussed earlier within this chapter, by the help of the ARIS methodology. Based on the process model, it is possible to specify the services and their reference to the business processes. This description is called service model. Thereby it would be the ideal case that the process model determines the service model related to the performance, but not backwards. The only effect which is considered relates to legacy and packaged software. These systems do not respect existing business processes and in this way a feedback is given from the service layer. The service model enables the professional execution of business processes and decouples in the next model the process use from the technology. A technique model or platform sensitive model describes, furthermore, the used technology and implementation of the related service for an efficient realisation (cp. Siedersleben (2007), p. 111). This description can include the wide range from a Service oriented Architecture Protocol (SOAP) for exchanging XML based messages, up to the Enterprise Service Bus (ESB) as central component for the link of services (cp. Liebhart et al. (2007), p. 266 et seqq.)



Source: Siedersleben (2007), p. 111

Fig. 2.12: Manifestation of SOA models

An example how a SOA environment work and should be used is pictures in figure 2.13. Thereby the individual functions of a business process gets packed into services and described in total by the service model. This abstraction layer represents the user defined combination of required services into process chains within a business process. In this way, the integration logic is decoupled from the systems but still above the business process layer for more flexibility and exchangeability of the workflow functions. The technology advantage for these procedures is the unification to one common integrated interface for every module, component, or application to response a request in a standardised service. From the process content perspective, this means, a fixing on the service and not the Java, .Net or ERP system application behind (cp. Köhler (2007), p. 19).



Source: Based on Köhler (2007), p. 19

Fig. 2.13: Service building blocks creates process chains

2.5 Business Process Execution Language

In the context of modelling a service orientation, it is the requirement to provide elements, which permit the extraction of adequate information for a formal specification used in the technical implementation level. Existing business process modelling standards seem to offer already promising modelling techniques for a SOA.

The core of a SOA represents the already mentioned workflow management systems. The WfMS characterises an information system with a collection of services orchestrated by a workflow (cp. Liebhart et al. (2007), p. 270). While process modelling is already a well established method to describe business activities, their realisation in an information system is mainly done by direct coding within an application. The Business Process Execution Language (BPEL) or the Web Service Business Process Execution Language (WSBPEL) tries to fill this gap with a direct conversion possibility of a graphical representation into source code. In this way, the execution of a workflow is no longer separated from the illustration (cp. Liebhart et al. (2007), p. 270 et seq.).

Similar to the business process modelling it is possible to describe, model, and edit a process with the current BPEL norm in version 2.0[4]. The difference to other modelling techniques represents the possibility to generated and show an interface between business process view and IT realisation level, with the creation of direct controls for the workflow engine respectively BPEL engine. Similar to a workflow needs a BPEL process a special runtime environment for an execution, the so called BPEL engine. All big IT companies provide an engine like the BizTalk from Microsoft, the BPWS4J interpretation from IBM, or the SAP Exchange Infrastructure from SAP where the ARIS for SAP NetWeaver represents the modelling component (cp. Liebhart et al. (2007), p. 275).

A BPEL process or later on the BPEL document contains of two structured parts based on XML. At first, the process interfaces which is described in a Web Service Description Language (WSDL)[5] to define the service. Secondly, the process scheme which explains the process flow and actions, kind of instantiation by the help of correlation sets, links to all involved partners, and mechanism of handling exceptions (cp. Liebhart et al. (2007), p. 273). In this way, the BPEL document represents a SOA service which can be called from other BPEL documents. In other words, individual processes could be now called as services within other processes.

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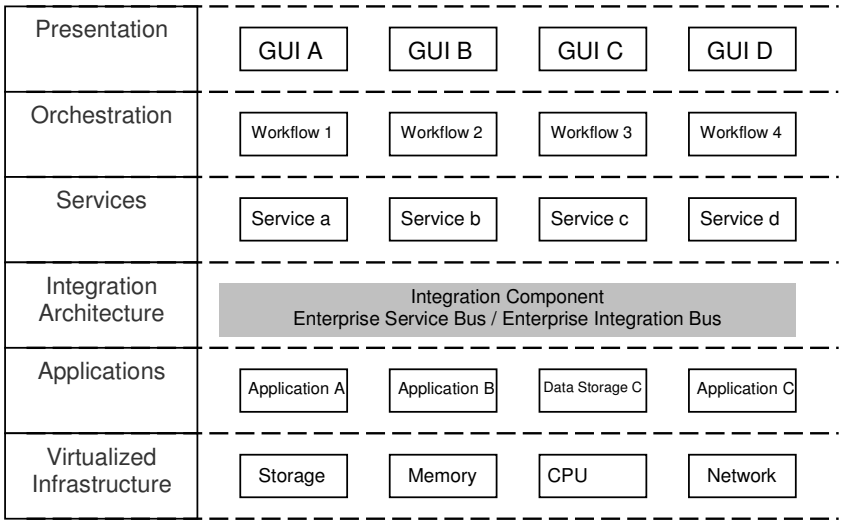
[4] Release date of WSBPEL 2.0 was in April 2007, by the Organisation for the Advancement of Structured Information Standards (OASIS).

[5] The current 2.0 version of WSDL were released on the 26th of June in 2007, by the World Wide Web Consortium (W3C).

2.5.1 SOA blueprint and procedural model

All big software producer acts on the assumption of one common architecture model for a SOA blueprint. The general breakdown in this model differentiates applications, services, and an orchestration layer. Furthermore, a virtualised infrastructure layer, a communication structure, and a presentation structure are included in the SOA blueprint related to figure 2.14.

The bottom virtualised infrastructure layer includes all resources which are required for the establishment of all SOA blueprint components. This includes all delocalised hardware components and in the second layer, all existing and software applications of an organisation. The integration architecture layer represents the communication infrastructure with the Enterprise Service Bus as central component for the link between services and interactions. Within the service layer it should be possible to find every service which is used and orchestrated through workflows as execution of a defined sequence of services. Their control results through a modelled process flow with decision points, single steps, and branching. Thus the modelling is the central element for the specification of an application which is concrete realised within a workflow. In this case, existing and well established modelling methods like eEPC or Petri nets are not that applicable as BPEL in combination with a graphical modelling. The intention is to generate from the graphical workflow BPEL files to run them on the BPEL engine and control the affected process. The last layer which is defined in the SOA blueprint represents the interface to the manual tasks by the help of the user interface (cp. Liebhart et al. (2007), p. 276 et seqq.)



Source: Liebhart (2007), p. 277

Fig. 2.14: SOA blueprint

3 Basic approach for an Integrative reengineering

The term reengineering was in common and in the context of business processes already defined in chapter 2.1.5. Generally, it means an ex post documentation or re-documentation of interfaces and single components of legacy systems (cp. Hufgard/Wenzel-Däfler (1999), p. 427). In combination with the term integration, it adds the general decision between replacement and reengineering, based on the operating efficiency. In this way, it is possible to uniform existing structures among each other or together with new ones (cp. Jung (1995), p. 544). In the case of business processes it means whether to replace or adjust an existing one within a process network structure. Added the condition of a best practice criteria, it means a total view and harmonisation within a common organisational process model. Thereby the terms standardisation and harmonisation are mostly used in conjunction. Within this thesis, the understanding of harmonisation means the adjustment of existing process models or original standard models in a common holistic view to receive a total performance increase and new standardisation. It looks to prevent or eliminate differences between processes respectively standards. In this way, a standard model does not mean to be ahead a complete harmonised solution.

This chapter aims on the basics for an integrative best practice reengineering approach. Not only as motivation, the chapter four will later on build up on these basics a procedural model. Therefore, targets, prerequisites and typical situations in practice will draw an up-to-date importance of this topic in foreground. The last part will discuss the correct theoretical classification in the context of existing approaches in the literature.

3.1 Motivation and existing proposals for an integrative reengineering

A typical and initial described situation is in the line described with the following quotation of a project manager for an ERP system introduction in Teufel et al.: „Wir mussten schnell einführen. Hätten wir vorher erst lange die Prozesse erhoben oder neugestaltet, hätten sich die Rahmenbedingungen bis zur R/3-Einführung schon wieder stark geändert, und die Arbeit [das Reengineering] wäre umsonst gewesen.“, (cp. Teufel et al. (2000), p. 23). Indeed, identified Mauterer that for example the average introduction duration of the typical ERP system from the SAP AG is between ten to fourteen months. Thereby included are the duration of the introduction of typical modules and the expenditure for external consultants (cp. Mauterer (2002), p. 121). Called upon the fact that the ERP system of the SAP AG as prime example had worldwide the highest number on installations, it means a problem which is already reflected within the literature of the recent years. Especially, the worldwide increasing

numbers of customers will provide the starting reason for an investigation of possible concepts. Another reason explains Reiter/Nüttgens. ERP system introduction projects were mostly implemented in a rapid way, with a fast ROI because of timely pressure. Thereby process optimisation and system documentation were rarely considered. This is confirmed through the point that basic reference models were used insufficient and possible process or system optimisations can only be done through extensive reengineering actions (cp. Reiter/Nüttgens (2002), p. 1). Regarded with the initially mentioned fact of organisational development, it strengthens the argumentation for the finding for an integrative reengineering concept. Following factors underline the requirement to re-document business processes and their support of the IT systems within an organisation (cp. Reiter/Nüttgens (2002), p. 2):

- Existing business models or portfolios are continuously changing and require the question of how these new processes are linked with existing internal and external processes, and IT systems.
- Possible company transformations like merger affects existing IT systems and processes wherefore a transparency of the existing process landscape is absolutely needed.
- To control continuous increasing IT costs, companies are confronted with infrastructure consolidation activities which have an impact on easier IT system updates or new ERP system releases. For example, missing documentations regarding the system usage, it is consistently not possible to use all new potential of new releases.

