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Implementing BPM systems: the role of process orientation

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Abstract

Purpose – The presentation and validation of a checklist that can be used to determine an organization's process orientation prior to a business process management systems (BPMS) implementation. Its aim is to help predict the success of BPMS implementation on the basis of the identified process awareness within an organization.

Design/methodology/approach – The checklist has been developed on the basis of relevant literature and augmented with practical experience from staff of one of the world's largest BPM system vendors. The study of three BPM System implementations at different client sites have been used to validate the checklist.

Findings – The study suggests that a lack of process orientation may be related to all kinds of problems that affect the speed and cost of a BPMS implementation. The checklist seems useful to predict those problems at sites where process orientation is insufficient.

Research limitations/implications – The number of cases used (3) is quite small. Furthermore, the retrospective assessment of the situation prior to BPM system implementation limits the reliability of the findings. Current results seem a good basis for further refinement and validation.

Practical implications – A very practical, easy to use instrument that can directly be applied by organizations that are expected to be involved in multiple BPM system implementations (e.g. large banks, consultancies, system integrators, etc.).

Originality/value – This paper presents an instrument that does not yet exist to measure a relation often hypothesized upon in existing research.

Keywords Business process re-engineering, Measurement, testing and instruments, Organizational processes

Paper type Research paper

Introduction

Business process management systems (BPMS) may result in considerable rewards for the companies adopting them. Typical advantages are: reduced lead times, less hand-off errors, and more flexibility to change the structure of supported business processes. On the other hand, implementation of these types of systems can be a complex and time-consuming effort (Bowers *et al.*, 1995). Different factors influence the ease of and the success – if any – of a BPMS implementation.

One of the influential factors on implementation success that emerges from research, trade literature and practice is the level of process orientation within an organization (Parkes, 2002). BPMS's support the enactment of business processes that flow throughout the organization across departmental borders. Therefore, it may be essential that an organization's mindset is such that processes by themselves are

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deemed valuable to improve business performance. Otherwise, people may want to stay within their functional silo's, not care much about ongoing efforts of process discovery and mapping and altogether refrain from making a BPMS implementation a success. Using a similar argument, Davenport (1993) and Hammer and Champy (1993) have identified process orientation as an essential ingredient for successful process redesign and reengineering efforts within organizations.

This paper presents a checklist that can be used to determine an organization's process orientation prior to a BPMS implementation. Its aim is to help predict the success of BPMS implementation on the basis of the identified process orientation level within an organization. The checklist has been developed in cooperation with one of Europe's leading BPMS vendors and validated using the results from three implementation projects at client sites. To protect the interests of these clients who prefer to remain unnamed, we will merely refer to the vendor organization in this paper as "the BPMS vendor".

The organization of this paper is as follows. In the next section, we will present an overview on BPMS's, BPMS implementation factors, and the essence of process orientation. The overview is used to give the reader the necessary background for the remainder of the paper and explain its particular focus and assumptions. Then, we will explain our research methodology, followed by a presentation of the results and a discussion. The paper ends with our concluding remarks.

Background

BPM systems

A BPMS is typically described as a piece of generic software that supports activities such as the modeling, analysis and enactment of business processes. Depending on the source, the exact definition varies, especially with respect to the list of process-related activities it supports (e.g. compare Smith and Fingar, 2002; Silver, 2002; Delphi, 2001; Gurley, 2003; Sinur and Bell, 2003). In the research community, there is some consensus that the essence of a BPMS is the functionality that has been attributed historically to a workflow management system (WfMS) (van der Aalst *et al.*, 2003, p. 4). This view places the emphasis on a BPMS' capability of process enactment. Note that several vendors and market analysts for commercial reasons often postulate BPMS's as completely new types of systems, ignoring or downplaying their products' similarities with WfMS's (Reijers and Heusinkveld, 2004).

Taking a workflow-oriented perspective, a BPMS is seen as primarily taking care of the automatic allocation of work to qualified and authorized resources – humans and/or applications – in accordance with a predefined schema of the process, the available resources, and their dependencies (Jablonski and Bussler, 1996; Lawrence, 1997; van der Aalst and van Hee, 2002). Note that this implies that processes within an organization should be identified, analyzed and mapped before a WfMS can become effective. A BPMS extends the capabilities of the earliest generations of WfMS's by offering more sophisticated build-time and run-time diagnostic capabilities and wider capabilities for enterprise application integration and business-to-business integration (B2Bi). Existing commercial BPMS's are offered by companies such as TIBCO Software, FileNet, and Intalio. For the remainder of this paper, we will use WfMS's and BPMS's as synonyms, except when we cite sources that specifically refer to either label.

