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Handbook on Business Process Management 2

Strategic Alignment, Governance, People and Culture

2nd Edition

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Editors

Handbook on Business Process Management 2

Strategic Alignment, Governance, People and Culture

Second Edition

Springer

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to my wonderful wife Christina and our lovely kids Moritz and Marieke

from Jan

to Louise, Noah and Sophie – with love

from Michael

Foreword to the 2nd Edition

The *BPM Handbook* brings the thought leaders around the globe together to present the comprehensive body of knowledge in Business Process Management (BPM). The first edition summarized the work of more than 100 of the world's leading experts in the field in 50 chapters and two volumes. Following the structure of BPM's six well-established core elements—strategic alignment, governance, methods, information systems, people, and culture—the *BPM Handbook* provides a comprehensive view of the management of processes using an enterprise-wide scope. After more than 5,000 hard copies sold and more than 60,000 single chapters downloaded, we are overwhelmed by and grateful for the positive reception of this book by BPM professionals and academics. Today, the BPM handbook ranges among the top 25 % most downloaded eBooks in the Springer eBook Collection.

Since the first edition was published in 2010, BPM has further developed and matured. New technologies provide new process design options. For example, in-memory databases afford new opportunities in the form of real-time and context-aware process execution, monitoring, and mining, and social media plays a vital role in embedding business processes in corporate and wider communities. At the same time, new challenges, such as increased demand in process innovation, process analytics, and process agility, have emerged. These and other organizational developments have expanded the status and the possibilities of BPM and motivated us to conduct a detailed review, update, and extension of the *BPM Handbook*, the second edition.

The structure of this second edition still centers on the six core elements of BPM while incorporating new topics and providing substantial revisions in the areas of theoretical foundations of BPM, practical applications to real-life scenarios, and a number of updates in order to reflect the most current progress in the field.

The new chapters address recent developments, such as in-memory technology and social media, as well as cases that show how BPM can be applied to master the contemporary challenges of process innovation, agility, and sustainability. We learned from our readers that introductory chapters to the six core elements of BPM are useful, as are advanced chapters that build on rigorous BPM research.

Therefore, we added a number of chapters to provide such introductions to the work on process frameworks, process simulation, process value, process culture, and process technologies. In the process, we welcomed a number of BPM experts to our team of authors, including Anna Sidorova, Jerry Luftman, and Hasso Plattner and their respected co-authors.

Some parts of the Handbook remain untouched, such as the contributions from Michael Hammer and Geary A. Rummler, who both passed away in 2008. Their thoughts remain and will always be inspirational for the BPM community.

We are grateful to the many people who worked enthusiastically on making the second edition of the *BPM Handbook* possible. In particular, we thank Christian Sonnenberg, from the Institute of Information Systems of the University of Liechtenstein, who brought order and discipline to the first edition and who has again been instrumental in the editorial process of the second edition. His strong commitment to this Handbook has been a critical factor in its success. We also thank Christian Rauscher from Springer for his strong support of this second edition and all of the authors for the significant time and effort they invested in writing and revising their chapters.

We trust that this consolidated work will find a wide audience and that this updated and extended edition will further contribute to shaping the BPM field as a management discipline.

May 2014 Jan vom Brocke
Vaduz, Liechtenstein/Brisbane, Australia Michael Rosemann

Foreword to the 1st Edition

Business Process Management (BPM) has emerged as a comprehensive consolidation of disciplines sharing the belief that a process-centered approach leads to substantial improvements in both performance and compliance of a system. Apart from productivity gains, BPM has the power to innovate and continuously transform businesses and entire cross-organizational value chains. The paradigm of "process thinking" is by no means an invention of the last two decades but had already been postulated by early economists such as Adam Smith or engineers such as Frederick Taylor.

A wide uptake of the process paradigm began at an early stage in the manufacturing sector, either as a central principle in planning approaches such as MRP II or as a factory layout principle. Yet, it took an amazingly long period of time before the service industries actually recognized the significance of processes as an important organizational variable. The ever increasing pressure in the ultimate journey for corporate excellence and innovation went along with the conception of a "process" as a unit of analysis and increasingly appeared in various disciplines.

As part of quality management, the critical role of process quality led to a plethora of process analysis techniques that culminated in the rigorous set of Six Sigma methods. In the information technology discipline, the process became an integral part of Enterprise Architectures and conceptual modeling frameworks. Processes became a "first class citizen" in process-aware software solutions and, in particular, in dedicated BPM-systems, formerly known as workflow management systems. Reference models such as ITIL or SCOR postulated the idea of best (process) practices, and the accounting discipline started to consider processes as a controlling object (Activity-Based Costing). Universities are now slowly starting to build Business Process Management courses into their curricula, while positions such as business process analysts or chief process officers are increasingly appearing in organizational charts.

However, while the role of processes has been widely recognized, an all-encompassing discipline promoting the importance of process and providing integrated BPM methodologies has been lacking for a long time. This may be a

major reason why process thinking is still not as common as cost awareness, employee focus, or ethical considerations.

BPM is now proposed as the spanning discipline that largely integrates and completes what previous disciplines have achieved. As such, it consolidates how to best manage the (re-)design of individual business processes and how to develop a foundational Business Process Management capability in organizations catering for a variety of purposes and contexts.

The high demand for BPM has encouraged a number of authors to contribute and capture different facets in the form of textbooks. Despite a substantial list of references, the BPM community is still short of a publication that provides a consolidated understanding of the true scope and contents of a comprehensively defined Business Process Management.

It has been our motivation to fill the gap for a point of reference that reflects the holistic nature of BPM without compromising the detail. In order to structure this Handbook, we defined BPM as consisting of six core factors, i.e., Strategic Alignment, Governance, Methods, Information Systems, People, and Culture. These six factors had been derived as part of a multiyear global research study on the essential factors of BPM maturity.

We now present a Handbook that covers these six factors in two volumes comprising more than 1,500 pages from over 100 authors including the world's leading experts in the field. Different approaches of BPM are presented reflecting the diversity of the field. At the same time, we tried to provide some guidance, i.e., by means of the six core elements, to make it easy to open up the various facets of BPM according to individual preferences. We give further comment on that in the "how to read this book" section.

Both volumes together reflect the scope of BPM. Each volume has been organized to have its own focus. The first volume includes the introduction to BPM and concentrates on its Methods and Process-Aware Information Systems. The second volume captures in three sections: Strategic Alignment, Governance, and People, and Culture. Both volumes combine the latest outcomes of high standing BPM research with the practical experiences gained in global BPM projects.

This first volume is clustered in three sections.

1. A set of five introductory chapters provides an overview about the current understanding of the aims, boundaries, and essence of BPM. We are particularly proud that we were able to secure the contributions of the global BPM thought leaders for this critical section.
2. The second section is dedicated to the heavily researched area of BPM Methods covering, in particular, process lifecycle methods such as Six Sigma and the essential role of process modeling in 12 chapters. Further, complementary chapters discuss process simulation, process variant management, and BPM tool selection.
3. The third section covers Process-Aware Information Systems and elaborates in nine chapters on the foundational role of workflow management, the agility that results from service-enabled business processes and the new potential related to the uptake of recommender systems or collaborative networking tools.

We are very grateful to the outstanding, carefully crafted, and responsibly revised contributions of the authors of this Handbook. All contributions have undergone a rigorous review process, involving two independent experts in two to three rounds of review. The unconditional commitment to a high quality Handbook required, unfortunately, in some cases, rejections or substantial revisions. In any case, all authors have been very responsive in the way they addressed the requested changes. We are very much aware of the sum of the work that went into this book and cannot appropriately express our gratitude in the brevity of such a foreword.

While producing this Handbook, the authors' enthusiasm was truly interrupted as we in the community were confronted with and saddened by the tragic loss of two of the most inspirational BPM thought leaders the world has seen. Michael Hammer, founder of the Business Process Reengineering discipline and maybe the most successful promoter of the process paradigm, passed away in September 2008. Shortly after, Geary A. Rummler, a pioneer in terms of the role of business process as part of the corporate search for organizational performance, died in October 2008. We are honored that this Handbook features some of the last inspirations of these two admirable individuals; we also recognize that the BPM community will be a poorer place without them.

A special expression of our gratefulness goes to Karin-Theresia Federl and Christian Sonnenberg, Institute of Information Systems, University Liechtenstein, who brought order and discipline to the myriad of activities that were required as part of the compilation of this Handbook. We hope that this Handbook on Business Process Management will provide a much appreciated, sustainable summary of the state of the art of this truly exciting discipline and that it will have the much desired positive impact for its future development and uptake.

June 2010 Jan vom Brocke
Vaduz, Liechtenstein/Brisbane, Australia Michael Rosemann

How to Read this Handbook

This book brings together input from BPM experts worldwide. It incorporates a rich set of viewpoints all leading towards an holistic picture of BPM. Compiling this Handbook, we did not intend to force all authors to go under one unique doctrine. On the contrary, we felt that it is rather the richness of approaches and viewpoints covered that makes this book a unique contribution. While keeping the original nature of each piece, we provide support in navigating through the various chapters.

- *BPM Core Elements:* We identified six core elements of BPM that all authors are using as a framework to position their contribution. You will find an introductory chapter in volume 1 of this Handbook explaining these elements in detail.
- *BPM Cross-References:* We asked each author to thoroughly read corresponding chapters and to include cross-references to related sections of the BPM Handbook. In addition, further cross-references have been included by the editors.
- *BPM Index:* Both volumes have a detailed index. In order to support a maximum of integration in each volume the keywords of the other volume are also incorporated.
- *BPM Who-is-Who:* We added an extended author index to each volume serving as a who-is-who. This section illustrates the individual background of each author that might be helpful in contextualizing the various contributions to the BPM Handbook.

We truly hope that these mechanisms help you in choosing the very the chapters of this BPM Handbook most suitable for your individual interest.

Contents

Part III People and Culture

Part I
Strategic Alignment

BPM must be aligned with organizational strategy in order to ensure BPM's relevance and contribution to the corporate long-term priorities. Strategic alignment is not necessarily a unidirectional undertaking in the sense that a BPM strategy must be oriented toward the corporate strategy; successful BPM can also shape corporate strategy when innovative process designs or improved process performance provide an opportunity for BPM to be a competitive differentiator. In addition, BPM has proven to be a powerful means by which to innovate business models in a great number of cases, such as through the creative appropriation of IT.

While the significance of strategic alignment is widely acknowledged, its operationalization often remains a challenge in BPM initiatives, and it remains a largely open question in the BPM community. Since there is often a gap between the overall strategy and the more operational issues of process operations, how we can demonstrate the strategic relevance of process-related initiatives or ensure strategy-supportive process design is a central issue.

In the opening chapter of this section Jerry Luftman introduces the field of strategic alignment by presenting the concept of strategic alignment maturity. Based on a thorough understanding of the role of process in strategic alignment, Luftman distinguishes five levels of strategic alignment maturity and six alignment maturity criteria and discusses measures by which to overcome gaps in alignment. Subsequently, Luftman presents an approach to measuring the strategic alignment maturity of an organization and reports on the results from 362 global companies across four continents that have gone through the assessment. After deriving a six-step-process on how to increase strategic alignment maturity, Luftman closes the chapter with a report on research that validates the contribution of strategic alignment maturity (SAM) to company performance based on the data gathered from the 362 organizations.

In the second chapter in this section, Roger Burlton focuses on the challenges of strategic alignment in BPM, referring to the problem of being "Lost in Translation." Burlton begins by unfolding the nature of this problem and provides specific methodological support for strategically aligning BPM. The approach also provides a framework for the subsequent chapters, which examine the various strategic

options BPM offers. The study from Mathias Kirchmer focuses on innovation and agility as cornerstones of many corporate strategies and discusses the role of process automation as a means by which to leverage these objectives.

Key to strategic alignment is the value assessment of Business Process Management initiatives. Jan vom Brocke and Christian Sonnenberg report on this stream of research that has emerged over the past years. After a thorough discussion of the concept of value, the authors present several methods as examples of how to assess the strategic value contribution of process-related work, including the return-on-process transformation as an effective performance measure. Along these lines, Markus Brenner, André Coners, and Benjamin Matthies introduce the concept of process capital management and illustrate the approach by means of a real-life example from Lufthansa.

In order to implement the strategic objectives, the "right" processes have to be dealt with in the "right" way. Frameworks are needed for this purpose to facilitate the selection of process and action. In the sixth chapter Constantin Houy, Peter Fettke, and Peter Loos introduce business process frameworks. The article analyzes and systemizes the various facets of process frameworks, describes and explains the classes of business process frameworks, and presents a number of exemplary process frameworks. Then business process reference models (as one prominent class of process frameworks) are presented in more detail. The seventh chapter by Chris Aitken, Christine Stephenson, and Ryan Brinkworth discusses how organizations can build on business frameworks in order to classify company-specific processes. Their results are summarized in a comprehensive framework that may serve as a starting point for developing an individual corporate process schema. Case studies from the health sector and the investment management industry, in which the framework is used to align descriptions of organizational behavior to produce useful integrated behavioral reference models and unified process model sets, are described. Their contribution shows that process frameworks must be individualized for an organization's specific context (e.g., products, customers, competition). Drawing from empirical studies, Tobias Bucher, David Raber, and Robert Winter present a taxonomy of BPM approaches to support choosing the right BPM approach for the specific contextual situation of an organization. The chapter concludes with a practical application of the approach.

The performance assessment of processes plays an important role in managing existing processes. Drawing from management accounting and performance measurement in particular, Diana Heckl, Michael Leyer, and Jürgen Moormann provide an overview of contemporary approaches to process performance measurement and apply process mining, as an example, to real case data to demonstrate the approaches. Given the attention big (process) data and related analytics have recently attracted, Michael zur Muehlen, and Robert Shapiro's chapter introduces business process analytics. The authors show how data generated by PAIS can be used for the cost-effective, real-time assessment of processes.

The strategic focus on corporate performance is increasingly constrained by conformance requirements that make process design a balancing act between performance and conformance. The contribution by Shazia Sadiq and Guido

Governatori addresses the management of business processes regulatory compliance. The authors describe a methodology for aligning business and control objectives, homing in on the role of BPM as a driver in achieving regulatory compliance.

Considering the various strategic implications of BPM initiatives, management must make decisions about the alternative BPM initiatives to be implemented by ranking initiatives according to their strategic contribution. The chapter by Wasana Bandara, Alain Guillemain, and Paul Coogans provides an overview of methods for prioritizing process-improvement initiatives and reports on related practical experiences in the financial services sector, rounding off the section on strategic alignment in BPM.

1. Strategic Alignment Maturity
   by Jerry Luftman
2. Delivering Business Strategy Through Process Management
   by Roger Burlton
3. Management of Process Excellence
   by Mathias Kirchmer
4. Value-Orientation in Business Process Management
   by Jan vom Brocke, Christian Sonnenberg
5. Process Capital as Strategic Success Factor
   by Markus Brenner, André Coners, Benjamin Matthies
6. Business Process Frameworks
   by Constantin Houy, Peter Fettke, Peter Loos
7. A Framework for Classifying and Modeling Organizational Behaviour
   by Chris Aitken, Christine Stephenson and Ryan Brinkworth
8. A Taxonomy of Business Process Management Approaches
   by Tobias Bucher, David Raber and Robert Winter
9. Process Performance Management
   by Diana Heckl, Michael Leyer, and Jürgen Moormann
10. Business Process Analytics
    by Michael zur Muehlen and Robert Shapiro
11. Managing Regulatory Compliance in Business Processes
    by Shazia Sadiq and Guido Governatori
12. Prioritizing Process Improvement: An Example from the Australian Financial Services Sector
    by Wasana Bandara, Alain Guillemain and Paul Coogans

Strategic Alignment Maturity

Jerry Luftman

Abstract Strategic Alignment is one of the six core elements of BPM. In this chapter, an introduction to Strategic Alignment is given. Against the background of foundations on IT-Business Alignment, several important insights are provided for the strategic alignment in BPM. A maturity model is presented in order to assess different levels of capabilities based on key criteria to evaluate alignment maturity. Also, results from a global empirical study are presented and discussed in the light of BPM.

1 Introduction

The global importance of alignment has remained on the top of information technology surveys for almost three decades. Alignment addresses both how IT is aligned with the business and how business should or could be aligned with IT. Consequently, strategic alignment is also one of the six core elements of BPM (Rosemann and vom Brocke 2014). Terms such as harmony, link, fuse, fit, match, meld, converge, interwoven, and integrate are frequently used synonymously with the term alignment (perhaps a reason why alignment has been so evasive). Whatever term you prefer, it is a persistent/pervasive problem that demands an ongoing process to ensure that IT and business strategies adapt effectively and efficiently together. Perhaps most important is recognizing that there is significant research available that demonstrates the relationship of alignment to firm performance (Luftman 2007; Luftman et al. 2011). More specifically, successful alignment ensures that organizations can create value out of their IT assets by furnishing these assets in a way that supports business processes according to business strategy (vom Brocke et al. 2014). Figure 1 illustrates this relationship and also indicates the

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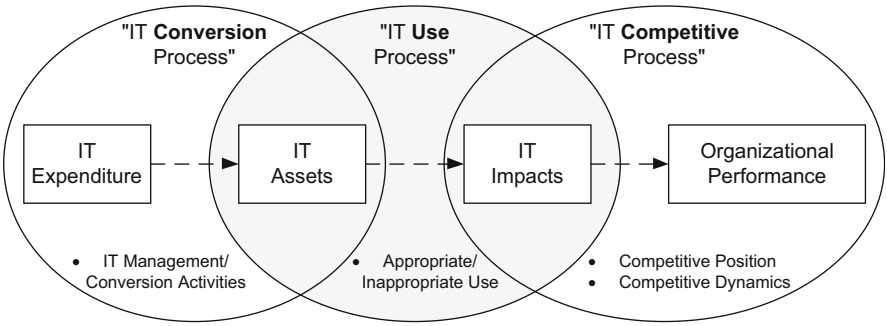


Fig. 1 How IT creates business value (Soh and Markus 1995, p. 37)

relationship between business process management (BPM) and IT business alignment.

Mature IT business alignment requires a mature "IT use process", i.e. business processes with well-defined requirements regarding IT support. Therefore, business process management translates between the business side and the IT side via the definition, execution, and control of "IT use processes" (vom Brocke et al. 2012). Mature IT business alignment also contributes to successful BPM (Luftman 2007) since it facilitates the management of "IT use processes" and thus increases the potential to translate IT investments into business value. In this regard, IT business alignment can be understood as being essentially a BPM task that primarily addresses both the strategy and the technology dimension of BPM (see the chapter on the six core elements of BPM in this handbook by (Rosemann and vom Brocke 2014) without neglecting governance, methods, people, and culture dimensions (see discussion below). Given the significance of IT business alignment maturity for BPM the question is how alignment maturity can be measured and how it emerges?

This chapter presents a Strategic Alignment Maturity (SAM) assessment tool that was developed from the author's work since 2000 (Luftman 2007; Luftman and Kempaiah 2007b; Luftman 1997, 2000). SAM, which has been applied globally by organizations of all sizes, evaluates six components (and 41 factors) of an organization to identify an alignment maturity score and more importantly specific opportunities to improve the IT business relationship will be elaborated on in this chapter. As an introduction, the six components (Communications, Value Metrics, Governance, Partnership, Technology Scope, and Human Resources) for assessing alignment maturity along with the 41 specific criteria/factors measured for each component are illustrated in Fig. 4 (X axis). Also illustrated in Fig. 4 are the average overall scores and the differences in the scores as assessed by business and IT leaders. The scores an organization achieves for each of the 41 factors included in the six components of maturity are based on a five-level maturity model. The model denotes the organization's IT-business alignment maturity, with Level 1 indicating the lowest maturity and Level 5 indicating exemplar maturity.

Business-IT alignment refers to applying Information Technology (IT) in an appropriate and timely way, in harmony with business strategies, goals, and needs. It has been a fundamental concern of business and IT executives since the 1970s. This definition of alignment addresses:

1. How IT is aligned with the business
2. How the business should or could be aligned with IT.

It does not matter whether one considers alignment from either a business-driven perspective (IT enabled) or from an IT-driven perspective; the objective is to ensure that the organizational strategies adapt harmoniously. The evidence that IT has the power to transform whole industries and markets is strong (Luftman 2007; Luftman et al. 2011; Luftman and Kempaiah 2007a; Luftman and Derksen 2012). Important questions that need to be addressed include the following:

- How can organizations assess alignment?
- How can organizations improve alignment?
- How can organizations achieve mature alignment?

The purpose of this chapter is to present an approach for assessing the maturity of a firm's business-IT alignment and its importance to business process management (BPM). Until recently, nothing has been available. The alignment maturity assessment described in this chapter provides a comprehensive descriptive and prescriptive vehicle for organizations to evaluate business-IT alignment in terms of where they are and what they can do to improve the alignment. The maturity assessment applies the previous research that identified enablers/inhibitors to achieving alignment (Luftman 2007; Luftman and Derksen 2012; Luftman and Brier 1999), and the empirical evidence gathered by management consultants who applied the methodology that leverages the most important enablers and inhibitors as building blocks for the evaluation.

2 Why Alignment Is Important

Alignment's importance has been well known and well documented since the late 1970s. (Luftman and Kempaiah 2007a; Luftman and Derksen 2012; Luftman and Brier 1999; Keen 1996; Henderson and Venkatraman 1996) Over the years, it has persisted among the top-ranked concerns of business executives. IT and business alignment was the second highest-ranked issue in the 2012 trends survey of IT leaders from 362 global organizations (Luftman and Kempaiah 2007a; Luftman and Zadeh 2011).

With the enduring economic uncertainties prevailing, organizations are focusing on leveraging IT to swiftly reduce business expenses by leveraging IT for BPM initiatives and, new to 2012, increase revenues. IT appears to be quite resilient, with IT budgets, hiring, and salary increases on the rise, and slowly approaching pre-recession levels.

BPM is considered one of the most important solutions for leveraging IT's ability to reduce business expenses, including working with business partners, to improve,

or to re-engineer processes (vom Brocke 2011). Technology alone is not sufficient; strong collaboration with the business to change how they leverage technology is required. This collaboration is mediated through business process management using business processes (or the "IT use process") as a sense making device.

Alignment seems more important as companies strive to integrate technology and business in light of dynamic business strategies and the continuously evolving technologies. In addition to the importance of alignment, what has not been clear is how to achieve and sustain this harmony between business and IT, how to assess the maturity of alignment, and what the impact of misalignment might be on the firm. To achieve and sustain this synergistic relationship is anything but easy.

There are several reasons why attaining IT-business alignment has been so elusive.

The first reason is that the definition of alignment is frequently focused only on how IT is aligned (e.g., converged, in harmony, integrated, linked, synchronized) with the business. Alignment must also address how the business is aligned with IT. Alignment must focus on how IT and the business are aligned with each other; IT can both enable and drive business change.

The second reason is that organizations (practitioners, consultants, academics) have often looked for a silver bullet. Originally, some thought the right technology (e.g., infrastructure, applications) was the answer. While important, it is not enough. Likewise, improved communications between IT and the business help, but are not enough. Similarly, establishing a partnership is not enough nor is balanced metrics that combine appropriate business and technical measurements. Clearly, mature alignment cannot be attained without effective and efficient execution and demonstration of value, but this alone is insufficient. More recently, governance has been touted as the answer – to identify and prioritize projects, resources, and risks. Today, we also recognize the importance of having the appropriate skills to execute and support the environment. Our research has found that all six of these components must be addressed to improve alignment.

