

Chapter 2

Business Process Management

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Process Management is not a new phenomenon in microeconomics or corporate planning and controlling. Since decades the organization and management of enterprise processes was studied and analyzed by interested bodies from university and business practice. Initiated by Hammer and Champy Business Process Management became a new management concept in the nineties of last century (Hammer and Champy 1993).

As the market leader of enterprise application software, SAP possesses a long experience in methods and procedures of business process management. Related know how on industry and topic specific reference and best practice processes was more and more developed in recent years (Rosenberg et al. 2010).

Before discussing the SAP Business Process Management approach in detail, a brief look regarding different meaning of processes and the context of process management in business practice shall be provided in next chapter.

2.1 Business Process Management in the Context of Business Practice

The term ‘Business Process Management’ is indeed widely used, but often with different meanings, because until now a common accepted definition is missing. On the one hand process management is understood as a management discipline which deals with re-engineering, optimization and standardization of in-plant activities. Corresponding economic methods focus on collection, modeling, documentation and especially optimization of business processes independent from related IT support. On the other hand process management embraces tools including software products which are used in IT organization for modeling, implementation and execution of processes. From an IT point of view the objective of process management was for a long time mainly the implementation of

enterprise resource planning (ERP) systems, the automation of workflows and the integration of IT landscapes by so-called enterprise application integration (EAI) tools (Keller and Teufel 1998).

The isolated co-existence of both process management disciplines was proven as inefficient in business practice and led again and again to frustration and doubled project efforts in business and IT organizations. For example, processes modeled before by business could not be implemented in a software package because the process descriptions were often not detailed enough. Or essential business requirements were not considered during implementation of IT systems especially by usage of standard software (Scheer 2002).

Nowadays a holistic view on process management has become accepted cross industries. Business and IT organizations recognize that the cost reduction potential by usage of enterprise application software can only put into effect, if the complete software configuration flexibility to support business processes will be used. Whenever possible and appropriate, standardized processes shall be selected. Business critical processes providing competitive advantage however, must not lose their differentiating characteristics by usage of standard software packages.

One important factor for this necessary holistic view on processes is to incorporate a unique process management approach on enterprise level. Thus a framework or governance structure will be set. There are global, regional and local responsibilities defined, modeling and documentation tools established as well as process design and roll-out procedures clearly specified.

In numerous companies process management projects are promoted and pushed by business and IT organizations together. Beside a standardized process modeling and optimization approach, the process understanding within a company is one factor for project success.

Based on SAP's extensive project experience a comprehensive process meaning is across industries one key pre-requisite for a collective process optimization by business and IT organizations.

2.2 Process Management in Process Industries

2.2.1 Business Process Management Practice

Nowadays, business processes must be both globally oriented and in a position to meet the needs of every group that uses them, be employees, management, business partners, or customers. This balancing act, coupled with the complexity and changeability of the business world, requires, among other factors, ongoing consolidation, subdivision, and data provision across all locations and levels so that everyone can access the business information they need, when and where they need it. On top of this come legal requirements, changes to corporate strategies, the ongoing search for ways to stand out from the competition, and much more besides.

Due to the necessity to take care of the particular needs of each individual company while identifying ideas for measures to help the company gain a competitive edge, every BPM project kicks off with an analysis of the current topics and trends affecting the industry or field in question.

Companies in process industries must now adhere to various compliance requirements, be environmental protection laws, the European legislation on chemicals (REACH), or the validation of manufacturing processes and systems as required by the US Food and Drug Administration (FDA) and the European Union.

Not all BPM projects have a strict industry focus, however. Many projects aim to optimize cross functions within a company. In this respect, the topics and trends of these supporting functions (finance, real estate management, human resources, purchasing, risk management, etc.) are also of interest. Taking human resources as an example, the spread of globalization both demands and encourages the harmonization of personnel data and processes. Traditional personnel tasks such as payroll and administration take a back seat as the spotlight is turned to strategic personnel topics such as finding, retaining and developing staff. Similar trends can be observed in the area of purchasing, where the department's contribution to the overall success of the company is no longer based solely on operational purchasing topics. Instead, strategic purchasing topics such as contract management and evaluation of suppliers are gaining importance. Since the traditional supporting functions are often regarded as a necessary evil, BPM projects also look at options for outsourcing these business processes.