Implementation factors

At least since the often cited study of Bowers *et al.* (1995), it is clear that the introduction of a WfMS on the work floor is far from straightforward. Various researchers have contemplated the factors that cause the success or failure of a WfMS implementation (Trammel, 1996; Antonucci, 1997; Kobielus, 1997; Grinter, 2000; Stohr and Zhao, 2001; Parkes, 2002). In the literature, we distinguished the following categories of success and fail factors in WfMS implementation:

- technology;
- management;
- human; and
- process.

A pronounced technology perspective is adopted by Groiss and Eder (1997), who focus on a WfMS' capability to interoperate with other systems as a key to their successful implementation. Earlier, Georgakopoulos *et al.* (1995) had identified this capability as a particular weakness of the technology at the time. Basu and Kumar (2002) explain that in the context of volatile, dynamic e-business, interoperability will remain an important issue in WfMS implementation.

Kobielus (1997) too recognized that exploiting the interoperability capability is key in making a workflow project successful. He adds another technology factor, namely whether a chosen workflow solution is scaleable. In addition to these technology factors, he puts equal emphasis on management and human issues by suggesting to implement a WfMS in phases and to obtain support of upper management and staff. This attention for both management and human issues is also found with Antonucci (1997), Chaffey (1998) and Stohr and Zhao (2001). The lastly mentioned researchers suggest that the important reasons for the failure of workflow projects are similar to those undermining business process reengineering projects, e.g. poor change management, resistance from rigid bureaucratic organizations, and lack of sustained top management support.

Particular emphasis on the human (particularly the end-user) side of a workflow implementation is expressed in, for example, the earlier cited study by Bowers *et al.* (1995). In the reported case at establishment printers, the print staff did not feel that the introduced workflow technology supported their way of work. Grinters (2000) suggests that having developers experience the end-user work that they aim to support with the WfMS may elevate this kind of problem. The work of Poelmans (2002) primarily focuses on end-user acceptance as a factor in successful WfMS implementations. His case studies and interaction with some 200 end-users show that, among other factors, perceived ease of use and end-user influence are crucial in making a WfMS a success.

What appears to be a relatively recent perspective in explaining the successfulness of a WfMS implementation is the process dimension. In 2003, the Howe School of Technology Management conducted a delphi study among over 20 workflow researchers, users and vendors, asking them for critical factors in process automation (Zur Muehlen *et al.*, 2003). The named factors covered management ("management support" "top management focus"), technology ("selection of the right tools" "mature technology"), and human aspects ("effective communication with employees" "deep user participation") as could be expected on the basis of the previous expose. In addition, participants mentioned as critical factors "a process oriented approach to

application development" "process awareness at an early stage of the project" and "(organizational) understanding of process concepts". These aspects seem to hint at the capability or organization concept that should be in place before the actual implementation of workflow-related technology.

The recent trade press (Sinur and Thompson, 2003) also gives clues for the significance of a process attitude, by identifying "cultural aversion to process" as a caution sign for lurking BPMS implementation failure. In the only empirical testing study of implementation factors we are aware of (Parkes, 2002), process design issues were identified as the top group of problematic factors in WfMS implementation success.

To augment our literature study, we interviewed a group of ten employees (sales representatives, implementation managers, consultants, and the CTO Europe) from the BPMS vendor involved in this study. This resulted in a list of 17 critical success factors for BPMS implementation. Process orientation of the involved company ranked second in terms of the number of citations as an inhibitor to successful BPMS implementation (the ability to realize "quick wins" once the implementation of a BPMS started was considered as most important).

In conclusion, a wide variety of factors is seen as influential on the implementation success of WfMS's. We argue that these, with perhaps the exception of some earlier limitations of the technology, still apply for current BPMS's because of their essential similarities. Our literature study identifies a seemingly influential perspective in this arena that, without disqualifying the other ones as irrelevant, is taken as the focus of this paper. We derive from earlier findings that a lack of process orientation is an inhibitor to successful BPMS implementation. One may argue that this perspective has been known for some time, but formulated in different terms. For example, Grudin (1988) identified the disparity between those who will benefit from an application and those who must do additional work to support it as a reason for the failure of computer supported cooperative work applications. The sacrifice, however, of personal or departmental efficiency for the broader good of an effective process execution, is very characteristic for adopting a process orientation as well. We will review the latter concept and its relevance in the following section.

Process orientation

As a response to increasing competition and more demanding customers, various authors have suggested companies to put less emphasis on hierarchical and functional structures, but instead focus and improve on entire chains of business operations, ranging often from client to client. Davenport and Short (1990), being among the early propagators of this concept, explicitly articulated "process orientation" as a beneficial management practice. Furthermore, it became considered as an essential ingredient for successful reengineering and redesign efforts (Hammer and Champy, 1993; Davenport, 1993). Various other authors have referred to organizations that adopted this view as "the horizontal organization" (Bryne, 1993), "the process-centered organization" (Hammer, 1996), "the process enterprise" (Hammer and Stanton, 1999) or "process focused organizations" (Gardner, 2004).