The third reason IT-business alignment has been elusive is that there has not been an effective tool to gauge the maturity of IT-business alignment – a tool that can provide both a descriptive assessment and a prescriptive roadmap on how to improve. As you will see the insights from the alignment maturity benchmarking provides extensive insights to this longstanding conundrum.

The fourth reason that IT-business alignment has been so difficult to achieve is that there is a tendency in many organizations (even ones where the importance of alignment is recognized) to focus their attention on IT infrastructure considerations. This unbalanced approach can often lead to missed opportunities to identify elements of the business infrastructure that are in need of improvements.

Finally, the fifth reason that the advancement of IT-business alignment has been stalled involves semantic differences in how to refer to it. Disagreements regarding alignment terminology ("linked" vs. "converged"; "integrated" vs. "harmonized") have ironically become a barrier to alignment itself.

While there is no silver bullet for achieving alignment, progress has been made. In fact, the research demonstrates that "a line" has been drawn. When organizations cross it, they have identified and addressed ways to enhance IT-business alignment.

The alignment maturity model is thus both descriptive and prescriptive. CIO's can use it to identify their organization's alignment maturity and identify means to enhance it. Yet, that "line" is dynamic and continually evolving. So alignment can always be improved.

From measuring the six components in organizations in the United States, Latin America, Europe, and India, it can be observed that most organizations today are in Level 3 of a five-level maturity assessment model. Hence, the pronouncement of the "death of alignment" is premature; there is still a long way to go in the journey for aligning IT and business.

Identifying an organization's alignment maturity provides an excellent vehicle for understanding and improving the business-IT alignment. As elaborated on in this chapter, alignment maturity focuses on six important areas. ALL must be simultaneously addressed to improve the harmony among IT and business. Too frequently consultants and practitioners, looking for the silver bullet, focused their attention on only one or a subset of these important considerations. As companies strive to link technology and business they must address both

- Doing the right things (effectiveness), and
- Doing things right (efficiency). (Luftman 2007; Luftman and Kempaiah 2007a; Luftman and Brier 1999)

In recent years, a great deal of research and analysis focused on the linkages among Business and IT (Luftman 2007; Luftman et al. 2011; Luftman 2012; Luftman and Kempaiah 2007a; Luftman and Brier 1999), the role of partnerships among IT and business management (Keen 1996), and the need to understand the transformation of business strategies resulting from the competitive use of IT (Luftman 2007; Luftman and Derksen 2012; Davidson 1996). Firms need to change not only their business scope, but also their infrastructure as a result of IT innovation (Luftman 2007; Weill and Broadbent 1998). Much of this research, however, was conceptual. Empirical studies of alignment (Luftman and Kempaiah 2007a; Henderson and Venkatraman 1996; Baets 1996) only examined a single industry and/or firm. Conclusions from such empirical studies are potentially biased and may not be applicable to other industries. These studies lacked the consistent results across industries, across functional positions, and across time. This provided the impetus for defining a vehicle for assessing business-IT alignment, along with providing a roadmap for how best to improve it: IT alignment maturity.

As previously discussed, alignment maturity evolves into a relationship in which the function of IT and other business functions adapt their strategies together. Achieving alignment is evolutionary and dynamic. IT requires strong support from senior management, good working relationships, strong leadership, appropriate prioritization, trust, and effective communication, as well as a thorough understanding of the business and technical environments. Achieving and sustaining alignment demands focusing on maximizing the enablers and minimizing the inhibitors that cultivate the integration of IT and business.

Alignment of IT strategy and the organization's business strategy is a fundamental principle advocated for several decades (Luftman 2007; Luftman and Kempaiah 2007a; Rogers 1997; Rockart et al. 1996). IT investment has been increasing since

its inception, as managers look for ways to manage IT successfully and to integrate it into the organization's strategies. As a result, IT managers need to:

- Be knowledgeable about how the new IT technologies can be integrated into the business, and with existing/emerging technologies
- Be privy to senior management's tactical and strategic plans
- Be present when corporate strategies are discussed
- Understand the strengths and weaknesses of the technologies in question and the corporate-wide implications (Rockart et al. 1996)

Several proposed frameworks assess the strategic issues of IT as a competitive weapon. They have not, however, yielded empirical evidence; nor have they provided a roadmap to assess and enhance alignment. Numerous studies focus on business process redesign and reengineering as a way to achieve competitive advantage with IT. This advantage comes from the appropriate application of IT as a driver and enabler of business strategies.

3 Strategic Alignment Maturity

The concept of alignment *maturity* as a necessary precondition for an organization's ability to implement its strategy emerged as a concept in the late 1990s as it became increasingly evident that organizations were, by and large, failing to successfully execute nominally well-defined strategic objectives. Why was this the case? Early research into this issue (Luftman 2007; Luftman and Kempaiah 2007b) hypothesized that an organization's ability to successfully implement strategy was related to the "level" of strategic alignment between IT and the business, which reflects both the dynamic nature of alignment and the fact that alignment is, itself, a *process* that reflects key organizational practices which enable (or inhibit, in their absence or misapplication) alignment (Luftman and Brier 1999; Luftman 2000). A model of alignment maturity emerged from this research that reflects these concepts. As Fig. 1 illustrates, the *Strategic Alignment Maturity* model involves the following five conceptual levels of strategic alignment maturity:

1. Initial/Ad Hoc Process – business and IT are not aligned or harmonized
2. Committed Process – the organization has committed to becoming aligned
3. Established Focused Process – Strategic Alignment Maturity established and focused on business objectives
4. Improved/Managed Process – Reinforcing the concept of IT as a "Value Center"
5. Optimized Process – Integrated and co-adaptive business and IT strategic planning

Each of the five levels of alignment maturity focuses, in turn, on a set of six components based on practices validated in 2001 with an evaluation of 25 "*Fortune 500*" companies. As of the writing of this Chapter 362 Global 1,000 organizations from around the world (and several hundred smaller companies) and 2,100 business and IT executives have participated in formally assessing their IT business alignment maturity. Some of the insights from these assessments are discussed in the

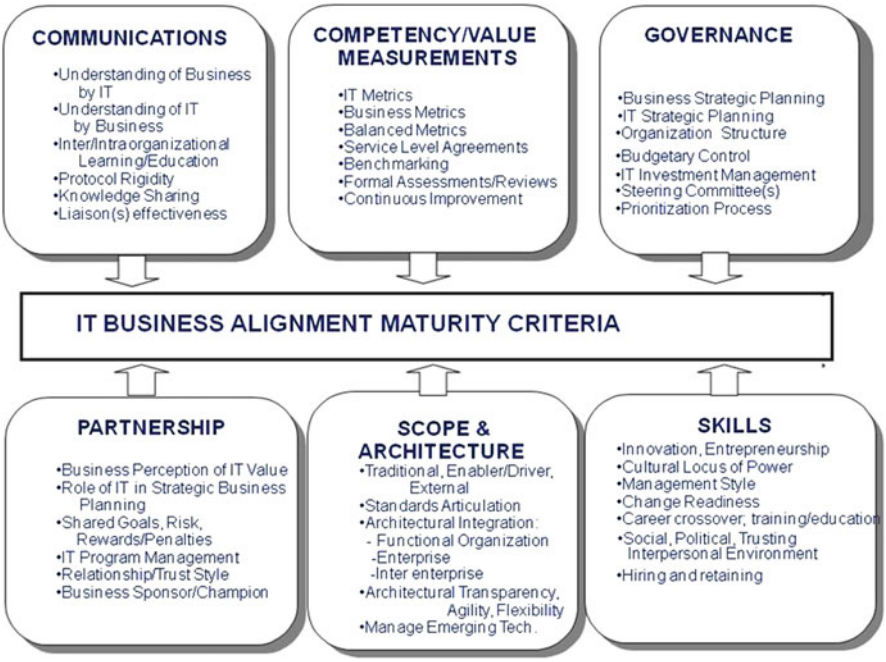


Fig. 2 Alignment maturity criteria

section of this chapter that describes the different maturity components. Assessments continue to be performed; what about your organization?

As discussed above, organizations have often looked for a silver bullet to improve the alignment of IT-business; fundamental for successful BPM. Some thought the right technology (e.g., infrastructure, applications) was the answer. While important, it is not enough. Likewise, improved communications between IT and the business help, but are not enough. Similarly, establishing a partnership is not enough, nor is balanced metrics that combine appropriate business and technical measurements. More recently, governance has been touted as the answer – to identify and prioritize projects, resources, and risks. Today, we also recognize the importance of having the appropriate skills to execute and support the environment. Research has found that all six of these components must be addressed to improve alignment.

Additionally, there has not been an effective tool to gauge the maturity of the IT-business alignment – a tool that can provide both a descriptive assessment and a prescriptive roadmap on how to improve. From measuring the six components in organizations in the United States, Latin America, Europe, and India, most organizations today are in a low Level 3 of a five-level maturity assessment model; there are still many opportunities for improvement.

The six IT-business alignment criteria are illustrated in Fig. 2 and are described in the following section of this chapter. All six must be addressed to ensure mature

alignment; looking for a single silver bullet answer, will just not do it. These six criteria are:

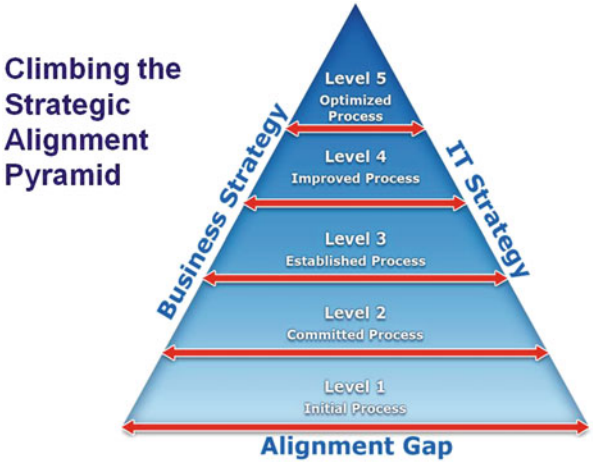
1. *Communications Maturity* – ensuring effective ongoing knowledge sharing across organizations
2. *Competency/Value Measurement Maturity* – demonstrating the value of IT in terms of contribution to the business
3. *Governance Maturity* – ensuring that the appropriate business and IT participants formally discuss and review the priorities and allocations of IT resources
4. *Partnership Maturity* – how each organization perceives the contribution of the other, the trust that develops among the participants and the sharing of risks and rewards
5. *Scope & Architecture Maturity* – The extent to which IT is able to:
   - Go beyond the back office and into the front office of the organization to directly impact customers/clients and strategic partners
   - Assume a role supporting a flexible infrastructure that is transparent to all business partners and customers
   - Evaluate and apply emerging technologies effectively
   - Enable or drive business processes and strategies as a true standard
   - Provide solutions customizable to customer needs
6. *Skills Maturity* – Human resource considerations such as training, salary, performance feedback, and career opportunities are assessed to identify how to enhance the organization's cultural and social environment as a component of organizational effectiveness

Knowing the maturity of its strategic choices and alignment practices makes it possible for a firm to see where it stands with respect to its "alignment gaps" and how it can close these gaps. The pyramid in Fig. 3 illustrates the alignment gap on each level of alignment maturity vividly. The five levels of alignment maturity are introduced in this section and then will be elaborated in the following section of this chapter.

Level 1: Initial or ad-hoc processes. Organizations at Level 1 generally have poor communications between IT and the business and also a poor understanding of the value or contribution the other provides. Their relationships tend to be formal and rigid, and their metrics are usually technical rather than business oriented. Service level agreements tend to be sporadic. IT planning or business planning is ad-hoc. And IT is viewed as a cost center and considered "a cost of doing business." The two parties also have minimal trust and partnership. IT projects rarely have business sponsors or champions. The business and IT also have little to no career crossovers. Applications focus on traditional back-office support, such as e-mail, accounting, and HR, with no integration among them. Finally, Level 1 organizations do not have an aligned IT-business strategy.

Level 2: Committed processes. Organizations at Level 2 have begun enhancing their IT-business relationship. Alignment tends to focus on functions or departments (e.g., finance, R&D, manufacturing, marketing) or geographical locations (e.g.,

Fig. 3 Alignment gaps



U.S., Europe, Asia). The business and IT have limited understanding of each others' responsibilities and roles. IT metrics and service levels are technical and cost-oriented, and they are not linked to business metrics. Few continuous improvement programs exist. Management interactions between IT and the business tend to be transaction-based rather than partnership-based, and IT spending relates to basic operations. Business sponsorship of IT projects is limited. At the function level, there is some career crossover between the business and IT. IT management considers technical skills the most important for IT.

Level 3: Established, Focused processes. In Level 3 organizations, IT assets become more integrated enterprise-wide. Senior and mid-level IT management understand the business, and the business's understanding of IT is emerging. Service level agreements (SLAs) begin to emerge across shared or acted upon. Strategic planning tends to be done at the business unit level, although some inter-organizational planning has begun. IT is increasingly viewed by the business as an asset, but project prioritization still usually responds to "the loudest voice." Formal IT steering committees emerge and meet regularly. IT spending tends to be controlled by budgets, and IT is still seen as a cost center. But awareness of IT's "investment potential" is emerging. The business is more tolerant of risk and is willing to share some risk with IT. At the function level, the business sponsors IT projects and career crossovers between business and IT occur. Both business and technical skills are important to business and IT managers. Technology standards and architecture have emerged at both the enterprise level and with key external partners.

Level 4: Improved, Managed processes. Organizations at Level 4 manage the processes they need for strategic alignment within the enterprise. One of the important attributes of this level is that the gap has closed between IT understanding the business and the business understanding IT. As a result, Level 4 organizations have effective decision making and IT provides services that reinforce the concept of IT as a value center. Level 4 organizations leverage their IT assets enterprise-wide, and they focus applications on enhancing business

processes for sustainable competitive advantage. SLAs are also enterprise-wide, and benchmarking is a routine practice. Strategic business and IT planning processes are managed across the enterprise. Formal IT steering committees meet regularly and are effective at the strategic, tactical, and operational levels. The business views IT as a valued service provider and as an enabler (or driver) of change. In fact, the business shares risks and rewards with IT by providing effective sponsorship and championing all IT projects. Overall, change management is highly effective. Career crossovers between business and IT occur across functions, with business and technical skills recognized as very important to the business and IT.

Level 5: Optimized processes. Organizations at Level 5 have optimized strategic IT-business alignment through rigorous governance processes that integrate strategic business planning and IT planning. Alignment goes beyond the enterprise by leveraging IT with the company's business partners, customers, and clients, as well. IT has extended its reach to encompass the value chains of external customers and suppliers. Relationships between the business and IT are informal, and knowledge is shared with external partners. Business metrics, IT metrics, and SLAs also extend to external partners, and benchmarking is routinely performed with these partners. Strategic business and IT planning are integrated across the organization, as well as outside the organization.

Figure 4 summarizes the results of the 362 Global 1,000 companies that have gone through the assessment to date. It illustrates where there is relative agreement regarding which areas are strong and which are weak, and it identifies the gaps between business and IT executive's opinions. The Y-axis represents the five levels of maturity; the X-axis expands each of the six components of maturity. This figure clearly identifies the maturity elements as the strongest and those that are assessed as the lowest (hence the areas leased aligned). A summary of the responses IT executives and corresponding assessments from business executives can also be observed. The areas where the IT and business executive responses/lines converge or overlap depict areas where there is the most agreement (and thus synergy) between business and IT. Conversely, areas with large gaps between the respective responses/lines are the ones that show disagreement among IT and business executives; these are area that need to be reconciled. For example, Fig. 4 illustrates a tighter synergy between business and IT in the areas of partnership and skills than for communications. The major elements will be discussed later in this chapter.

Figure 5 summarizes these results by region. A general trend that Fig. 5 illustrates is that across most components, Asian organizations have higher maturity scores, followed by American and Latin American organizations, and then European organizations. The pattern of maturity scores for Australian organizations (denoted by the thick line) reveals that in some dimensions they score as high as or higher than Asian organizations, while for other dimensions they score lower than all other regions. (Since there is only one African organization is represented in the data, no trends for African organizations are assumed.)

With an overall average maturity score of 3.09, it is clear that there are still opportunities to improve the IT business relationship; alignment is not dead.

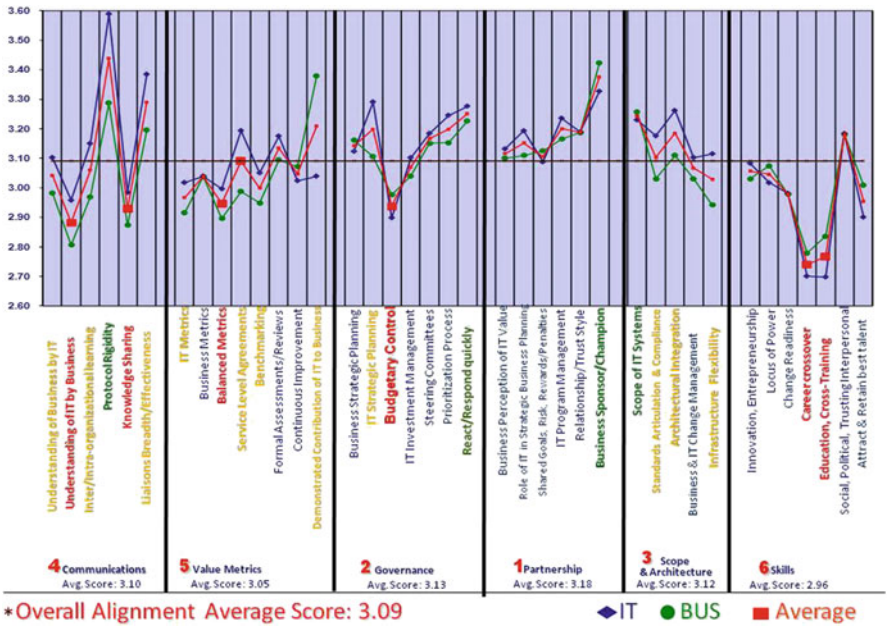


Fig. 4 Overall SAM assessment maturity

A similar graph may be used to plot the responses from an individual organizations assessment to identify opportunities for improvement (using the assessment as a prescriptive tool) and to benchmark things such as how a specific organization compares to:

- the overall average set of responses
- the responses from exemplar organizations
- other organizations in their industry (Finance, Pharmaceutical, Utility, Retail, Health Care, Education)
- respondents from similar positions (e.g., CIO's, CEO's, CFO's,) in other firms

Once the maturity level is understood, the assessment method provides the organization with a prescriptive roadmap that identifies opportunities for enhancing the harmonious relationship of business and IT. This alignment process is expanded in this chapter.

4 The Six Strategic Alignment Maturity Criteria

This part of the chapter describes each of the six components (illustrated in Fig. 2) that are evaluated in deriving the level of strategic alignment maturity. Examples taken from actual assessments illustrate the kinds of insights that can be identified. Most organizations today appear to be around a level 3, as illustrated in Fig. 6.

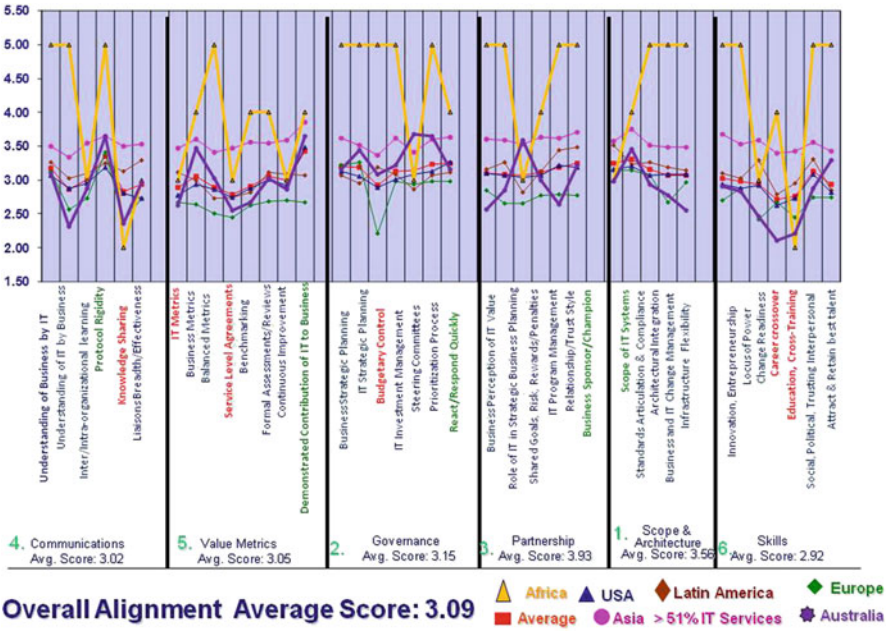


Fig. 5 Geographic SAM summary

That means that the average results from the 362 Global 1,000 companies' formal assessments (and the several hundred additional informal assessments from multiple years of Society for Information Management surveys) to date are around a level 3. A gradual increase in the overall maturity level over the past decade can be observed Table 1. The results are similar to what has been found by the Carnegie Software Engineering Institute development process model that assesses the comparable stages of application development maturity.

So, while IT business alignment seems to be improving, it is still a pervasive persistent problem. Naturally, the objective of the Strategic Alignment Maturity model is to identify opportunities to move the organization to a higher level (i.e., higher than a Level 3) of Strategic Alignment Maturity. Keep in mind that the primary objective of the assessment is not the maturity level used just as a descriptive tool of an organizations maturity; albeit it provides interesting benchmark comparisons. The primary objective of the assessment is to understand (as illustrated in Figs. 4 and 5) where IT and business executives:

- agree that a criteria needs to be improved
- agree that a criteria is good, but can be better
- disagree with how good/bad a criteria is
- desire to focus their efforts to improve

As illustrated in Fig. 5, there were differences in the overall SAM alignment scores by region. On average, Asian organizations had higher scores than their

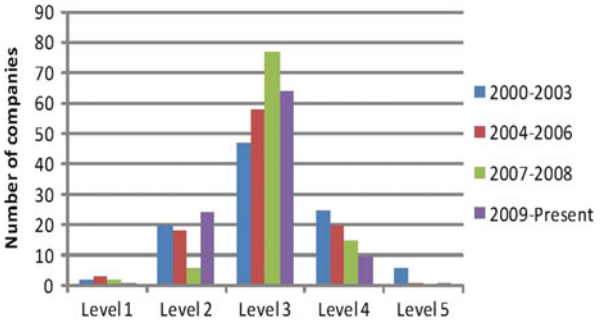


Fig. 6 Distribution of SAM scores

American, Australian, and European counterparts. The SAM scores by criteria and by region are summarized in Table 2, below. It is valuable to benchmark organizations by geography as well as comparing alignment trends across the geographies. This will be discussed later in this chapter.

When there is agreement among the participants regarding the criteria assessment, the model can be used as a prescriptive roadmap to identify how alignment maturity can be improved. However, when there is disagreement, the key stakeholders (i.e. any groups or individuals who can affect or are affected by IT in the firm) need to understand the points-of-view of the participants and come to an agreement regarding the criteria and how to enhance it. The organization cannot identify an appropriate road to take if they cannot come to agreement regarding where they want to go. Once the group has identified an agreed to list of areas for improvement, they can proceed to use the model as a prescriptive roadmap. Hence, it is not the maturity "number" that is important. It is what the organization does as a result of identifying how they can work together to improve the alignment maturity.

The next six sub-sections discuss each of the Strategic Alignment Maturity criteria in more detail and include examples of how they manifest themselves in organizations. These examples have been abstracted from recent research done with a number of major U.S. and global organizations (Luftman and Zadeh 2011). Table 3 summarizes the data from this research across the six SAM components by industry. In terms of their alignment maturity, it is evident that industries can vary considerably in their overall scores. For example, the service sector out-performed the transportation sector by an overall score of 3.31 to 2.84, while the gap between the retail and educational sectors was almost a full point (3.62 vs. 2.63).