An even more ERP system related view is given through Bohr. Possible IT system consolidations, release changes, or organisational modifications require a strong transparency of the existing business processes. This is the prerequisite for documentations, trainings, identification of weak points, know-how transfer, and over time changing quality requirements. Therefore, the following advantages are declared to underline the characteristic for a re-documentation proceeding (cp. Bohr (2006), p. 19):

- The build up of a process model take not part with a green field development rather by the help of a semi-automatic investigation.
- Beside IT system supported processes also organisational and manual activities should be recorded.
- The identification of weak points deduces the needed actions to improve the business processes, with a firstly testing these adjustments.

In total, the described requirements within the literature run into the same direction. After an introduction of a standardised IT system within an organisation, a proper documentation of the reengineered business processes have not took place. Over the years of usage the business processes changed and evolved for several reasons. Therewith, the IT support for the business process changes as well. This means an IT system or mainly the ERP system were changed in the same way, over the years. Already standardised processes fall back into a non-standard and over-individualisation. These historical evolved process structures cause problems within a release change of the IT system, an organisational modification of the company structure, or the introduction of new technical concepts within an organisation. Thus, it is common accepted within the literature to need a re-documentation concept.

Possible concepts for a way out of this situation, describes mainly a partial or one-sided way of an IT system based view (cp. Reiter/Nüttgens (2002), p. 1; Jung (1995), p. 1; Scheer/Nüttgens (2000), p. 366). Common and general concepts are therefore missing, especially related to existing models to receive a CPM within an organisation. A promising basis approach to clear this issue and introduce the next step of integration was firstly defined from the biggest standardised software user group within Germany. The user group Deutschsprachige SAP Anwendergruppe (DSAG) proposes a five step procedure to introduce a service oriented architecture within an organisation. This includes on a rough level a re-documentation and firstly introduction of a CPM (cp. Beuthner/Frisch (2006), p. 14):

Tab. 3.1: Proposed DSAG steps for a service preparation

Step	Proposed Activity
1	At first, the technical introduction of a business process platform related ERP system has to be done.
2	The second step should be the consolidation and standardisation of the business processes within an organisation on a collaborative level.
3	Third, a build up of a process management has to be done with the responsibility within the business departments.
4	The next step is the introduction of special roles and responsibilities, like a business analyst or process architect, if they are not already implemented.
5	The last step is the cooperative work of business departments and IT department via several common projects about best practices and benchmarking.

The disadvantage of this approach is that organisations are already acting with parts of this proposal like release changes or consolidation activities. Therefore, a more common approach is necessary with a break away of an IT system related view. Business processes are not only supported by standardised software or be conducted by an IT system. To develop such an approach or a procedural model it is firstly necessary to define the required environment.

3.1.1 Prerequisites

The main precondition which has to be fulfilled is the need for an integrative best practice reengineering within the company, firm, organisation or in common large business. Furthermore, it implies the existence of high complex process structure and the use of standardised software to support them within several worldwide locations, production plants, or business units. Thus, only large-scale enterprises and groups are meant which are highly common active on multiple worldwide markets by the help of the globalisation. Within the literature these terms are also applied within the already discussed different views on common problems (cp. Reiter/Nüttgens (2002), p. 2; Hufgard/Wenzel-Däfler (1999), p. 427).

In the case of small and medium-sized enterprises (SME) such an approach is only suitable to a limited extent. The reasons are definitely better manageable business processes and well arranged organisational structures than within large-scale enterprises. Thereby the point of internationalisation, worldwide operation, and uniform appearance is in a higher gear within groups or large companies than it is the case in SME. The individual locations within small and medium-sized enterprises are more addicted to act as individual location instead of acting as a group representation. This raises special problems for a company-wide realisation of such method. In total, this thesis implies large-scale enterprises and groups as client for a possible development of a procedural model.

Another reason which can deduced from this first prerequisite, is a typically behaviour for locations, plants, or business units. They are not built up in the same way, time, or structure. A historically evolvement had take part as a natural behaviour and based on internal and external business modifications. That includes merger, acquisitions, or start-ups of locations, plants, or business units. To come back to the need for an integrative best practice reengineering proceeding, the organisation mainly run through a firstly appearance of weak points, followed by the clarification of problems, to an afterward crisis. Even if there is no crisis, the common need to re-document existing

processes including an adjustment, is essential accepted within the literature and practice as well (cp. Hufgard/Wenzel-Däfler (1999), p. 427).

Another prerequisite could be a planned and management-driven implementation of a SOA, as the next step of integration. Therefore, a discussion within the literature takes part for several years about the organisational and module based problematic within ERP or IT systems (cp. Auer/Reiter (2006), p. 17; Reinhard (2007), p. 15). Until now, a business process is supported by several modules within an ERP system or in a worst case by several IT systems. If something changed the business process, all ERP system modules or IT systems have to be modified or customised as well. Within a SOA a business process is supported through a loose coupling of several services from the ERP modules or IT systems. This means, if something changes the business process, only the related services have to adjust to the new configuration. The IT systems or ERP modules remain in the same kind. But to realise these primary technical concept the business processes have to be clearly defined and transparent, to close the circle.

Furthermore, the organisational structure and management must change within a SOA as well. Today, it is mostly the case that still several functional departments own parts of a business process, like the purchasing owns only the material procurement and later on the production only generate the product. The idea behind SOA requires that all departments have the same amount of responsibility on a business process and should orientate themselves on the value added chain. Therefore, it is now possible to define only one process owner based on a holistic view from an organisational structure. But to set up a SOA within a management, the process orientation has to be strongly lived within the organisation.

3.1.2 Objectives

The proceeding of an integrative best practice reengineering must have in total three main targets which are achievable for a performing organisation or large business:

- The re-documentation of existing business processes and based on them, a best practice selection by harmonisation of the process network.
- Secondly, the establishment of a common and organisation wide valid business process standard template.
- At last, the preparation of a starting point for a continuous business process management and further concepts must take part.

These main objectives are deduced from the discussed motivation and prerequisites for an integrative best practice reengineering. Thereby it tries to substantiate the claim on the existing business and IT area with following possible positive impacts (cp. Frisch (2007), p. 15; Thole (2007), p. 9):

- Reduction of process landscape complexity and process costs through cutback of existing different process variations.
- Reduction of IT costs by individual processes through supporting only one unique and transparent process for a functional area.
- Based on benchmarking a definitely increase of productivity will take part. Typical examples could be found by the reduction of throughput time, further automation, or speed up of operational workflows.

Further general effects which are not monetary measurable but also important and deduced from possible company strategies or corporate policies are the following:

- Internationalisation and further integration of worldwide partners, locations, plants, or business units based on existing process structures. No fundamental roll-out of redesigned processes should be required.
- Better transparency through clear and valid process landscape by simplified information retrieval. This supports for example further release changes or technology modifications.
- An increase of flexibility take part for a further creation or change of processes based on an existing process landscapes with simulation possibilities.
- Internal process expertise and know-how will be reviewed and replaced in case of a lack.

The initially specified two main targets are linked each other. Furthermore, it provides together with the mentioned expected outcome the head for a possible project based proceeding. Therefore, the identification of existing processes must to run out from the business departments with a supported IT perspective. In this way and based on process modelling, the build up of a common and organisation wide company process network must take place. Thus, it must be possible to select best practices by the help and use of a process simulation, reference models, and process benchmarking. Due to that harmonisation a common and validated process network results a company process template as standard set of all business processes within an organisation.

The last defined main target is the provision of the source for a CPM and further concepts. Thus, the continuous process management represents not only importance for a further maintenance of the process model but rather it is for the permanent anchorage

of process-oriented improvement steps. The other point means the general support by a further and faster adjustment possibility of new techniques. This could be the current consideration of service oriented architectures or any other coming integration technique to reduce respectively control business or IT heterogeneous situations.

To sum up, the scope within an integrative reengineering has to be firstly the identification of so called best practices. Therefore, the term best practice and therewith the related benchmarking should be in the centre of the following attention.

3.2 Best practices and benchmarking

The term best practice could not be separated from the term benchmarking or especially the process benchmarking. Thereby the benchmarking concept has various characteristics and understandings within the literature. A benchmarking is mainly a designation for a systematically comparison and learning from organisations by the objective to adapt so called best practices for a sustainable improvement of the own position (cp. Legner (1999), p. 7). In general the target is to identify weak points for a possible improvement. Another definition from the American Productivity & Quality Centers (APQC), speaks about a constant process of measurement and comparison of the own organisation with the target to improve the own performance. Furthermore, it includes the best practice term with a leadership, management, or operational method or approach which leads to an exceptional performance. A further definition of the term implies any technique or methodology which is proven through experience and research to reliably lead to a desired result (cp. Spencer/Johnston (2003), p. 18). This procedure model uses the APQC definitions which are commonly accepted within the literature. Therefore, the following core elements are applicable:

- A systematically performance comparison must base on objective criterions or so called indicators.
- The evaluation of weaknesses and strengths has to be done on the benchmark as reference value from the performance comparison.
- The identification of best practices must provide the reason for a performance difference.
- A formulation and realisation of targets and actions must lead to a performance improvement.