It is sometimes difficult to see through the rosy images of process-oriented organizations (Hammer and Stanton, 1999). As noted by McCormack (2001) and Sussan and Johnson (2003), most literature on process orientation "has been in the popular press and lacks research or an empirical focus". Incidentally, researchers do present

the counter side of this management concept, such as Silvestro and Westley (2002) in their study of an electronics and retail company.

The study by Frei *et al.* (1999) can be seen as the first empirical support of the positive effect of process orientation on improved business results. Their study of financial service institutions suggests that process orientation can have a direct effect on customer satisfaction. Previous research on customer satisfaction demonstrates it positively affects market value and accounting returns (Anderson and Fornell, 1994; Ittner and Larcker, 1997), making to link to tangible business results complete. A wider study among 100 manufacturing companies by McCormack (2001) gives more direct evidence that process orientation helps companies to improve business performance, reduce inter-functional conflict and improve "esprit de corps". This study shows that smaller manufacturing companies tended to score better than larger ones. A later study by Gustafsson and Nilsson (2003) among 281 Swedish firms, also showed a direct impact of process orientation on customer satisfaction. In contrast to McCormack's study, the researchers found that the effect was apparent with large service organizations and almost absent for smaller services.

In today's business world, process orientation sounds like an attractive and effective organization mode for companies. There are positive indications that it directly and positively affects business results. Also, because it makes processes within an organization transparent it shapes an environment for improving operations through reengineering initiatives. The focus in this paper is on the added benefit of process orientation to BPMS implementation, as explained before. In the next section, we will clarify the used research methodology in the development of a checklist to determine an organization's process orientation. Although process orientation to some may seem as inescapable and beneficial, it is good to remember that for many professionals it is very different from the task fragmented, specialized and professional bureaucratic setting they still operate in (Buchanan, 1998).

Research methodology

Our research consisted of two phases:

(1) the development of a simple checklist to determine the level of process orientation within an organization; and

(2) a subsequent case study validation of the checklist's value to predict implementation success.

The respective instruments of checklist and case study will be elaborated in the remainder of this section. As will become clear, the feedback group of ten professionals from the BPMS vendor we mentioned in the previous section also played an important role in the validation and augmentation of the instruments, in this way adding an important practical dimension to findings from literature.

Checklist

The process orientation checklist has been designed in likeness of the Ergotool (van Rhijn *et al.*, 2002), which was developed to help employees assess the sociotechnical and ergonomic aspects of their daily work. Just like the traffic-light nature of the Ergotool, the process orientation checklist returns either a green, yellow, or red signal after it has been filled out by a single professional. "Green" refers to the situation where

an organization shows a sufficient level of process orientation to go ahead with implementation, "yellow" to a level where implementation problems may be expected, and "red" to a situation where the existing lack of process orientation would seriously jeopardize a successful implementation.

The conceptual model underlying the process orientation checklist is based on the process orientation definition by Davenport (1993, p. 5): "A process orientation to business involves elements of structure, focus, measurement, ownership and customers." The five mentioned elements, i.e. structure, focus, measurement, ownership, and customer are thought to formatively construct process orientation. A similar breakdown of elements has later been proposed by Hammer (1996) in his action plan for an organization to become process-oriented.

For each of the five elements of process orientation, a literature study has resulted in an analysis of its various aspects and suitable variables to make these aspects measurable. An evaluation of the distinguished variables by the members of the feedback group resulted in an additional variable, the "information systems architecture". This indicates the degree of integration between information systems, which was felt to indicate process orientation within an organization in a similar sense as other higher-weighing variables. The complete checklist is included as Appendix 1.

For each variable, a five-point Likert scale was developed that could be used to score it, ranging from A (lowest) to E (highest). In the development of the checklist, level E was defined first on the basis of ideal descriptions of process orientation with respect to that aspect. Then, the lower answer levels were derived in part by deduction and in part by using literature, until a level of complete absence of the aspect was established (level A). The distances were formulated such that they expressed equidistant levels.

Initial weights for all variables were determined on basis of their relevance given in literature. Three variables were given less weight than the others. McCormack (2001) found in his study that "use of process language" and "level of process documentation" were not highly related to process orientation. Furthermore, the existence of a functional (as opposed to a process-oriented) "organizational structure" does not necessarily mean the complete absence of process orientation (Hammer and Stanton, 1999). The feedback group was asked for comments on the answer categories and weights, which resulted in only minor textual changes and no different weights.

Next, for each distinguished variable the possible scores were classified into "red" "yellow" and "green" zones, indicating, respectively, an insufficient process orientation score, a questionable degree of process orientation, and a sufficient process orientation score. A scoring table was determined to relate a specific score to one of the traffic lights levels, assuming the correctness of the interval scale (see Appendix 2). Scoring all questions on level A results in a score indicating total lack of process orientation, i.e. the minimal "red" rating. The upper bound of the "red" rating scores is determined by the value that is obtained when answering each question with its highest possible "red" answer category (e.g. answer B for the question on process language). The other bounds were determined similarly. Scores were normalized, so that the checklist score expresses a percentage of maximal process orientation.