Since this research is still ongoing and the companies that have participated have been assured anonymity, it is not possible to share the specific names of the participating organizations. However, each section illustrates specific issues of strategic alignment maturity that have been uncovered in the research and identifies the industry of the participating organizations.

Table 1 Maturity levels by year

Years	Number of companies	% of companies in level 1	% of companies in level 2	% of companies in level 3	% of companies in level 4	% of companies in level 5	Overall average
2000–2003	**83**	2	20	47	25	6	**2.99**
2004–2006	**99**	3	18	58	20	1	**3.06**
2007–2008	**64**	2	6	77	15	0	**3.11**
2009–Present	**116**	1	24	64	10	1	**3.19**
Overall	**362**	1.25	12.92	56.67	27.92	1.25	**3.17**

Overall alignment average score: 3.09

Table 2 Geography maturity by component

Geography	Number of Companies	Communication	Competency	Governance	Partnership	Scope of IT architecture	Skills	Overall average
Europe	61	2.85	2.63	2.94	2.78	3.01	2.70	**2.82**
Australia	28	2.88	3.01	3.15	2.96	2.96	2.68	**2.94**
USA	184	2.93	2.93	3.07	3.09	3.12	2.84	**3.00**
Latin America	44	3.17	2.94	3.03	3.16	3.27	3.00	**3.10**
Asia	44	3.52	3.59	3.58	3.64	3.60	3.55	**3.58**
Africa	1	4.0	3.71	4.13	4.4	4.0	4.0	**4.05**

Overall alignment average score: 3.09

Table 3 Industry maturity by component

Industry name	# of companies	Communications	Competency	Governance	Partnership	Tech. scope	Skills	Overall average
Retail	10	3.54	3.52	3.70	3.75	3.73	3.45	**3.62**
Hotel/Entertainment	10	3.23	3.39	3.38	3.49	3.77	3.35	**3.44**
Service	48	3.26	3.23	3.34	3.36	3.34	3.35	**3.31**
Insurance	11	3.19	3.34	3.51	3.31	3.34	2.89	**3.26**
Oil\Gas\Mining	13	3.05	3.31	3.36	3.06	3.37	2.98	**3.19**
Manufacturing	54	3.21	3.03	3.10	3.15	3.24	3.07	**3.13**
Financial	106	2.93	2.87	3.13	3.17	3.14	2.82	**3.01**
Utility	7	3.09	3.21	2.64	2.76	3.40	2.75	**2.98**
Pharmaceutical	15	2.95	2.77	2.98	2.89	3.00	2.97	**2.93**
HealthCare	18	2.94	2.85	3.02	2.97	3.04	2.73	**2.92**
Transportation	21	2.77	2.97	2.82	2.93	2.84	2.68	**2.84**
Government	9	2.91	2.54	3.03	2.99	2.86	2.49	**2.80**
Chemical	7	2.75	2.64	2.86	2.81	3.08	2.44	**2.76**
Telecommunication	11	2.68	2.68	2.94	2.69	3.03	2.44	**2.74**
Agriculture	11	2.54	2.61	3.13	2.63	2.50	2.41	**2.64**
Educational	11	2.66	2.48	2.83	2.53	2.72	2.56	**2.63**

Overall alignment average score: 3.09

4.1 Communications

Effective exchange of ideas and a clear understanding of the key ideas that ensure successful strategies are high on the list of enablers and inhibitors to alignment. Too often there is little business awareness on the part of IT or little IT appreciation on the part of the business. The 362 Global 1,000 benchmark firm results indicate that 21 % of the IT organizations either do not understand or have a limited understanding of business; while 39 % of the business executives either do not understand or have a limited understanding of IT. Given the dynamic environment in which most organizations find themselves, ensuring ongoing knowledge sharing across organizations is paramount.

Many firms choose to employ people in formal inter-unit "liaison" roles or cross-functional teams to facilitate this knowledge sharing. The key word here is "*facilitate*". Some organizations have facilitators whose role is to serve as the sole conduit of interaction among the different units of the organization. This approach tends to stifle rather than foster effective communications. Rigid protocols that impede discussions and the sharing of ideas should be avoided. The 362 Global 1,000 benchmark firm results indicate that 54 % of the firms identify liaisons as a major opportunity for improvement.

For example, a large aerospace company assessed its communications alignment maturity at level 2. Business-IT understanding is sporadic. The relationship between IT and the business function could be improved. Improving communication should focus on how to create the understanding of IT as a strategic business partner by the businesses it supports rather than simply a service provider. The firm's CIO made the comment that there is "no constructive partnership". However, in an interview with the firm's Director of IT Infrastructure, he stated that he views his organization as a "strategic business partner". One way to improve communications and, more importantly, understanding, would be to establish effective business function/IT liaisons that facilitate sharing of knowledge and ideas.

In a second case, a large financial services company's communication alignment maturity placed it in level 2 with some attributes of Level 1. Business awareness within IT is through specialized IT business analysts, who understand and translate the business needs to other IT staff (i.e., there is limited awareness of business by general IT staff). Awareness of IT by the firm's business functions, is also limited, although senior and mid-level management are aware of IT's potential. Communications are achieved through bi-weekly priority meetings of the senior and middle level managers from both groups, where they discuss requirements, priorities and IT implementation. But it is still a 2 because of the effectiveness of the interaction.

In a third example, a large utility company's communication alignment maturity places it at a level 2. Communications are not open until circumstances force the business to identify specific needs. There is a lack of trust and openness among some business units and their IT team. IT business partners tend to be bottlenecks in meeting commitments. IT's poor performance in previous years left scars that have not healed.

From a geographic perspective (as illustrated in Table 2) Asian organizations achieved the highest level of maturity in the communications component with an overall score of 3.52, followed by Latin America with a score of 3.17. The United States, Australia, and European scores were 2.93, 2.88, and 2.85, respectively.

4.2 Competency/Value Measurements

Too many IT organizations cannot demonstrate their value to the business in terms that the business understands. Frequently business and IT metrics of value differ. A balanced "dashboard" that demonstrates the value of IT in terms of contribution to the business is needed (see also vom Brocke and Sonnenberg 2014). The 362 Global 1,000 benchmark firm results indicate that two-thirds of the firms can improve this important area.

Service levels that assess IT's commitments to the business often help. However, the service levels have to be expressed in terms that the business understands and accepts. The service levels should be tied to criteria (see criteria 4. Partnership, below) that clearly define the rewards and penalties for surpassing or missing the objectives. The 362 Global 1,000 benchmark firm results indicate that 63 % of the firms can significantly improve their SLAs.

Frequently organizations devote significant resources to measuring performance factors. However, they spend much less of their resources on taking actions based on these measurements. For example, an organization that requires analyzing ROI before a project begins, but then does not review how well objectives were met after the project was deployed provides little to the project's success. It is important to assess these criteria to understand (1) the factors that lead to missing the criteria and (2) what can be learned to improve the environment continuously.

For example, a large aerospace company assessed its competency/value measurement maturity to be at a level 2. IT operates as cost center. IT metrics are focused at the functional level, and Service Level Agreements (SLAs) are technical in nature. One area that could help to improve maturity would be to add more business-related metrics to SLAs to help form more of a partnership between IT and the business units. Periodic formal assessments and reviews in support of continuous improvement would also be beneficial.

A large software development company assessed its competency/value measurement maturity at level 3. Established metrics evaluate the extent of service provided to the business functions. These metrics go beyond basic service availability and help desk responsiveness, evaluating such issues as end-user satisfaction and application development effectiveness. The metrics are consolidated on to an overall dashboard. However, because no formal feedback mechanisms are in place to react to a metric, the dashboard cannot be considered to be managed.

At a large financial services company, IT competency/value was assessed at a level 2 because the company uses cost efficiency methods within the business and functional organizations. Balanced metrics are emerging through linked business

and IT metrics, and a balanced scorecard is provided to senior management. Service level agreements are technical at the functional level. Benchmarking is not generally practiced and is informal in the few areas where it is practiced. Formal assessments are done typically for problems and minimum measurements are taken after the assessment of failures.

Table 2 shows significantly different IT competency SAM scores across regions. Asian organizations lead the way with an overall score of 3.59, followed by Australian firms with a score of 3.01; Latin American firms (2.94) are followed closely by American firms (2.93). European organizations scored the lowest in this dimension, with a score of 2.63.

4.3 Governance

The considerations for IT governance were defined briefly in Fig. 1. Ensuring that the appropriate business and IT participants formally discuss and review the priorities and allocation of IT resources is among the most important enablers/inhibitors of alignment. This decision-making authority needs to be clearly defined. The 362 Global 1,000 benchmark firm results indicate that 57 % of the firms should be improving this important component of alignment.

For example, IT governance in a large aerospace company is tactical at the core business level and not consistent across the enterprise. For this reason, they reported a level 2 maturity assessment. IT can be characterized as reactive to CEO direction. Developing an integrated enterprise-wide strategic business plan for IT would facilitate better partnering within the firm and would lay the groundwork for external partnerships with customers and suppliers.

A large communications manufacturing company assessed its governance maturity at a level falling between 1 and 2. IT does little strategic planning because it operates as a cost center and, therefore, cost reduction is a key objective. In addition, priorities are reactive to business needs as business manager's request services.

A large computing services company assessed their governance maturity at a level 1+. A strategic planning committee meets twice a year. The committee consists of corporate top management with regional representation. Topics or results are neither discussed nor published to all employees. The reporting structure is federated with the CIO reporting to a COO. IT investments are traditionally made to support operations and maintenance. Regional or corporate sponsors are involved with some projects. Prioritization is occasionally responsive.

From a geographic perspective (as illustrated in Table 2) Asian organizations achieved the highest level of maturity in the governance component with an overall score of 3.58. Australian organizations came in second with a score of 3.15, followed by American companies with a score of 3.07. Latin American and European organizations earned scores of 3.03 and 2.94, respectively.

4.4 Partnership

The relationship that exists between the business and IT organizations is another criterion that ranks high among the enablers and inhibitors. Giving the IT function the opportunity to have an equal role in defining business strategies is obviously important. However, how each organization perceives the contribution of the other, the trust that develops among the participants, ensuring appropriate business sponsors and champions of IT endeavors, and the sharing of risks and rewards are all major contributors to mature alignment. This partnership should evolve to a point where IT both enables AND drives changes to both business processes and strategies. Naturally, this demands having a good business design where the CIO and CEO share a clearly defined vision.

For example, a large software development company assessed their partnership maturity at a level of 2. The IT function is mainly an enabler for the company. But IT does not have a seat at the business table, either with the enterprise or with the business function that is making decisions. In the majority of cases, there are no shared risks because only the business will fail. Indications are that the partnership criterion will rise from a level 2–3 as top management sees IT as an asset, and because of the very high enforcement of standards at the company.

Partnership for a large communications manufacturing company was assessed at level 1. IT is perceived as a cost of being in the communications business. Little value is placed on the IT function. IT is perceived only as help desk support and network maintenance.

For a large utility company, partnership maturity was assessed at a level of 1+. IT charges back all expenses to the business. Most business executives see IT as a cost of doing business. There is heightened awareness that IT can be a critical enabler to success, but there is minimal acceptance of IT as a partner.

Partnership for a large computing services company was assessed at level 2. Since the business executives pursued e-commerce, IT is seen as a business process enabler as demonstrated by the Web development. Unfortunately, the business now assigns IT with the risks of the project. Most IT projects have an IT sponsor.

From a geographic perspective (as illustrated in Table 2), Asian organizations have a partnership maturity score of 3.64. The next closest region was Latin America, with a partnership score of (3.16). The American, Australian, and European partnership scores were 3.09, 2.96, and 2.78, respectively.

4.5 Scope and Architecture

This set of criteria tends to assess information technology maturity and the fitness of IT assets to support business process (see “IT use process” in Fig. 1). Therefore, these criteria assess the extent to which IT is able to:

- Go beyond the back office and into the front office of the organization
- Assume a role supporting a flexible infrastructure that is transparent to all business partners and customers
- Evaluate and apply emerging technologies effectively
- Enable or drive business processes and strategies as a true standard
- Provide solutions customizable to customer needs

Scope and Architecture was assessed at a level of 2+ at a large software development company. This is another area where the company is moving from a level 2 to a level 3. ERP systems are installed and all projects are monitored at an enterprise level. Standards are integrated across the organization and enterprise architecture is integrated. It is only in the area of Inter-enterprise that there is no formal integration.

A large financial services company assessed their scope and architecture at level 1. Although standards are defined, there is no formal integration across the enterprise. At best, only functional integration exists.

Once again, Asian companies led in this dimension, scoring 3.6 for the scope & architecture component. Latin America came in second, with a score of 3.27, followed by the United States, which scored 3.12. European and Australian organizations scored 3.01 and 2.96, respectively.

4.6 Skills

Skills were defined in Fig. 1. They include all of the human resource considerations for the organization. Going beyond the traditional considerations such as training, salary, performance feedback, and career opportunities are factors that include the organization's cultural and social environment. Is the organization ready for change in this dynamic environment? Do individuals feel personally responsible for business innovation? Can individuals and organizations learn quickly from their experience? Does the organization leverage innovative ideas and the spirit of entrepreneurship? These are some of the important conditions of mature organizations. The 362 Global 1,000 benchmark firm results indicate that 55 % of the benchmarked firms do not effectively support career crossover opportunities (IT into the business and the business into IT) and that 55 % of the benchmarked firms do not effectively support education cross training.

For example, a large aerospace company assesses their skills maturity at a level 2. A definite command and control management style exists within IT and the businesses. Power resides within certain operating companies. Diverse business cultures abound. Getting to a non-political, trusting environment between the businesses and IT, where risks are shared and innovation and entrepreneurship thrive, is essential to achieve improvements in each of the other maturity tenets. Organizational behavior research has demonstrated that sharing information that is

based on expertise is often the most successful approach to influencing others to cooperate and trust one another (Luftman 1997).

Skills maturity at a large computing services company is assessed at a level of 1. Career crossover is not encouraged outside of top management. Innovation is dependent on the business unit, but in general is not encouraged. Management style is dependent on the business unit, but is usually command and control. Training is encouraged but left up to the individual employee.

Finally, from a geographical perspective, Asian companies earned a maturity score of 3.55. Latin American organizations came in second, earning a score of 3.00. American, European, and Australian organizations received SAM Skill scores of 2.84, 2.70, and 2.68, respectively.

4.7 Results by Geography and Industry

As noted above, results from the assessment from the 362 Global 1,000 companies by region reveal higher alignment scores by Asian organizations across all maturity components. As a group, they scored 3.58, as compared to 3.00 for the United States and 2.82 for Europe. A complete illustration of regional SAM scores by component is shown in Table 2 and Fig. 5.

What was it that made Asian organizations score higher in every SAM component than their European, American, and Latin American counterparts? An examination of the factors that have led to the remarkable success of India's service sector offers several lessons. A strong culture that promotes communication between employees, the emphasis of CMM/CMMI-based continuous improvement efforts, and well-planned strategies that promote organizational flexibility are just some of the factors that are fundamental.

An analysis of SAM data shows that the retail, hotel/entertainment, service, and insurance sectors performed well above the average SAM score of 3.09 in all dimensions. As noted in Table 3, these industries scored 3.62, 3.44, 3.31, and 3.26, respectively. (Note – there were relatively few retail and hotel/entertainment companies in the sample, however.) The well-represented industry in the Global 1,000 was the financial industry, which earned an overall SAM rating of 3.01. The manufacturing industry performed closest to the mean, with an overall average of 3.13.

5 Levels of Strategic Alignment Maturity

5.1 Level 1: Initial/Ad Hoc Process

Organizations that are at Strategic Alignment Maturity Level 1 can be characterized as having the lowest level of Strategic Alignment Maturity. For example: in the "Communications" criteria of the model, understanding of the business by IT is very low (see the "Communications" criteria box in Fig. 7). Similarly, the attribute called "Understanding of IT by the business" is also very low for an organization at Level 1 maturity.

It is highly improbable that these organizations will be able to achieve an aligned IT business strategy, leaving their investment in IT significantly unleveraged. See Fig. 7 for the specific criteria for Level 1.

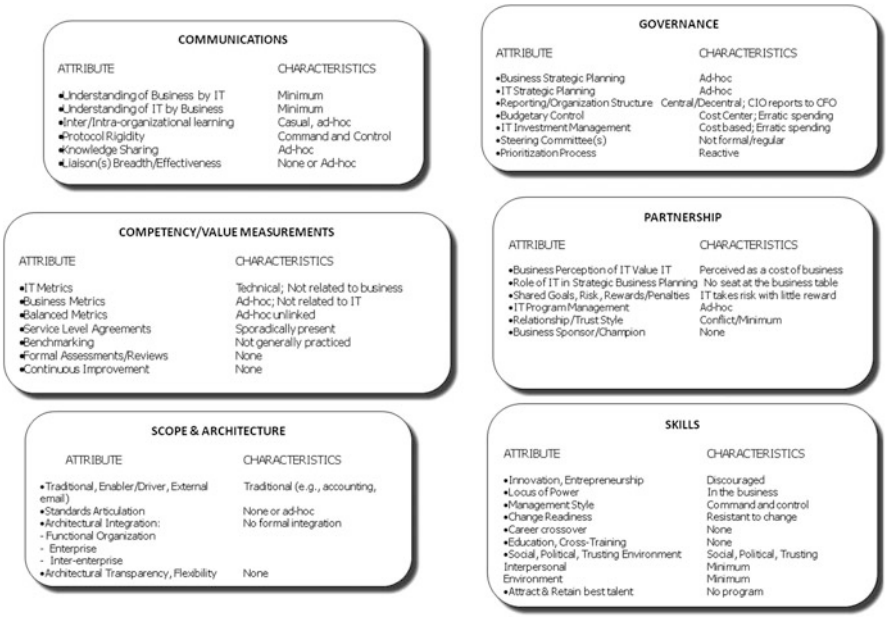


Fig. 7 Level 1 Strategic Alignment Maturity criteria

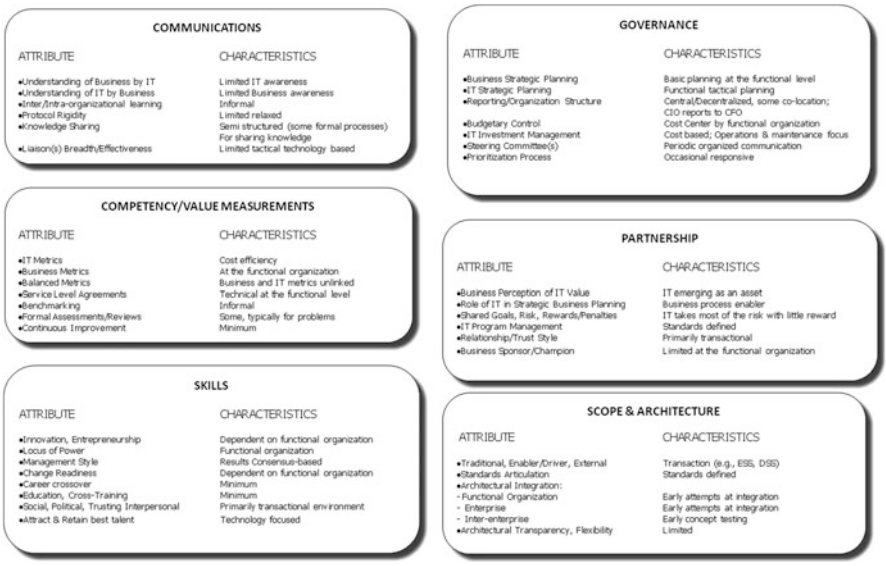


Fig. 8 Level 2 Strategic Alignment Maturity criteria

5.2 Level 2: Committed Process

Level 2 organizations can be characterized as having committed to begin the process for Strategic Alignment Maturity. For example: in the "Competency/Value Measurements" criteria of the model, IT metrics (an "attribute") are focused on cost and efficiency (see the "Competency/Value Measurements" criteria box in Fig. 8). Similarly, in the "Partnership" criteria of the model, the business perception of IT (again, another "attribute") is that IT is emerging as an asset to the organization.

This level of Strategic Alignment Maturity tends to be directed at local situations or functional organizations (e.g., Marketing, Finance, Manufacturing, H/R) within the overall enterprise. However, due to limited awareness by the business and IT communities of the different functional organizations use of IT, alignment can be difficult to achieve. Any business-IT alignment at the local level is typically not leveraged by the enterprise. However, the potential opportunities are beginning to be recognized. See Fig. 8 for the specific criteria for Level 2.

5.3 Level 3: Established Focused Process

This level of Strategic Alignment Maturity concentrates on governance, processes and communications towards specific business objectives. The reasons for this focus are:

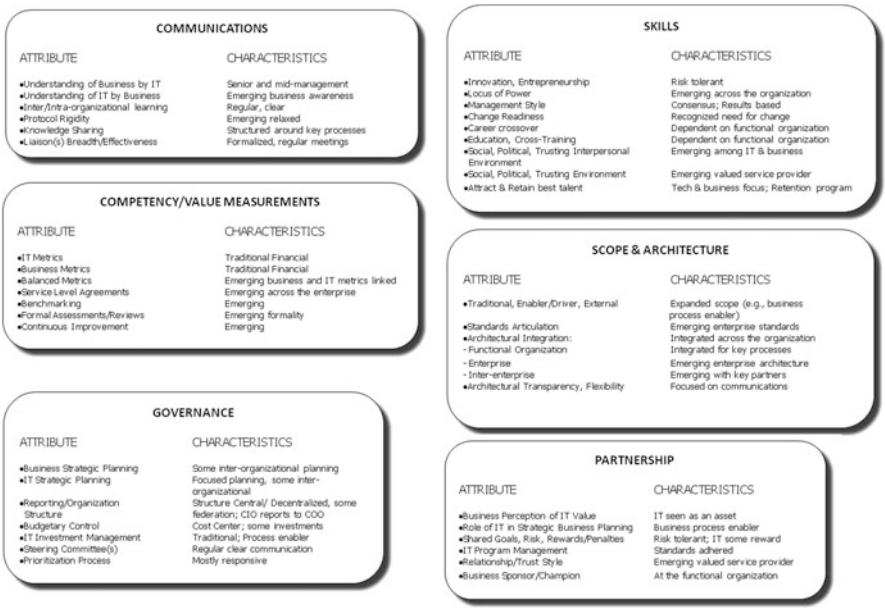


Fig. 9 Level 3 Strategic Alignment Maturity criteria

- The organization needs better decision-making processes (governance) around which business processes to invest scarce IT dollars
- The organization wants to focus on those business processes that generate the most long-lasting competitive advantage (and presumably, profitability), and
- The organization has to effectively communicate its vision and get "buy-in" from all employees and management

IT is becoming embedded in the business. Level 3 leverages IT assets on an enterprise-wide basis and applications systems demonstrate planned, managed direction away from traditional transaction processing to systems that use information to make business decisions. The IT "*extrastructure*" (leveraging the inter-organizational infrastructure) is evolving with key partners. For example: in the "Communications" criteria of the model, the sharing of knowledge (an "attribute") tends to be structured around key processes (see the "Communications" criteria box in Fig. 9). Similarly, in the "Governance" criteria of the model, the prioritization process (again, another "attribute") tends to be reactive. See the Fig. 9 for the specific criteria for Level 3.

