

Business Process Management (BPM) – A Pathway for IT-Professionalism in Europe?

Jan vom Brocke

Abstract: *According to recent studies, there is a dramatic demand for IT education in Europe: EMPIRICA estimates an average of half a million IT professionals needed in Europe within the upcoming years. In December 2009 the so-called eSKILLS initiative was launched in order to stimulate measures in all member states. From an academic perspective, this development seems to call for an extension of educational programs in the field of computer science and information systems on the one side. On the other, this trend also underlines the necessity to maybe rethink such programs in light of in how far they actually meet the current business requirements in Europe. This discussion lies at the core of the EU-project TRICE in which various EU-partners are brought together in order to create and evaluate ideas and programs for future IT education. In this speech, I will highlight and give reason for the importance of Business Process Management skills. The newly founded Master Program in Business Process Management at the University of Liechtenstein (MSc BPM) serves as an example for how such a program may be designed. A fruitful discussion may arise as to in how far process thinking may be set in relation to further pathways to IT professionalism in Europe.*

Key words: *IT Professionalism, Business Process Management, e-Skills.*

INTRODUCTION

There is a dramatic need for IT professionalism in Europe. Already in 2007 it was estimated that there are 4.2 million ICT practitioners in the EU and that approximately 180 million people are using ICT at work [2]. Just in the years between 1998 – 2004, a study on the supply and demand of e-skills reported an increase in the estimated number of employees IT practitioners of about 48% [13]. Apart from ICT being the basis for most business transactions today, studies indicate that also 40% of the productivity in growth in Europe are induced by ICT [6]. According to the e-skills monitor of the EU, an estimate of half a million IT professionals is needed in Europe in the upcoming years [5].

However, these studies also indicate the demand for a particular kind of qualification, which we see in competencies on how to design and manage business processes. This focus is special in at least two directions: First, it is the focus on “technology in use” rather than an inventing new technology. No doubt, new technology will always play a vital economic role but to a large extend of our modern economy – and from a regular company’s perspective – it is the efficient and effective use of technology in business processes that matters most. To this extend, IT professionalism neither calls for pure computer science nor for pure business administration but rather the linking bridge between both disciplines. Hence, people are needed that can understand both worlds, understand business related questions and IT-related solutions at the same time and who can intermediate between different people to be involved in solutions. This already indicates the second speciality: a second interlinkage between theory and practice. As a result, universities need to educate students not only to understand complex phenomena but also to act accordingly in practice. Apart from factual knowledge, this requires to a large extent methodological and social skills that re-needed in order to interact with people from different backgrounds on innovative IT-enabled solutions.

A recent review of CIO’s by Gartner [7] confirmed the significance of BPM. For the fifth year in a row, the study „Meeting the Challenge” confirmed competencies of improving business processes to be the priority number one among CIOs worldwide [7]. At the same time, very few companies actually succeed in managing their business processes right. Accordingly, Hammer resumes in his latest article that “despite its elegance and power, many organizations have experienced difficulties implementing processes and process management” [9]. However, very few study programs at our universities actually account

for this demand. With this study, we want to characterize the concept of business process management as a means for IT professionalism. Against the background of a deeper understanding of BPM we would like to take a specific Master Program of BPM as an example, in order to show how BPM can be taught at our universities. We present a real life program, introduced by the University of Liechtenstein in 2008 and discuss directions for future work in the field.

THE CONCEPT OF BUSINESS PROCESS MANAGEMENT

BPM can be characterised from different conceptual perspectives. To give a first impression, we would like to look at it as the missing link between IT and Business. A simple picture describing this role is given in Fig. 1.

