Bridging the Gap Between the Use of SAP ERP and BPM

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Abstract. Many companies use the standardised enterprise resource planning (ERP) software SAP and combine this with a business process management (BPM) approach. This use of SAP standard software specifies a variety of business processes that then influence the overall application of BPM. This article presents a final report of nine principles based on the experience of professional users in different companies. These principles can be applied in industrial companies as a process improvement technique to take full advantage of the use of SAP and the application of BPM.

Keywords: SAP; ERP; Enterprise Resource Planning; BPM; Business Process Management;

1 Introduction and Motivation

Both the use of SAP Enterprise Resource Planning (ERP) and the use of Business Process Management (BPM) promise to improve business processes. To achieve this goal, SAP offers standard business processes within its ERP software, while BPM has the general goal of improving business processes in an organisation. However, importantly, both operate and can be used independently.

Essentially, BPM and SAP have nothing to do with each other. BPM is an approach to defining and operating business processes in organisations and can be used without an IT system or any IT infrastructure [1]. However, in practice, most companies use IT software tools to administer the BPM of an organisation. Standard software such as SAP ERP can assist the behaviour of an organisation and their processes and make them more efficient.

SAP SE is a German company and the world's largest provider of enterprise application software; as of 2018, it serves more than 378,000 customers in over 180 countries [2]. The ERP system from SAP provides software solutions for the full range of business processes in companies, including manufacturing, sales, finance and human resource management, and is the de facto industry standard worldwide for many industries [3]. If the application of SAP and the given process is the industry standard for a company, then it seems very difficult to consider BPM as a holistic approach. A holistic BPM approach should not allow IT applications to dictate how processes should proceed [4], but in practice, IT systems such as ERP can influence a company's business processes [5].

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The objective of this article is to leverage SAP's influence and close the gap between using SAP ERP and BPM. Therefore, it presents nine principles for the successful and practical use of BPM and SAP ERP software. Through a variety of questions and techniques, a practical approach is demonstrated that does not make the application impractical. Based on the experience of professional users in different companies with many years of practical experience, this article illustrates how the use of BPM and SAP ERP software can be combined in practice and critically scrutinised.

2 Development

The development strategy uses triangulation [6] from various data sources and a cross-sectional snapshot study to examine the relationship between BPM and an SAP ERP system. The data collection was based first on eleven personal interviews conducted in Germany, Austria and Switzerland. All interviews were conducted with practitioners who have at least ten years of experience and work as process specialists in different industries and companies. Consequently, the interviewees handle SAP and BPM on a daily basis. A total of 14.5 hours of semi-structured interview data exploring practical experience were transcribed and constituted the first data set. The data of all interviewees were then compared, considered and checked with the help of the software tool MAXQDA. The transcribed interviews were analysed by the frequency of individual words and coded to identify relationships and generalisations. The explanations that were mentioned most frequently and that were considered as absolutely necessary by some experts resulted in findings that were identified as key statements from the interviews for the general collation of the topics. From the main results of the interviews, nine key points were identified and used to developed principles that the author considered to be the most important. The selection was also influenced by the author's experience of more than 15 years as an SAP consultant for various companies and industries.

As a second important step, a web survey was used to assess the general applicability of the developed principles and the general feasibility of the interview findings. Possible participants for this web survey were found principally through the German-speaking business network Xing. The intention was that experienced users in the BPM environment would come primarily from process consultants and process managers who handle SAP and BPM on a daily basis. Table 1 demonstrates that this group of participants took part, and 151 participants from different industries evaluated the principles. Each participant assigned himself to a predetermined position.

Table 1. Current position.

Position	*Quantity*	*Position*	*Quantity*
Consultant	68 participants	System User	8 participants
(Process-)Manager	44 participants	Other	25 participants
Researcher	5 participants	Not specified	1 participant

Potential participants also had experience in the surveyed areas of SAP and BPM. For this reason, they were asked how many years of experience they have in each area. Table 2 shows the average experience of all participants for each area.

Table 2. Years of experience.

Area	*Average years of experience*
SAP	12.41 years
BPM	9.37 years

The main purpose of the web survey was the clarification of the principles, and whether these principles would find support within the business practice. Therefore, all principles were assessed according to a Likert Scale approach [7], which asked whether the participant agreed with the principle or not using a four-point scale. Due to the even number of answers and absence of a mid-point, a participant was forced in one direction to agree or disagree [8]. Therefore, each respondent could classify each principle as follows:

☐ Agree Strongly ☐ Agree ☐ Disagree ☐ Disagree Strongly

In addition, it was possible to omit a question or answer 'don't know', but very few participants did so.

Figure 1 illustrates that all nine principles received between 79 per cent (principle 9) and 98 per cent (principles 3 and 6) acceptance and were rated by the participants with 'Agree Strongly' or 'Agree'.