A summary of the checklist design is shown in Table I. The rightmost column indicates which score is considered to express a "yellow" level of process orientation; lower scores from A up to (but not including this) level are considered "red" higher scores are considered "green".

Elements (Davenport, 1993)	Distinguished variables	Sources for variable in process orientation	Primary source for levels of process orientation	Weight	"Yellow" answer category
Structure	Organizational structure	Hammer and Champy (1993), Armistead and Rowland (1996) and Hammer (1996)	Armistead and Rowland (1996)	1	B
Focus	Use of process language	Armistead and Rowland (1996), Hammer (1996), Nyström (1999) and McCormack (2001)	McCormack (2001)	1	C
	Level of process documentation	Harrington (1991), Hammer and Champy (1993), Nyström (1999) and McCormack (2001)	Hammer and Champy (1993)	1	C
	Utilization of process documentation	McCormack (2001)	McCormack (2001)	2	C
	Information systems architecture	Feedback group	Feedback group	2	C
Measurement	Level of process performance measurement	Harrington (1991), Hammer and Champy (1993) and McCormack (2001)	McCormack (2001)	2	C
Ownership	Existence of process managers	Hammer and Champy (1993), Hammer (1996), Armistead and Rowland (1996) and Nyström (1999)	Armistead and Rowland (1996)	2	B
Customer	Understanding of customer requirements	Harrington (1991), Davenport (1993) and Armistead and Rowland (1996)	Armistead and Rowland (1996)	2	C

Table I.
Process orientation checklist design

Case studies

The checklist has been retrospectively validated in three differentiated case studies. At each site, the checklist was used when the implementation was completed to determine the pre-implementation situation in retrospect. This outcome was then compared to the actual implementation success, established through semi-structured interviews with the same professionals. Retrospective validation is particularly used in software engineering to establish documented evidence that a system does what it purports to do based on a review and analysis of historic information (Kitchenham, 1996; Huber, 2001). In our case, it was preferred over more traditional approaches because of the inherent risk that a BPMS implementation would be stopped before any validation of the checklist would be feasible at all. To appreciate this threat, consider studies by Herrmann and Hoffmann (2005) and Reijers (2004) and where, respectively, five out of five and two out of six WfMS implementation projects under study did not deliver any WfMS implementation at all.

Organizations were selected from the client base of the BPMS vendor on the basis of the following criteria. In the first place, the implementation of the BPMS needed to be initiated and completed within the last two years, allowing for a reasonably reliable retrospective validation. Secondly, employees would have to be available that had knowledge of the supported processes both before and after the implementation of the BPMS. Thirdly, the organization would at the time of participation be able to assess the success of the implementation, both from the perspective of the project course and the implementation results. More specifically, we adopted the following definition of a successful BPMS implementation: the system is implemented in time and within budget and the pre-determined objectives of the business case have been fulfilled. This explains that the existence of both a project planning and a business case were crucial for the involvement of an organization. Finally, a balance was aimed for between organizations with varying degrees of success. Obviously, at the time of selection only rough indications of implementation success could be used.

The participation of four different organizations was solicited for, of which three responded favorably. The first organization, referred to as MSP from now on, is a fully independent service provider for mobile telecommunications and mobile internet solutions. The Dutch branch, which was involved in the study, employed approximately 700 people, served 1.4 million customers and achieved a turnover of €520 million in 2002. The international organization of MSP had a turnover of €2.5 billion in the same year. The focus of the BPMS implementation was the support of MSP's customer loyalty process, which delivers personalized discount offerings to new and existing customers. The main objective was to drastically reduce the lead time of bringing out "loyalty offers" in this way reducing "customer churn".

The second organization is an asset management group (AMG), which is a Dutch business unit of a multinational financial concern. AMG conducts independent research for financial advisors and private investors, resulting in reports in various forms, increasingly in a digital format. In 2002, it employed 60 people and had a budget of €12 million. It serves some 4 million end-users with investment advice. Their objective with the BPMS implementation was to reap more benefits from their earlier investment in setting up a document management system, in particular to be able to handle a growing number of electronic deliveries.

The third organization, to which we shall refer as RtB, is a major retail bank for the private and business markets in The Netherlands. It operates some 350 local bank offices and is active in areas such as insurance, investment, asset management and real estate. In 2002, it employed over 50,000 people and earned a net profit of approximately €1.4 billion. A BMPS implementation was part of a larger project to centralize the service deliveries taking place through new customer channels (e.g. the internet).