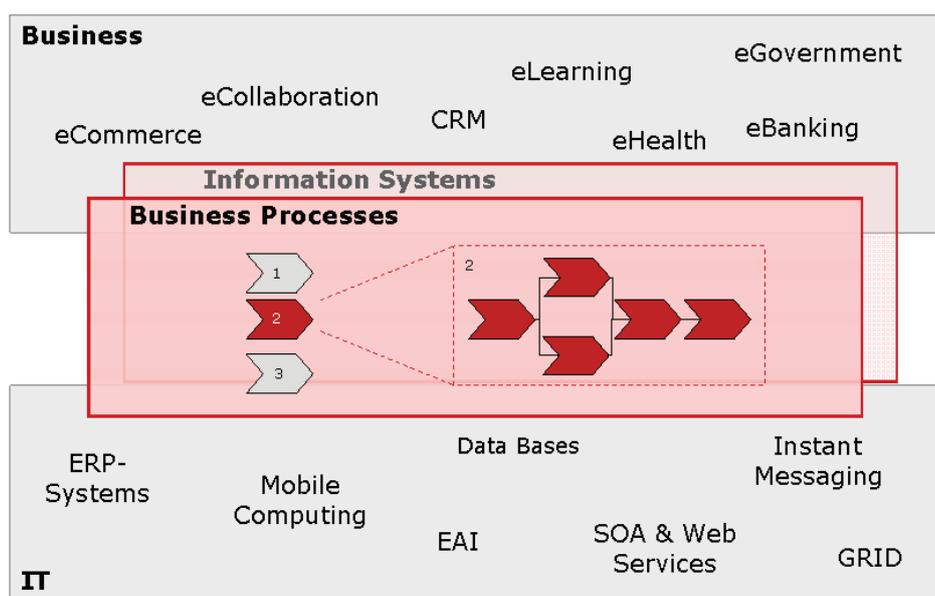


Fig.1. BPM as an Approach for IT Business Alignment

Without a doubt there are great achievements stemming from IT, such as integrated databases that have revolutionised information and process management in corporations worldwide. However, we can also learn from history about the effects of overestimating the economic potentials of IT. We did see this very clearly using the example of the new economy that led to one of the world's most serious economic crises. But still today, we see new technologies rocketing up very likely to be overestimated, such as Service-oriented Architectures, Software as a Service, Enterprise Mashups, or Cloud Computing. Actually, the development illustrated here, also finds empirical proof, looking for example at the Gartner Hype Cycle Analysis [8] that indicate a certain pattern of technology going through a certain "peak of inflated expectations" followed by a disillusion and then hopefully reaching a plateau of productivity. Business, at the same time, tends to underestimate the efforts related to making use of new technology in a sustainable manner. Very often, we see conventional disciplines such as "commerce", "banking", "government" relabelled to "eCommerce", "eBanking" and "eGovernment", with little substantially changed but the intention of making use of new technology, particularly the internet.

What is needed is a linking layer that – to our belief – can well be provided by BPM. From this perspective, BPM is about a differentiated look on certain business areas enabling us to specifically choose IT devices, finding the most effective and efficient ways

of integrating them, as well as identifying challenges and opportunities for business transformation. For example, in customer relationship management, different channels of customer interaction can be identified and detailed according to standard operating procedures. This puts us into the position of specifically choosing at what particular stage of the process and for what particular purpose, for example, mobile devices may be of use for the process.

But what is the particular beauty of business process management? To our mind, this is the concept of process thinking, meaning to think in terms of specific work steps leading to a certain value for a customer. The beauty is that such work steps are literally everywhere. They even happen when they are not managed. So, from this perspective, you cannot avoid processes. It is only a matter of identifying, managing and innovating them to the best service for the organisation. Fig. 2 gives a rough picture of the pattern of process thinking.

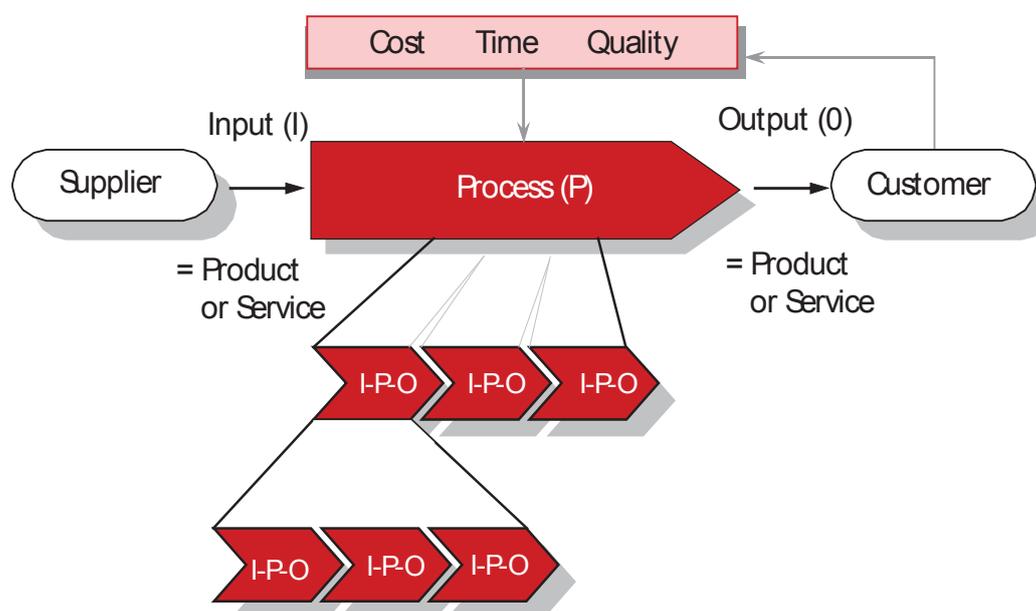


Fig.2. BPM and the “Process Pattern”