Within this context, a benchmark characterises the quantified optimum value as reference. Thus, the designation best practice is only a superior term for several

methods, approaches, and frame conditions which could be applied through two possible benchmarking specifications (cp. Legner (1999), p. 8).

- The first approach is a measurement and positioning check or the so called quantitative benchmarking. This implies a comparison of the performance and own position based on objective criterions and indicators.
- The second method is the learning from successful practices or so called qualitative benchmarking. This is more the design recommendation and transfer of practices.

This means, a benchmarking or in combination with business processes also called process benchmarking, supports the continuous process management in two ways. Adapted to the integrative best practice reengineering procedural model, a BPR approach, or a CPI procedure it represents a qualitative benchmarking with the definition of best practices. Thus, the cross functional business processes stands for the object of comparison and characterise the initial point of origin for following point. Secondly, it supports within the CPM cycle through realistic benchmark data of the business processes as clue for possible improvements and process target definitions.

In total, benchmarking symbolise an instrument for the organisational structure design because of problem analysis and design formation characteristics. However, before a realistic business process benchmark can take part, these exceptional performance methods or approaches have to be identified with an individual drawn up and description in the following.

The identification of a best practice process must start with a requirements deduction from the overall business process target. That follows a reduction to economical objectives of the business process in scope. The reason is to have a solid objective data basis for the definition of possible benchmarks on performance indicators. Afterwards the inclusion of all different business process versions is necessary to define core activities which are the same in every process variation. By checking the IT support, ownership, and interface issue for an analogue equality within the core activities it should be possible to set up a common best case. Because of different environments, regulations, and other conditions within locations, plants or business units it is necessary to provide a possible modification framework for a best practice process at last. But every modification from the best practice case should be verified and reasoned. It could be possible that for example some production processes varies because of different production methods. But it could be not possible for that within the finance and controlling area variations exists because of, for example, worldwide valid regulations like the International Financial Reporting Standards (IFRS) (cp. Wöltje

(2004), p. 8). The last step in the best practice selection procedure is a preparation of possible adjustment to transform the existing versions into the best case version. Figure 3.1 is showing these best practice selection progress in a visualised way.

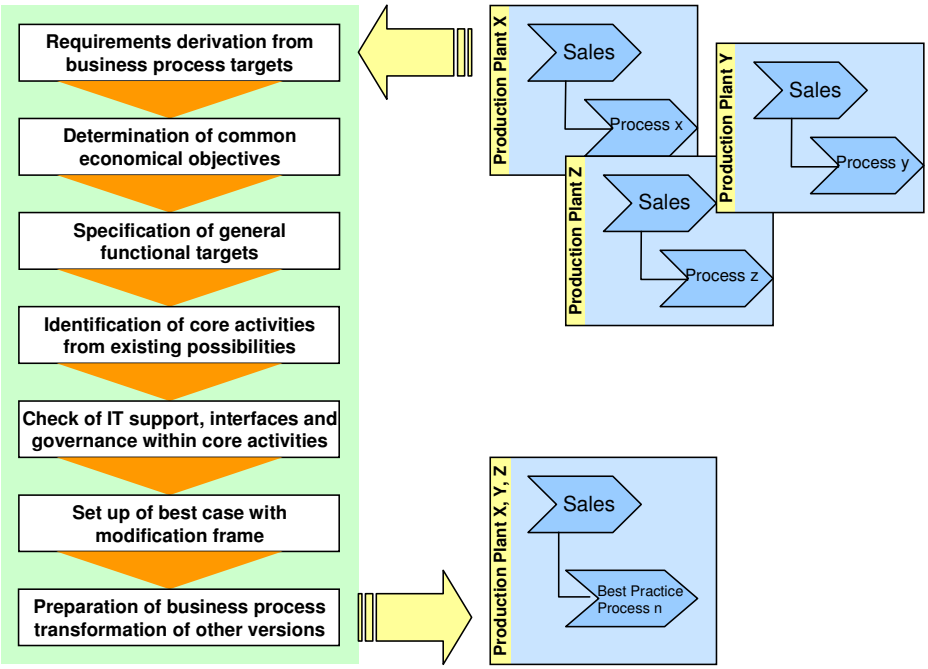


Fig. 3.1: Best practice identification approach

3.3 Typical situation in practice

Practical harmonisation projects or consolidation initiatives which work within an organisation on historical evaluated structures could be found very often at the specialised press. It is in fact a topic of high demand and let the conclusion that it is an important subject for groups, companies, and organisations. For example a German group had done in 2006 a migration of their SAP server landscape from sixty-three individual servers into four high availability servers. This simplification of the IT infrastructure and software landscape was done for a following companywide unique release version change within their ERP systems. Furthermore, it is the basis for a following consolidation of the individual ERP systems which is planned to receive the highest possible IT harmonisation (cp. Ruckert (2006), p. 22). But this can not be done without a standardisation of the business process-oriented view which is supported by the ERP systems.

Another group or case study speaks about a technical release change of their ERP system in 2005. Therefore, it was within the group necessary to achieve a business

process consolidation between several locations, plants, and business units (cp. Seidel (2006), p. 16). There are still more examples or case studies within the literature. But based on them, it is possible to describe typical approaches for a harmonisation, standardisation, and consolidation of historically evolved process structures in organisations.

Mostly the first impulse is given through the constant pressure of cost savings for competitiveness. Periodically, and after a good deal of thoughts, the most organisations do the step into a necessary infrastructure movement. This means, especially for the IT departments a service centralisation for the further avoidance of individual solutions. In other words an IT infrastructure migration tries in a first step to reverse uncontrolled growth of individual solutions as one of the main issue regarding historically evolvement within an organisation. Furthermore, it is the preparation of a simplified possible technical release change of an IT system, or also further standardisation and harmonisation initiatives. Thus, the next step of an IT based system consolidation is possible. In order to that, it enables the highest achievable consolidation and feature potential implementation of new technological concept like SOA.

On the business side which is supported by the IT infrastructure, similar initiatives could be found. This ranges from process consolidation activities to the standardisation projects or a mix of both methods. Business consolidation is based analogue to the IT system consolidation and includes the centralisation of multiple business processes within several locations, plants, or business units. Standardisation or harmonisation projects are in contrast a step back to a standard based on a reference model or even the adjustment to a new reference model. By having the so called best of breed also new technical concepts will be encouraged. Figure 3.3 shows theses typical IT harmonisation and consolidation activities compared with business initiatives. This is commonly based on an ERP system within an organisation by several locations or production plants. Thereby the graphic is attached to the subject of process based software implementation and operation due to the paradigm of service oriented applications. Even ERP manufacturer had realised that monolithic IT system architectures are reaching the limits of flexibility respectively the support they can offer for their individual customer processes. Architectural approaches like the ESOA concept of the SAP AG serves to reinforce thinking in process terms, not only when the IT system is initially implemented but also when it is in continuous operational use or consolidation (cp. Scheer et al. (2006), p. 4; Beuthner/Frisch (2006), p. 14).