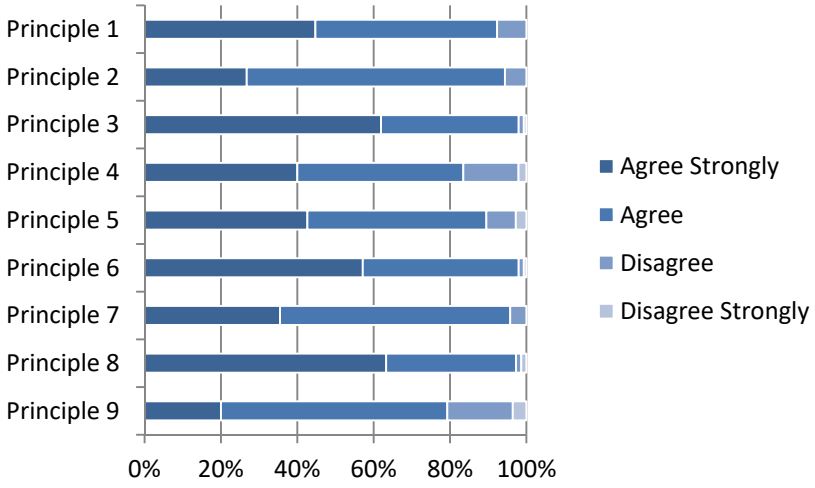

Fig. 1. Agreement with the principles

For each verified principle, it was also possible to leave a comment. On average, one third of the respondents commented on each principle in the web survey. These com-

ments were individually checked and used for the further development of the principles. Based on this development of interviews and the web survey, Section 3 of this article presents nine principles which can used to bridge the gap between the daily use of SAP and BPM, and observe the possible dependencies between both topics.

The following principles are a further development of the principles which were analysed by the practitioners in the web survey. All principles have been developed from the experience of SAP and process consultants who have been using the SAP ERP system and the BPM approach in practice on a daily basis for many years.

3 Principles

The interviews and web survey have confirmed that the SAP and BPM concepts are closely related. In practice, the SAP system is the leading ERP system in many companies and dominates many business processes.

Based on the key findings of the expert interviews and the web survey, the following principles have been developed for analysing the SAP usage within a BPM application. All principles summarise how a link between the topics can be analysed. The goal was to develop a simple method to illustrate the possible dependencies.

Not all of the listed principles are very closely related to a used SAP system. However, the interviewees recommended that some statements should always be clarified and elaborated upon if an SAP system is used. For this reason, the principles are divided into two categories:

General principles
There are general principles that are not directly related to an SAP system. However, these topics were extremely important to the participants, even if they were not directly influenced by an SAP system. Nevertheless, these principles could even be applied in a company without an SAP system.

SAP principles
With SAP principles, it is more obvious that these apply when an SAP system is used in a company. These principles are directly related to the SAP system.

All principles can be used as a basis for a company's considerations of how to ensure a successful connection between the use of an SAP system and the application of BPM. These principles are not meant to be comprehensive; rather, they are intended to prompt thinking about the connections and to subsequently develop them for specific environments, as appropriate. Overall, the following principles allow users to rethink the use of their SAP ERP system in a BPM environment.

3.1 General principles

Principle 1: Ensure that the concept and operation of process management is understood and owned by the senior management.

There should be support from, and the requirement of, senior management to be directly involved in the introduction of BPM. The motivation for increasing the BPM maturity has more influence if the top management is involved and demands a higher process maturity. The successful implementation of BPM is only possible if the top management demands this and a top-down approach is carried out in the company for the introduction and application of process management.

Principle 2: Establish a minimum level of maturity for each process in the company.
The company should decide for itself the minimum maturity level that should be attained. In practice, it is not conceivable to develop all processes up to the highest possible maturity. Each company should determine which process level should be reached from all processes as a minimum requirement and which processes should be developed to the maximum maturity. Therefore, a company should define important processes within the company. These processes should be developed to a very high process maturity. For example, quotas can be defined in the company, e.g. at least 80 per cent of all processes should reach a certain level of maturity and, for instance, use an IT system to store important information.

Principle 3: Establish a BPM team within the company that consists of different specialists who know the IT as well as the business requirements.
BPM is not a general IT topic and other departments should be involved and support the topic. For example, a process manager could be established for each main process who has ERP knowledge and knows the demands of the business. These employees must speak the IT language to formulate requirements, be able to influence the ERP system and have the expertise from the departments. That means that the BPM team must be the link between the IT and the people and must understand the IT and the business people. Team members need to be aware of what IT can do for them and what they need to handle their business.

Many BPM teams comprise stakeholders from various disciplines. A BPM team should include a specialist who understands the SAP system, as well as people who know the detailed company process flows. It can also be useful to integrate the HR department because process changes affect the people involved much more than the IT systems. IT should only support the BPM process improvement and should not play the main role in a BPM project. For this reason, it is important to integrate stakeholders from different areas and IT specialists together in one BPM team.

3.2 SAP principles

Principle 4: Ensure that management fully supports the use of SAP in the enterprise to the full extent if SAP is used as the main software of the organisation.
The use of an SAP ERP system within a company as the central IT software can be a strategic decision. In this case, a company should decide how to integrate this requirement into the BPM approach of the company. The interviewees declared that the

top management should be the trigger of the topic and promote it. Furthermore, the management must determine who decides possible solutions or any adaptations of an SAP system, and whether other systems besides the SAP system can exist. The first principle of whether the process management is supported by the senior management also applies here. The successful implementation of an SAP system is only possible if the senior management demands an SAP system and applies it within the company.