Within each case study, a business manager, an IT architect/specialist, an end-user, and a BPMS vendor consultant, all involved in the implementation project, were asked to fill out the checklist. The inclusion of these various disciplines was intended to obtain a balanced view on the BPMS implementation, which was expected quite possibly to differ across the various officers. Furthermore, several people were involved to improve the reliability of the retrospective findings. An organization's process orientation was then determined as the average value of the four individual process orientation scores. Note that the exact same make-up of representatives is also used by the BPMS vendor in so-called RAD sessions to identify and analyze the processes to be supported by a BPMS.

Immediately following the filling out of a checklist by a representative, each of them was interviewed. Interviews were conducted to obtain more insight into the following issues:

- The organizational situation in general as it was prior to the implementation and more specifically with respect to the issues of the checklist.
- The initial business case: why was the BPMS implementation started in the first place?
- The course of the implementation, as well as the implementation results in terms of the business case.
- The background of potential differences between opinions from people with various perspectives.

All interviews were recorded with permission of the interviewees and were subsequently transcribed. All transcripts were sent to the participants for verification and authorization, and received back. The used interview plan is included as Appendix 3. Before it was used, the plan had been pre-tested with three members of the feedback-group resulting in a somewhat different organization of questions.

Results

In Table II, the scores are presented that were established with the process orientation checklist for the three case studies. For each organization, the individual scores of each

Organization	Business manager	IT architect/ specialist	End-user	BPMS vendor consultant	Process orientation score
MSP	Yellow (48)	Yellow (60)	Yellow (64)	Yellow (42)	Yellow (53)
AMG	Red (14)	Red (4)	Yellow (34)	Red (14)	Red (16)
RtB	Yellow (39)	Yellow (39)	Yellow (65)	Yellow (29)	Yellow (43)

Note: Figures given in parentheses are percentage

Table II.
Process orientation scores using the checklist

of its employees and the involved BPMS vendor consultant are presented. Furthermore, the total process orientation scores are given as well.

As noted, interviews took place immediately following the filling out of the checklist. The interviews with the people involved with the BPMS implementation at MSP revealed that the determined project timeline was slightly exceeded (10-15 per cent), as was the budget (less than 5 per cent). The main reasons were some drawbacks during system development, as well as the unplanned inclusion of additional features and functionalities considered "nice to have". User acceptance was more problematic, as end-users initially expressed to be seriously impaired by the BPMS. End-user acceptance grew when they became more involved in updates and improvements. With respect to the business case, the initial objectives and targets set out by MSP have been realized. In particular, the number of loyalty offerings that can be delivered within the same amount of time with the same number of resources as before is increased almost tenfold.

At AMG, considerable problems occurred during the implementation of the BPMS. A poor fit of the BPMS within the existing architecture was recognized and integration with existing systems was found to pass with difficulty. Even now, technical problems are still being encountered, although on a much smaller scale. On a positive note, end-users were relatively satisfied with the system which they found easy to use. Budget and planning, however, were royally exceeded. The project was delayed with 9 months on an initial total of 12, and 30-40 per cent extra budget had to be allocated. Halfway the project, the systems integrator involved in the project was sent away and another party stepped in. From the business case perspective, the objectives to be able to route and send digital documents with more ease are fulfilled. It is expected that the used solution can be scaled up easily. A positive side-effect of the BPMS implementation is that four full-time equivalents of administrative processing work on these documents could be re-allocated to other processes within AMG.

The realization of the BPMS at RtB did not experience or induce major technical problems. Quite at the start of the project, however, an extension of the project planning with two more months took place. The initial planning had proved to be too ambitious given the speed of the project. Owing to the transition of local to centralized fulfillment just preceding the implementation, it also turned out to be difficult to comprehensively define the new process models for the new situation. Also, the combined introduction of new work procedures with a new support system was considered by some end-users as too much of a change at one time. All business case objectives were realized at the end of the (extended) project, notably a total change of the effective work procedure being enforced by the BPMS. Substantial (but unspecified) efficiency gains are also established, which were seen as positive "side-effects".

An overview of the results is given in Table III.

Discussion

In Figure 1, the process scores of the checklist from Table II have been ranked. It can be seen that the relative rankings of the process orientation scores within each category of professionals, quite accurately follows the relative rankings of the organizations as a whole. For example, AMG as a whole has the lowest process orientation score of all organizations and AMG's business manager's score is the lowest among the business

Table III. Overview checklist and interview results

	MSP	AMG	RtB
Objective	Reduce lead time loyalty offerings	Integrate with document management, scaleable solution	Centralize service processes and enforce new procedures
Nature of objective	Quantitative	Qualitative	Qualitative
Implementation carried out by	MSP and BPMS vendor	AMG, BPMS vendor and third party (replaced)	Mainly RtB, with limited BPMS vendor support
Main problems	System development, user acceptance	Integration of BPMS, cooperation third party	Define process models
Planning	Some delay (10-15 per cent)	Substantial delay (70-80 per cent)	"Planned" delay (15 per cent)
Budget	Slightly exceeded (<5 per cent)	Exceeded (30-40 per cent)	Realized
Implementation course	Moderately well	Poor	Moderately well
Implementation results	Good, main objectives realized	Good, main objectives realized, positive side-effects	Good, main objectives realized, positive side-effects
Process orientation score	Yellow (53 per cent)	Red (16 per cent)	Yellow (43 per cent)