5.4 Level 4: Improved/Managed Process

Organizations at Level 4 leverage IT assets on an enterprise-wide basis and the focus of applications systems is on driving business process enhancements to obtain

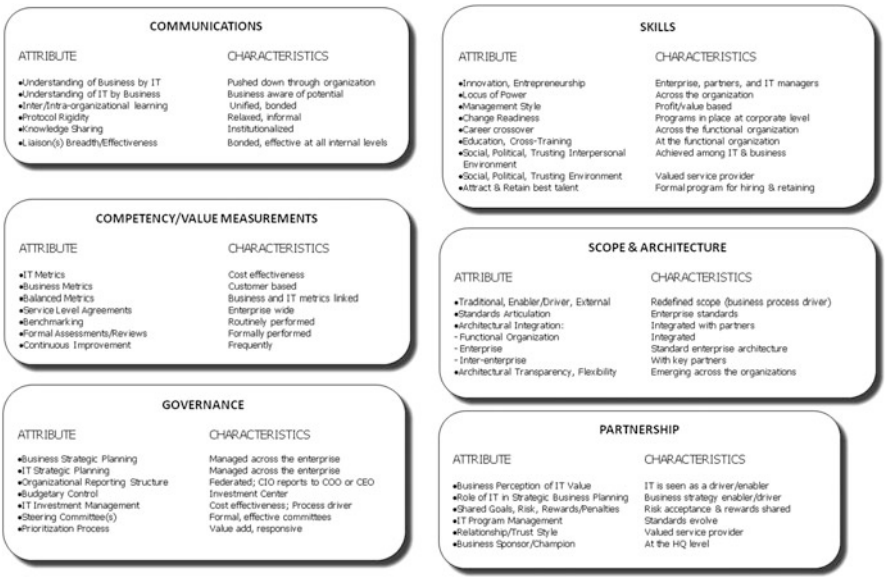


Fig. 10 Level 4 Strategic Alignment Maturity criteria

sustainable competitive advantage. A Level 4 organization views IT as an innovative and imaginative strategic contributor to success. The enterprise-wide emphasis of Level 4 organizations breaks down the "process silos" that exist among business units in lower level organizations in order to capitalize on the information and knowledge embedded in an organization's business processes and practices. Level 4 organizations also utilize IT "hard" (i.e., hardware and software) and "soft" assets (e.g., knowledge and information about customers, competitors and products and employee skills) by consciously deploying enterprise-wide architectures. One example of such architecture might be an enterprise intranet portal for collecting, categorizing and sharing customer/product information as well as unstructured information (e.g., web URLs, journal articles, etc.) about competitor products.

This level of Strategic Alignment Maturity demonstrates effective governance and services that reinforce the concept of IT as a value center. For example: in the "Communications" criteria of the model, the sharing of knowledge (an "attribute") is institutionalized. Similarly, in the "Scope and Architecture" criteria of the model, the organization has established enterprise standards. See the Fig. 10 for the specific criteria for Level 4.

5.5 Level 5: Optimized Process

Level 5 organizations leverage IT assets on an enterprise-wide basis to extend the reach (of the IT extra-structure) of the organization into the supply chains of

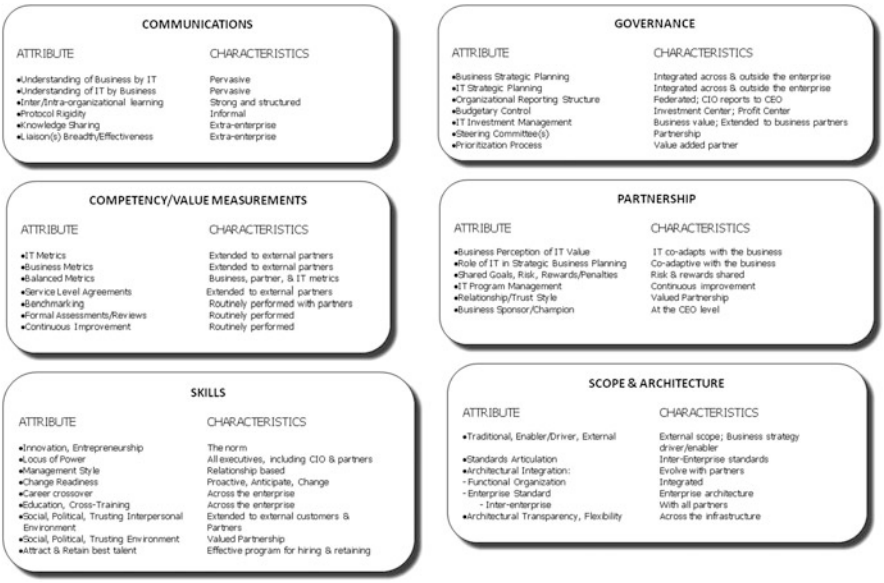


Fig. 11 Level 5 Strategic Alignment Maturity criteria

customers/clients and suppliers/partners. For a Level 5 organization, it is often difficult to determine if they are more an information technology company than a commercial company (e.g., securities, insurance, travel (e.g., Travelocity), retail (e.g., Amazon)).

A sustained governance process integrates the IT strategic planning process with the strategic business process. For example: in the "Communications" criteria of the model, "understanding of the business by IT" and "understanding of IT by the business" (two elements) are pervasive. Similarly, in the "Skills" criteria of the model, "Innovation and Entrepreneurship" are the norm for the organization. See the Fig. 11 for the specific criteria for Level 5.

6 Assessing Strategic Alignment Maturity

An essential part of the assessment process is recognizing that it must be done with a team including both business and IT executives. The convergence on a consensus of the maturity levels and the discussions that ensue are extremely valuable in understanding the problems and opportunities that need to be addressed to improve business-IT alignment. As previously discussed, the most important part of the process is the creation of specific recommendations that address the problems and opportunities identified from the assessment. The most difficult step, of course, is actually carrying out the recommendations. This section ties the assessment metrics

together. The examples and experiences provided in the preceding section on the Six Strategic Alignment Criteria, together with the procedure described in the next section, served as the vehicle for validating the model.

Each of the criteria and levels are described by a set of attributes that allow a particular dimension to be assessed using a 1–5 Likert scale, where:

1 = this does not fit the organization, or the organization is very ineffective
2 = low level of fit for the organization
3 = moderate fit for the organization, or the organization is moderately effective
4 = this fits most of the organization
5 = strong level of fit throughout the organization, or the organization is very effective

Different scales can be applied to perform the assessment (e.g., good, fair, poor; 1, 2, 3). However, whatever the scale, it is important to evaluate each of the six criteria with both business and IT executives to obtain accurate assessment perspectives. The intent is to have the team of IT and business executives converge on a maturity level. Typically, the initial review will produce divergent results. This outcome is indicative of the problems/opportunities being addressed. A summary of the 362 Global 1,000 companies' results for all six components and their respective criteria can be found in Figs. 4 and 5.

The relative importance of each of the attributes within the criteria may differ among organizations. For example, in some organizations the use of SLAs (Service Level Agreements) might not be considered as important to alignment as the effectiveness of liaisons. Hence, giving SLAs a low maturity assessment should not significantly impact the overall rating in this case. However, it would be valuable if the group discussed why the organization does not consider a particular attribute (in this example, SLAs) to be significant.

Using a Delphi approach with a Group Decision Support Tool often helps in attaining the convergence (Luftman 1997). Experience suggests that "discussions" among the different team members helps to ensure a clearer understanding of the problems and opportunities that need to be addressed.

Keep in mind that the primary objective of the assessment is to identify specific recommendations to improve the alignment of IT and the business. The evaluation team, after assessing each of the six criteria from level one to five, uses the results to converge on an overall assessment level of the maturity for the firm. They apply the next higher level of maturity as a prescriptive roadmap to identify what they could/should do next. A trained facilitator is typically needed for these sessions.

As previously discussed, there have been over 362 Global 1,000 organizations from around the world (and several hundred smaller companies) and 2,100 business and IT executives that have participated in formally assessing their IT business alignment maturity. As illustrated in Figs. 4, 5, and 6, the average level of maturity is about a 3. Given the number of companies that have participated exemplar benchmarks based on factors such as industry, company age, company size, and job tiles have been factored into the research to obtain their effect on alignment maturity. Some of the benchmark insights have been discussed in this chapter.

7 Strategic Alignment as a Process

Attaining and sustaining business-IT alignment must first focus on understanding the current level of Strategic Alignment Maturity; followed by steps that concentrate organizational energy on maximizing alignment enablers and minimizing inhibitors. This process embraces the steps (Henderson and Venkatraman 1996) illustrated by Fig. 12 and elaborated in the following text.

1. *Set the goals and establish a team*. Ensure that there is an executive business sponsor and champion for the assessment. Next, assign a team of both business and IT leaders. Obtaining appropriate representatives from the major business functional organizations (e.g., Marketing, Finance, R&D, and Engineering) is critical to the success of the assessment. The purpose of the team is to evaluate the maturity of the business-IT alignment. Once the maturity is understood, the team is expected to define opportunities for enhancing the harmonious relationship of business and IT. Assessments range from three to twelve half-day sessions. The time demanded depends on the number of participants, the degree of consensus required, and the detail of the recommendations to carry out.
2. *Understand the business-IT linkage*. The Strategic Alignment Maturity Assessment is an important tool in understanding the business-IT linkage. The team evaluates each of the six criteria. This can be done via executive interviews, group discussion, a questionnaire, or a combination. A trained facilitator can be valuable in guiding the important discussions.

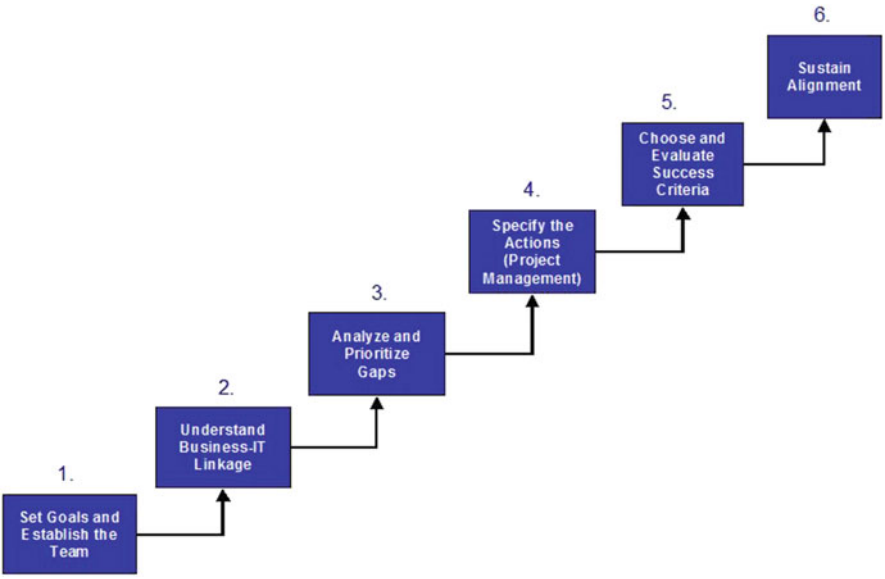


Fig. 12 Strategic alignment as a process

3. *Analyze and prioritize gaps*. Recognize that the different opinions raised by the participants are indicative of the alignment opportunities that exist. Once understood, the group needs to converge on a maturity level. The team must remember that the purpose of this step is to understand the activities necessary to improve the business-IT linkage. The gaps between where the organization is today and where the team believes it needs to be are the gaps that need to be prioritized. Apply the next higher level of maturity as a roadmap to identify what can be done next.
4. *Specify the actions (project management)*. Knowing where the organization is with regards to alignment maturity will drive what specific actions are appropriate to enhance IT-business alignment. Assign specific remedial tasks with clearly defined deliverables, ownership, timeframes, resources, risks, and measurements to each of the prioritized gaps.
5. *Choose and evaluate success criteria*. This step necessitates revisiting the goals and regularly discussing the measurement criteria identified to evaluate the implementation of the project plans. The review of the measurements should serve as a learning vehicle to understand how and why the objectives are or are not being met.
6. *Sustain alignment*. Some problems just won't go away. Why are so many of the inhibitors IT related? Obtaining IT-business alignment is a difficult task. This last step in the process is often the most difficult. To sustain the benefit from IT, an "alignment behavior" must be developed and cultivated. The criteria described to assess alignment maturity provides characteristics of organizations that link IT and business strategies. By adopting these behaviors, companies can increase their potential for a more mature alignment assessment and improve their ability to gain business value from investments in IT. Hence, the continued focus on understanding the alignment maturity for an organization and taking the necessary action to improve the IT-business harmony are keys. Implicit in this is to periodically repeat the process to see how the organization evolves over time.

Fundamental to the effective use of the Strategic Alignment Maturity assessment is to not only measure the maturity level of IT-business alignment but also to identify the problem/opportunity areas; and more important use the model as a roadmap to define specific initiatives for improvement. Repeating the assessment periodically can be insightful.

For example, when the strategic alignment maturity model was first used to assess the level of alignment maturity for a large financial company (fictitiously referred to as Stonehenge), they were assessed at a Level 2 (Committed Processes). At the time, Stonehenge had recently adopted the federated IT organization model, so no one considered that the IT organization structure would be the area to consider in identifying why this financial giant was only at level 2. After all, the federal (or hybrid) IT organization design has been found to produce higher alignment maturity scores over centralized and decentralized IT organization alternatives; because it captures the benefits of both centralized and decentralized IT organizations. The federated IT organization deployed at Stonehenge essentially centralized

IT architecture and common systems, while decentralizing the strategic business unit applications and resources. The centralized IT structure supports the development of strong and efficient IT infrastructures while the decentralized IT group fosters business-IT relationships. Following the above logic, Stonehenge had decentralized its formally centralized application development staff, expecting that the relationships with the business management would improve. However, the analysis of the Stonehenge SAM assessment data showed that:

- The indicators that measure the understanding of business by IT and the understanding of IT by business, which are covered in the "communications" area of the SAM model, were very low. Knowledge sharing in the organization was at a minimum to none. IT and business met occasionally (only during major walkthroughs) in a formal setting.
- IT-business relationship and trust measures that are covered under the "partnership" area were also at the minimum. Business viewed IT as a cost of doing business. There was an ongoing conflict between business and IT; they blamed each other for every late or unsuccessful delivery.
- Competency metrics –measuring value of IT area showed that IT operated as a cost center.
- Social-interaction indicator, which is covered under the HR area, was pointing to minimal IT-business interaction.

These and several other criteria used in the assessment suggested that there was conflict in the IT-business relationship in Stonehenge and that trust levels were at a minimum – typical in a centralized IT organization with poor linkages between business and IT. The fact that the company had already adopted the federated model motivated managers to further analyze the data to find out why the relationship with the business management did not improve.

Several other indicators, such as the differences between the IT and the business managers' opinions and the differences between the top and the middle managers' opinions in the SAM model pointed to the problem in the implementation of the federated model. Looking at the organization charts and the grouping of the departments, they seemed in line with the federated model, meaning that the application development groups were created within the business units and dual reporting relationship for the divisional IT heads were created. Yet, the location of the development teams and the way they were functioning were not different from what they would be like in a typical centralized IT organization. At the end of the study, it was apparent that the management couldn't diverge from the routine they followed for many years. Indicators such as the tendency of the employees' resistance to change (measured in the HR area) were also in support of this hypothesis.

As illustrated in this example, SAM not only helped identify Stonehenge's' maturity score, but it also allowed managers to identify specific problems and opportunities to improve the IT-business alignment. Once again, organizations should not be in pursuit of a silver bullet. All six components of alignment maturity should be considered to determine the areas that require improvements and the

opportunities that exist to help improve the IT-business alignment maturity level of the organization.

The periodical SAM measurement and results at Stonehenge are reviewed by both business and IT managers to ensure appropriate alignment. SAM provides guidance for business changes as well for a better alignment. SAM assessment should be considered as a continuous process of improvement in the organizations facing turbulent changes in business environment to enable organization-led increased strategic alignment maturity in the organization.

8 Strategic Alignment Maturity and Business Performance

The concept of performance underlies a lot of the research in strategic management and information science. A broader conceptualization of business performance would include emphasis on indicators of operational performance in addition to indicators of financial performance. Under this conceptualization it would be logical to treat measurements such as market-share, new product introduction, product quality, marketing effectiveness, manufacturing value-added, and other measurements of technological efficiency within the domain of business performance.

Research done by Luftman, et al., validated the contribution of Strategic Alignment Maturity (SAM) to company performance based on the data gathered from 362 global organizations across four continents. The research identified that the six SAM components (Communications, IT Governance, Value, Partnership, Technology Scope, and Skills) have approximately equal contribution to form the overall SAM score and they are strongly correlated to each other, as illustrated in Fig. 13. Regarding the relationship of SAM and company performance, the regression weight (.34) for SAM in the prediction of Performance is significant, hence this proves the contribution of strategic alignment maturity as a major contributor to a company's performance (see Fig. 13). This relationship was found to be valid across all industry types, cultures, and geographic locations.

In addition, research has shown that the organization's structure – whether it follows a centralized, decentralized, or federated model – also has an impact on SAM maturity (see Fig. 13). Notably, companies with federated IT structures are able to combine the benefits of centralized structures (such as standardization and economies of scale) and decentralized structures (local flexibility and control). These companies tend to have higher alignment maturity ratings (Luftman 2007; Luftman and Zadeh 2011).

This relationship also supports the contention that achieving alignment is not a matter of addressing a single "magic bullet" issue. If IT-business alignment leads to better performing organizations, then the implication is inescapable. An organization that fixates on one component at the expense of others is all but certain to be an underperforming organization.

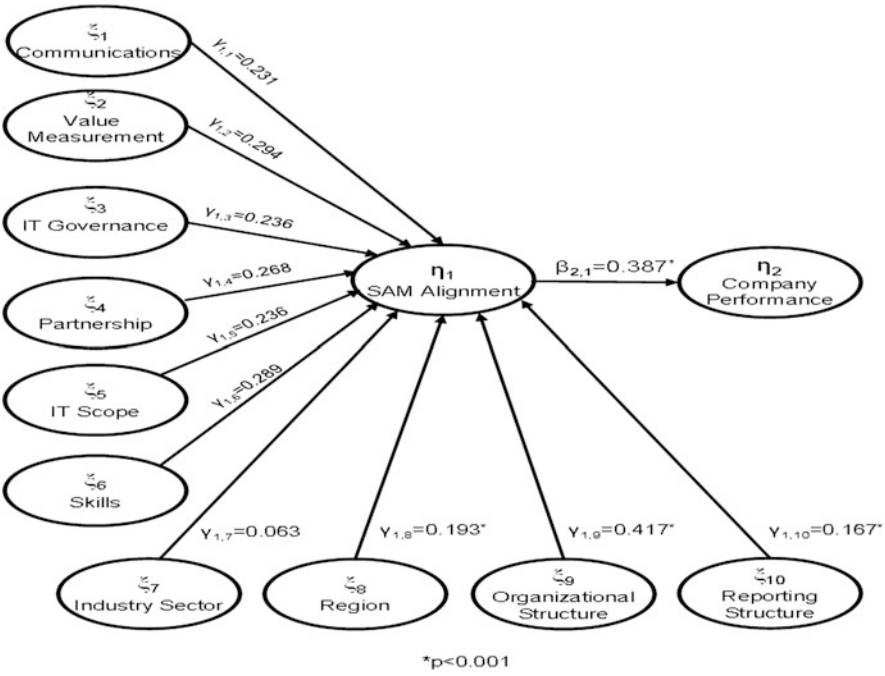


Fig. 13 Structural equation: IT value & SAM

This research builds upon the work done in 1993 by Henderson and Venkatraman, whose strategic alignment framework was based on four components: business strategy, IT strategy, organizational infrastructure, and IT infrastructure. This was the first time that a strategic alignment framework was used by both researchers as well as practitioners in the field.

As an example of the relevance of alignment for business results, Figs. 14 and 15 provide significant insights regarding the correlation between pharmaceutical companies ranking based on their alignment maturity score and the respective ranking of sales and productivity. Nine pharmaceutical companies are represented. It is clear that the higher the alignment maturity, the higher the respective ranking for the success of the company.

There is no better example than the success of Indian IT Service Companies to illustrate the significant contribution SAM has on the business performance. Given the consistently higher SAM scores for the Indian IT service companies, the remainder of this section will elaborate on many of our observations from working with these firms. For example, see Figs. 16 and 17 for SAM's contributions to Indian IT Service Companies.