Processes can be perceived as transitions, transforming certain input-objects into output-objects such as products or services. Requirements for this transformation are derived from the customer perspective and, ideally, also specified as operational targets for the transformation, often structured by target dimensions such as time, cost and quality. The transformation itself is conducted by people following certain work steps and applying a certain technology aiming at a maximum of customer satisfaction. The particular beauty of process thinking now comes in as this pattern can be applied to various units of analysis. In particular, the pattern can be transferred both horizontally and vertically within a company. Horizontally, we see that units are acting as suppliers to customers and at the same time also act as customers towards their own suppliers. In this regard, requirements articulated by final customers are literally traced back in the entire value chain until the very first supplier. Looking at these entire value chains is very often referred to supply chain management. In particular, with today's requirements in mind in terms of sustainable businesses, such tracing back the working conditions and emissions not only within one company but within the entire value chain becomes of major importance. Apart from the requirements derived from the overall end-to-end process, they can be drilled down to each single sub-unit that itself can be perceived as a process. This

brings in the concept of so-called internal customer-supplier-relationships that are essential for achieving business excellence in process-oriented organisations nowadays.

Indeed, establishing a process-oriented company turns out to be still a challenge for most companies [9]. Hence, profound competences are required leveraging the integrating power of BPM. Research on BPM maturity models helps to get an overview of the multifaceted discipline. In Fig. 3, a model illustrating the six core elements of BPM [15] is displayed that has been derived from empirical studies on BPM maturity (see [3, 4, 10, 11, 16]).

Strategic Alignment	Governance	Methods	Information Technology	People	Culture	Elements
<ul style="list-style-type: none"> • Process Improvement Plan • Strategy and Process Capability Linkage • Process Architecture • Process Output Measurement • Process Customers and Stakeholders 	<ul style="list-style-type: none"> • Process Management Decision Making • Process Roles and Responsibilities • Process Metrics and Performance Linkage • Process Management Standards • Process Management Controls 	<ul style="list-style-type: none"> • Process Design and Modeling • Process Implementation and Execution • Process Control and Measurement • Process Improvement and Innovation • Process Project and Program Management 	<ul style="list-style-type: none"> • Process Design and Modeling • Process Implementation and Execution • Process Control and Measurement • Process Improvement and Innovation • Process Project and Program Management 	<ul style="list-style-type: none"> • Process Skills and Expertise • Process Management Knowledge • Process Education and Learning • Process Collaboration and Communication • Process Management Leaders 	<ul style="list-style-type: none"> • Responsiveness to Process Change • Process Values and Beliefs • Process Attitudes and Behaviors • Leadership Attention to Process • Process Management Social Networks 	Capability Areas

Fig.3. The Six Core Elements of BPM [15]

The model distinguishes six core elements critical to BPM. These are Strategic Alignment, Governance, Methods, Information Technology, People, and Culture.

- **Strategic Alignment:** BPM needs to be aligned with the overall strategy of an organisation. Strategic alignment (or synchronization) is defined as the tight linkage of organisational priorities and enterprise processes enabling continual and effective action to improve business performance. Processes have to be designed, executed, managed and measured according to strategic priorities and specific strategic situations (e.g. stage of a product lifecycle, position in a strategic portfolio). In return, specific process capabilities (e.g. competitive advantage in terms of time to execute or change a process) may offer opportunities to inform the strategy design leading to process-enabled strategies.
- **Governance:** BPM governance establishes appropriate and transparent accountability in terms of roles and responsibilities for different levels of BPM (portfolio, programme, project, operations). A further focus is on the design of decision-making and reward processes to guide process-related actions.
- **Methods:** Methods in the context of BPM are defined as the set of tools and techniques that support and enable activities along the process lifecycle and as part of enterprise-wide BPM initiatives. Examples are methods that facilitate process modelling or process analysis and process improvement techniques. Six Sigma is an example for a BPM approach that has a set of integrated BPM methods at its core.