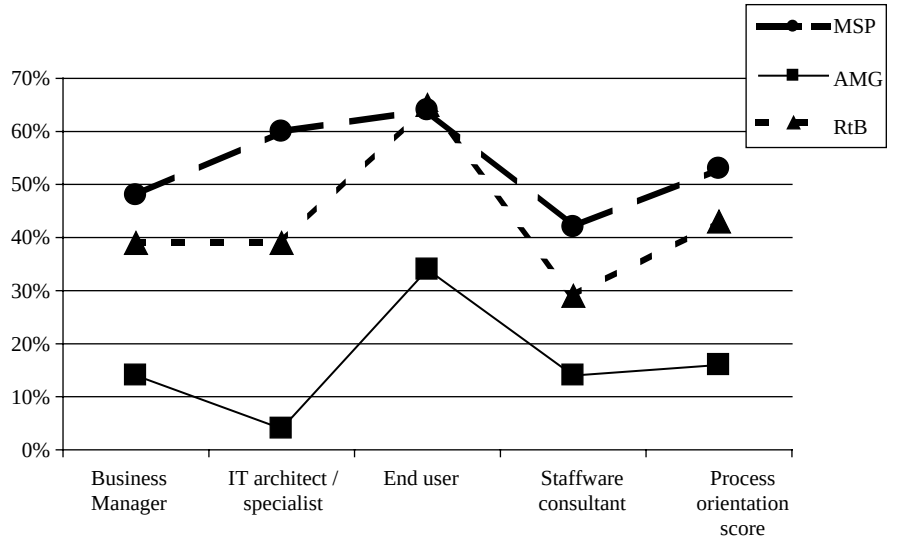

Figure 1.
Comparison checklist scores

manager's scores. Therefore, despite the limits of a retrospective approach, memories of officials at least seem consistent. It also seems to follow from this analysis that it does not matter much which type of official is asked to fill out a checklist, as long as the scores of the same category of officials are compared on a relative scale.

Quite interestingly, the end-user seems to systematically rate the level of process orientation higher than any other professional. We tend to believe that this results from an end-user's necessarily very local view on an organization's process organization. In the cases we report on, end-users' perception on process orientation may be biased positively by the local BPMS implementation taking place locally.

In two out of three cases, the BPMS vendor consultant is the one giving the lowest process orientation score, but in the case of AMG it is the IT architect/specialist. One could argue that the BPMS vendor consultant as an outsider has a limited view on an organization's process orientation. He or she may not see all process initiatives which are going on and ends up with too negative an opinion. In the case of AMG, the IT dimension of the implementation problems was so dominant, that it is not surprising the IT architect/specialist rates process orientation so low.

As a following step, it is interesting to consider the process orientation scores and the implementation results as established from the interviews (Table III). At first sight, it seems that the level of process orientation score agrees with implementation success, be it with one particular aspect of it: the course of the implementation process (i.e. planning and budget issues). Delay and budget problems were serious at AMG, where the process orientation score was indeed established as "red". These kinds of problems were much less substantial at MSP and RtB were process orientation was "yellow". But despite the "red" and "yellow" scores of the three involved organizations, they all achieved their business case objectives. We may ask ourselves: Does not process orientation affect the level of this aspect of implementation success at all? We think the correct answer is subtle. It seems that for all three organizations the fulfillment of the business case objectives was more important than overrunning and overspending the project plan.

Had the budgets and plannings be fixed, it seems unlikely that the business objectives in any of these cases were fulfilled. So, because the implementation's course and results are highly interrelated, we do believe to see clear signs process orientation and a broad interpretation of implementation success to be related.

As a point of critique on the accuracy of the checklist, one could argue that that the "yellow" case study scores resulting from the process orientation checklist may be too negative considering the implementation success of the MSP and RtB projects. After all, who would not gladly agree at the start of a project with a future overspending of at most 5 per cent? Perhaps we should conclude here that process orientation must rise above a certain threshold in order not to obstruct implementation success. Success factors such as management commitment, end-user participation, and communication may positively tip the balance, even when process orientation is not on "green". The real value of the instrument then seems to lie in its ability to support relative comparisons between different organizations process orientation, so that critical values of process orientation may be detected early.