The rise of Indian service companies has been a notable success when measured against other service companies from other geographic regions in standard indicators such as sales, exports, and employment. There is no single element that has contributed to the accomplishment of these firms but, elements such as legal

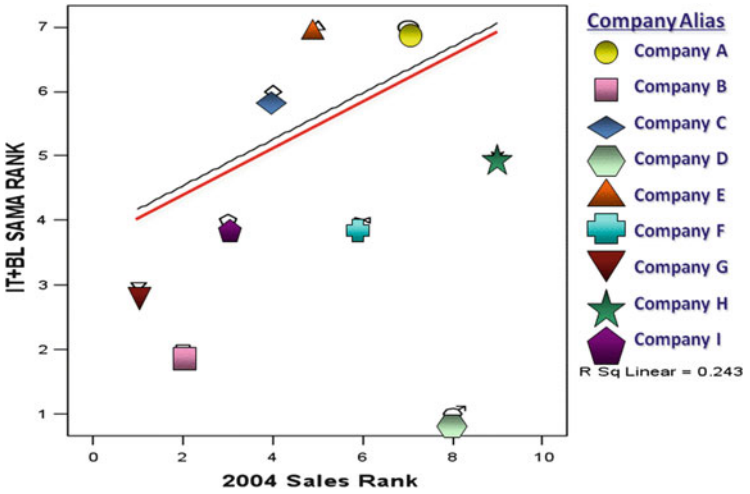


Fig. 14 Correlation between strategic alignment maturity & sales (pharmaceutical industry)

transparency, education, culture, population base, low labor costs, and quality have all contributed to their success. The growth of IT service firms has been possible not just because India is a less expensive alternative, but also because of the well planned strategy of building and marketing the domain skills adopted by these companies. Leaders of these service companies have carried out successful

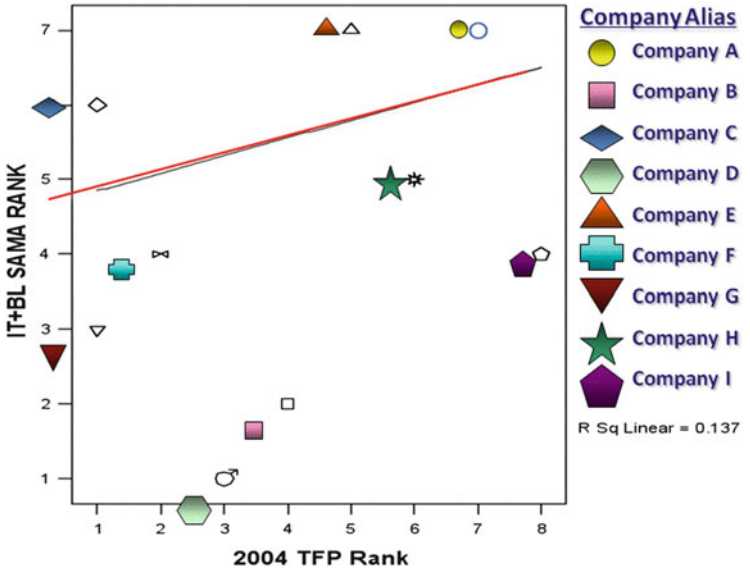
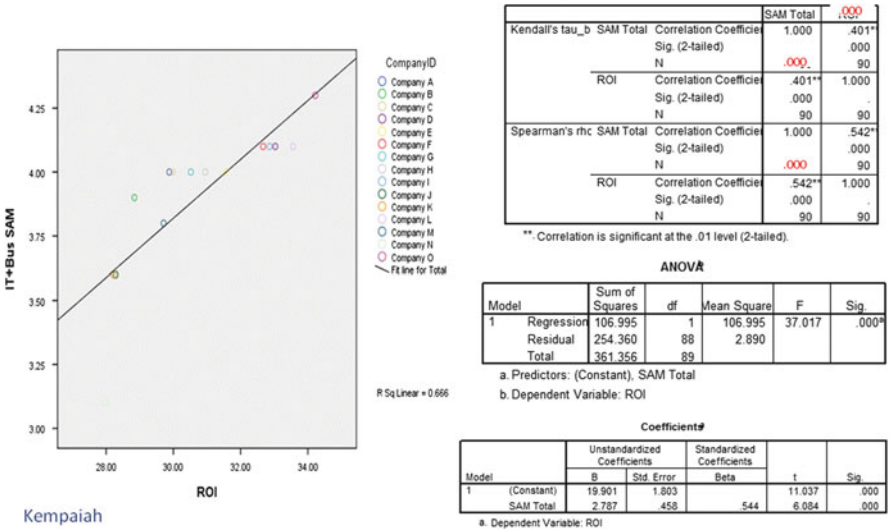


Fig. 15 Correlation between strategic alignment maturity & productivity (pharmaceutical industry)



			SAM Total	.000
Kendall's tau_b	SAM Total	Correlation Coefficie	1.000	.401**
		Sig. (2-tailed)		.000
		N	.000	90
	ROI	Correlation Coefficie	.401**	1.000
		Sig. (2-tailed)	.000	
		N	90	90
Spearman's rho	SAM Total	Correlation Coefficie	1.000	.542**
		Sig. (2-tailed)		.000
		N	.000	90
	ROI	Correlation Coefficie	.542**	1.000
		Sig. (2-tailed)	.000	
		N	90	90

**. Correlation is significant at the .01 level (2-tailed).

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	106.995	1	106.995	37.017	.000
	Residual	254.360	88	2.890		
	Total	361.356	89			

a. Predictors: (Constant), SAM Total

b. Dependent Variable: ROI

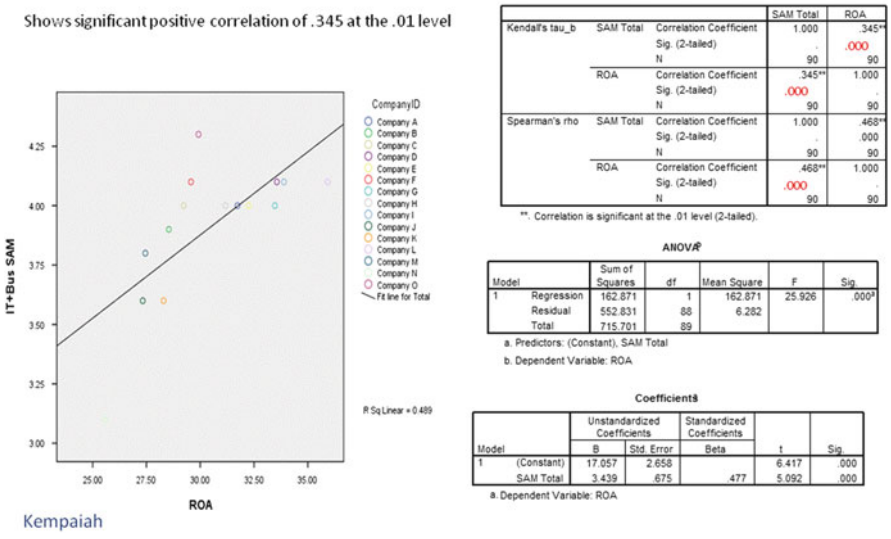
Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	19.901	1.803		11.037	.000
	SAM Total	2.787	.458	.544	6.084	.000

a. Dependent Variable: ROI

Fig. 16 Correlation analysis of SAM scores to return on investment (ROI) – Indian IT service firms

initiatives to increase market penetration by expanding their global presence and by acquiring strategically important companies abroad. The outsourced business model has incorporated certain complementary organizational capabilities such as the human resource ability to scale up quickly in response to growth in demand,



Correlations

			SAM Total	ROA
Kendall's tau_b	SAM Total	Correlation Coefficient	1.000	.345**
		Sig. (2-tailed)	.	.000
		N	90	90
	ROA	Correlation Coefficient	.345**	1.000
		Sig. (2-tailed)	.000	.
		N	90	90
Spearman's rho	SAM Total	Correlation Coefficient	1.000	.468**
		Sig. (2-tailed)	.	.000
		N	90	90
	ROA	Correlation Coefficient	.468**	1.000
		Sig. (2-tailed)	.000	.
		N	90	90

**. Correlation is significant at the .01 level (2-tailed).

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.871	1	162.871	25.926	.000
	Residual	552.831	88	6.282		
	Total	715.701	89			

a. Predictors: (Constant), SAM Total

b. Dependent Variable: ROA

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	17.057	2.658		6.417	.000
	SAM Total	3.439	.675	.477	5.092	.000

a. Dependent Variable: ROA

Fig. 17 Correlation analysis of SAM scores to return on assets (ROA) – Indian IT service firms

software process management capabilities, and the ability to manage global operations.

IT Metrics: Demonstrating process quality and expertise in IT service delivery are the key elements driving India's sustained leadership in global IT services. From the birth of the industry, there has been a culture of quality. Various quality control and process management tools have been developed and improved in India. Indian IT service firms have been focusing on quality initiatives to ensure compliance with international standards. ISO 9001, COPC, Six Sigma are examples of some of the established quality initiatives. In fact, 90 out of the world's 117 SEI CMM Level 5 companies are from India (NASSCOM Strategic Review 2007); albeit their overall SAM is at 3.7. This implies that while India is exemplary in tactical and operational aspects of IT, they still have opportunities to improve in strategic areas.

Over the years, the Indian IT service industry has built robust processes and procedures to offer world class IT software and technology related services by developing next-generation tools, technology concepts, and standards. The quality of the software has not only impacted India directly (e.g., making India a favored destination for IT enabled services), it has also impacted the overall IT field by raising the software quality bar for all IT applications and services.

Indian IT service firms have a reputation for better, faster, and cheaper project delivery. These firms hire top talent who they immediately provide training in their SEI CMM Level 5 standardized methodology. They follow rigorous processes, employing quality management techniques and using the latest technology. They have developed a new generation of project-management skills that enables work to be carried out from multiple locations simultaneously. Core to this global delivery model is a heavy emphasis on quality standard.

Human Resources/Skills: Low-cost, highly skilled IT professionals are widely believed to be the key to India's success story. India has the single largest pool of engineering talent among the emerging countries. Over 50 % of the population in India is less than 25 years old. India's young demographic profile is a unique advantage, complemented by a vast network of academic infrastructure and the legacy effects of British colonization. These have all contributed to an unmatched mix and scale of educated, English speaking talent. 80 % of the IT professionals have engineering degrees. Having engineering degrees has helped IT service firms with problem solving skills, a rigorous method of thinking logically, and in learning tools that helps in adapting quickly with rapid changes in technology, domains, and tasks. This is in comparison to the reduction of these engineering and related computer science skills in the United States. Additionally, given the strong demand to have an appropriate balance of technical, business/management, interpersonal (communications, teams), it is clear that academic changes are required everywhere.

In-house testing and training has become a regular and significant component in the Indian service firm hiring process. Companies have also established dedicated facilities for employee skill enhancement initiatives. NASSCOM (National Association of Software and Services Companies) has developed a comprehensive skill

assessment and certification program for entry-level IT talent. It also has implemented an image enhancement program to create the awareness of opportunities in the field of IT. The HR Skills maturity component for Indian Service companies is at an average score of 3.71.

Improvement in the quality of their education system is being actively discussed at the highest level of policy formulation in India. The educational curriculum is being upgraded to international standards at many institutions. When it comes to senior IT professionals or managers, IT service companies are able to manage with either the local experienced IT professionals or returning expatriates, whom IT service companies have found very useful in bridging cultural gaps between local IT professionals and foreign clients.

Partnership: For Indian IT service companies' culture and closer customer relationships are keys to competing successfully in providing high-end services. However, immigration rules for obtaining work visas create project planning and management risks. Recognizing these difficulties, Indian IT service companies are acquiring consulting firms in the United States and Europe, and are aggressively hiring hundreds of IT professionals from within the U.S. and Europe.

The irony, of course, is that as global companies from the West are trying to set up less expensive offshore delivery capabilities, the Indian IT service firms are building front-end consultancy in the West. Major IT service companies such as IBM Global Services, Accenture, EDS, and Ernst & Young are aggressively expanding their own operations in India because of the considerations discussed above.

Governance: Indian IT service firms are enjoying minimal regulatory and policy restrictions along with a range of incentives provided by both the state and the central governments. Software Technology Parks of India (STPI) have also helped the growth of IT service firms across the nation. Some of the major reforms such as rationalization of international taxation policies, mutual trade agreements with partnering countries, and a proactive and positive stance on international free trade are helping IT service firms to grow. Until the recent Satyam scandal, India had a relatively untarnished reputation.

9 Conclusions

Achieving and sustaining IT-business alignment continues to be a major issue, and is fundamental to successful BPM. Experience shows that no single activity will enable a firm to attain and sustain alignment. There are no silver bullets. The technology and business environments are too dynamic. The research to derive the business-IT alignment maturity assessment has just begun and the tools and processes are still being refined.

Much work still needs to be done to refine hypotheses around Strategic Alignment Maturity and to measure its impact on organizations and their ability to execute strategy.

Research conducted over the course of a decade clearly shows that companies are getting better at aligning their business and IT; albeit alignment is still a pervasive and persistent problem. Overall maturity scores have increased from 2.99 in 2000–2003 to 3.17 for 2009–2010. There is evidence that higher levels of alignment have positive effects on company performance regardless of industry type or organization structure. However**,** results from the assessment of 362 Global 1,000 companies demonstrates that some industries clearly do a better job of aligning their IT and business operations than others, Additional studies have linked high alignment maturity levels with better company performance measures, including sales, productivity, ROI, ROA, ROE, and NPM. The research also indicates that there are differences by region. This suggests that the strategic alignment of a company may depend both on industry norms as well as local factors.

Achieving significantly higher levels of IT-business alignment across a wider range of organizations is a long-term journey. The journey in each organization begins with a complete assessment of how business views IT, and how IT views business. The journey continues with how business and IT executives work together to close the gaps and improve the performance of the organization. And in the quest for continuous improvement within a dynamic global environment, the journey may never end.

10 Epilogue

This chapter has discussed the concept of Strategic Alignment Maturity as a critical enabler to an organization's ability to execute its strategic objectives and has explored the concepts of a model that can be used to assess alignment maturity for any organization. We have also explored the concept of strategic alignment as an ongoing process and reviewed a series of activities that organizations should follow in measuring and sustaining business-IT alignment.

It is not a question of whether an organization is aligned or not aligned. It is a question of how to enhance the IT-business relationship to help improve opportunities for leveraging IT. The Strategic Alignment Maturity Assessment is a proven vehicle for attaining this objective.

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Delivering Business Strategy Through Process Management

Roger T. Burlton

Abstract There is no shortage of planning activities in organizations today. However, the concept of a process to develop the connections between an organization's intent and its capabilities to enable that intent is woefully weak and inconsistent in most cases. This chapter strives to outline how an organization can develop a more rigorous statement of strategic intent as the starting point for all investments in change. It delves into what is needed to ensure that the hope expressed in such strategic plans and annual reports is actionable and becomes a reality. It provides a structured and repeatable method to articulate environmental pressures, intent, stakeholder interests, strategy, business processes, and various other capabilities and the relationship among them with integrity. It provides a process for establishing the business process architecture of the organization and uses it as the alignment linchpin to provide traceability from choices made in prioritized programs of change in technology, human capability, policy, and other supporting mechanisms back to their raison d'être: the enterprise strategy.

1 Introduction

This chapter will describe what organizations must do if they wish to see their bold statements of intent and strategic direction realized through the mechanism of business processes. In enterprise after enterprise in all sectors and countries there is no shortage of strategic plans and documented statements of positioning. In addition, there is no shortage of human effort and financial resources expended on programmes, initiatives and projects for change within many different professional domains. There is a large gap, however, between the performance and behavioural outcomes anticipated and the reality of what sees the light of day.

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In my view, the prime role of Business Process Management (BPM) at this enterprise level is to assure that the various developed capabilities are aligned with one another and together they deliver traceable process performance back to the stated strategic goals and objectives of the "Organization-in-Focus" (OIF). The prime role of enterprise level process management, then, is to ensure that capability investment decisions for change and ongoing management of process operations are always in synch with a set of agreed strategic criteria and not to personal preferences of managers. Our processes should act as the coordinator to ensure we optimally allocate scarce resources consistent with delivering enhanced value to the customers of the OIF within the constraints of other stakeholders' requirements such as regulatory bodies.

The chapter is an update to my book: Business Process Management: Profiting from Process (Burlton 2001) that shows a framework for establishing or validating strategic intent in a form that can be leveraged. It will identify means for identifying and resolving potential conflicts among various stakeholders' needs and expectations, products and services and business drivers. It will show how customer relationship lifecycles can be used to ensure we focus on the core value proposition, value chains and value streams against which all other internal efforts and capabilities should be assessed. It will define the processes to manage the relationships with all stakeholders and to support the core value chain to customers, also known as business process governance. It will establish a set of reconciled stakeholder-based criteria to help prioritize and manage changes downstream.

The chapter will consider the role of industry reference frameworks which, along with stakeholder and asset lifecycles, will produce a stable process architecture defining 'what' the OIF does today and will do in the future. This architecture along with the strategic and stakeholder criteria developed earlier will assure that improvements in 'how' the processes perform are prioritized and resourced according to traceable strategic drivers resulting in an aligned program of change.

It will briefly discuss the performance management aspects of BPM made possible by the process architecture and the stakeholder analysis and how these plus the strategic objectives of the OIF provide the basis for a better scorecard and human motivation system.

Also, the chapter will briefly introduce the connection to the capability aspects of the enterprise including technology, human competencies and culture, organizational design, facilities, equipment and locations, policies and business rules and knowledge sharing.

2 Lost in Translation

2.1 Today's Reality

By now, we all know that many grand ideas are never realized. Classically somewhere in the range of half of all ideas described in strategic plans never see the light of day and a high proportion of those that do are late or misaligned, thereby

robbing the enterprise of opportunity promised in some form of compelling business case. These are sad numbers and they have led many organizations to be very wary of strategic planning; sometimes seen as not worth the effort. Consequently, many of these organizations have reverted to disconnected functional and tactical planning instead. These functionally oriented approaches, however, have actually led to value streams and workflows full of disconnects and waste. Today, moreover, everything an enterprise does is interconnected and the rippling effect of a change in one domain or department can spill over to many others with severe unintended consequences. We still see plans developed by functional managers that largely disregard their peers' needs and are blind to the ultimate value proposition to customers. The assumptions made by these domain managers are often self serving due to incentives to be that way. They may optimize their parts while sub optimizing the whole. This should be no surprise since their motivation, as driven by formal accountability mechanisms, encourages localized behaviour.

Functional managers request services and capabilities from enabling parts of the organization such as Information Services and Human Resource departments based on their functional needs and in many cases the functional groups own the budget for change making it difficult to paint a bigger picture from an enterprise capability perspective. The resource allocation processes often drive support groups to become tactical order takers at the expense of their own future credibility. This is how many organizations ended up with 20 or 30 applications and databases all supposedly containing the same but redundant customer information that cannot be consolidated.

In this vein, a number of management styles have proven to be sub optimal:

- Management by order-taking
- Management by decibel level
- Management by bullying and ridicule
- Management by hope and slogans

There is a better way than taking an all too prevalent inside-out approach that ignores enterprise strategic intent and customer value creation.

2.2 The Outside-in Perspective: The One That Counts

Customers and consumers do not care at all about our insides. As a matter of fact no external stakeholders do. They only value what they get and how they are treated. There are many approaches to becoming capable that have been in existence for some time that recognize this. Fortunately these are becoming better and better recognized, especially in difficult economic or competitive circumstances.

- Lean and its predecessors Kaizen and value analysis are completely built around the concept of starting by understanding what the customer values and assessing all activity in order to eliminate "waste" or unnecessary non value added work.

- Michel Porter brought us the concept of Value Chains whereby we evaluated how well all the key aspects of work could be planned to optimize the whole company not just the parts of an enterprise.
- Kaplan and Norton brought us the powerful models of Value Proposition (Kaplan and Norton 2001) to help organizations sort out the predominant style, thinking and behaviours they needed to differentiate themselves in the marketplace.

If we take a customer centric approach, then all of these methods just reflect the common sense that places the consideration of 'ends' before 'means'. Fortunately we are starting to see organizations take aligned strategy and capability management more seriously.

- A BPTrends survey in 2006, 2007, 2009 and 2011 asked the question 'What does BPM mean to your organization?' Approximately 40 % responded that it is *'A top-down methodology designed to organize, manage and measure the organization based on the organization's core processes'* (BPTrends 2009).
- Under the industry leadership of John Zachman, mature levels of Enterprise Architecture have become more than just technology planning for IT organizations (Zachman 2009).
- Kaplan and Norton's Balanced Scorecard, used intelligently, is becoming adopted as a way of seeing more than just a financial perspective on corporate performance (Kaplan and Norton 2006).
- Compliance programs such as Sarbanes Oxley and Basel II, as well as many others, can be implemented to help cross functional management of value chains as well as meeting compliance regulations.
- The concept of Customer Relationship Management has the potential to be more than a technology if it starts with customer relationship values and not software as its perspective. Other forms of Enterprise Resource Planning (ERP) have the same potential.
- Service Oriented Architecture (SOA) starts with the goal of reusable software assets across a set of enterprise processes.

Our risk is perhaps now having too many choices of potentially competing and confusing cross functional programs that will vie for management attention and lead to a hope that one of these is sufficient and can solve all problems and deliver on the enterprise strategy with traceability of performance and alignment of capabilities. To stay connected to intent they will all require a common process perspective and set of artifacts.

2.3 Methodology Implications

With so many pressures and options facing managers an integrative approach seems necessary. Modern methods recognize the need to work at many levels in many domains but also to be connected among them. The BPTrends Associates Pyramid

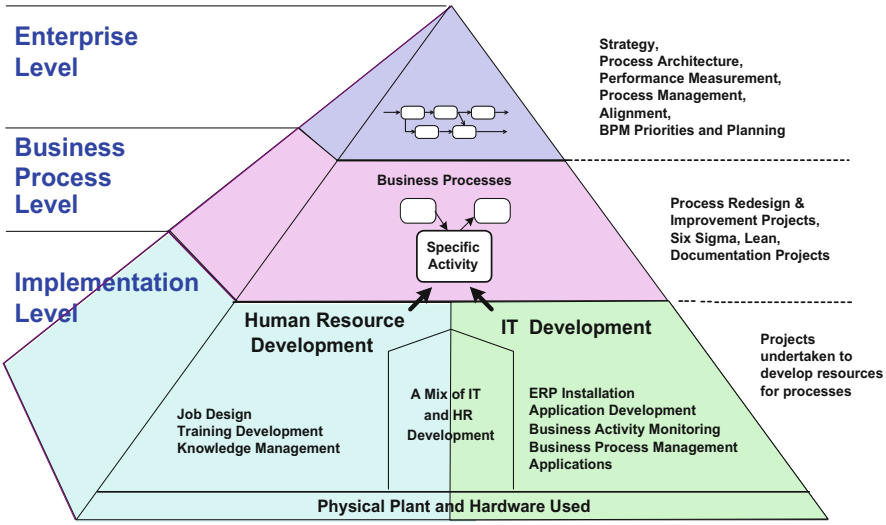

Fig. 1 The BPTrends Associates Pyramid (Harmon 2014)

conceived by Paul Harmon in Fig. 1 shows an Enterprise level that deals with overall strategic alignment and management of the process asset with governance, prioritization and resource allocation for process transformation. The Process level takes individual processes or activities and scopes, analyzes and designs new ways of working with a healthy dose of project management thrown in. The Implementation level builds the technological, human and infrastructural resources required for the processes to work and intent to be achieved. These can be done independently but strategic alignment is best served starting at the top and working down selectively within the scope of the architecture.[1]

The BPTrends Methodology, derived from the Process Renewal Group (PRG) Methodology is shown in Fig. 2 developed over a decade ago, it has always provided a multi-level approach that connects the enterprise, process and implementation aspects of the BPTrends Pyramid and adds the post project aspect of governance and continuous improvement.

The Burlton Hexagon shown in Fig. 3 shows that processes are the mechanisms that are measurable and deliver performance through the definition of the process KPIs in support of the stakeholder relationship and corporate objectives. It also shows that work flows by themselves are not sufficient. The processes must also consider the constraints or empowerment delivered by policies and rules, software technologies, facilities, all aspects of human capital, human motivation and organization design.

[1] Harmon (2014) provides an in-depth discussion of these levels with regard to the scope and evolution of Business Process Management.

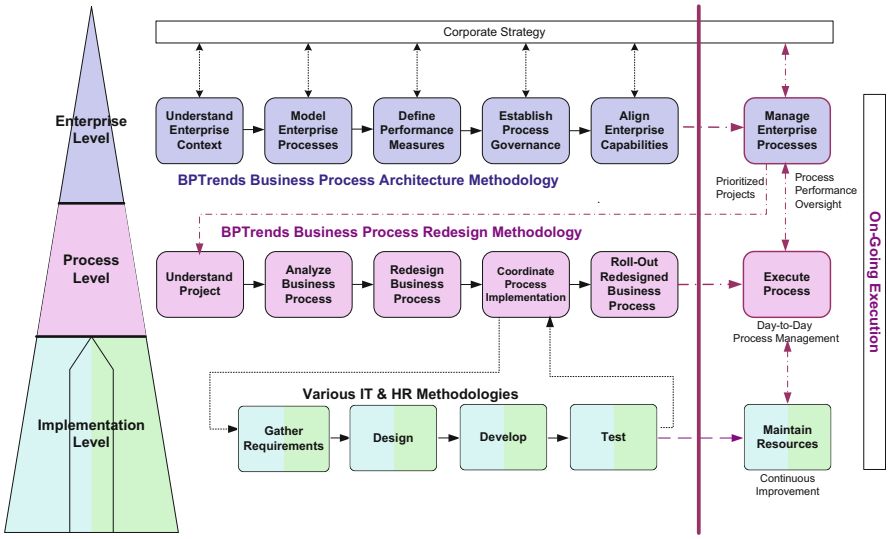

Fig. 2 BPTrends' business process management methodology

At all levels of the pyramid, alignment among the hexagonal components must be established and maintained. In addition, with processes being managed as corporate assets at the enterprise level then traceability of the hexagonal components to strategic intent is mandatory. Clearly the management of the information asset is also critical since information is created, consumed and updated by business processes.

3 An Integrative Model from Drivers Through Aligned Capability

Figure 4 is essential to align all capability to Strategic Intent. External factors are understood, strategic intent understood and strategy derived including stakeholder value propositions. Processes and other capabilities needs are compared to current capabilities of various sorts, gaps are identified, aligned and prioritized aligned programs of change established. Cross functional capability enhancement programs and projects are resourced and conducted. Traceability of changes is carefully monitored against strategic intent.

Figure 4's approach is supported by the first three activities in the enterprise phase in the BPTrends Enterprise level work as well as one aspect of the last one: Manage Enterprise Processes.