Process Management plays an important role in different project and program types. On the one hand process management is part of huge business transformation programs. Such programs focus to a lesser extent on a detailed process optimization rather than a process harmonization across the whole enterprise. Usually so-called template programs are accompanied by implementation of enterprise application software for business process support.

Next to huge business transformation programs the business process management approach is of course also a vital part of every smaller process optimization project. Independent from project scope and type there is no fundamental difference in use of a business process management methodology.

2.2.2 SAP's Business Process Management Approach

2.2.2.1 BPM Process Model

The reasons mentioned above help to explain why companies have become so intensely concerned with business processes in general and are applying methods and tools to manage their business processes. The individual reasons are always strongly dependent on the situation, industry, and environment of each company. Therefore SAP Consulting's generic BPM approach to identify and address specific action areas for process improvement and optimization shall be presented.

Based on their extensive project experience SAP Consulting had developed a cross industry process model, including specific methodology and procedures. Processes corresponding to this model are typically described using following dimensions:

- 1. process flow, i.e. the sequence of single process steps containing relevant process parameters and key performance indicators for process outcome measurement,
- 2. organizational view, i.e. the persons and organizational units involved and
- 3. IT system view, i.e. the process support by IT applications especially data processing and process automation.

The process model provides a framework of four mandatory modeling elements, each representing a specific process hierarchy level. Following a top-down approach the first level modeling elements are used to describe the value chain and supportive process areas. Every process area, e.g. Sales and Marketing will then be broken down into several process groups, like Sales Planning, Key Account Management and Service. The matrix of first and second process hierarchy levels results in a Business Process Map, which offers a holistic view of a company’s processes. A company’s value chain, its process areas as well as its process groups and supporting processes are mapped in a standardized and compact form. In contrast to SAP Solution Maps, which are based on SAP’s solution portfolio, the business process map is based on the customer’s business processes. This holistic view is useful when deciding how to structure and prioritize necessary changes best.

For a detailed process description further refinement is required. Therefore additional modeling levels are used to achieve the required degree of detail. In the chosen approach, the process groups itself contain business processes at level three which itself are divided into process steps (level four). Business processes comprise the activities and actions carried out in the company. Process steps are the smallest business-related element of a process and do not possess any further subordinate elements.

Depending on circumstances in a particular project environment the above mentioned mandatory process modeling elements can be enhanced by additional elements like process variants and sub processes (Table 2.1).

Table 2.1 Modeling levels

Modeling levels		
Level	Mandatory	Optional
1	Main process (process area)	
2	Process group	Process variant
3	Business process	Sub-process
4	Process step	

2.2.2.2 BPM Predefined Content

For efficiency reasons, i.e. to decrease project duration and implementation costs SAP Consulting provides business process related industry-specific predefined content beside the generic process model with its modeling convention.

SAP Consulting’s BPM methodology contains as basic parts so-called industry and topic fact books which provide up-to-date information on each of the industry and topic areas covered. For process industries SAP’s industry and process experts compile fact books for companies of chemical and pharmaceutical segments.

All fact books have following common structure (Fig. 2.1):

- Summary
- Market environment analysis (PEST)
- Competitive forces (Porter’s five forces)
- Holistic process view (Business Process Map).

The analysis of the market environment is based on the PEST structure (political, economic, social, and technological), which offers a framework for analyzing factors in a market’s macro environment. This means that the industry’s political environment, economic situation, socio demographic circumstances, and technological possibilities are examined and charted.

The competitive forces at work are examined using Michael E. Porter’s five force’s model, which looks at a market’s micro environment (Porter 1980). The