Conclusion

This study resulted in a checklist to determine process orientation, based on insights from literature augmented with the experience of one of the largest BPMS vendors in the world. Process orientation is increasingly recognized in theory and practice as a significant factor affecting the ease and success of implementing a BPMS. Three case studies were used to validate the instrument, as presented in this paper. For each organization, professionals with different backgrounds and an involved BPMS vendor consultant used the checklist to determine an *ex post* assessment of an organization's initial process orientation. In semi-structured interviews, these people explained the actual course of the implementation, the problems encountered, and the degree to which business case objectives were accomplished.

On the basis of the results, we cautiously conclude that there is a relation between process orientation and BPMS implementation success. In particular, this study suggests that a lack of process orientation may be related to all kinds of problems that affect the speed and cost of a BPMS implementation. This is in line with findings from research where a lack of process orientation is seen as a major fail factor (Parkes, 2002), the trade press which warns for a lack of process awareness (Sinur and Thompson, 2003) and field experience with the involved BPMS vendor. Although in all three cases the business objectives were finally achieved, the relative degree of implementation problems across the organizations could be explained using a similar relative level of process orientation.

Clearly, this is a preliminary study with a small number of cases to support the validity of the checklist. Furthermore, the checklist only focuses on process orientation as a fail factor, which restricts its use as a comprehensive instrument to predict implementation success. On the other hand, it is simple and easy to use and seems to be able to identify a critical lack of process orientation. Its major merit lies in its offering as a preliminary instrument to be used and developed further by BPMS vendors and organizations implementing BPM technology alike. Then, the aim would be to get a better understanding of the factors underlying the ease and success of BPMS implementation, currently most notably – but in the end merely encompassing – process orientation. The vendor organization that we cooperated with to develop it, will

be using the checklist to assess the process orientation level prior to future implementations of their BPMS product. It is expected that particularly the relative scores of different organizations will be insightful to predict implementation problems and to take corrective measures accordingly. On the basis of a larger number of cases, it will become more comfortable to evaluate the link between process orientation and implementation success. We intend to report on this wider use when more data becomes available. Making the instrument available at this time is already thought to be beneficial to vendors, end-user organizations and researchers alike interested in the success of BPMS implementation.

An open matter at this time is the correct scope of a checklist instrument such as the one we developed. For the given checklist, the scope is the entire organization, but this perspective may not be the right one for organizations with quite diverse process-related experiences and practices. Obviously, one can easily imagine different business units of the same organization to perform very differently implementing a BPMS. Indeed, this is the same problem that researchers worldwide face in developing a business process maturity model for organizations: should such a maturity level be determined and/or measured on a process level, a departmental level or at an organizational level? It is one of the issues that will require further research.

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Appendix 1. Checklist process orientation

Variable	Answer categories
Category structure	
Organizational structure	A. The organization is characterized by functional departments
1. Which answer fits best to describe how the organization is organized?	B. The organization has functional departments. Some cross-functional activities are executed by teams (e.g. new product development)
	C. The organization has functional departments, but employees regularly participate in cross-functional teams
	D. Nearly all activities are executed by cross-functional teams, to which employees are being assigned
	E. The organizational structure can best be illustrated as a collection of processes. Functionally based "centers of excellence" support them
Focus	
Language	A. Employees talk about their own function and tasks
2. What terms do employees use when talking about their work or when communicating with each other?	B. Employees talk about the functions and activities of their department
	C. Terms like gaining input and delivering output are being used in conversations
	D. Employees talk in terms of them being a part in a process, together creating a product
	E. Employees on all levels of the organization talk in terms of processes, customers, teams, process performance, etc.
Documentation	A. No processes have been identified
3. To what extent are processes described and to what extent are these descriptions maintained?	B. The main processes are identified and named
	C. Several processes have been documented onto some level of detail
	D. Processes are mostly documented, onto several levels of detail, using text documents and/or graphical illustrations. The documentation is occasionally updated
	E. All processes are fully documented, using text documents, graphical models and/or dedicated software. Documentation is periodically updated
Utilization	A. Processes are primarily being executed on an *ad hoc* basis
4. To what extent is process documentation actually utilized?	B. Processes execution carried out according to "business routine"
	C. The actual way of working is based on the process descriptions, but frequently tasks are executed differently from the process descriptions

(*continued*)

Table AI.