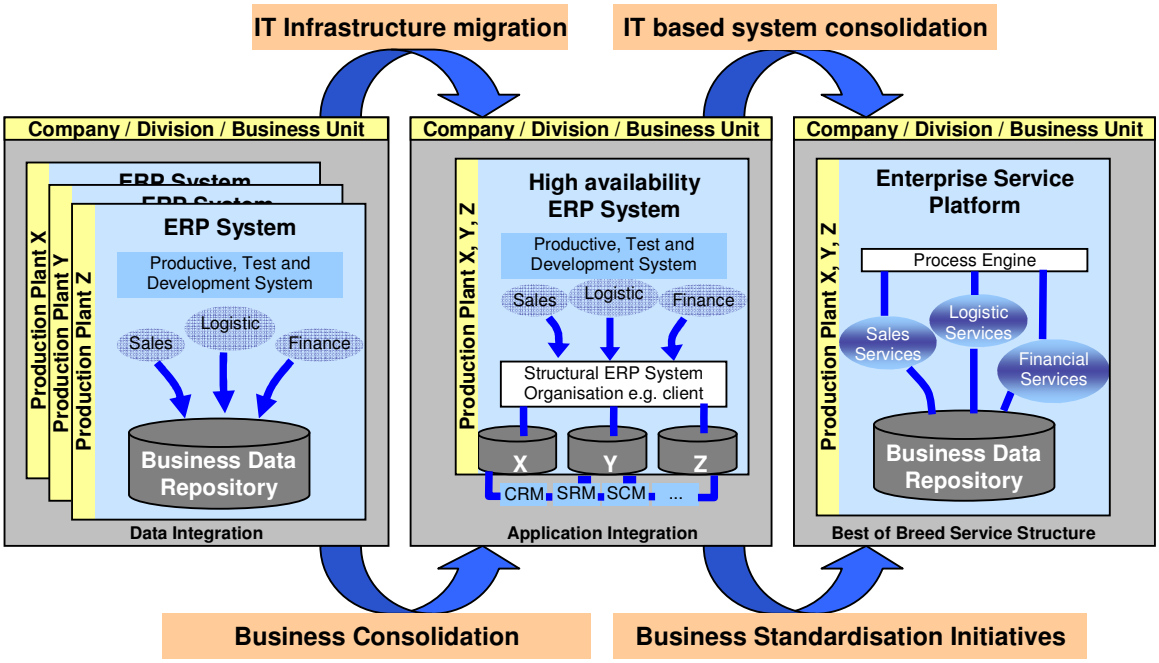


Fig. 3.2: Typical harmonisation projects and consolidation initiatives

3.4 Classification and demarcation to classical approaches

Based on the initial prerequisites, best practice definition, and the within chapter two described CPI and BPR approaches, an integrative best practice reengineering proceeding could be theoretical arranged between BPR and CPI. It is not a holistic complete green field development and not only a particular detail improvement within business processes. Furthermore, it is the holistic identification of detailed best cases on multiple existing business processes. Thus, the proceeding has to be performed bottom-up but from the partial processes with an overall pertaining to the existing process landscape. This includes that existing organisational structures are also regarded within a later on possible modification or build up of a process. By the consideration of all process targets, organisational structures, and criterions it should be possible to perform a process simulation. This is useful to verify the best practices for a following constant realisation of adjustments to the existing processes. Altogether, an integrative best practice reengineering is intended to be an incremental, unique, and uniform change process method.

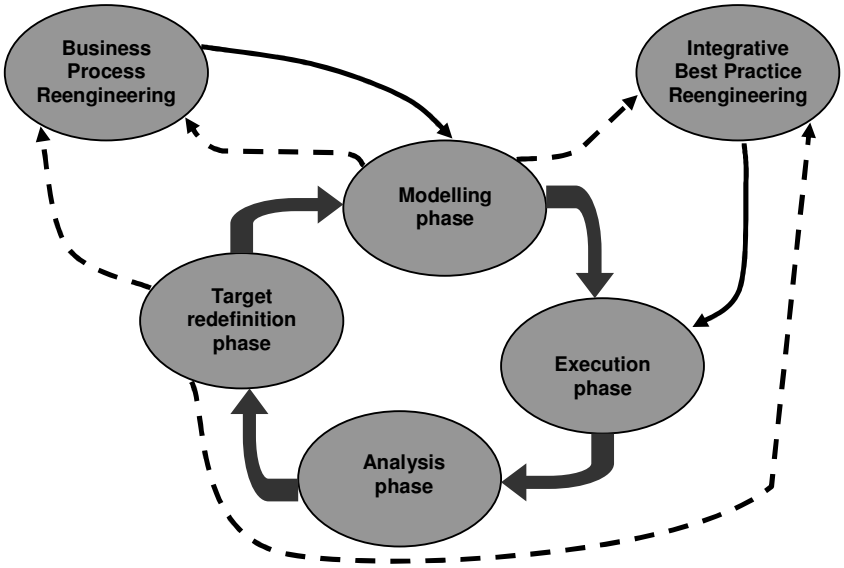
By the help of the described classifications of the classical approaches, it is possible to add a view of the integrative best practice reengineering. The following table is based on Becker et al. and compares these characterisations, with the extension of the classical

constructs by an integrative best practice reengineering concept (cp. Becker et al. (2005), p. 300).

Tab. 3.2: Characteristics of CPI, Integrative Best Practice Reengineering and BPR

Business Process Reengineering	Integrative Best Practice Reengineering	Continuous Process Improvement
Redefinition of functions and processes (process understanding and reconstruction)	Orientation on overall existing functional objectives and processes	Orientation on existing functional objectives and processes
Unique and innovative change process	Unique, uniform and incremental change process	Incremental and possibly permanent improvement process
In principle a holistic view on process	Holistic and partial perspective on process landscape	Focus on partial processes possible
First time implementation of process-oriented organisational structure (interface avoidance strategy)	Build up and possible modification on existing organisational structures (interface adjustment)	Build up on existing organisational structures (interface management)
Single-edge prioritisation of process efficiency; Resource efficiency through IT usage	Consideration of all organisational, economical targets and efficiency criterions through simulation	Consideration of all organisational targets and efficiency criterions
Unstable change	Stable adjustment with controlled adjustments (realisation strategy)	Comparative stability with controlled modification
Top-down proceeding	Bottom-up proceeding, (Top-down additional)	Bottom-up proceeding

Furthermore, it is necessary to bring the integrative best practice reengineering in composition to the CPM. Target should be to set up the CPM by the help of such proceeding, similar to the BPR approach which rather introduces in general a process orientation. Comparable with a BPR the target redefinition phase provides an impulse for an integrative best practice reengineering. This happens if the CPM discovers a performance discrepancy which is not adjustable with an incremental improvement method or a radical redesign is not possible or necessary. But also external effects, as described in the initial prerequisites, can dispose such proceeding. Existing modelling views, if they are already established within an organisation, does also provide input for the integrative best practice reengineering. Possible results of the best practice analysis are then feed in with the execution phase of the CPM. Figure 3.3 represents these coherences whereas further details will be discussed within the next chapter.



Source: Based on Becker et al. (2005), p. 310

Fig. 3.3: Integrative best practice reengineering within the CPM cycle

4 A procedure model for integrative best practice reengineering

The following chapter provides a theoretical procedure model to describe an integrative way to reengineer best practice processes within organisations or large businesses. This project based approach is deduced from requirements and frame conditions explained in chapter three and based on existing concepts from the theoretical chapter. In the following, project management responsibilities, proceeding phases with detailed work package activities and required results are described within the sub chapters. In the last part of this chapter a clarification will be done for the required crossover to a continuous process management.

4.1 Project management responsibilities

Every project based procedure requires a temporary type of organisation consisting of company expertise and methodical know-how which also can belong to company external parts. The set up of continuous process management through the re-documentation of existing processes, need a project management as well. This issue includes the project organisation with project leader, steering committee, and project team. They are liable for the overall function of project management consisting of project planning, resource allocation, controlling, and fulfilment monitoring. Not in scope of the project management are activities of the project target definition or identification of common expected benefits for a project realisation decision. These specifics have to come from the project client like an organisational unit or a person who receives the project results (cp. Litke (2004), p. 54). The responsibility for the project management of an integrative best practice reengineering way is based on the decision for their necessity with setting up a project strategy and frame condition. Thereby it has to be defined in which way the proceeding of the project will take part and what kind of regulation framework it is surrounded.

The normal strategy within process oriented concepts is to settle a top-down approach. This means a complete deduction of the considered processes down from a company strategy. It is, for example, typically in the case of process-oriented reorganisation projects or BPR approaches because of an initially needed global company view and the downwards definition of every following to-be processes in detail. For the situation of an integrative best practice reengineering approach, it is advantageous to use the bottom-up proceeding instead. Bottom-up directed means a view from low-level processes to top-level processes based on already existing information like process landscapes, process overviews, or documented process knowledge. In common, existing knowledge should be used instead of creating new ones. This must include already

visualised models, process descriptions, user guides, operating instructions, and retrievable data from the IS and employees as well. The top-down analysis from a company strategy is additional and should be only involved in special cases which can have an impact on responsibilities. It has to be understood, that a complete redesign of the organisation is formally not the task of an integrative best practice reengineering project. Such requirement can appear during the best practice selection and process harmonisation with an unclear, wrongly assigned, or missing content and a redefinition of roles or ownership will become necessary. The already implemented process-oriented organisational structure within the client company should normally allow these proceeding.

The strategy with a proceeding from bottom-up is entirely a critical factor of success and specifies which people are concerned from the beginning. Especially, a bottom-up approach means a direct and intensive involvement of department employees from the related processes which are in the scope of reengineering. In other words, the project framework has to be deduced from the strategy decision and the client-defined project targets. This implies how far the investigation for best practices should go, which company departments are affected, and what kind of processes are in the project scope.

Beside the project strategy definition and the lay down of frame conditions, a preparation of Business Process Engineering (BPE) activities has to be done ahead of the main project performance. The BPE enunciate the right to design business processes in an engineer-like way by the help of a methodical problem solution proceeding (cp. Knackstedt/Pellengahr (2007), p. 731 et seq.). Such process engineering tasks, within a best practice reengineering project, include the following points:

- Modelling and simulation issues.
- Process responsibility characteristics.
- Process implementation strategy.

The modelling and simulation issues consider the whole environment of process modelling as already described in chapter two. This strategy includes the modelling specifications, modelling design, modelling guidelines, process documentation, modelling requirements, process landscape architecture, process landscape deployment, simulation tool, simulation criteria, simulation of test cases, and the IT support. Furthermore, the preparation of the modelling practice has to be defined with respect to the process implementation procedure, described in detail in chapter 4.2.3. This point is the determination of the total model environment and degree of detailing which has to

be visualised. Deduced from the project strategy and regulations, this decision includes a guideline for special process cases like IT system automated parts, interfaces, or non-standard processes. In general the rule has to be that nothing what exists has to be created again except that a data conversion needs more effort than recreate.