- **Information Technology:** IT-based solutions are of significance for BPM initiatives. With a traditional focus on process analysis (e.g. statistical process control) and process modelling support, BPM-related IT solutions increasingly manifest themselves in the form of process-aware information systems PAIS. Process-awareness means that the software has an explicit understanding of the process that needs to be executed. Such process awareness could be the result of input in the form of process models or could be more implicitly reflected in the form of hard-coded processes.
- **People:** People as a core element of BPM is defined as individuals and groups who continually enhance and apply their process and process management skills and knowledge in order to improve business performance. Consequently, this factor captures the BPM capabilities that are reflected in the human capital of an organisation and its ecosystem.
- **Culture:** BPM culture incorporates the collective values and beliefs with regards to the process-centered organisation. Although commonly considered a 'soft-factor', comparative case studies clearly demonstrate the strong impact of culture on the success in BPM [4]. Culture is about creating a facilitating environment that complements the various BPM initiatives. However, it needs to be recognised that the impact of culture-related activities tends to have a much longer horizon than activities related to any of the other five factors [23].

A CURRICULIM FOR BPM-EDUCATION

BPM requires skills from various disciplines. Apart from Business and IT, the six building blocks of BPM show that also people- and culture-related skills are needed to leverage the integrating power of BPM. Looking at today's study programs at University, we rarely see such a wide coverage of relevant disciplines. The few programs considering BPM cover BPM in single courses or modules. In these programs BPM is mostly limited to modelling activities and languages of processes, such as BPMN (Business Process Modeling Notation), ARIS (Architecture of Integrated Information Systems) or UML (Unified Modelling Language) sometimes combined with technical issues of Workflow Management and customising of ERP-Systems (Enterprise Resource Planning). However, looking at the six core elements of BPM, we see that this covers merely one third of the capabilities needed to successfully implement BPM in a company. Going back to where we started in this article, we can also say that only looking into methods would actually not account for the characteristics of today's IT professionalism.

Due to the interdisciplinary nature of BPM, the competences required can hardly be covered sufficiently in one course or module of a study program neither in computer science, information systems nor business administration. On the contrary, there is a specific need to develop specifically shaped study programs for business process management. Such a program has been developed at the University of Liechtenstein. The program has been developed according to the Bologna Process and is accredited by internationally perceived institutions as a Master of Science in Business Process Management (MScBPM). In 2008 the first students from more than 15 member states of the EU entered the program, of which the first students will graduate in summer 2010. As part of the ERASMUS Mundus programs Lot 11 and Lot 14 also an increasing number of students from outside of Europe are now appointed to the program.

The curriculum of the program is displayed in Fig. 4 and will be briefly illustrated in the following [19].

The program is structured by means of core modules, support modules and special interest models. Core modules represent essential steps in BPM, namely:

- **Business Process Analysis:** The program starts by delivering competences in analysing business problems according to a process-oriented way of thinking. Here, a wide variety of modelling techniques is subject to the course. Apart from standard methods for conventional business processes a focus lies on considering different context situations of process analysis [14]. Hence, both highly standardised and highly creative areas are differentiated, for example, calling for a special set of methods [18]. Also, in addition to teaching the method, emphasis lies on techniques and experiences on how to apply them in practice. This for example includes different techniques of inquiry.

1st semester 30 ECTS	Business Process Analysis (10 ECTS)	Systems Modeling (5 ECTS)	Business Statistics (5 ECTS)	Design Science Research (5 ECTS)	Immaterial Property Rights (5 ECTS)
2nd semester 30 ECTS	Business Process Implementation (10 ECTS)	Systems Development (5 ECTS)	Operations Research (5 ECTS)	Human Resources and Relations Management (5 ECTS)	International Economics and Politics (5 ECTS)
3rd semester 30 ECTS	Business Process Management (10 ECTS)	Collaborative Business (5 ECTS)	Risk and Security Management (5 ECTS)	Business Intelligence (5 ECTS)	Topics in IS Research (5 ECTS)
4th semester 30 ECTS	Master Thesis Business Process Engineering (30 ECTS)				