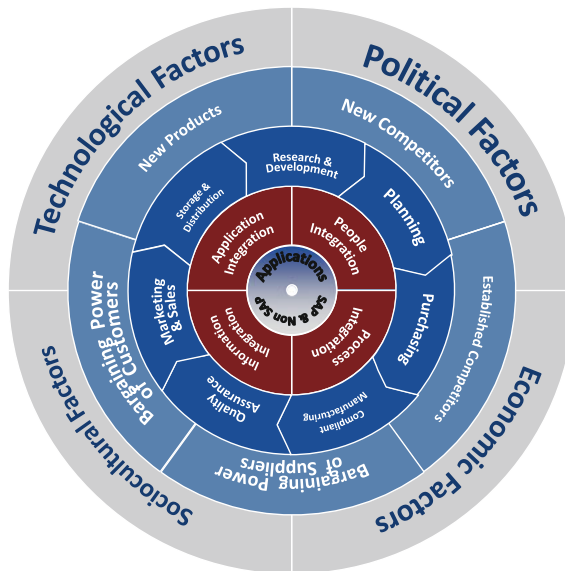


Fig. 2.1 Analytical structure used in industry fact books

model determines the competitive intensity and therefore attractiveness of a market. On the one hand, it considers the risks of horizontal competition caused by the threat of substitute products, the threat of established competitors, and the threat of new entrants. On the other hand, it examines the risks of vertical competition caused by the bargaining power of suppliers and the bargaining power of customers.

This holistic view on each industry offers a complete overview about relevant trends and changes. Presented as fact book, the information can be used to support discussions with management about potential improvements within a company. Once a broad consensus has been reached on the areas in which action is potentially needed to align the corporate strategy or to adopt processes further steps shall be started. At this point, corresponding business process map can be a valuable asset in providing a basis for discussions between the company's management team and process owners about relevant process changes.

Another industry specific content document is related to process group level. The details of those process groups are set out in process descriptions known as process fact sheets (PFS). The process fact sheets offer some insights of the process groups being described, how it fits into the business process map, and an explanation of the business processes involved. A process fact sheet exists for every process group in a business process map.

The process fact sheet is a structured text document containing a description of the business context of the process group, all key information required to describe the process and a short description of the associated business processes and any process variants and sub processes these may have.

The already described predefined content documents (fact book, business process map, and process fact sheet) deal with the BPM topic from a general perspective and provide detailed information up to business process level only. Since a further layer of detail is required to model business processes, important processes were selected by SAP Consulting's industry and process experts in order to provide complete process descriptions as predefined content, too. Process descriptions are preconfigured, process-specific forms presented in tables. Their purpose is to facilitate the tasks of analyzing as-is processes and describing to-be processes. Taken together, the following 10 fundamental aspects provide a complete description of a business process:

- Aim and purpose

Why is the process executed?

- Objects

What objects are used, modified, and produced?

- Technology

What technology enables the process to be executed?

- Medium

What media are used to interact with the process?

- Process flow

Which processes come first and which follow?

- Organizational units

Which organizational units are responsible for executing the process?

- Roles

Which roles are needed to execute the process?

- Process owner

Who has main responsibility for the process?

- KPIs (key performance indicators)

How are the process and its results measured?

- Business rules

What business rules apply?

A short description with examples of these 10 aspects can be found in the following Fig. 2.2.

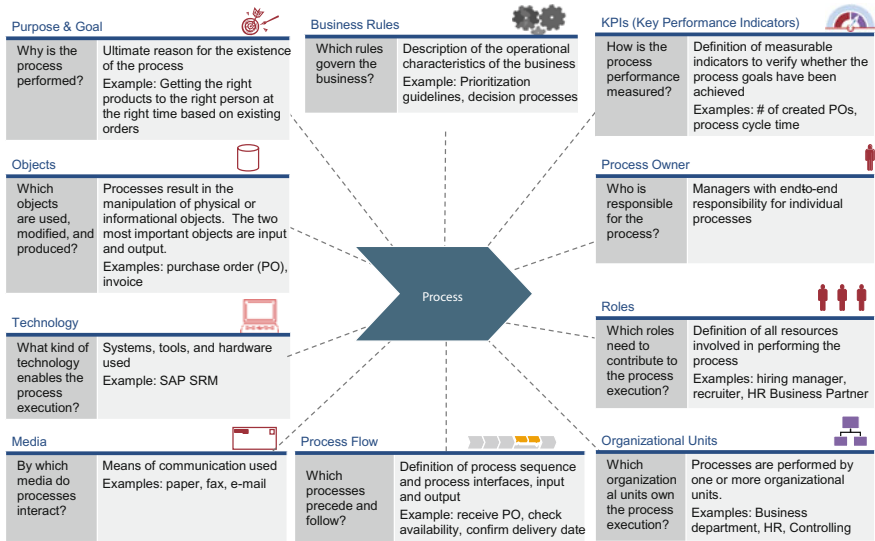


Fig. 2.2 Aspects of business process description

Each process description consists of two work areas. The first provides key organizational information about the process as well as an overview of the business process in the particular context. In conclusion, selected process characteristics are set out clearly (for example, aim and purpose, KPIs, and business rules) along with additional background information to support the analysis (for example, typical issues, SAP Consulting experience, and implementation options using SAP).