Principle 5: Establish as many SAP ERP standard processes as possible at the company in order to minimise the complexity of system upgrades or enhancements.

It is important to prioritise whether, and to what extent, the standard SAP processes should be used and when it is better to use self-defined solutions. The standard SAP processes are often the de facto standard for many companies and nobody scrutinises these processes. These standard SAP processes reduce the time, cost, resources and other operational constraints and support the introduction of new SAP enhancement packages or release changes. Each change makes it necessary to test one's own solutions and adjust the customer-specific programming to the changed SAP system. However, a BPM team should not accept processes as a given and must analyse which approach is better suited to them. Not all standard processes are the optimal solutions for every company, and a company should not submit to the IT system. Each company should regularly check whether IT innovations or new system improvements can lead to process changes. In practice, it is often difficult to decide whether a standard process or an individualised process should be used.

Principle 6: Ensure that all processes have been regularly documented, analysed and understood, even if they are pre-defined by the SAP system.

The use of SAP standard processes does not absolve a company from the duty to document, analyse and understand that process. A company should know exactly how its processes are running and not accept them as a given. An analysis of the pre-defined process must always be designed to enable a company to examine whether the standard process is usable or whether an individual process should be developed.

Technically, it is currently not possible to get a fast and actual process flowchart from an existing SAP system and observe how customising settings within an SAP system may change a process flow. Therefore, it is very important to understand and analyse these SAP processes in detail. This is the only method for avoiding correct or error-prone processes. An analysis of the pre-defined process must always be designed to enable a company to examine whether the standard process is usable or whether an individual process should be developed. The process is not optimal when data is only recorded because the SAP system requires these data and nobody analyses these values.

Principle 7: Establish a procedure that ensures that all interfaces are regularly analysed for their BPM relevance, regardless of whether they are used between different systems or to and from the SAP system.

Interfaces between different systems often offer an increased optimisation potential for process improvement. The practitioners have learned that, especially in the case of system breaks and interface connections, a large amount of data are transmitted in a different way to how they are requested and needed. Many departments have their own language and understand a term quite differently than other departments. For example, is it always clear when and who sets a reception date? Interface problems are often caused by people not speaking the same language. It could be helpful to agree a common language and know exactly which data is necessary for the end-to-end process. It is also important to analyse the standard interfaces, because the standard process may not be the best and most optimal process for the organisation.

Principle 8: Ensure that all teams within a company, especially the BPM team and the SAP team, develop the same processes and process maps and that only one process map exists within the organisation.

The situation in which different teams work independently on different process models must be avoided for time and budget reasons. SAP is a very powerful tool that communicates with many different systems, and it is not always easy to distinguish this system from other topics. It is crucial that different teams cooperate and avoid developing different worlds for almost the same requirement. It must be avoided that different process maps are developed because teams do not accept each other.

If a process map was already developed within a company, a BPM team should analyse, and if applicable also use, these maps. The situation whereby two different teams work independently on a process model for the company must be avoided. For this reason, the BPM team should consist of a variety of different stakeholders in order to determine in advance what knowledge is available in the company.

Principle 9: Ensure that all necessary key figures are generated directly from the SAP system if SAP ERP is the main system of the company.

The SAP system is often the leading financial system and provides many instruments for the generation and monitoring of KPIs. Many figures are already included in the SAP system, and the system provides many instruments for the generation and monitoring of KPIs. This may have grown historically, but it still offers advantages for the analysis, even if the BPM approach was later established within the organisation.

Many companies attempt to implement quick solutions and find it much easier to create an Excel or Access database for their analysis than to generate the numbers within an SAP transaction. However, SAP provides many predefined reports or could create measurements directly from the SAP database that are then more recent than an older Excel spreadsheet. Therefore, it could be much more effective to generate this data directly from the SAP system, even if the creation of the data requires more time for the first initial analysis. It may take longer to determine the required fields for a first analysis within the SAP system, but for frequent use, it is much faster to retrieve the numbers directly from the SAP system. The SAP Business Warehouse system should also be considered as an analytics tool because it can be a useful analysis system that imports and analyses data directly from the SAP database.

4 Conclusion

The previously described list of principles is not exhaustive and does not represent a ranking. These principles are developed mainly from the analysis of the research interviews and the feedback from the participants of the web survey, and they are considered to be important by the author.

A major objective was to present an approach, through a variety of questions and techniques, that does not make the implementation impractical. Already, the first presentation of the principles within a web survey has shown that their application is practicable but requires self-discipline. Furthermore, the web survey resulted in an additional development of the principles. The current status of this development was presented here. The simplicity of the question makes it possible for every company to decide for themselves how comprehensively each individual principle should be considered and developed.

The presented principles can be used as a form of advice or management guidelines for practising managers and other relevant stakeholders. The development of nine principles provides practical advice for all companies using SAP and BPM. The web survey demonstrates that the principles are accepted to a high degree and add value to practitioners working in the field. However, every organisation is different, and principles should always be evaluated and applied depending on the specific company context.

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