Especially for the modelling and process understanding part within a best practice reengineering project, it is essential to have high expertise included. The reason is possible trivia as pointer for a best practice which can be lay down in small process details but has enormous interfere with higher level or abut processes. Therefore, a model-based visualisation and following simulation provides already a transparent picture to explain problematic cases better than any written process documentation. But to read process models and understand the process behind, knowledge of process modelling and business as well, is definitely needed.

The process responsibility characteristic means a consideration of the organisational and operational structure with check for process owner and process implementation responsible for every process regarding completeness, validity, performance, clearness, and duplicate assignments which can lead to misunderstandings. This typical construction implies the hierarchical coordination of company parts based on division of labour and the detailed creation of the workflow to network the sub processes related to their sequence. The process owner is working on the process and is in charge for the content, objective, performance, evaluation, and improvement of them. In contrast, the person responsible for implementation and execution is in charge for realisation and adhering to the established processes specification directives as well as attaining the predetermined targets.

The comprehensive process implementation strategy must prepare an acceptance concept within the organisation. This is important because on the on hand the project team, steering committee and other involved people need a clear motivation, based on the expected results from the project. On the other hand, they need a way to sensitise for coming adjustments of already establish process-oriented working. Every time the question for a possible strategy should be, how the best practice adoption can take part within the company, what timely proceeding is achievable, and what kind of business or IT support is necessary. Furthermore, the implementation strategy should include a process release procedure, where potential changes on the IT system are regarded in an advanced arrangement. This relates to the requirements for a possible system change on technical and manual foundation like customising, possible training lessons for key-user, technical documentations, or master data. In total, the literature provides three

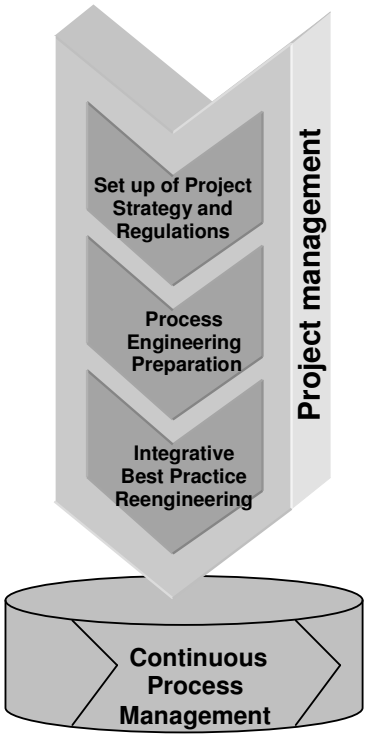
possible introduction proceedings which are feasible for the process roll-out (cp. Becker et al. (2005), p. 271 et seqq.):

- A pilot-based roll-out within one location, one area, one plant, or one process with the advantage to get experience and learn from a clear arranged introduction test case. The disadvantage is to delay the real introduction and to ignore real high complex process structures.

- A step-by-step introduction as the successive realisation of the best practice adaptation allows a continuous learning from the process-related conditions within an organisation. Unfavourable are the temporally interfaces during initiation and possible process variances over time which can appear by using this approach.

- A Big-Bang proceeding represents a complete, one time, and total adaptation which takes part within the whole organisation. Compared with a short introduction time and missing process differences through a step-by-step proceeding, it is the most dangerous approach in the case of failures.

Principally, the integrative best practice reengineering represents the main part of the project based proceeding which is arranged to realise and set up a continuous process management within an organisation. This will be now explained in detail from the following sub chapter 4.2. All these project management responsibilities are displayed in figure 4.1 which were changed and based on the procedure of a process-oriented reorganisation from Becker et al.



Source: Based on Becker et al. (2005), p. 22

Fig. 4.1: Project management approach for a continuous process management

4.2 Integrative best practice reengineering

The core of the project based procedure model deals with the identification, modelling, harmonisation, and adaptation of the best practices from existing and historically evolved business processes in organisations and large businesses. Therefore, chapter three already described the current and typical initial situation for client companies in international business environments with worldwide production plants. This explains the necessity to re-document exiting process structures and identify best practices by usage of a common process model. The rough proceeding to reach this target is to record organisation wide existing processes and information, followed by the decision about a best practice based on a process model, and a final harmonisation of the total process network to adapt them to the organisation. Thus, the procedure model starts with an identification phase succeeded by the modelling and selection phase. Based on the now existing organisational process template an adaptation can take part to introduce these adjustments and set up a continuous business process management. In the following, a detailed description will blueprint the activities of every phase based on the graphical overview in figure 4.2.

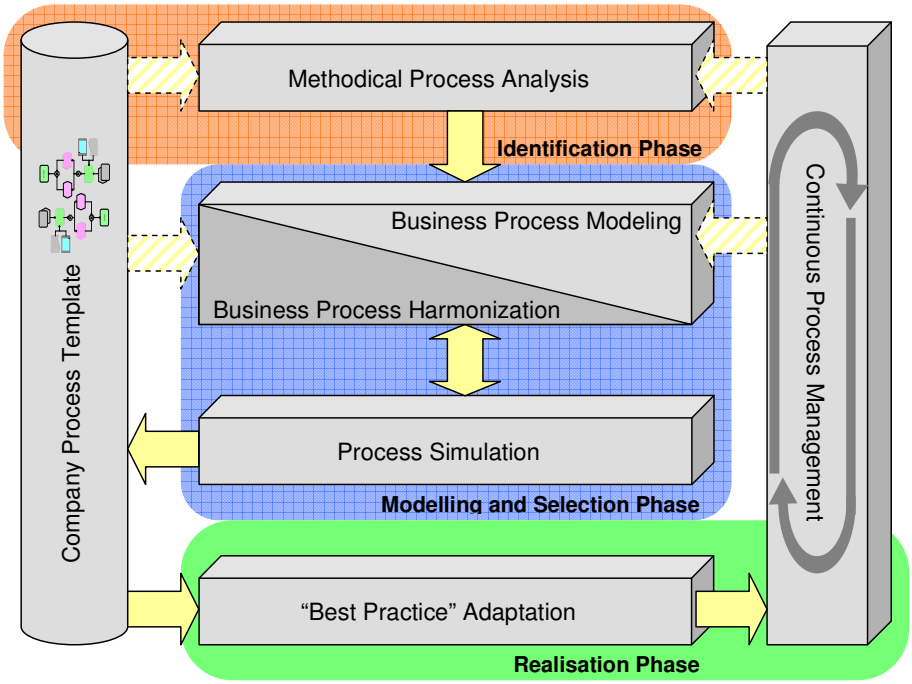


Fig. 4.2: Procedure model for integrative best practice reengineering

4.2.1 Identification phase

The point of departure within an integrative best practice reengineering approach is a methodical business process analysis with activities for identification and process recording. Based on the proceeding strategy, a bottom-up approach specifies a start of the detailed analysis at low-level processes on an already existing process landscape. This is possible because of the already established process orientation within the organisational structure as described initial condition for an integrative best practice reengineering. Target of the identification phase is the preparation of all relevant company process information for a possible process model, oriented on the individual project strategy. Therefore, figure 4.3 illustrates the way of proceeding to achieve this data by several sub steps.

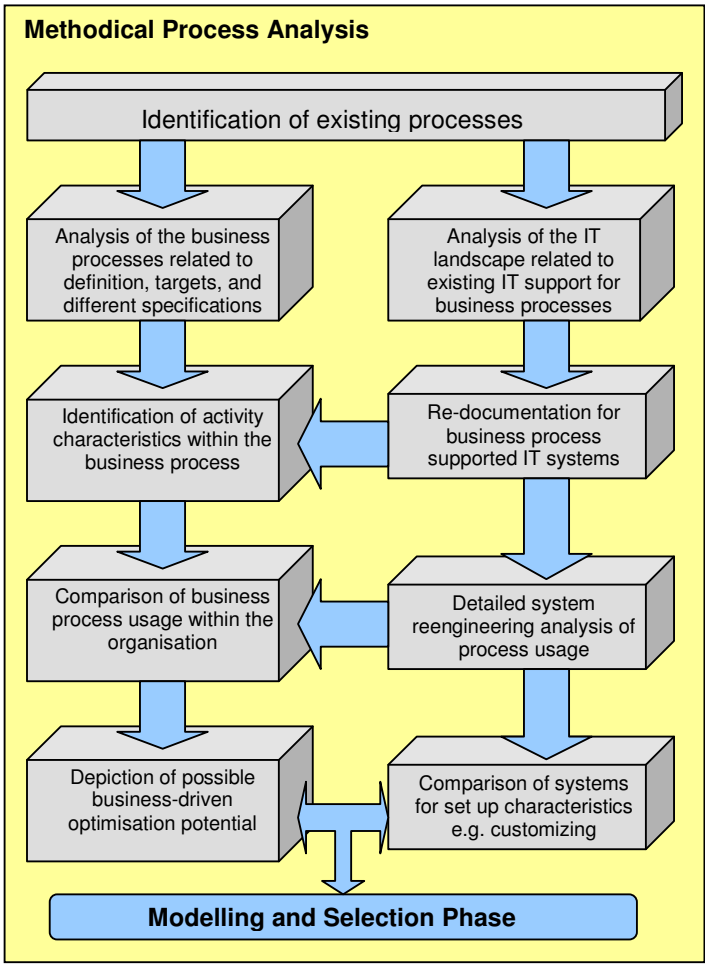


Fig. 4.3: Proceeding within the identification phase

The first step within a detailed analysis represents the initial detailed process identification. Identification means a decision which on the existing process landscapes, previous company process templates, process documentations, process models, IT system documentations, possible redefined process targets, or in short existing knowledge based on the project strategy. Therefore, the existing material has to be reviewed in detail by the project team with an afterwards decision about which core, support and management processes are in project scope. Deduced from this decision it is, furthermore, necessary to filter the locations, plants, areas or business units are concerned or has to be involved. The decision, if a functional or an object oriented detailed investigation will be done, is depending on the existing organisational structure of the client company. In any case, it can be possible that processes have no clear view or position within this decision, related to the existing process landscape or organisational structure. Therefore, it is necessary to analyse and record every view on a process by considering the problem later on the modelling and selection phase.