In the second work area, each process is analyzed and described step by step. Each process step is mapped to the IT solution and corresponding roles are allocated in accordance with the RACI method (Smith et al. 2005). RACI is an abbreviation for responsible (R), accountable (A), consulted (C), and informed (I).

The RACI method is used to describe which role is responsible for which activity and which other roles are involved. This produces a clear description of responsibilities at process level. The benefits of the RACI method are that it is straightforward, adaptable, and can be used at all organizational levels.

A RACI analysis typically involves the following steps:

- Break down the process into the individual steps.
- Enter the person(s) or groups at the top of the RACI segment on the work sheet.
- Identify and define the roles and responsibilities (enter the corresponding letter, that is, R, A, C, and I).
- Analyze the matrix for weak spots in respect of roles and responsibilities.
- Devise a target matrix depicting the ideal scenario.
- Derive a job description and document any required organizational changes/adjustments.
- Reach a consensus on the target model and detailed implementation.

The RACI process description shape may vary depending on project requirements. SAP Consulting project experience shows the benefits of process descriptions created by quite simple office tools like Microsoft Excel in order to provide quickly a first to-be process documentation (Fig. 2.3). In further steps it might be helpful to transform selected processes in graphical form using a notational and modeling convention, usually as event-driven process chains (EPC) (Scheer 2001) or Business Process Management Notation (BPMN) (Allweyer 2011). The graphical presentation is independent of the tool being used (for example, ARIS for SAP NetWeaver, Microsoft Visio, or Microsoft Powerpoint).

2.2.2.3 SAP BPM Methodology

Generic SAP Business Process Management Methodology

Depending on project type and specific requirements there are different procedures how to use the SAP Business Process Management Methodology. Usually process

Processing			Involved Roles				
Input	Processing	Output	Responsible Audit - Team	Lead Auditor	Audit Team Assistant	Approver	Auditee
Audit Decision							
Next audit plan need to be planned	Select suitable suppliers	List of suppliers	R				
List of suppliers with calculated risk factor	Generate audit records and audit plan	Audit plan generated (or enhanced) audit records assigned to audit plan	R				
Audit plan created (or enhanced) audit records assigned to audit plan	Select suitable audit records	List of selected audit records	R				
List of selected audit records	Generate GxP relevant audit plan document	Audit plan document	R				
Audit plan document	Initiate approval process	Approved audit plan document	R			C	
Approved audit plan document	Check-in audit plan document in DMS	Approved audit plan document in DMS	R				
Detailed Audit Planning & Scheduling							
Approved audit plan	Select suitable audit records	List of selected audit records	R				
List of selected audit records	Assign lead auditor per audit record	Lead auditor assigned per audit record	R	C			
Lead auditor assigned per audit record	Group audits by region/country and optimize planned audit schedule	Audits scheduled (planned)		R			
Audits scheduled (planned)	Check planned dates with auditee	Audit schedule checked		R			C
Audit record checked	Confirm audit schedule	Audit schedule confirmed			R		
Audit schedule confirmed	Update audit record	Audit record updated			R		
Audit record updated	Perform travel arrangements	Travel arrangements booked		I	R		I

Fig. 2.3 Process description example according RACI

optimization projects following the generic SAP BPM methodology can be split into following four phases: calibration, as-is analysis, to-be process design, and solution transformation (Snabe et al. 2008). These phases are integrated into the overall SAP implementation method ASAP 7.0. Result of those phases is a Business Blueprint. This generic procedure is typically used in such projects, when neither a corporate process governance nor a process understanding is available (Fig. 2.4).