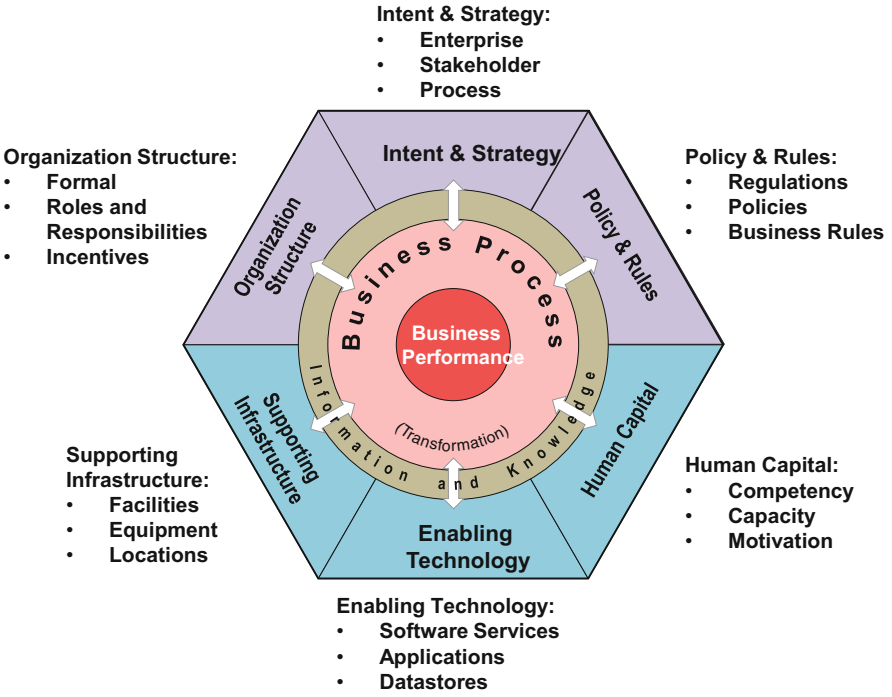

Fig. 3 The Burlton hexagon: using business processes as aligner of capabilities

The chapter will describe in turn the activities and deliverables that the top line of enterprise activity encompasses It will cover:

1. Understand Enterprise Context
2. Model Enterprise Processes
3. Define Performance Measures
4. Establish Process Governance
5. Align Process Capabilities
6. Manage Enterprise Processes

I will deal with each of this in order with only a brief discussion of the last two (5 and 6) which will be covered elsewhere.

It should be recognized that the activities will naturally build off of one another in a never ending cycle from year to year. The next round of enterprise strategy formulation may be constrained or enhanced by current and planned capabilities from the previous round. If you are fortunate then your new capabilities will be leveragible into new strategic plans that exploit them. Consequently, the activities in the two boxes are significantly iterative although, for the sake of explanation, I will show these sequentially.

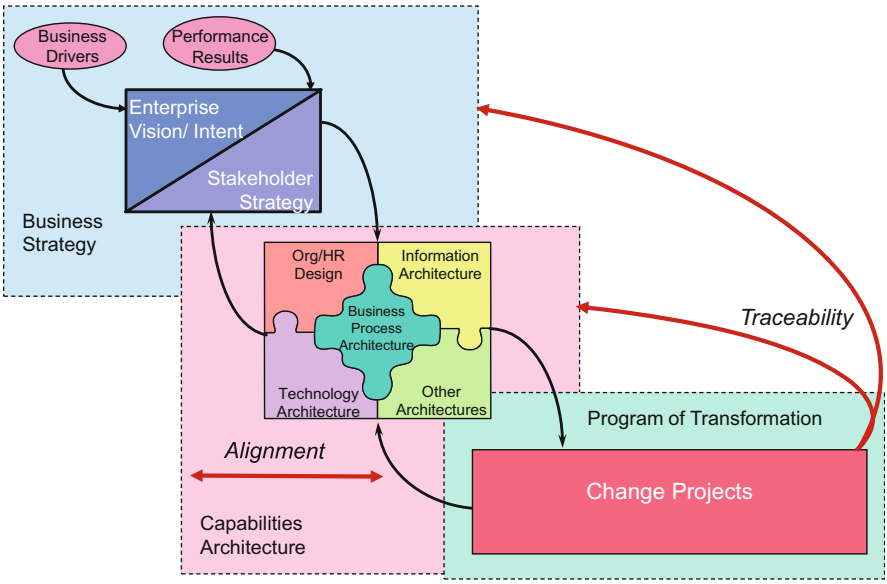

Fig. 4 Process centric strategic integrity model

3.1 Understand Enterprise Context (Methodology 1)

3.1.1 Purpose of the Activity

The purpose of this methodology activity is to understand and validate:

- The planning horizon for the strategic statements
- The scope of the enterprise "Organization in Focus" (OIF)
- External and internal business drivers
- The strategic intent of the OIF
- Organizational principles
- Known OIF strategies
- Existing OIF scorecards
- The strategic criteria for future decision-making in all following process work

It is important to note that, when it comes to the perspective of managing processes as enterprise assets, the work of the architects has a context that is traceable to the intended direction of the OIF. Consequently, the effort conducted at this point is NOT to be confused with actually developing corporate strategy but instead it is to understand what has been done and be sure that the interpretation of it is a commonly understood and accepted one. Lack of agreement is a warning flag that cannot be ignored since processes have purposes and the analysis of performance and capability gaps must be assessed against a common set of accepted criteria. If some members of the senior management team see the OIF as being all about customer relationships and others believe that cost reduction and operations

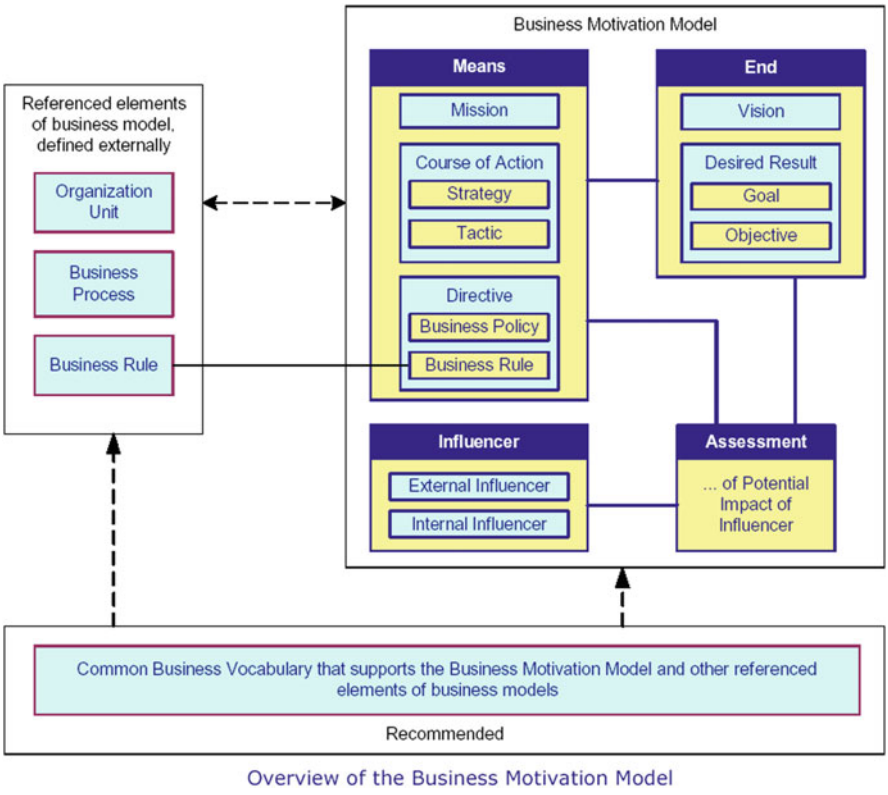

Fig. 5 Object management group's business motivation model

should be the emphasis then the remainder of the enterprise level BPM work will thrash and stall.

3.1.2 Strategic Concepts

A good starting point and repeatable metamodel for this work has been evolving over the past several years thanks to the work of the Business Rules Group. This work is now published as the Business Motivation Model (BMM) standard (OMG 2009) by the Object Management Group. One only has to look at any number of strategic documents across organizations to find that words such as 'Mission' and 'Vision' become confused. 'Goals' and 'Objectives' are freely used interchangeably despite their differences. Even the term 'Strategy' itself is inconsistently applied. This problem of lack of precise wording has made it difficult to document statements of direction in any repeatable fashion. It also means that it is difficult to communicate higher statements of intent and approach to lower levels of the enterprise and to ensure traceability of performance tracking from bottom to top.

The BMM shown as Fig. 5, defines both the structure of the strategic concepts as well as the semantics of the terms used. It not only covers the traditional

components of strategic planning but also includes the concepts of Influencers (stakeholders in the remainder of the chapter) and Assessments. These will be covered in later sections. An important feature of this model is the perspective offered on its components by Reference Elements. The ones of most interest from the point of view of BPM are Organization and Process. The message is that every level of the organization and also the processes of the organization should have a model with a consistent structure as depicted by the BMM framework.

3.1.3 Scope of the Strategic Models

The BMM implies, as does common sense, that every part of the enterprise from the whole to specific units should be able to articulate its Mission, Vision, Goals and Objectives as well as other driving motivations. The same is true for each and every process. Of course, the set of organizational and process attributes should also be connected, aligned and traceable among one another.

At the enterprise level a good starting point is to determine the scope of what is being addressed. Once again I will refer to this as the Organization in Focus (OIF). The OIF can be wide or narrow but must be clear. Some choices are:

- Group of corporations
- Corporation
- Division
- Department
- Internal Group

The advantages of a wider scope are better integrity of overall value creation and customer value chain benefits, however going too big can become time consuming due to complexity and is almost always political. The advantages of a more narrow scope are easier effort and less political struggles internally, however, sub-optimization is a common risk.

3.1.4 External Assessments

For the strategies of the OIF to have grounding external assessments must be understood by all. These external assessments can be opportunities or threats for us depending on our relative strengths and weaknesses. One of a number of variations of business environmental analysis approaches is labeled the STEEPL model (Kotter and Schlesinger 1991). The STEEPL components are:

- Social
- Technological
- Political
- Economic
- Environmental
- Legal

These are the realities from which we cannot escape. Separately or taken in combination, the enterprise strategy must honestly assess its ability to deal with them or better yet, be able to anticipate a range of external possibilities for them and be ready should they occur. For some, the drivers may represent great opportunities waiting to be exploited for business gain so long as resources are available to take advantage of them. For others, they may be seen as threats to be managed to mitigate risk. The response strategically will depend on whether the enterprise has internal strengths that can help leverage new business opportunity or mitigate the threat. Alternately if there are internal weaknesses it must determine how to overcome them to prevent business erosion or lost opportunities.

3.1.5 Strategic Analysis of External Assessments

There are a number of ways, described below, to discover strategies to deal with the opportunities and threats posed by the external drivers. A few of these are Business Scenario Analysis, Value Proposition, and the Balanced Scorecard. All have their strengths and are more powerful when used in conjunction based on a common process architecture framework.

Business Scenario Analysis

Responding to threats and opportunities as they happen is required but risky. Many organizations are trying to mitigate this as well as build more agile capabilities by using Business Scenario Analysis (Schwartz 1991) techniques originally developed by Shell Oil in the sixties. This approach assumes that no set of drivers is totally predictable so a range of possibilities should be considered from pessimistic through optimistic and assembled into possible scenarios. These are then used to test proposals for solutions and design for differing possibilities under 'what-if' situations. It emphasizes the planning elements (drivers) that have highest impacts and greatest uncertainty. Although there will be a range for each element some will be more likely than others. Some will be inevitable, some strongly possibilities and other just possibilities.

Value Proposition

A key component that subtly but strongly will drive the strategy and also the management of processes is the determination of the Value Proposition. Kaplan and Norton have stated that *"The Core of any business strategy is the customer value proposition, which describes the unique mix of product and service attributes that a company offers. It defines how the organization will differentiate itself from competitors to attract, retain and deepen relationships with targeted customers.*

The Value proposition is crucial because it helps an organization connect its internal processes to improved outcomes with its customers" (Kaplan and Norton 2001).

The Value Proposition observes that no organization can be best at everything and that although it must be competent in all things it has to lead with one of:

- Operational Excellence
  Customers value the efficiency and reliability of what the organization provides. Utility companies would fall into this category for the most part.
- Customer Intimacy
  Customers value the relationship with the organization above anything else. The products and services are secondary and can change based on the trust relationship with the organization. Knowledge intensive industries such as personal financial advisors would fall into this category for the most part.
- Product Leadership
  Customers value the uniqueness and novelty of the company's offerings. The company will focus on fast time to market and innovation primarily. Certain innovators such as some fashion or electronics companies would qualify.

Different companies can operate with differing propositions in the same industry. Each of them, however, reaches out in different ways of interacting with customers and consumers in the market. Finding the appropriate proposition can be hard and political but the process architecture depends on it and the allocation of resources for capability change demands it.

Balanced Scorecard

Kaplan and Norton also developed the concept of Balanced Scorecard and Strategy Maps as a response to the shortcomings of traditional financially oriented and backward looking measurement systems observed in most companies. They arrived at the concept that organizations should also be looking at a quadrant of measures that adds customer measures, process measures and learning and innovation measures to the traditional lagging ones. Over the years I have been using a slightly wider view of the measurement system to ensure alignment among all stakeholders, all processes, and all capabilities and building a traceability line of sight up, and across down the set of organizational units (Atkinson et al. 1997). Sometimes referred to as an "Accountability Scorecard" I and others have found it more suitable than a classic Balanced Scorecard when it comes to ensuring process performance traceability. The traceability line states that poor capability means ineffective or inefficient processes that affect customers and other stakeholder relationships negatively and ultimately poor bottom line performance at the enterprise level. Likewise strength at all levels drives hard to match business performance.

3.1.6 Documenting the Strategic Intent

Experience has proven that following the structure of the BMM from OMG shown earlier is useful in documenting the OIF's strategic statements in a form that will help the enterprise level BPM work to be conducted with integrity. Separating ends (vision, goals, objectives) from means (mission, strategies and tactics) crystallizes the articulation of the guides for the establishment of process prioritization and design later.

There are other strategic factors of interest such as principles and values but this set is a great starting point as an irrefutable context for relationship management and process management that follows. The strategy becomes more tangible when we add an analysis of the products and services we currently exchange and we want to exchange in the future with each of our external stakeholders in the next activity.

3.2 Determine Stakeholder Relationships

3.2.1 Purpose of the Activity

The purpose of the stakeholder analysis activity is to understand or determine:

- Customer segmentation
- Other external stakeholder types and sub types
- Today's and tomorrow's products, services and information given to and received from each stakeholder type (interactions)
- The starting point for process architecture development and process analysis
- The health of the current interactions between stakeholders and the OIF
- Consensus on the types of external relationships
- The expected needs and expectations (our goals) of the relationships
- The performance indicators and objectives (goals with KPIs and targets) of the relationship
- The supporting capabilities required to be successful

Especially useful will be the ends, means and assessments attributes described in the last section for the OIF but applied in a more focused way for each stakeholder relationship.

The first questions to be answered regarding external connections are 'Who cares about us?' and 'Who do we care about?' Some stakeholders interact with us on a regular basis and exchange things with us. Some stakeholders may not interact with us much but certainly affect what we do or are affected by what we do. Others may be interested but are not as close as the first two groups. We need to care about all of them and get them to care about us for the right reasons of course. Once we understand them we can decide what we need to do to optimize our part in the ecosystem within which we all participate. It all starts with gaining agreement on the classification of the various types of stakeholders that we wish to see. It is

important to note that this classification most likely will not be identical to the classic marketing segmentation used for advertising or sales campaigns. The segmentation through processes is more based on how we interact with or deal with the various types. For example we may organize and structure sales messaging for selling to the banking marketing segment and the telecommunications market with different teams. However, the way we do the work and the sales approach itself may not need to differ even if the sales proposal terms themselves do. In this case we would say for the purposes of process management that the stakeholder type is the same at the higher level of composition even if the ads themselves differ. Be careful regarding the stakeholder segmentation names used and the definitions of them since this can be the source of major semantic, cultural and political disconnection.

The classic starting top levels of stakeholder types prior to decomposition are:

- Customers and Consumers: those we are in business to serve.
  This category is often not as simple as it may seem since there may be many intermediaries or channels to market, many types of products and services for different markets and differences among buyers, influencers and users.
- Owners: those who invest in or direct our activity.
  This category includes all the investors, boards of directors and senior executives. Again there will likely be sub levels depending on degree of control.
- Staff: those who work on serving and supporting the enterprise and its stakeholders.
  Staff is considered to be an external stakeholder type since members are part of the enterprise due to their own free will and will have to be attracted and satisfied personally as well as assuming internal roles once hired. There may be several types based on the permanency of their tenure or association with collective bargaining units.
- Suppliers: those who provide products, services and resources to us.
  Suppliers may be segmented according to their nature of supply.
- Community: those who govern, guide or influence what and how we do what we do.
  This can be a very broad category with many segments since those who provide regulatory and compliance requirements and certification will be different to those who may be simply influencers on us or for us.
- Competitors: those who fight in our markets for our customers.
  Competitors may be targets for capacity enhancement through acquisition of them or them of us.
- Enterprise: the enterprise itself.
  This category is somewhat esoteric in that it considers the enterprise to be a different stakeholder than its staff or owners or customers in that its perspective is sustainability and freedom to act in the best interest of its longer term health.
- Overlaps and Oddballs: those who play conflicting roles.
  There will always be other types that do not fit the normal sectors. There will also be those that play multiple roles such as customers or suppliers that compete with you or competitors that own part of your company.

These are all decomposable into sub types but there will be a practical limit to breaking down too far to the point where the further levels are not useful for enterprise level work. Each can also be weighted so that some will be considered more heavily when it comes to influencing choices and design decisions. The weighting is a strategic choice. You will have to ask yourself the question if the five customers that make up 75 % of your business volume should be considered the same as the thousands that make up the remainder. Your value proposition should help you since weights will differ among each possible choice. Remember if you do not weight them, you are saying they are all equally strategic and important and you are in fact weighting them.

3.2.2 The Stakeholder Business Context

The Stakeholder Business Context is a model of stakeholder interactions and exchange health. It is represented by drawing a simple diagram of the actual and planned exchanges delivered to and received from each stakeholder type and the "Organization in Focus" We can show all current and future exchanges including:

- Products delivered or received
- Services provided or received
- Information exchanged
- Knowledge shared
- Commitments (formal and informal) made
- State changes of various assets or relationships

When building a context model expect to find that an incoming item will often be paired with one or more outgoing exchange items. For example a request for credit may come in and a rejection or acceptance may go out in response.

A triage-like assessment of each exchange can be made to get a good start on understanding relationship issues and opportunities. Taken together it becomes obvious which relationships are in good health overall and which need serious attention in terms of the processes that support them or are supported by them. The real value of the exercise lies in the common insights gained across a typically diverse and silo'd group of internal decision makers.

3.2.3 Stakeholder Relationship Analysis

We will need a gauge of current versus future performance gap to discover the capabilities needed and the extent of change. Start with gaining an agreement on the future we want to see with each stakeholder type, determine how to measure the success and progress towards it and then derive the capabilities or critical factors required to close the gaps.

3.2.4 Stakeholder Expectations and Goals

A useful technique for sorting out the stakeholder vision is called Time Machine Visioning. In this 'back to the future' scenario the architect and strategist imagine themselves going to the future they would like to see at the planning horizon time when all results are in and the OIF is performing as desired. Statements are postulated as to what each stakeholder type would say, or better yet what you want them to say. It then becomes the OIF's role to do everything necessary to make the statements come true. The statements become the voice of the customer and the other stakeholders as well. These are referred to as the stakeholder needs and expectations indeed become our goals for the relationship. The technique defines value criteria and keeps everyone aimed squarely at the purpose of the initiative but the criteria must be used as the guide to all design decisions. This is not to say that all stakeholders will love what we want for them but since it is our business we must choose. It is also good practice to write the statements as if the stakeholder were actually saying it in real sentences that may start with words such as 'As a result of the success of the enterprise transformation program, we can now say . . .' James G. Barnes book 'Secrets of Customer Relationship Management' (Barnes 2001), offers a set of categories for these statements that can be reused and interpreted in this exercise. This approach applies equally well when examining a single process for its stakeholder goals.

3.2.5 Measurement of Relationship Performance

The stakeholder goal statements are the basis for the determination of the performance indicators required to be able to monitor success of the relationship and progress towards success. These will now become contributing Key Performance Indicators (KPIs) towards the strategic intent ones. They measure value creation from the perspective of the stakeholder as well as the OIF. Both sides must realize value from the relationship to attain its expectations. These will be a combination of effectiveness, efficiency, quality, and adaptability. To avoid sub-optimization one KPI will not do. A balance among these will be needed.

The goal statements are also the basis for establishing the relationship objectives. That is the target values of the KPIs that the organization will aim for. These will be set for the same timing as the time machine destinations. They may also be established for interim points in time as milestones to be achieved along the way. These KPIs now become part of the Scorecard which in turn will be supported by process measures that will be derived from the process architecture.

3.2.6 Critical Success Factors (CSFs) and Required Capability for Relationship Success

The gap in current versus target goals and objectives will indicate the state of the relationship change required and the extent of supporting capability changes needed. The size of changes in each Burlton hexagon segment will be greater and more of the segments will be affected when the performance relationship gap is larger. Small performance gaps will not require launching major new systems but a big gap may. Small gaps will not require significant organizational changes but large ones may depend on them.

In order to discover the CSFs, make sure you answer the following question: "In order to achieve our vision and improvement targets from where we are today it is absolutely vital that ….". Obtain three to five responses from the perspective of each stakeholder type. Consider all aspects of the hexagon as well as dependencies on other processes. The responses should be linked to strategic intent and the stakeholder goals and objectives discovered earlier.

Taken together, the results of the stakeholder analysis will provide additional strategies and criteria for later decision making as well as the beginning of the design of the process architecture. There will be conflicts among stakeholder perspectives that will have to be sorted out. This is the time to do it not later in the middle of design, or worse, implementation.

3.3 Consolidate Strategic Criteria

3.3.1 Purpose of the Activity

The purpose of this methodology activity is to:

- Discover and reconcile inconsistencies and conflicts among stakeholder views
- Gain agreement on the decision making criteria to be used to:
  - Assess alternatives and prioritize resource allocation
  - Remove personal biases toward solution design in later transformation activities
- Balance the enterprise's intent with the stakeholder criteria

This activity provides assurance that the process architects will subsequently design an architecture that truly helps the enterprise manage the capabilities required to attain its corporate objectives with the appropriate value proposition. It will validate the fit among strategic components, contradictory programs and among conflicting stakeholder perspectives.

Ideally this will be a simple negotiation that will also summarize the results into a brief OIF and Stakeholder Charter upon which programs of change will be chosen. It also will be the starting point for defining the process architecture that will define the structure and organization of OIF processes.

3.4 Model Enterprise Processes (Methodology 2)

3.4.1 Purpose of the Activity

The purpose of this methodology activity is to determine:

- All value chains, value streams, business processes and sub processes of value to the enterprise stakeholders
- The relevance of any published industry process frameworks to the OIF
- The Core Processes of value to the customers of the organization
- The Guiding and Enabling Processes supporting the Core
- High Level Process Map and Attributes
- The KPIs of the architected processes

The BPTrends pyramid articulates the levels of process work we can conduct. Our challenge is to optimize process performance at all of these levels. However, the Process Architecture that describes what we do in terms of what's important to those for whom we do it, starts at the top. Its existence provides significant benefits to business process decomposition since it automatically provides context and scope for each. Since the performance scorecard must provide traceability from what everyone does everyday to full process results to stakeholder value to attainment of strategic objectives there is no other way to connect these dots. We need integrity delivered by a sound and elegant architecture.