Afterwards, the further analysis has to be done in two manners for the individual locations, plants, areas or business units. The first task is to get a clear and complete business view on the common activities within the process. This is because of mainly personal alongside end-to-end activities with high potential of added value and costs. Process targets, specifications, content, owner, information and reports have to be recorded, therefore, in a first total view. The second task which has to be checked represents the relevant and current process support through the IT systems. Scope of this identification is a later on build up of an IT landscape for possible consolidation potential. Thereby the first question has to be, what IT system is supporting the business process and how does the related IT system support the business process. The same re-documentation must take place from a business view perspective which means a detailed characteristic recording about how the necessary steps are handled. If these actions are done within the project team of expertise and on a total rough level, the next point considers the utilisation within the locations, plants, or business units. This means an internal survey must deal with the detailed process usage, process proceeding, and process differences by the help of an IT system based evaluation report.

For a first view, this survey must reconsider a detailed business perspective on a process, to get an overview where it is used in the organisation or business. Therefore, the communication must preferable take place in a hierarchical way to the process key-users to avoid that possible process responsible are left out. Furthermore, this analysis must provide an answer on what and why there are differences in the detailing of the process steps. Within this step, it could be the case that further special cases appear which were not initially identified. These business processes have to be checked too for their content, proceeding, and usage. Such cases are conceivable in special production processes which belong to high specified locations or plants only. In contrast, the group reporting process in the finance and controlling sector has to be mainly the same worldwide caused by international finance and reporting laws or regulations for companies.

For a detailed investigation of the process based IT support, an automated reengineering analysis about the process usage can take part. Existing concepts like the Reverse Business Engineering (RBE) can be used to get a functional IT system based view on the supported processes. A reverse engineering implies a pure technical analysis of an existing system to recognize system components, review their relation ships, and create a information basis on different level of abstraction (cp. Hufgard/Wenzel-Däfler (1999), p. 427). Such an IT based organisational and tool supported view is, mainly, a part of a universal concept with a split up into a re-documentation and a redesign part. Thus, the build up of a semantic representation can take part with a later on redesign of the

focused objects into a model with higher level of. The target is to find out which processes, process steps, and functions are supported or exists, through the customising configuration of the IS. The answer will be given by a usage degree usage of master data and transactions, based on a total company model. Prerequisite for this empiric result is a unique and stable data basis, a master model, and a potential analysis tool. For example, within a SAP based ERP system it is the SAP reference model and the so called Business Engineer tool from SAP. The idea behind represents the reconstruction of an IT system from the original introduction to the current modified customising. Therefore, a first system based data extraction will follow by a tool based analysis to prepare the process structure generation and transfer to a possible process model. The following IT system comparison is thereby possible and includes conclusion statements about the different business processes behind. The RBE result and IT system comparison information are later on used together with the depiction of possible business-driven optimisation potential, to define a best practice process.

Another realisation of this concept exists within several tool characteristics like the ARIS Redocumentation Scout. This total analysis about a transaction based usage within an ERP system includes benchmarks on operating ratios. A result can be the statement that a transaction of changing a customer order is used more often than the transaction of creating a customer order. In this way, the disadvantage and reason to use business and IT perspectives as well becomes clear. The statements represent only a total quantified view on possible potentials. Real validated potentials are only possible with a quality business perspective analysis and a quantified total IT system analysis.

The last step in the methodical process analysis is the depiction of possible business-driven optimisation potential. This should be a collection about problems within handling the process, possible improvement ideas from the key-users, or further needed adjustments for the business, related to every process. These ideas can also be rest upon a technical comparison of the IT systems between the locations, plants, or business units for the process which is in focus. Comparison means the detailed look into location, region, plant, or business unit specific configurations and customised settings by RBE.

Summarised, is the identification phase a preparation of large-scale information which has to be used on modelling the business processes on the next phase. Practically, the modelling can already start after the process is firstly described in a total view. Refinements can be done in the further course of the next phase based to completed information. In addition, the first information about possible best practice criterions is collected and available for the modelling and selection phase which will be described hereafter.

4.2.2 Modelling and selection phase

Based on the process analysis of previous phase a common process model can be build up by the help of a modelling tool. To verify the created model the so called process simulation must take part in an association with a business process harmonisation before any process realisation can take part. The phase starts as show in figure 4.2 with the comprehensive part of as-is processes modelling. This means that activities of every business process have to be modelled in for example extended Event-driven Process Chains (eEPC) as common accepted and predominant way of visualisation. The eEPC model as semi-formal process documentation gives now a clear and transparent overview of the existing business process in an IT and organisational view as well. This is based within the fact that for example RBE data and key-user knowledge about the process were combined in their views for a process modelling. Without this process documentation there will be little chance to continue successful. A common supporting tool represents the current ARIS Platform for modelling, were it is later also possible to generate if needed a formal workflow implementation language, as described within chapter two.

Subsequent to the modelling activity, smoothly follows the transition to the business process harmonisation tasks as challenging part within the integrative best practice reengineering procedural model. The target is to identify the best practice processes by an afterwards verification in the process network model through a simulation. All best practice processes within the process network, establish the so called company process template such as a business blueprint. Figure 4.4 shows the proceeding within the business process harmonisation.

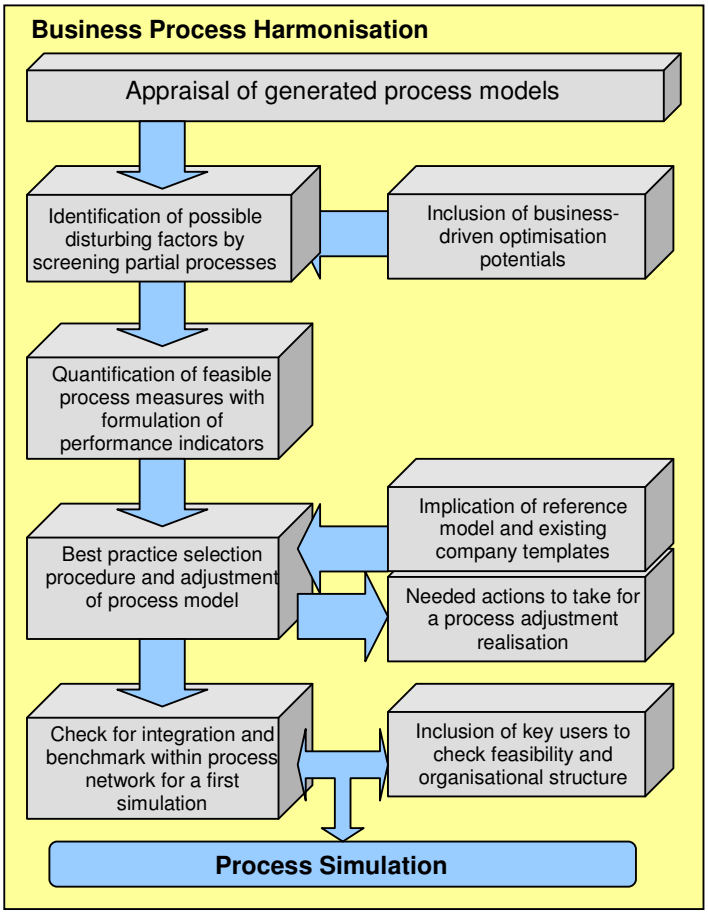


Fig. 4.4: Proceeding of a business process harmonisation

Firstly, the generated process model has to be reviewed by the project group, with split up the complexity of the process landscape and reduce it to manageable process structures. In this way, the identification of all disturbing factors can be done related to the chosen processes. This can be deduced by the help of a detailed cause-and-effect chain analysis or just on typical questions, like:

- What is the difference between the existing processes from the locations, plants, regions or business units?
- Which process variant has the efficient document or information flow?
- Are the process owner and responsible clear within the process total?
- Is the timing with the system correct or are there any data inconstancies, timely overlapping, or bad timely and contently discrepancies?

An inclusion of business-driven optimisation potentials and IT system comparison result should provide afterwards a common view on the process. Furthermore, it should

represent a good data basis for a primary quantification of measures based on process performance indicators and for the following process consolidation to a best practice process. A tool representation for these tasks could be found within the ARIS Process Performance Manager.