Fig. 4. Curriculum of the MSc in BPM at the University of Liechtenstein

- **Business Process Implementation:** For one thing, students know how to come up with to-be models for a specific business problem, they then learn how to implement these processes properly [21]. In terms of technical implementations, we use SAP as a role model for standard software products. Students can obtain an internationally perceived certificate from SAP (TERP10) on top of their diploma [17]. Business Process Implementation, however, does not only comprise technical implementation. Also organisational challenges of implementing new processes are subject to the module. Hence, apart from ERP Systems also Change Management plays an essential role [1].
- **Business Process Management:** Once processes are implemented, continuous activities for monitoring and measuring processes have to be tackled. Hence, in this module mechanisms of analysing the performance of processes lie in the focus. This comprises both the evaluation of running processes and the evaluation of potential process redesign [20]. While the former show a rather good coverage in management accounting, the latter is still highly under-researched. Here, we apply methods from investment accounting in order to evaluate the return on investment (ROI) of alternative process designs [22]. Apart from financial measures, we widen the scope towards sustainability thinking. Hence, we enable our students to also consider the ecological and social consequences of process management in order to prepare for sustainable business.

In parallel to the core modules, support modules provide in-depth knowledge on special skills required for different tasks in BPM such as analytical skills in maths (e. g. Operations Research), people-related business (e. g. Human Resource Management) or methodological skills in academic work (e. g. Design Science Research). In addition, also

modules aiming at widening the scope are included here, such as international economics and politics, comprising courses in e. g. in intercultural communication. Apart from support modules also modules for special interest are included in positions for the third semester. These courses aim at focusing on special fields of interest currently of major interest in practice (e. g. Collaborative Business or Risk and Security Management). In order to capture most current issues, also a seminar on topics in IS research is included that is updated on a yearly basis.

As to the didactics, large amounts of the program are thought following principles of action learning. For this purpose students engage in practical projects by means of so-called project seminars that are also subject to research as part of the TRICE project. In these seminars, students are actively involved in practical work conducted at local organisations. In addition to projects in cooperation with large scale companies, such as the Hilti Corporation, also social work is conducted with the students. For instance, in the winter term 2009/10 a process analysis has been carried out together with 20 students helping a therapist school in Liechtenstein. These courses are essential for the students to learn how to apply their knowledge in a real life setting. In addition, these projects are highly appreciated by the industry and recognised by the local media and the government.

CONCLUSIONS AND FUTURE WORK

To our practical experience, the Master Program in BPM proves successful. Students from the program enjoy a high reputation of employance. So far, there is an employability of 100% and students usually enter attractive positions in companies already during their studies. There are fellowship programs initiated by the local industry to financially support students to come abroad in order to enter the Master Program in BPM such as the Hilti Fellowship Program [12].

One may argue that BPM might be a trend. To our belief, however, BPM is rather a core competence that has been relevant in the past and that will remain (and increase) its relevance. Its core principles, subject to this educational program can well be traced back to a plethora of modern management approaches, such as Quality Management, Business Process Reengineering and Operations Management just to name a few. As IT becomes more and more a commodity, we can even expect competencies of flexibly combining solutions according to business process needs to be of growing and sustaining importance in the future.

Another concern might be the broadness of the educational program. It is, therefore, recommendable, to our knowledge, to build BPM education on a profound first education, such as a bachelor program. This could either be a bachelor in information systems, business administration, computer science or engineering. Hence, the aim is a rather "T"-shaped education with the BPM program helping to both broaden the scope and also to integrate different subject areas as required in practice.

So, finally, coming back to the overall theme of this article, we can conclude that BPM is indeed a pathway to IT professionalism. In addition, since products and services become more and more standardised, it may also be process leadership that might lead to competitive advantage and thus sustain profitable growth in Europe. That said, we can indeed imagine further pathways to IT professionalism in Europe which will be fascinating to further export in the future. To that extend, we hope that our perspective from BPM may well serve as a starting point for further discussion.

REFERENCES

[1] A. M. Aladwani, "Change management strategies for successful ERP Implementation," *Bus. Process Manage. J. (BPMJ)*, vol. 7, no. 3, pp. 266-275, 2001.