The architecture is built from the perspective of a clear "Organization in Focus" with defined boundaries and responsibilities. An architecture level process is defined by the Business Process Manifesto (Burlton 2012): Now translated into more than 12 languages. 'An organization's Business Processes clearly describe the work performed by all resources involved in creating outcomes of value for its customers and other stakeholders.'

It starts with an understanding of the exchanges developed as part of stakeholder analysis conducted earlier. Common sense will tell us that everything coming into the OIF must come from an external stakeholder and be received by at least one process and likewise everything leaving the OIF must go to an external stakeholder and be produced by at least one process. This is the essence of integrity.

The interactions that come from and go to the customers, consumers and main value chain partners will mostly define our Core Processes. The ones that involve owners, regulatory or influencing stakeholders will define our Guiding Processes. Those which send and receive reusable resources such as technologies, people and facilities will establish our Enabling Processes. The typical depiction of these with Guiding at the top, Core in the middle and Enabling at the bottom is shown conceptually in Fig. 6.

A well formed architecture will exhibit a set of processes consistent with well formed naming conventions also as defined by the Business Process Manifesto

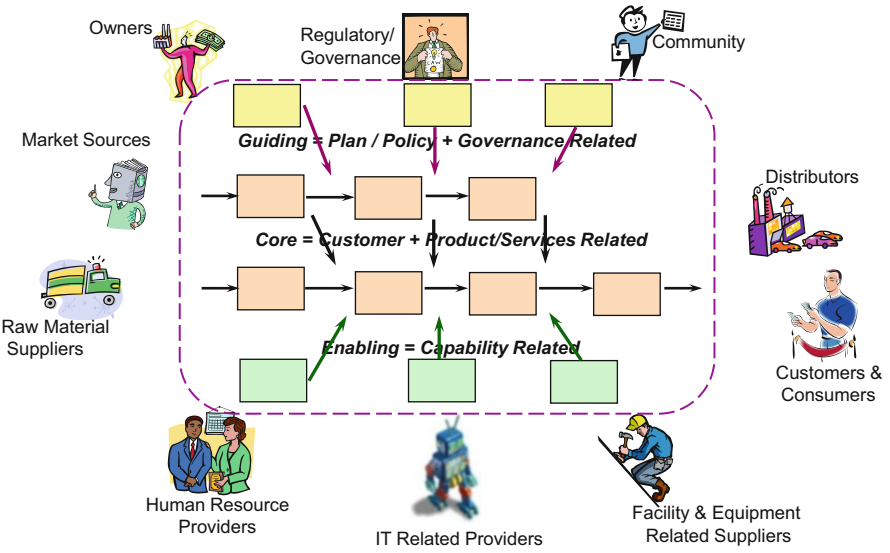

Fig. 6 Stakeholder-driven processes

(Burlton 2012). The first of these is simply that each process, activity and task, should be named by an active *verb-noun* combination. Just as a sentence needs verbs to indicate action or transformation so does a process. In addition, the name should be strong and not employ some non-descript or lazy verb. The process name should unambiguously communicate the intent of the process not its start or some vague action. That means that non–verb structures cannot be tolerated. Gerunds and other noun forms with endings such as . . .ing, . . .ent, . . .tion and . . .al must not be used.

'Marketing' is not a name for a process. 'Procurement' is not a name for a process. 'Evaluation' is not a name for a process. 'Approval' is not a name for a process. All of these are unclear and in many cases extremely confusing with imprecise starts and stops and a strong association with an organizational function. Unfortunately this vague form of the language is used by many Enterprise Architects who have chosen to name the organization's capabilities this way rather than using clear process names as the foundation of defining the abilities required. Process names must be crisp, unambiguous and convey commonly understood meanings. This means that, despite what some process modeling academics have shown in their works, the following lazy or vague verbs such as manage, handle, process, and do should be avoided if possible and replaced by something definitive that is outcome oriented. Rather than say 'handle order' say 'fulfill order' which shows the result of the process. Rather than saying 'Manage IT' say Provide IT Capability. Show the process value proposition in its name and do not clump

several processes together under a functional heading. This is not a trivial suggestion. Do it and you will thank me later.[2]

3.4.2 Lifecycle Approach to Building the Architecture

Business Processes move stakeholder relationships through a lifecycle of state changes – from unawareness through termination of the relationship. They also move enterprise assets and other items of interest through a lifecycle of their own – from idea through retirement or termination. There is a time when our customers do not know we exist. There is also a time when they will no longer be customers or potential customers for whatever reason. There is a time when a product has not yet been thought of. There is also a time when it has been retired from service. In between these extremes are a series of state changes that require someone to do something to move them to the next progressive state. These are processes in value streams that we have to make work otherwise potential customers will not be identified, qualified or sold to. There are also processes that take product ideas and test them, launch them and sell them. Among the relationship cycles and the asset cycles there may be redundancies. The customer cycle will sell products as will the product cycle. The lifecycle approach is typically easy for staff to articulate one at a time and it avoids the normal problems of seeing processes within organizational boundaries since it looks at the life of a relationship from the stakeholder perspective and not the internal organizational one. The lifecycle approach does not miss much and is easier for subject matter staff to work through methodically and for architects to facilitate.

3.4.3 Reference Frameworks Approach to Building the Architecture

In the past decade we have witnessed the growth of a number of industry and specific value chain process frameworks or reference models that articulate a set of best practices for viewing and managing the work of organizations. These frameworks serve the purpose of providing a starter kit or a point of comparison for organizations that want a consistent way of evaluating themselves against a benchmark. Typically organized as a hierarchy of functions, processes and activities with or without dependencies among them, they provide names, descriptions,

[2] Methodological aspects of how to architect high quality business processes are covered elsewhere in this handbook. Reijers et al. (2014) present a framework for realizing high quality process models and discusses additional parameters for deriving a well-formed architecture. Koschmider and Oberweis (2014) suggest an approach to design business processes with a recommendation-based editor. This approach can help overcoming productivity barriers and low process model quality by reducing the need for the user to study the modeling notation. Becker et al. (2014) point out that it is not only important to create models which can be readily understood by humans, but also by computers in order to improve decision making on process architectures.

performance indicators and other attributes that may be reused. These frameworks are not always relevant due to the peculiar nature of the business. They may also use names that clash culturally. Few organizations can expect to simply take the reference models and apply them without thought or some amount of assessment and modification. For process areas that simply require a best practice, these often work well. After all, if you are building capability that will not differentiate you no matter how good you are in it, why would you want to stray from what is proven? Why would you not examine the documented results of work performed by many intelligent professionals who typically would have collaborated over a long period of time to reach consensus and subsequently had the ideas tested in the real world. However, in the areas that you have chosen to be the basis for competition or differentiation, taking on the industry best practice alone will make you the same as the industry at best. Is that 'best' good enough for you? If not, you have to develop your own models or variations and then keep quiet about them.

Generic Enterprise Models

There are a number of models intended to describe organizations of all types in all sectors. The best example of these is the original Process Classification Framework from The American Productivity and Quality Center (APQC) (APQC 2009). The PCF is very general in nature since it does not try to be industry specific. It is, however a useful reference in that it is comprehensive, covering not only core processes but also, enabling, guiding and management ones that some other frameworks overlook. It tends, however, to quite functionally-oriented in places where it takes an area such as the finance function and drills into its activities rather than seeing these as components of other wider processes viewed from an outside-in stakeholder perspective. Nonetheless it is a useful reference but cannot be relied upon alone to replace good enterprise analysis of processes.[3]

Industry-Specific Models

There are a number of industry models in place and emerging that aim to describe an industry in whole. The implicit assumption is that every player in the industry is essentially the same as all the others at the basic level. One of these is e-TOM from the Telemangement Forum (TeleManagement Forum 2009) which describes a generic telecommunications organization. In places it is remarkably useful as a process reference, especially in the area of provisioning and similar engineering like processes. Recently APQC has released a set of industry specific frameworks for certain industries that are more helpful. In all of these be careful of a tendency to

[3] Aitken et al. (2014) propose a generic approach to develop organizational models based on process classification frameworks such as the APQC framework.

be functionally oriented. Nonetheless, many do contain just about everything a company might wish to do if you look hard enough.

Domain-Specific Models

There are a number of models developed surrounding particular functions within the organization and the processes within them. Some of the best examples of these can be seen in the IT function. Most prevalent is ITIL (IT Infrastructure Library) (IT Governance Institute 2009) which is a framework of best practices supporting IT services management. It is particularly strong in the areas of service support and weaker in the general IT management aspects for which one might supplement with other models. Its use is very widespread in the IT community and recognized as best practice. Another model that works well in the IT Domain is COBIT (Control OBjectives for Information and related Technology) which was originally developed as an IT audit framework by the non-profit ISACA organization but is now being recognized more for IT management in general (IT Governance Institute 2009). It is a good partner model for IL especially as the two frameworks start to converge in their latest releases (ISACA 2009).

Process, Lifecycle and Value Chain Models

The longest running framework that takes the perspective of end to end business processes as the point of view would be SCOR (Supply-Chain Operations Reference) (Supply Chain Council 2009). Its purpose is to examine all work in a connected business process chain from the supplier's supplier through to the customer's customer across and within enterprises. In existence for about a decade and supported by over 800 member organizations, it is well respected and highly adopted in companies and industries with significant logistics challenges especially across multiple partners. A growing perspective, however, is that supply chains exist in various guises beyond the movement of physical goods and advocates of SCOR will use it for non traditional process customer – supplier challenges.

The VRM (Value Reference Model) has a wider perspective than SCOR although it also tackles supply chains (Value Chain Group 2009). It has added product development and customer relations perspectives as well and, when taken together, these provide a wide value creation framework more universal than SCOR. These describe the normal process sequences and dependencies in order to take and deliver an order, get a product to market and optimize a customer relationship. They do not cover the general management of the business nor the provisioning of reusable resources. While weak on these guiding and enabling processes, these two are quite robust in their areas of focus.

A government-oriented services framework has been developed by the Government of Canada. GSRM (Governments Strategic Reference Model) takes the lifecycle perspective of a generic government service from concept through

decommissioning (Treasury Board of Canada Secretariat 2009). Its patterns are intended for use by governments to manage the life of services at each of the stages of maturity.

3.4.4 Architecture Consolidation

Both the process lifecycle and the process frameworks approaches have merit. The combination of them is unbeatable in completeness, richness and relevance. Both approaches tend to delve to a level of detail that is deeper that the single page snapshot that is often seen in the first view of process architecture diagrams. Careful layering is needed to ensure that a manageable architecture is derived. A rough guideline of 10–15 core business processes and an equivalent number of guiding and enabling business processes for a total of about 30 should exist at the top layer showing the value chains and value streams has been found to be useful. This mile-wide and inch deep perspective ensures we see the full picture at all levels. Each of these top level processes can be broken into a similar number of sub processes depicted on their own diagram.

Keep in mind that the structure and semantics of the architecture will be political, there will be a functional bias and it will be confusing for those not exposed to process thinking. Be prepared to make those managers aware before trying to sell the models to them. You are changing the semantics and to some degree the culture of the enterprise as you do this so be patient and give it enough time to steep.

3.5 Define Performance Measures (Methodology 3)

3.5.1 Purpose of the Activity

The purpose of this methodology activity is to:

- Identify the key performance indicators (KPIs) to be used for each business process
- Associate the process architecture KPIs with the strategic objectives and stakeholder measures
- Determine traceability of measures across the start to end of the value streams and end to end business processes
- Identify which measurement data can only be captured in processes later in the value stream that reflect those ones earlier such as customer complaints

Measurement attributes at this level must be consistent with or contribute towards the enterprise scorecard. They will have a vertical perspective connecting business processes to the more strategic measures and a horizontal one connecting to the prior and following processes as well. Both are important.

Top Down and Horizontal Perspectives

By now we should have a good start towards the strategic measures of the OIF and the ways to measure stakeholder relationship success. If not we must go back and get this clear or the process architecture level will have no measurement context or criteria. For each business process at the top level of the architecture we determine which processes are relevant in support of the strategic direction of the OIF, which are of value to the stakeholders, and the KPIs for each process in terms of the support for the higher level strategic and stakeholder KPIs. We must also establish the KPIs for each process that can only be captured in a later process if there are any. For example the measures of customer satisfaction or dissatisfaction with the taking of an order may only be measured in a downstream process that receives and settles returned goods from the customer. Effectiveness measures typically fall into this category only becoming apparent later in the value stream. We can also set the targeted performance objectives for the process at this time. Remember that an objective is a KPI with a target level by a defined time.

It is critical to have well-formed KPIs since in many cases the ones proposed are not truly measurable. A well-formed KPI has the following characteristics:

- Relevant: supports the assessment of a purpose, vision or goal
- Comparable: has a Unit of Measure
- Time-bound: is associated with a period of time or a point in time
- Measurable: reliable data can be attained without bias or excessive time and cost
- Trustworthy: people feel confident that it is accurate

Finding a combination of KPI types is best practice since focusing on one type alone often leads to sub-optimization in the others for the same business process. For example becoming too efficient can affect resource availability and hence service to customers. In addition, the performance of an early process may affect those that follow in a way that diminishes the downstream process' performance due to questions not asked or inattention to data quality. Once again, four types of measures are efficiency, effectiveness, quality and adaptability. Look for one of each for each process and never lose sight of effectiveness.

Efficiency and Quality measures are traditional based in more traditional industrial engineering disciplines and are typically the easiest to measure since they can be easily counted up, divided and compared at all levels of a process decomposition.

Effectiveness measures are those which are associated with the value received by the business process customer or output recipient. Effectiveness measures are typically harder to measure since they require the receiver's perception of value to be known. They have their basis in total quality management disciplines such as Lean and consequently measuring effectiveness at lower levels of process decomposition may not be useful if it truly is the whole stream that is important to the receiver. In these cases proxies that stand in for the overall KPI may have to be found.

Efficiency and Effectiveness measures do not question the product or service or capability that is being produced. They assume that these are stable. Adaptability measures are those which are associated with timing of product and service

availability or the ease of capability change. In response to or anticipation of strategic or product changes.

Measurement sounds much easier that it is and means of gathering reliable measurement data are sometimes the biggest issue. Some information may not be affordable or even possible to capture in a timely fashion. Some may be highly suspect in terms of bias and reliability. Sampling theory requires statistical significance. It also questions relevance as to the time the sample is taken. All too often, projecting the sample results to the full population from which the sample is taken will be biased by the time of day or year when the sample is taken. The anthropic principle (Bostrom 2002) tells us that the act of measuring often changes the measurement results due to motivational or physical factors involved in the measuring. For example watching staff conduct the work will surely result in different behavior that when no one is around. In considering the KPIs we must consider the feasibility of the means of gathering reliable data in addition to the unit of measure itself.

3.6 Establish Process Governance (Methodology 4)

3.6.1 Purpose of the Activity

The purpose of this methodology activity is to:

- ensure clear responsibility for all processes
- establish sustainable process governance and start-to-end management
- start to define an organizational migration path to a new way of managing

Process Governance can be confused with process management supporting services normally found in a process support group or center of expertise that provides capability and consulting to process projects. That is not what this section will deal with. Other chapters in the book will look at those issues of support and enablement. Here we will discuss the activities required to take responsibility for continually optimizing and managing the process assets of the OIF; its performance and timely improvement. We must answer 'Who will manage process execution and govern performance and improvement on a sustainable basis and how will this be done?'

There are a number of key roles that must be played in order to assure that processes continue to be effective assets at their best. At this point the reader may have expected a discussion on process ownership. Instead we will discuss a wider set of concepts since 'ownership' as a uni-dimensional concept is proving to be too simplistic given that the management and governance aspects of processes are far more complex than that. The term 'owner' will not be used here since the emotion and resistance from non-'owners' of processes who are day to day managers of staff that work in the process can be too great and often lead to a conflict of motivational alignment at the personal manager level. I will articulate a set of roles that are

required in order to maintain optimal process performance at multiple levels of value chain, value stream, business process and activity responsibility. As in data management, which abandoned the term 'owner' years ago since the data asset is a corporate one and therefore not owned but shared, I will use the term 'steward'.

In larger mature organizations, specific process instances will be executed and managed operationally in multiple locations. They will be monitored for performance and consistently improved across all locations, and along with the total set of all processes, governed for optimization and alignment. This will require a number of roles to be clearly differentiated:

- A *process lead* is responsible for ensuring the completion of a specific process instance for a specific customer or requestor all the way from the initiating through to the closing event and result delivery.
- A *process manager* plans, directs and monitors defined sets of processes instances and resources and adjusts them to produce expected outputs and business results day to day. Sets of instances may pertain to specific locations, transactions, projects, clients, accounts, etc. The process leadwill typically line-report to this manager operationally.
- A *process steward* is responsible for the designs of a related enterprise business process and its guides and enablers. He or she plans and sponsors their development and deployment universally. The steward also periodically monitors their performance and assesses their continued fit in light of market conditions and recommends funding of changes. This person will act as project champion for any transformation of the project to deliver change.
- A *process executive* governs a logical group of enterprise processes at the value stream or value chain levels of complex and large enterprises. The *executive* will ultimately be responsible for both performance and change oversight.

Other optional roles are:

- A *governance coordinator*, supports, enables and coaches the stewards and provides executives and stewards with required services.
- A *process management council* brings together stewards and executives for standards setting, coordination, change prioritization and change issue resolution. This council also makes process change prioritization recommendations or decisions

These can be seen graphically in Fig. 7.

Note that these are roles and not positions and the titles may vary from enterprise to enterprise. In large complex organizations they may be assumed by different people. However, in simpler enterprises multiple roles may be assumed by one person. For example, the process steward and process manager will most likely be the same person when the process only runs and is managed in one place as opposed to multiple locations.

To assure overall knowledge sharing, motivation and consistency as well as architecture control and overall synchronization, a process management council can be formed for governance purposes. It is comprised of process stewards and

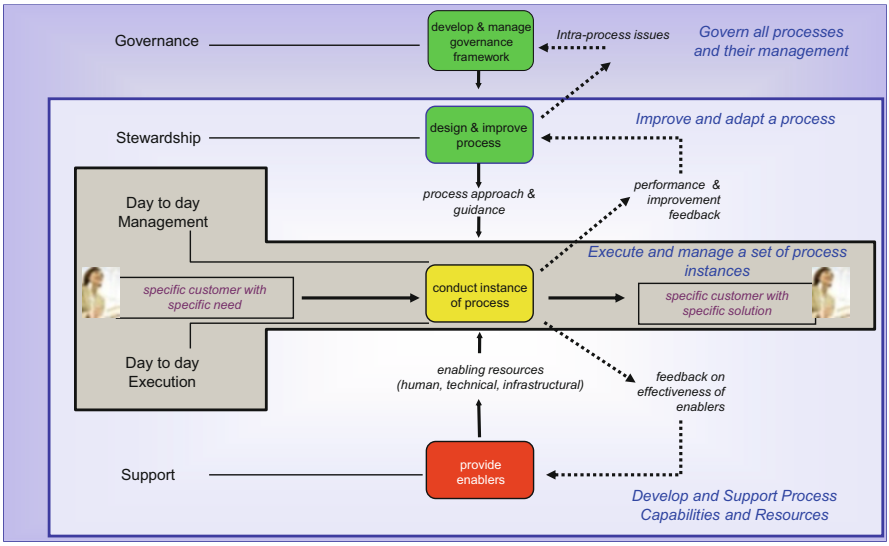

Fig. 7 Process governance roles

executives and supported by the governance coordinator who may be from the centre of expertise.

3.6.2 Motivation Alignment and Stewardship Support

The deliverables from the first three methodology sections must come together and be in complete alignment. Governance without an agreed process architecture means we have no consistency in what we are managing. A business process architecture with no measures for performance paints a nice picture with no ways of assessing results. Governance with measurement and reporting is required in order to have business process accountability for managers, stewards and executives. Conflict between the goals of the processes and the personal performance plans of the stewards is a certain recipe for dysfunction at best. Governance will not last long because no one will care about it.

Another challenge is that the process executives and stewards typically need help in becoming effective even at the best of times when their motivation is in synch with the stakeholders receiving value from the business process. These are new and unfamiliar roles that are often overlaid on existing responsibilities and often seen as more work. The BPM Center of Expertise, if experienced enough, can be important contributors in enabling sound process governance.

With the governance model in place it is now possible to prioritize opportunities for process and capability renewal according to process performance and outcomes and manage cross functional change.

3.7 Manage Enterprise Processes (Methodology 6)

Author note: I have jumped over Methodology Activity 5 for the moment since in many cases a comprehensive alignment with other capabilities will take too long and the alignment will be done in a phased manner in synch with the priority processes. I will return to it immediately following this section in Sect. 3.8. This section will discuss one aspect of Methodology 6. Also please note that this section will only deal with the prioritization of changes and not the many other aspects of Managing Enterprise Processes.

3.7.1 Purpose of the Activity

The purpose of this methodology activity is to:

- Determine which processes are critical to the achievement of Strategic Business Objectives and Stakeholder Value Creation (Highest Gain)
- Identify the gaps in process performance between current state performance and ideal state target performance (Highest Pain)
- Find the potentially best choice to improve value according to the strategic criteria created earlier
- Begin the ranking of processes and related capabilities for feasibility assessment, business case analysis and renewal

Now that we know the criteria for what is important to the enterprise and its stakeholders and we have a shared understanding of what our end to end business processes are, we can connect up the stakeholder based strategic criteria to give us a ranking of where our biggest return on investment for change will come from.

This will be comprised of an assessment of process strategic value contribution ranking based on each process' individual Direct Outcomes and process performance gaps using real performance data or consensus of anecdotal feedback. The best opportunities for raising enterprise performance will be in business processes that have both the highest potential value to stakeholders in support of our strategic intent (the north star of the OIF) and those that also have the largest performance (KPI) gap today from where we need them to be at the end of our planning horizon. In order to do this we can produce a series of matrices and grids of process-value contribution versus potential process-performance gap that are carefully aligned. We may do this in a very formally manner or in a more subjective way if time pressures demand.

		Scoring for all criteria: 1. None, 2. A Little,3. A Moderate Amount, 4. A Large Amount, 5. A Significant Amount					
Process Name		Strategic Outcome Statements and Weighting					Gain Summary
		Sustain the quality of our food	Sustain our licenses	Increase revenue, profitability with positive cash flow	Increase customer satisfaction	Decrease our carbon footprint	
	Process #	15%	30%	30%	20%	5%	
Plan the business	1	3	2	4	3	3	3.00
Determine regulatory requirements	2	3	5	3	2	2	3.35
Develop polices and rules	3	2	4	2	3	2	2.80
Assess compliance	4	4	5	3	2	3	3.55
Develop marketplace strategy	5	2	2	5	4	1	3.25
Plan restaurant operations	6	3	2	4	4	1	3.10
Update finances	7	1	3	2	1	1	1.90
Design business processes and capabilities	8	4	4	4	4	3	3.95
Advertise restaurant	9	1	1	5	3	1	2.60
Purchase supplies	10	5	2	4	4	1	3.40
Prepare food	11	5	5	3	4	1	4.00
Serve restaurant customers	12	5	2	4	4	1	3.40
Deliver pizza order	13	5	4	5	4	4	4.45
Provide customer services	14	2	3	3	4	1	2.95
Provide and maintain facilities	15	3	4	3	2	2	3.05
Acquire and maintain equipment	16	5	4	3	4	2	3.75
Assign human resources	17	4	3	4	3	2	3.40
Provide IT capability	18	1	1	3	3	1	2.00

Fig. 8 Process/strategic outcome matrix (GAIN)

3.7.2 Matrix Alignment Approach

The Process/Strategic Intent Matrix

By cross referencing the Strategic Outcomes of the OIF, developed from Stakeholder Outcomes and the OIF's value proposition to the business processes in the architecture in a matrix we can assess the value that each process should or could provide to the chosen direction of the enterprise. When summed up and weighted by the relative values (i.e. importance) of each strategic outcome statement, defined earlier, we can identify the level of *GAIN* the business process can contribute towards the North Star goals and objectives. Figure 8 illustrates how this may be structured. This evaluation uses the OIF stakeholder analysis and strategic intent results.. In the illustration A scale of 1–5 can be applied for each process towards the strategic intent statement and the sum of all scores for each process will allow a ranking scale of most value added process to the strategic intent to least value added.