The followed best practice selection proceeding were already described in chapter three. Within an integrative best practice reengineering it is, furthermore, necessary to include the reference model of the used IT system and all existing previous company knowledge. The initially reduced process structures now helps to define the needed detailed actions which have to be done for a possible process adjustment within the realisation phase. In this way, the last step is a check of the possible best practice process regarding a process network integration and benchmark on the process performance indicators. This has to be done in inclusion with the affected key-users to check for realisation feasibility, relevance, organisational structure integration, and business related effects before the process simulation takes part.

The simulation of business processes helps to understand, analyse, design, evaluate, and compare business processes (cp. Jansen-Vullers/Netjes (2006), p. 2). It represents a quantitative supported choice for a best practice decision by showing possible estimates of an impact the process could have on the process performance in a network. Two numbers of steps can be distinguished for a business process simulation in an integrative best practice reengineering based process model.

- At first, the business process has to map onto the process model. This includes process steps, activities and entities that flow through the system and creates the control flow. Furthermore the connectors and resources have to identified and assigned to the related activities.

- At last, the business process performance characteristics have to included such as resource utilisation, throughput time or handling values.

Based on this simulation model multiple sub runs of parts should firstly verify the receiving of a statistically valid simulation. Is this done, the total simulation result can be analysed for a possible adjustment which can take part on the process model or simulation model. Whatever simulation tool is used, these steps are the same and should be applicable within every tool. Target in the best practice reengineering is to receive an objective confirmation a best practice process within a process network. Therewith it is possible to verify the best practice process model and keep it as a template for the company process landscape.

4.2.3 Realisation phase and Continuous Process Management crossover

Within an integrative best practice reengineering project, the realisation phase stand for the modification of existing business processes and their adjustment of the individual IT system support within an organisation or large business. Based on the now existing company process template it definitely means a best practice process adjustment instead a complete new process roll-out which is typical for classical reengineering or reorganisation projects. Only one exception is granted, therefore, within an integrative best practice reengineering. This exception had two reasons for their appearance:

- The location, plant, or business unit was not prior using the focused process, but it became now necessary to use it for the process network.
- The location, plant, or business unit used a totality non-standard way of the originally introduced process which will be no longer fit into the process network.

For these exclusions it had to be individually checked, if it makes sense to do the handling in a best practice way and if it is generally feasible to realise them instead of a possible interface. Not every worldwide production plant, location, or business unit has the same environment, structural conditions, size or even need for a best practice process. As already described, these cases were normally regarded by the project group experts in advance during the modelling and selection phase respectively especially in the process simulation.

Furthermore, a realisation phase must include a clear commitment of the process modifications to the individual key-users by the process implementation responsible. In the cases where the process needs to be rolled-out also training lessons should be prepared and conducted, based on the conformed work instructions. In general, a minimum review and adjustment of existing work instructions and regulations has to be done. This includes also the IT system landscape adjustment which means for example a customising of the related ERP system, a removal of legacy systems, or an additional purchase of IT systems. In common a consolidation and reconfiguration of the IT landscape will become necessary related to the business processes affected software systems. Figure 4.5 show the proceeding of best practice adaptation within the realisation phase.

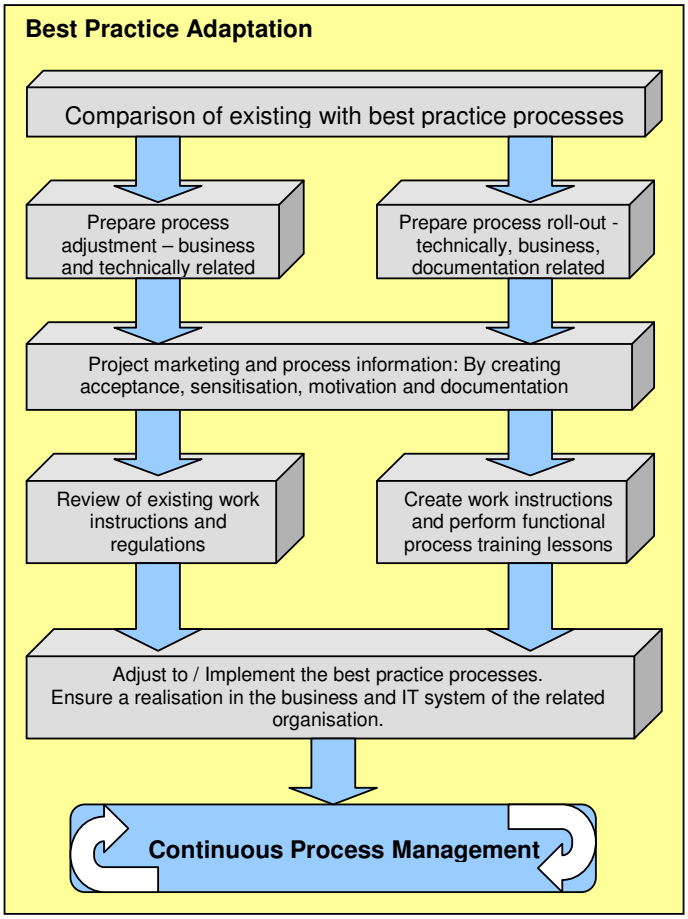


Fig. 4.5: Proceeding within the realisation phase

Related to an IT system adjustment or in cases of process roll-out an IT system implementation, it is an advantage to use integrated process management tools. Especially modelling tools which operate jointly with the ERP system should be mentioned thereby. Integration means in this case a direct link from the process model to the affected ERP system configuration. This is possible today and one example for such an established combination of an ERP system with a modelling tool is the current ARIS software as common accepted and literature quasi standard.

The current ARIS Platform 7.02 provides, for example, with the ARIS Business Architect for SAP NetWeaver a direct functional interface to the common ERP system of the SAP AG via the SAP Solution Manger within the SAP NetWeaver environment. By the help of the open SAP NetWeaver integration and application platform it is possible to connect user, information and business process technology cross company-wide. Open in this definition means the usage of common technologies to connect and integrate third party applications into the SAP landscape, like the .Net specifications from the Microsoft Inc. or the Java Enterprise Edition (J2EE) outline. Thereby

characterises the SAP Solution Manger a tool for the implementation, operation, support and configuration of SAP systems. Furthermore, the link of these two software solutions is a clear defined and open bidirectional interface, or so called synchronisation functionality (cp. Brabänder/Schmidt (2006), p. 2 et seqq.). This synchronisation functionality acts as a both way data comparison between ARIS and SAP Solution Manger, based on a middleware component, the so called SAP Java Connector (SAPJCO). With the aid of an object oriented programming language it is possible to develop SAP-compatible components and applications in Java. It enables a communication link with the SAP Server in both directions which means inbound and outbound calls. Inbound, is represented if Java calls ABAP functionality and outbound if ABAP calls Java functionality. The idea behind represents the synchronisation functionality of a firstly business defined view to the requirements of an end-to-end processes chain by the help of ARIS for SAP NetWeaver. Within business process models the business logic, flow of information, roles, responsibilities, manual tasks, process interfaces, the supported IT system landscape, and system independent activities can be build up corresponded to the identification phase. This company template can be used via synchronisation within the SAP Solution Manager. The advantage now is a transparent integrated business based view on the existing business processes. Now, a change on the business process level creates automatically test cases within the SAP Solution Manger and affects later on the realised SAP system requirements (cp. Seidler (2006), p. 9). To sum up, it is an advantage to use integrated modelling tools instead of standalone business process modelling software. Beside business process modelling for documentation, maintenance or process performance controlling, also other arguments have to be reflected by the process engineering preparation.

The set up and adoption of identified best practice processes must lead to a continuous process management as already described. Complete best practice performance targets can not be reached within the realisation phase. The concerned people have to learn, understand and accept again with a possible change of their activities. Such a realisation is always high specific to the organisation, the individual evolvement situation and depends on the context views (cp. Bucher/Winter (2007), p. 709). Therefore, no other possibility for a continuous review exists to check of the introduced best practice processes based on the key performance indicators. It is a stepwise reaching of the process performance targets as already described in chapter two. Trying to reach the best practice standard means also the further evolvement which can take part within the continuous process management.

An advantage of the project based integrative reengineering proceeding, furthermore, is the growing transparency and knowledge which can be used for the set up of a CPM. Pictured in figure 4.6 the increase of the process knowledge will mainly take part in the process identification phase and modelling and selection of the best practices. This is due to the fact that there is firstly a detailed exchange of process know-how between experts on locations, production plants, areas or business unit levels. This communication is very important for the project group to understand similarities and differences for a best practice finding. An example is thinkable within a logistics department in Europe compared with a logistics department in Asia, where a faster material order process can relate to their suppliers or even a better IT support with a higher integration for their supply chain. Certainly, there is still the question of feasibility for such processes but it should break the ever mentioned wearing of professional blinkers. The second amount of knowledge growth is during the visualisation of identified processes and comparison by the use of industry reference process models. Compared to the original introduced standard process, it is easy to define and select a best practice which is the first part of the knowledge increase. More knowledge potential lay down in the build up of the process network by understanding the coherences. At last, the third phase does not include any further process knowledge but rather an experience increase. Thereby the collected information is spread into the organisation to apply it for the continuous process management.