Variable	Answer categories
	D. Processes are executed according to the process descriptions
	E. Processes are executed according to the process descriptions. If occasionally a process cannot be executed according to its description, this is a reason for reviewing the process description
Information systems	A. No or few tasks are supported by information systems
5. To what extent do information systems support the execution and control of tasks and processes?	B. Many tasks are individually supported by information systems
	C. All tasks are supported using information systems that are or can be integrated with each other
	D. Most information systems used are integrated with each other
	E. (Integrated) information systems support entire processes, controlled by a central system
Category Measurement *Performance measurement*	A. Performance measures are only related to employees
6. Please indicate which type of performance measures are commonly used at lower levels of the organization?	B. Task related measures, like task-associated costs, processing time
	C. Product related measures, e.g. throughput time, product costs
	D. All main processes are measured using key performance indicators on a frequent basis
	E. Key performance indicators are used for continuous monitoring and optimizing performance of all main processes
Category Ownership *Management*	A. There are no process owners (process managers) within the organization
7. To what extent is management based on processes?	B. Owners have been appointed for the main processes
	C. There are process managers with full responsibility, for several processes
	D. There are process managers with full responsibility and authority for all main processes
	E. There is a clear and strong ownership of all processes at any level in the organization
Category Customer *Customer requirements*	A. Customer requirements/satisfaction is only considered in terms of external complaints
8. To what degree are customer requirements understood and drive the organization?	B. Measures of customer requirements/ satisfaction are available from surveys
	C. There is a customer care policy that is widely published
	D. Continuous research on identifying and meeting individual customer needs is embedded in the organization
	E. Customer satisfaction information is fed back into the organization in a structural manner (to be used as management information)

Table AI.

Appendix 2. Scoring table checklist

Category	Category weight	Question	Question weight	Red	Yellow	Green
Structure	1	1	1	A → 0	B → 1	C → 2 D → 3 E → 4
Focus	1	2	1	A → 0 B → 1	C → 2	D → 3 E → 4
		3	1	A → 0 B → 1	C → 2	D → 3 E → 4
		4	2	A → 0 B → 1	C → 2	D → 3 E → 4
		5	2	A → 0 B → 1	C → 2	D → 3 E → 4
Measurement	1	6	2	A → 0 B → 1	C → 2	D → 3 E → 4
Ownership	1	7	2	A → 0	B → 1	C → 2 D → 3 E → 4
Customers	1	8	2	A → 0 B → 1	C → 2	D → 3 E → 4

Table AII.

Process orientation score
(the sum of all question scores/52) expressed as a percentage.

Question score
answer category value × category weight × question weight.
Red range process orientation: 0-20 per cent
Yellow range process orientation: 21-65 per cent
Green range process orientation: 66-100 per cent

Appendix 3. Interview plan case studies

Case: Date:
Interviewee: Location:
Current position:
Tape ID:

Introduction
This interview consists of two main parts:

- *Part I.* It focuses on the situation as it was before the BPMS was implemented. It is important that the questions are answered for the situation prior to implementation. The results obtained are used to verify the checklist results. By comparing, any errors, obscurities or misconceptions in the checklist can be identified, that lead to other (answer) results than were intended.
- *Part II.* Part two focuses on determining the implementation course and implementation success. Was the BPMS implementation according to plan, on budget, etc.? Based on this information the validity of the checklist will be determined, e.g. does the checklist provide an accurate diagnosis.

Procedure

- With permission, the interview is recorded; else only written notes will be taken.
- The interview will be transcribed.
- The interview notes will be presented to the interviewee for review.
- Remarks will be processes into final interview results.
- Recordings will at last be erased once the case studies have been completed.

Interviewee profile

(1) What was your function around the time the implementation of the BPMS took place?

(2) How were you involved in the project, what was you responsibility?

Checklist

(3) Is the purpose of the checklist clear? If not, please comment.

(4) Were the questions clear and easy to understand? If not, what changes would you suggest?

(5) Were you able to answer all questions (did you have access to the required information)?

Part I. Organisation prior to implementation of the BPMS

Project drivers.

(6) Can you (briefly) describe the problems that were the reasons for starting an improvement project?

(7) Can you describe/indicate the reasons why this solution was chosen and how this solution would solve the problems mentioned earlier?

(8) Were targets defined that where to be realized through the improvement project?

Organisation (checklist items)

(9) How did people talk about their work and regarding their position in the organization?

(10) How much insight do you think people had regarding seeing the "big picture" of organizational activities?

(11) How were processes and task documented at the time?

(12) How often were these descriptions reviewed?

(13) Were activities performed based on the (available) documentation?

(14) To what extent did information systems support execution and control of tasks?

(15) How would you describe the organizational structure prior to implementation?

(16) How would you describe the management structure at the time?

(17) Which kind of performance measures were used, can you provide some examples?

(18) To what extent did customer requirements drive the organization/organizational activities?

Part II. Implementation

(19) Who took care of the implementation, your company, the BPM vendor, a third party or a combination of these?

(20) Was a due date set for completion of the implementation project?

(21) Was this target met? If not, how big was the deviation (per cent)? Target met: skip the next question.

(22) What was the cause of the difference?

(23) Was there a predetermined budget for the project?

(24) Was the project finished within budget? If not, how big was the deviation (per cent)? Target met: skip the next question.

(25) What was the cause of the difference?

(26) What difficulties did you experience during the implementation? (Organizational, technical, social, etc.)

(27) Have the performance targets been realized, that were set regarding the initial problems?

Conclusive

(28) Would you like to make any additional remarks or corrections concerning the interview?

(29) Do you have any other comments?

I would like to thank you for your time and efforts.

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