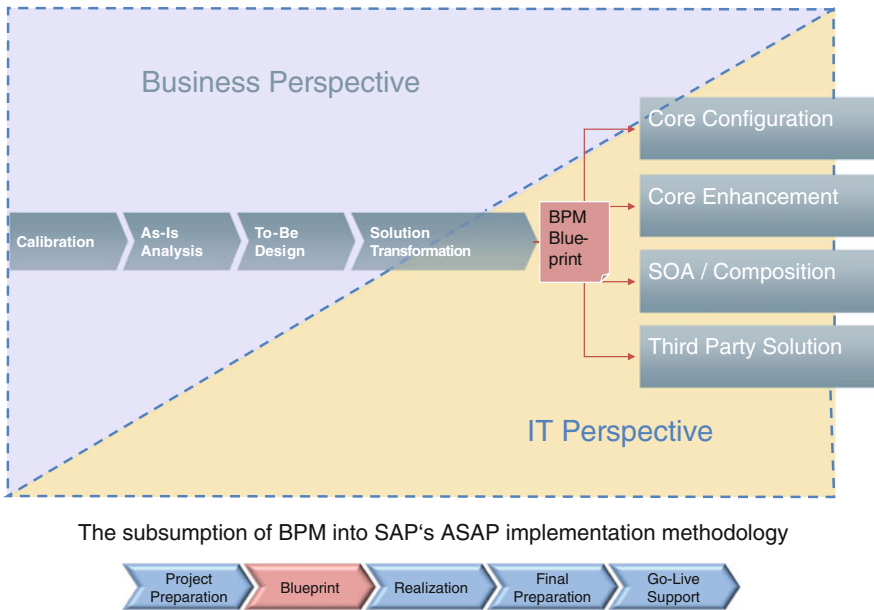


Fig. 2.4 Generic SAP business process methodology

The phases in detail:

1. The purpose of the calibration phase is to identify the business processes that are to be examined in detail. It features a comprehensive overview of the company's process landscape and the business success factors derived from the corporate strategy. On the basis of this information, criteria for evaluating business processes are defined and each process is assessed. The outcome of this phase is a prioritization of the processes to be analyzed.
2. The overall goal of the as-is analysis is to understand business reality and its weaknesses, and develop solution ideas in order to finally define optimized to-be processes. Understanding the business reality is a precondition for the later process optimization. The first step of the as-is analysis is to record relevant processes. Interviews and workshops are held to identify process steps and corresponding key performance indicators and process parameters. In a second steps process related weaknesses need to be determined and documented. Afterwards these areas should be analyzed more closely in order to identify root-causes and interdependencies. Based on identical causes the weaknesses shall be clustered and prioritized according to their potential for process improvement. This results in a list of most promising processes for to-be process design.

3. In the to-be process design phase initially concepts to eliminate the weakness cluster of the previous phase shall be developed and documented. Then appropriate to-be processes must be defined in order to realize the benefits from previous elaborated concepts. A precise description of all relevant process parameters is crucial. Defining to-be processes is an iterative procedure and the optimization potential shall be evaluated during this procedure by comparison of as-is and to-be processes. Usually such process changes also incorporate organizational adjustments. Therefore this phase results beside optimally defined and documented to-be processes in accompanying organizational changes.
4. The last phase, the solution transformation, deals with the construction of to-be processes within the IT infrastructure. IT systems, applications and services required to implement the to-be design shall be identified in the existing or a planned solution landscape. In an SAP environment the to-be processes will be mapped against corresponding standard software packages which results in following categories of SAP coverage:
 - Processes supported by core configuration,
 - processes supported by core enhancements (e.g. user exists),
 - processes supported by composite applications/enterprise services and
 - processes supported by non SAP solutions.

Finally a detailed target architecture is planned, and the required implementation, development, and integration steps are defined. In an SAP environment, the outcome corresponds to a SAP blueprint.