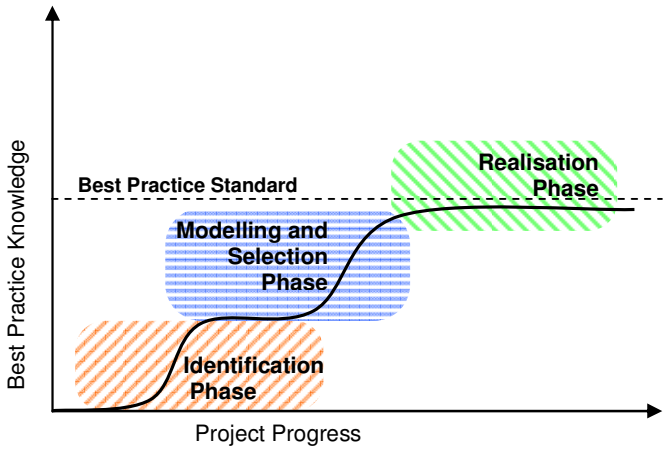


Fig. 4.6: Grow of process knowledge during a best practice reengineering

Based on the now adapted best practice processes, the continuous process management can take part. The prerequisites are established, including a model-based process landscape, key performance indicators for a process performance management, and an expertise about the processes in scope.

5 Summary and conclusion

This thesis deals with a common procedural model to re-document model-based existing process structures within organisations and large businesses. Firstly, a widespread theoretical introduction was given into the area of business process management. Furthermore, existing techniques of business process architecture, project management methods and software specific characteristics were discussed with an outlook to the next integrative step of service orientation. Based on these theoretical fundamentals, a consideration of typical initial situations for organisations and large businesses were possible, followed by a clear motivation to set-up an integrative, project based procedure model. This establishment required a characterisation of all activities from preparation, like strategic decisions or process engineering groundwork, over realisation, like best practice adaptations, up to post processing with CPM.

Thereby represents the core part of the procedural model three key phases. A primary identification phase nominates which business processes are within the scope of investigation. It includes the collection about all existing information, which will proceed from a business perspective and an IT view as well. IT based means, by the help of supporting tools or half part automated concepts like the reverse business engineering, to analyse an IS. The following modelling and selection phase creates a model of the related business processes, based on the collected information from the identification phase. With techniques like eEPC diagrams, a clear and transparent company process template will be generated, after several internal process harmonisation and simulation steps. This has to be done individually and network based in cooperation with the related departments, to receive a best practice process. The final realisation phase decides which adjustments are required for the existing business processes within a process landscape. This is related to their IT support and anchorage within the organisation or large businesses. Finally, and in an uninterruptible crossover, the establishment of a continuous process management will ensure the maintenance and change management of the exiting company process template.

5.1 Risks and limitations

In common, the highest risk in performing the procedural model will be a missing acceptance of the adjustments within an organisation or large business. Caused by the possibly high amount of involved people, departments, or regions, it definitely needs a direct management attention to avoid delays, receive fast decisions and lower the risk of disproportional additional expenses. This important project organisation fact can be traced back to a well defined and accepted project strategy with a following solid

groundwork by the conclusion and collection of all existing significant information or resources, true to the proceeding for identification of best practices from existing processes.

Furthermore, three main limitations have to be clear for the procedural model. Firstly, the proceeding is not advisable to introduce process orientation or new knowledge within am organisation or large business as a whole. The key word here is re-documentation. The second point represents the reduction of not to reengineer new processes but rather to use and adjust existing and historical evolved processes within organisations and large businesses. The last limitation typifies a clear understanding that an integrative best practice reengineering is not an innovative strategy like a BPR approach. It is more a business strength element for competitive factors with the build up of transparency not only for the organisation or large business but rather for customers or stakeholders. The common organisational structure will be mainly kept or adjusted, even if it is the reason for disturbing factors within a best practice definition within the project.

5.2 Open issues and further research

The discussed procedural model regards exclusively an internal process landscape of an organisation or large business. But company processes go out of the company border which are mostly modelled through dozen of process interfaces. There are decisions, events behind the company process template that directly have an input for the company internal processes. This affects not only manual handled tasks, but also automated IT system based activities. Therefore, the literature pledges currently for the use of SOA to simply manage and compose such process network architectures with a loose coupling of business services, communication, and data. An interesting question would be, how this next step of IS integration have an effect on the existing process models or how a model can be used to deploy this service orientation. The high specific modelling language BPEL could be only a start in this field, because it poorly supports the visualisation of human interactions by only manual complex review work.

Another high research potential provide the analysis of a possible company process template design respectively their way of using for a related process monitoring within a continuous process management. Current researches aim on the link with service oriented architecture to receive a real-time monitoring of the company performance (cp. Momm et al. (2007), p. 319). But the question should be, what alternatively ways, concepts, or tools of real-time process monitoring can fit and adapted into an integrative

best practice reengineering procedural model to ensure a continuous check for sustainable acceptance.

Further research is also necessary, to validate the discussed procedural model on a case study within the business reality or within a comparison of similar proceeding projects. The search for a standard approach, based on selective catalogue architecture, could help to fit the procedural model for specific requirements and needs in practical harmonisation projects. In this case also smaller integration projects could be performed within SME. The other point of investigation could be the role of the IS like an ERP system. A possible question could be aim on the target on what kind of quality the adjustments of internal functions were realised within the IS and how to check for a sustainability of usage on a long-term view. To change a process and the related IS is easy but real usage acceptance and realised quality comes with the day to day business over the time. In this way, a further question could be how to ensure the maintenance of the created template. Business and IS are still changing and without attention a divergence into non standard will definitely take part within an organisation or large business. This point includes a clarification check to existing and used quality management concepts and what ideas these can share each other.

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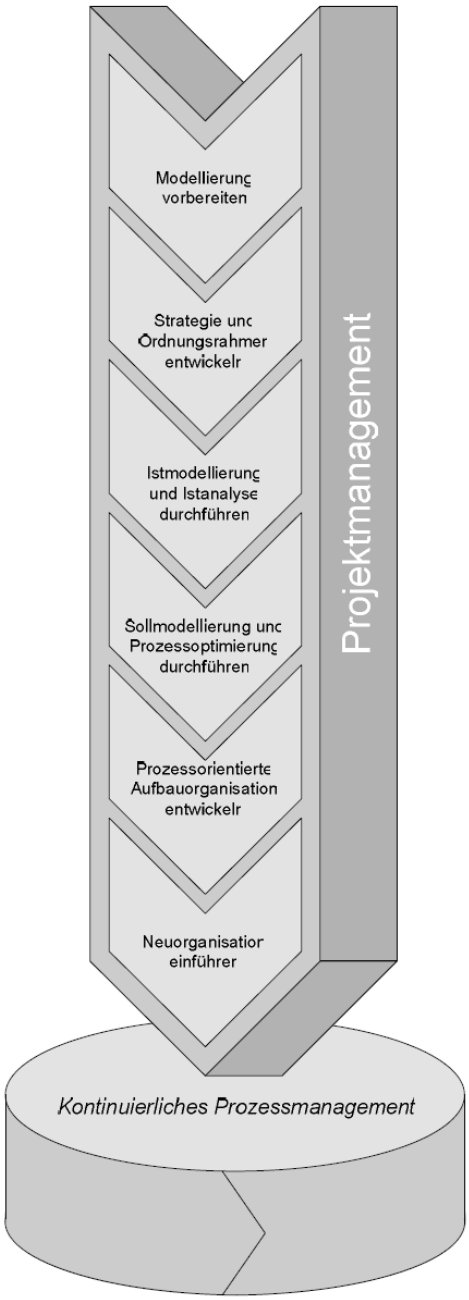
Appendix

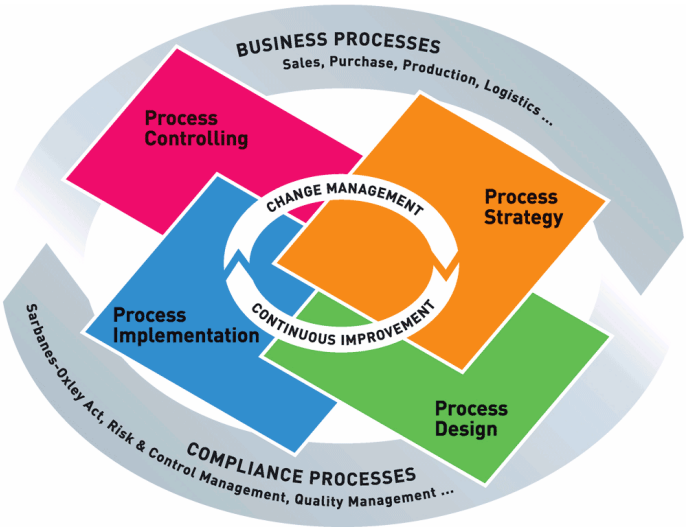
A Procedure model from Becker



Source: Becker et al. (2005), p. 22

Fig. A.1: Proceeding of a process-oriented reorganisation project

B ARIS Platform overview



Source: IDS Scheer (2007)

Fig. B.1: Support of the ARIS Platform within the BPM lifecycle

Abschließende Erklärung

Ich versichere hiermit, dass ich die vorliegende Diplomarbeit selbständig, ohne unzulässige Hilfe Dritter und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sind als solche kenntlich gemacht.

Magdeburg, den 30. September 2007.