- [2] CEPIS (2007). Thinking Ahead on e-Skills for the ICT Industry in Europe, February, 2007.
- [3] B. Curtis, J. Alden and C. V. Weber, (2004). The Use of Process Maturity Models in Business Process Management. Borland Software Corporation. [White Paper].
- [4] T. de Bruin, "Business Process Management: Theory on Progression and Maturity," Ph.D. dissertation, Queensland Univ. of Techn., Brisbane, Australia, 2009.
- [5] Empirica (2009). After the crisis, the e-skills gap is looming in Europe. [Online]. Available: <http://www.eskills-monitor.eu>
- [6] EUCIP Programm (2008). Competitiveness and Innovation Framework Programme (CIP). [Online]. Available: <http://ec.europa.eu/cip>
- [7] Gartner (2009). Meeting the Challenge: The 2009 CIO Agenda.
- [8] Gartner (2010). Gartner Hype Cycle Analysis. [Online]. Available: http://www.gartner.com/it/docs/reports/asset_154296_2898.jsp
- [9] M. Hammer, "What is Business Process Management?" in *Handbook on Business Process Management: Introduction, Methods and Information Systems (International Handbooks on Information Systems)*, vol. 1, J. vom Brocke and M. Rosemann, Eds. Berlin et al.: Springer, 2010.
- [10] P. Harmon, *Business process change: A Manager's Guide to Improving, Redesigning, and Automating Processes*. Amsterdam, Boston: Morgan Kaufmann, 2003.
- [11] P. Harmon. (2004). *Evaluating an Organisation's Business Process Maturity*, viewed 18th June 2007 [Online]. Available: http://www.bptrends.com/resources_publications.cfm
- [12] Hilti Fellowship (2010). Hilti Fellowship Program in Business Process Engineering. [Online]. Available: http://www.hilti.com/holcom/page/module/home/browse_main.jsf?lang=en&nodeId=-8468, 30.05.2010.
- [13] Rand Europe (2005). The Supply and Demand of e-Skills in Europe, September 2005.
- [14] J. Recker, M. Rosemann, M. Indulska and P. Green, "Business Process Modeling: A Comparative Analysis,". *J. of the Assoc. for Inform. Syst.*, vol. 10, no. 4, pp. 333-363, 2009.
- [15] M. Rosemann and J. vom Brocke, "The Six Core Elements of Business Process Management," in *Handbook on Business Process Management: Introduction, Methods and Information Systems (International Handbooks on Information Systems)*, vol. 1, J. vom Brocke and M. Rosemann, Eds. Berlin: Springer, in print.
- [16] Rummler-Brache Group, "Business Process Management," in *U.S. Firms Today (A study commissioned by Rummler-Brache Group)*, Mar. 2004.
- [17] SAP (2010). TERP10 - SAP ERP - Integration of Business Processes [Online]. Available: [http://www.sap.com/services/education/catalog/globaltabbedcourse.epx?context=\[\[TERP10||095|G\]\]](http://www.sap.com/services/education/catalog/globaltabbedcourse.epx?context=[[TERP10||095|G]])
- [18] S. Seidel, "Toward a Theory of Managing Creativity-intensive Processes: A Creative Industries Study,". *Inform. Syst. and e-Bus. Manage.*, accepted for publication.
- [19] University of Liechtenstein (2010). Master of Science in Business Process Management, MScBPM. [Online]. Available: <http://www.hochschule.li/GraduateSchool/MasterStudium/BusinessProcessEngineering/tabid/204/language/en-US/Default.aspx>
- [20] J. vom Brocke, J. Recker, and J. Mendling, "Value-oriented Process Modeling: Integrating Financial Perspectives into Business Process Re-design," *Bus. Process Manage. J. (BPMJ)*, vol. 16, no. 2 (in print), pp. 333-356, 2009.
- [21] J. vom Brocke, B. Schenk and C. Sonnenberg, "Classification Criteria for Governing the Implementation Process of Service-oriented ERP Systems - An Analysis

based on New Institutional Economics,” presented at the Business-IT Alignment - Trends im Software und Servicemarkt Systems (AMCIS 2009), San Francisco, CA, 2009.

[22] J. vom Brocke, C. Sonnenberg and A. Simons, “Value-oriented Information Systems Design: The Concept of Potentials Modeling and its Application to Service-oriented Architectures,” *Bus. & Inform. Syst. Eng.*, vol. 1, no. 3, pp. 223-233, 2009.

[23] J. vom Brocke, M. Petry, T. Sinnl, B. Ø Kristensen and C. Sonnenberg, “Global Processes and Data. Learning from the Culture Journey at Hilti Corporation,” in *Handbook on Business Process Management: Strategic Alignment, Governance, People and Culture (International Handbooks on Information Systems)*, vol. 2, J. vom Brocke and M. Rosemann, Eds. Berlin: Springer, in print, 2010.

ABOUT THE AUTHOR

Univ.-Prof. Dr. Jan vom Brocke, Martin Hilti Chair of Business Process Management, Department of Information Systems, University of Liechtenstein, Phone: +423 265 1300, E-mail: jan.vom.brocke@uni.li