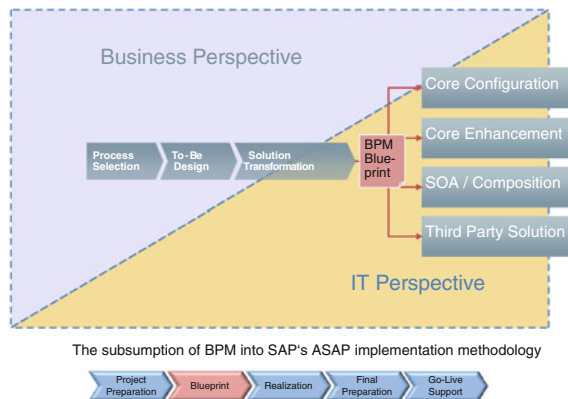


Fig. 2.5 Accelerated SAP business process management methodology

Accelerated SAP Business Process Management Methodology

Due to already mentioned efficiency reasons, i.e. to decrease project duration and implementation costs SAP Consulting provides an accelerated procedure of the BPM methodology (Fig. 2.5). This procedure utilizes ‘Business Best Practices’ related to business processes, i.e. industry-specific predefined process descriptions provided by SAP Consulting. Therefore the usually time consuming as-is analysis can be reduced in most instances.

The procedure for business process optimization is structured in the following three phases: process selection, to-be process design and solution transformation. Due to SAP’s overall approach to reduce implementation costs and time the accelerated procedure will be presented in more detail.

Process Selection

Similar like in the calibration phase of the generic procedure it must be determined which process areas shall be in the focus of the process optimization project. For this SAP Consulting provides predefined industry and process specific lists with typical process weaknesses. These typical weaknesses will then be checked in workshops for their relevance in the particular situation. The process areas with quite high optimization potential will then be in focus of the next phase.

Business Process Catalog - Life Sciences (Pharmaceuticals)				
Process Area (Level 1)	Process Group (Level 2)	Business Process (Level 3)	Subprocess (Level 4)	Process Step (Level 5)
05. Quality Assurance				
	05.03 Partner Qualification			
		05.03.02 Ongoing Audit Program		
			05.03.02.01 Audit Decision	
				05.03.02.01.01 Select suitable suppliers
				05.03.02.01.02 Generate audit records and audit program
				05.03.02.01.03 Select suitable audit records
				05.03.02.01.04 Generate GxP relevant Audit Plan document
				05.03.02.01.05 Initiate approval process
				05.03.02.01.06 Check-in Audit Plan document in DMS
			05.03.02.02 Detailed Audit Planning & Scheduling	
				05.03.02.02.01 Select suitable audit records
				05.03.02.02.02 Assign lead auditor per audit record
				05.03.02.02.03 Optimize planned audit schedule
				05.03.02.02.04 Check planned dates with auditee
				05.03.02.02.05 Confirm audit schedule
				05.03.02.02.06 Update audit record(s)
				05.03.02.02.07 Perform travel arrangements
			05.03.02.03 Audit Execution	

Fig. 2.6 Process catalog example (excerpt)

To-be Process Design

At the beginning of the to-be process design SAP Consulting provides a reference process catalog with typical processes for chemical or pharmaceutical companies (Fig. 2.6). This process catalog will be discussed with the business and the IT organization and if applicable adopted according to the specific enterprise situation. Purpose is here to establish a common understanding of the initial situation and project scope as well as a common language for further project activities.

One result of the reference process catalog comparison is an enterprise specific business process map. Due to the intensive discussions during the workshops all information is available that are required as an input for the individual to-be processes. Based on the specific business process map corresponding processes must be described in detail and compiled in a final version. Of course all to-be processes shall be documented using the three dimensions process flow, organizational and IT system view. During the creation of the process descriptions relevant key performance indicators and process parameters must be captured. The organizational view will be described by the involved roles and units as well as their responsibilities according to RACI.

Solution Transformation

In this phase the support of the to-be processes by means of IT resources will be designed. This procedure is identical with the generic one. Per process step relevant SAP components and functions are described. If applicable, a list of functional gaps and required enhancements will be assigned, too.

2.2.3 Summary

All methods, tools and elements used by SAP's Business Process Management approach to describe and illustrate the processes that occur in an industry, industry segment, or company area have been presented. With these tools and SAP Consulting's experience, which is documented in reusable form, potential process innovations can rapidly be identified and then transformed into a target concept (Fig. 2.7).

In a huge number of business transformation and process optimization projects the SAP Business Process Management approach contributes valuably by supporting companies in optimization of their processes towards Business Best Practices. The resulting to-be process documentation forms in addition the basis for the further transformation of these processes into an implementable realization within the SAP Business Process Platform.

Business Process Management within Chemical and
Pharmaceutical Industries

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