Process Name	Process Number	Scoring for all criteria: 1: Always, 2: Mostly, 3: Sometimes, 4: Rarely, 5: Never Process Performance Pain Criteria (1 - 5) Relative to the ideal state of the process.				
		The process achieves its ideal direct outcome	The process can be executed consistently	All resources are efficiently utilized in the execution of the process	Pain Summary	Pain Ranking
Plan the business	1	4	4	2	10	7
Determine regulatory requirements	2	1	2	2	5	16
Develop polices and rules	3	4	4	3	11	5
Assess compliance	4	4	4	2	10	7
Develop marketplace strategy	5	3	3	3	9	10
Plan restaurant operations	6	3	4	2	9	10
Update finances	7	1	2	2	5	16
Design business processes and capabilities	8	4	4	4	12	2
Advertise restaurant	9	2	3	3	8	13
Purchase supplies	10	1	2	2	5	16
Prepare food	11	2	4	3	9	10
Serve restaurant customers	12	2	2	3	7	14
Deliver pizza order	13	4	4	5	13	1
Provide customer services	14	4	4	3	11	5
Provide and maintain facilities	15	4	3	3	10	7
Acquire and maintain equipment	16	4	4	4	12	2
Assign human resources	17	2	3	2	7	14
Provide IT capability	18	5	3	4	12	2

Fig. 9 Process performance-gap matrix (PAIN)

The Process Performance Gap Matrix

The Process Performance Gap Matrix is similar to the Process/Strategic Intent Matrix in structure. It contains the same process rows but the columns vary since they are assessing performance and capability gaps not strategic contribution. The intersecting cells, obviously, reflect a different assessment. This time they reflect the potential gaps of the process while holding constant the value or importance of the process in the first matrix. The question is one of how well will today's process design, and its current supporting capabilities, be able to meet the future strategic and stakeholder performance needs? Note that today's performance and capabilities may not have a large gap but future requirements may mean that current abilities will not keep up with changing requirements and hence a gap is recognized. This is referred to as the level of *PAIN* as shown in Fig. 9.

Pain and Gain

By assembling the results of the two matrices' rankings we can map Pain rank versus Gain rank and produce a grid of Highest to Lowest Gain versus Highest to Lowest Pain as depicted in Fig. 10.

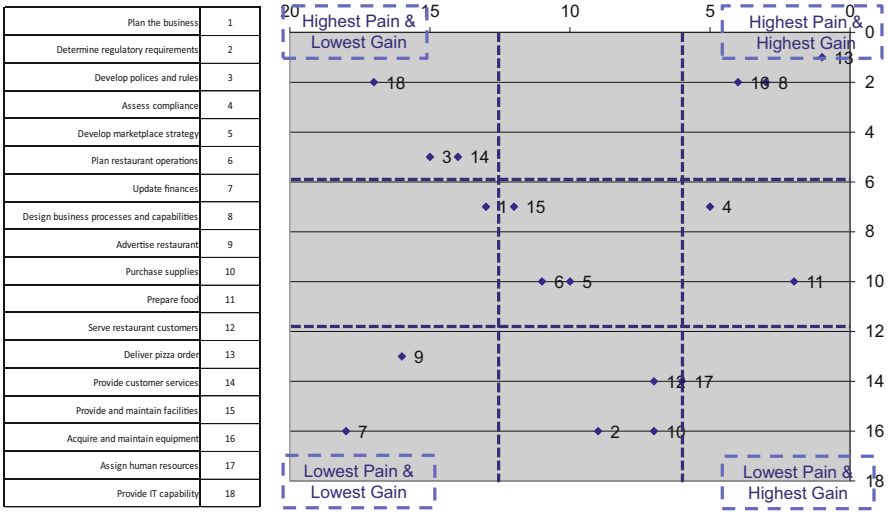

Fig. 10 Process/capability migration strategy grid

The processes in the Lowest Gain column represent those that must be done competently but do not make much difference to value creation if they are performed exceptionally well relative to the others so these can be dropped from further analysis right away. The processes in the Lowest Pain row represent those that we perform very well relative to the others so are not really candidates for major transformational changes from a business point of view. The ones remaining in the grid of medium to high in both Pain and Gain are the ones that will give us more bang for the buck.

The Highest Pain/Highest Gain quadrant is clearly where the greatest advantage can be realized and most of the transformation focus and resources should be allocated. Processes here solve the largest performance problems that are most important to the value proposition and intent of the OIF. Lower Gain/Highest Pain processes are not as rewarding enterprise wide and are a second choice. Highest Gain/Lower Pain is better but we must be careful not to fall behind on these and we must remain aware of potential threats and opportunities that change the assessment. Lower Gain/Lower Pain may be better served by remaining in continuous improvement mode while we attack the others. The findings from the grid must still be vetted and adjusted from a cost/benefit, dependency, political and other types of feasibility perspectives to build the transformation plan.

A fast-track version of this grid can be performed using a nine-block triage approach that uses a relative comparison of the processes in the architecture against the enterprise value proposition and company vision, goals and objectives as the Gain perspective. The three Gain categories are whether or not each process is a differentiator towards world class performance (Highest Gain), is a requirement not requiring industry leadership but needing best practice parity or simply a commodity process that will never make a big difference no matter how well we make it

perform. The Pain perspective is also triaged into potential performance gap from biggest at the top to smallest at the bottom. Together they provide another way to pick priorities when time does not allow a more structured assessment.

3.7.3 Establish Enterprise Transformation Portfolio

This activity identifies all existing projects of any type currently underway, all planned and funded projects of any type, all planned and unfunded projects of any type and current budgets and commitments-to-complete; maps and assesses the fit of existing and planned projects against priority processes and required enabling capabilities. In addition, this activity determines any constraints that will hinder changes in the priority processes, produces funding criteria for continuation or freezing of existing projects and initiation of new ones, recommends approval or freezing projects; and produces the Enterprise Transformation Portfolio.

The tasks performed during this activity are:

- Validate Priorities
- Identify Existing Programs/Projects
- Rationalize Current with Required Future Initiatives
- Create/Update Enterprise Transformation Program

Detailed methods for this part of the method will be covered elsewhere in this book but if this work is not managed continuously starting with the strategy, process and capability architectural activities described in this chapter then it will quickly revert to a process of fielding and reacting to internal special interests and politically biased misaligned resource allocation.

3.8 Align Process Capabilities (Methodology 5)

3.8.1 Purpose of the Activity

This method activity determines the information needed in order to be able to conduct the envisioned processes and identifies the gaps in information quality; assesses the contribution of knowledge to the processes, identifies barriers to process performance due to overly constraining, inappropriate or inadequate guides, determines which policies and core rules should and must be changed, initiates the knowledge and policy changes; and determines the supporting capabilities and assets (strategic technologies, human competencies and physical facilities) needed to conduct the envisioned processes in the optimal manner for their stakeholders. The tasks performed during this activity are:

- Determine Enterprise Information Fit/Gap
- Determine Knowledge Fit/Gap
- Identify Organizational Structure Fit/Gap

- Identify Policy Fit/Gap
- Identify Technology Fit/Gap
- Determine Human Competency Fit/Gap
- Establish Physical Facility Fit/Gap

Detailed methods for this part of the method will be covered elsewhere in this book but without our the foundational strategic and process methodological work described in this chapter all of these will be misaligned and change will not be delivered holistically.

4 Conclusion

The work described in this chapter is the foundation for managing a modern enterprise; one that is customer-focused, strategically-aligned and process-centric. Customers do not care about our departments, functions or organization chart and should not be exposed to the navigational problems across them. Business strategies are not paper documents to be ignored. They must be used and connected to everything that everyone does every day. Business processes are the only things that connect the dots to create stakeholder value consistent with enterprise strategic intent. This fundamental shift in work towards linked performance management and change management must become a relentless pursuit for change agents. It will happen sooner or later to all organizations that survive. What I have attempted to describe here is a simple and common sense approach to remain true to the ideals of managing by process for stakeholder outcomes not by function for internal reward.

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Management of Process Excellence

Mathias Kirchmer

Abstract In order to be successful, enterprises have to adapt quickly to new opportunities and threats. They have to take smart decisions and execute fast. Innovation and agility become main success factors. The Management of Process Excellence (MPE) is a key enabler. It is a value-driven approach to business process management that can result in dynamic operations of an enterprise. MPE links business strategy with people and technology based execution – at pace with certainty. Technologies such as Service Oriented Architectures (SOA), software-as-a-service (SAAS), cloud-computing or the Web 2.0 support this approach. MPE enables business outcomes through those technology architectures. Knowledge assets such as reference models increase productivity again. The resulting next generation enterprise is ready for long-term success since it can adjust to the volatile business environment. This chapter discusses MPE, an approach to achieve agility and innovation through Business Process Management. It describes the relation between process management and innovation and how next generation process automation can support that effort. Finally, an appropriate process governance approach for MPE is presented.

1 Management of Process Excellence (MPE) Requirements and Approach

The *requirements* for the Management of Process Excellence (MPE) (Kirchmer 2011a) result from its specific goals. MPE takes a holistic and value-driven Business Process Management (BPM) approach (Franz and Kirchmer 2012a) and focuses it on achieving two key goals:

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- Innovation
- Agility

Consequently, MPE is closely linked to an organization's strategy. It transfers business strategy into people and technology based execution – at pace with certainty. The business process is the critical link between both. A company following a traditional BPM approach may launch a process automation initiative to achieve a cost reduction. They are proud of their new automation tool. However, when later on new products have to be launched, the automated processes may not be flexible enough to handle that situation. An organization following an MPE approach would, from the beginning on, drive an automation initiative in a way that leads to a flexible process execution, using people and technologies in a way that allows an easy adaptation to changing requirements, while still achieving the desired cost effects. The company is proud of the business outcomes as well as the new process and its capabilities to adjust it. This flexibility can, for example, be achieved by using a process repository to capture all process-related documentation as basis for the automation or by applying the right process monitoring approaches. The resulting transparency enables the required flexibility.

MPE must achieve two important key outcomes:

- Enable smart decisions regarding the transfer of strategy into execution – in other words, high- quality decisions made in a timely manner
- Enable the fast execution of the actions resulting from those decisions

MPE not only does clarify strategic direction, align resources, and increase discipline, as "traditional" BPM approaches do but it also provides quality information in the required time frame to support the right decisions on all levels of an organization and delivers the infrastructure necessary to enable the fast execution of resulting tasks, making change easier. MPE can help setting the right focus – on business outcomes and the high impact processes that affect those outcomes most.

MPE must enable the desired results at the lowest cost level and combine efficiency with quality, reflecting management's desire to get "more for less" (Spanyi 2006). Only the economically feasible approach is relevant in practice. Therefore, MPE requires the use of available standards and best practices wherever possible, based on an approach known as "open BPM" (Kirchmer 2007). This "open" approach leads to high flexibility around the process lifecycle because of the integration of the various process- management phases. This is achieved in a resource-efficient way by establishing an appropriate process management organization and governance to identify and roll out the necessary tool, delivery and transformation standards and guidelines applied through Open BPM. It is all about establishing the right "process of process management". Examples are methodologies for incremental improvement like Six Sigma or transformation approaches, architecture standards or standards for modeling methods and tools, process automation engines, or business activity monitoring (BAM) systems.

The MPE *approach* is illustrated in Fig. 1. It has been developed based on Scheer's ARIS Three Level Framework for Process Excellence (Jost and Scheer 2002;

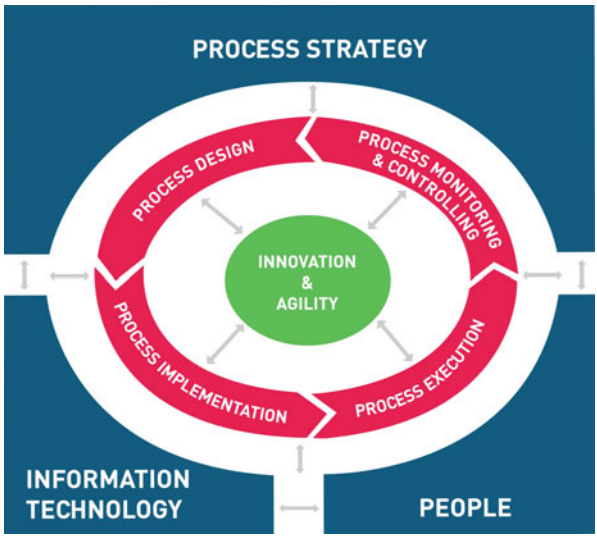

Fig. 1 MPE approach

Kirchmer and Scheer 2004; Scheer 1998a, b), a widely used general methodology for business process lifecycle management. In addition to this and other general approaches (e.g., Kirchmer and Scheer 2004), MPE places explicit focus on innovation and agility. Every phase of the process lifecycle has to be aligned with those objectives; other process goals are reflected as "sub-objectives". The entire "process of process management" is organized appropriately (Franz and Kirchmer 2012a). This creates the basis for a high-performance business focused on business outcomes and value-creation – and with that on the customers. MPE underlines BPM's role of enabler for innovation and agility.

MPE begins with the business process strategy of an organization. The process strategy transfers the overall business strategy into appropriate process structures and its hierarchical decomposition.

First, the main business processes of a company are identified. Next, innovation potentials and their general process impacts are defined, delivering the basis for the definition of the business process structure and its hierarchical decomposition and the related process goals. Result are process models identifying a company's end-to-end processes. Innovation areas as well as processes and sub-processes that are especially important to achieve competitive advantage are identified using this process map which is linked to the relevant innovation and agility goals, the strategic imperatives of an organization. The overall goals can be described using concepts such as the "balanced scorecard" (Kaplan and Norton 1996) and then connected with the process definition in a "process impact matrix". This allows to identify the high impact processes a company competes with – about 20–25 % of all processes (Franz and Kirchmer 2012a). The underlying application system architecture is planned accordingly, supporting the required agility. This means flexible application architecture with componentized systems are preferred in "high impact processes" to

huge monolithic applications that are difficult to adjust. Commodity processes may still be executed based on standard systems like ERP since a company doesn't compete with those processes. All aspects combined set the guidelines and strategic directions for a process-centric organization focused on innovation and agility. The guidelines and directions deliver the overall basis for all process-related activities in the following phases of MPE. The process strategy provides drives the process governance implemented in the process of process management.

The strategic guideline is passed to the process design phase, where the business processes are specified in detail. Here, the approach of the "process factory" is used to define process in form of process models as efficiently and effectively as possible to enable the highest agility in the day-to-day process management activities. A process factory is an "industrialized" environment to support the development and the systematic reuse of process and other information models (Kirchmer 2008). Core is an integrated process model repository that stores the process-related "knowledge assets" in an easy-to-use format. Thus, a process design can be quickly modified and used as input in the other phases of the process life cycle. Every process initiative delivers its design results in the repository format so that it can be reused in other initiatives. High impact processes are then optimized and examined for potential process innovation, using appropriate tools and techniques like process simulation, Lean or Six Sigma (Snee and Hoerl 2003; Harmon 2003; George 2003). Commodity processes (about 75–85 %) can be addressed through copying common practices in an industry (Franz and Kirchmer 2012a). An important aspect, especially to address commodity processes, is the use of process reference models as starting points for process design (Fettke and Loos 2007). This reduces design and modeling time and increases model quality. A process factory is necessary to enable a quick move from strategy to the implementation and execution phase while still having sufficient time to focus on desired process innovations. In the design phase, business processes must be specified in detailed and consistent descriptions, which can be used to drive the process implementation and execution. In other words, the created knowledge assets must include all relevant information about the processes to be executed to support the close link between strategy and execution. The result is a process blueprint consisting of business process models that form the enterprise's process knowledge assets and drive the following phases of the business process life cycle.

Based on these process models, all physical and information-processing activities of a process are implemented within an enterprise and across organizational boundaries. The results are intra- and inter-enterprise processes, ready for execution. The implementation can be carried out based on IT to support the following automated execution or manual execution through people. Generally, it is a mixture of both: automation may deliver the necessary speed and efficiency to be agile; manual steps provide the required flexibility and adaptability. Some parts of a process may even need to be executed in teams [e.g., brainstorming activities in a research department (Harmon 2007)] to ensure the appropriate creativity to support innovation activities. This implementation phase includes the software configuration or development, as well as the people change management, consisting of

information, communication, and training (Kirchmer and Scheer 2003). For the implementation phase, it is important to have the process design in a format that enables a very time-efficient implementation, so that the execution can start quickly. This can be ensured through the aforementioned process factory approach. In this phase, the organization goes through a transformation process to achieve the defined innovation and agility.

During the process execution phase, processes are executed based on the implemented IT or people resources. The software systems can be standard application packages, such as enterprise resource planning (ERP), supply chain management (SCM), or customer relationship management (CRM) systems, that primarily support best practice processes. Alternatively, processes can be executed based on more flexible application solutions, such as next-generation business process automation systems, based on a service-oriented architecture (SOA). Software-as-a-Service or "Cloud computing" bring additional flexibility since you can procure quickly and in a focused way the required functionality. An MPE approach has to ensure that processes identified in the process strategy as high impact and "innovation candidates" are executed using application systems with the highest flexibility so that they can be easily adjusted to the necessary change. These are processes "built to change". The people- based execution may be supported by continuous learning and talent management initiatives, for example, through computer-based training approaches or regular face-to-face training initiatives. The execution has to deliver the targeted innovation and agility.

The actual executed processes are measured and controlled in the process monitoring and controlling phase of MPE. In order to do that efficiently, systems for Business Activity Monitoring (BAM) and Process Analysis should be used. These software applications can help to acquire relevant information fast and to move quickly from insight to action. If there are negative differences observed between the actual values and the planned KPIs that were defined based on the goals identified in the process strategy, action must be taken. Either a "continuous process improvement" (CPI) is initiated through the process design phase (the design is improved to meet the defined goals and passed on to implementation and then to execution) or the situation is resolved on a strategic level if the business environment has changed significantly. Hence, a larger process transformation initiatives may be launched. This phase of MPE overlaps with the execution phase. In this monitoring and controlling phase, process performance improvement methodologies, such as Six Sigma (Snee and Hoerl 2003; Harmon 2003), Lean, or combinations of such approaches (George 2003), can be applied to support incremental improvements and fix specific issues. This phase delivers necessary information about the execution to enable smart decisions based on process KPIs and initiates their execution. It enables a continuous focus on the goals defined in the process strategy and helps measure the business outcomes and success.

An organization can begin a BPM initiative at any of the phases of MPE. Of course, the typical entry point is process strategy, followed by the analysis and design of processes. However, some organizations start with the monitoring and controlling of existing processes, which leads to strategy and process design. The

implementation of a process-based software solution can also serve as a starting point. The decision about the MPE starting point should be based on the company-specific situation: the current issues and budgeted initiatives, the political situation, the staffing situation, and similar aspects.

In many cases, companies select a two-step approach and begin with a pilot project focused on one or two processes. The first nucleus of a process organization, for example, in the form of a Center of Excellence is established. Based on the result, the entire MPE approach can be rolled out. Whatever starting point is chosen, it is important to envision the entire MPE concept, so every initiative becomes a building block of a successful overall MPE approach.

The design phase, including the process strategy, and the implementation phase comprise the process build-time activities. In this instance, companies created the ability to act fast in order to achieve MPE's goal of "fast execution." The process execution, as well as the monitoring and controlling phase, consist of the run-time activities of the process life cycle. They deliver the necessary information to ensure timely and high-quality decisions.

All phases of MPE should be supported by available BPM software, especially modeling software and repositories (as required by the process factory). The data volume to be handled by BPM activities and MPE's specific demand for speed and high-quality information make this request even more important. The necessary integration and consistency of process-related knowledge, especially the business process models, cannot be achieved manually.

2 Innovation: Key Target of MPE

To master the continuous changes and new developments of today's business environment, innovation – especially business process innovation – has become a core focus area for successful organizations. To ensure long-term survival, an enterprise must make innovation part of day-to-day business. Only then, can enterprises attain desired revenue and profit stability, growth and high performance in general. Consequently, business processes have to be managed in a way to support and drive innovation. MPE makes innovation a key target. But what exactly do processes and innovation have to do with each other? That question has to be clarified to be able to organize MPE appropriately (Kirchmer 2011b).

More and more companies are built on the principles of process innovation. Dell, for example, did not invent the PC. But it did invent new business processes to bring PCs to market, eliminating unnecessary steps in the supply chain, while offering more flexibility and control to the customer. These processes were Dell's main differentiator in the competitive marketplace. Process innovation was the basis for starting and growing this company. Amazon.com did not invent the book, but it introduced a now-popular process of buying books online from the comfort of your living room. This is a process innovation based on the Internet with its new technical capabilities. eBay did not invent the auction, but its online, easy-to-use

processes increased the popularity of the auction. This is again a process innovation as the basis for a new business.

Traditional companies are also focusing on process innovation. For example, enterprises in the machinery industries offer more convenient and reliable service processes based on Internet connections to their clients or directly to the delivered equipment. Airlines have simplified the ticketing process to reduce cost and increase, or at least stabilize, service levels through online ticketing. This is a process innovation that eventually became the standard, an industry best practice. Banks reduce cost and improve their service levels through online banking.

Business process innovation is clearly of the highest importance for every company. But what is it all about? How do "innovation" and "business processes" really fit together? Innovation is defined as the act of "introducing something new." A useful structure of innovation is proposed by Davila et al. (2006). According to them, innovation has two major directions:

- Business model innovation
- Technology innovation

Business model innovation includes a new or modified value proposition, new business processes (especially in the supply chain), or new target customers and markets. Let us look at a few examples. Levis Strauss & Co. introduced denim jeans. Because of the company's new process of putting rivets in pants for strength, jeans were introduced as working clothes for farmers and factory workers. Since the first introduction of the denim jeans, the company's value proposition has changed and evolved as denim jeans have become an expensive fashion product. In its PC offerings, Dell's value proposition was the convenient custom configuration and ordering of products – the supply chain processes eliminated dealer networks and enabled individual configuration by the client, while the target customers remained, more or less, the same as those of competitors. The opening of new markets for existing offerings is another kind of business model innovation. If a company has always sold to the US market, but now decides to also deliver products to Europe, this is a form of business model innovation (new market). Sometimes, the pricing is considered as an additional component of the business model; however, it may also be seen as part of other elements (e.g., aspect of the general value proposition).

Technology innovation has the following levers: offerings, including products and services; process technologies; and enabling technologies. New product technologies (e.g., the introduction of digital cameras) are some of the most obvious forms of innovation. Process technologies support efficient and effective business processes. ERP systems, for example, were able to make specific processes more efficient and effective. Supporting technologies improve either product or process technologies. For example, the development of efficient relational databases supported the development of integrated application software, especially the aforementioned ERP systems.

Innovation in the fields of processes and process technologies show the direct link between "process" and "innovation." But the other forms of innovation also lead to new processes. New value propositions and expansion into new markets

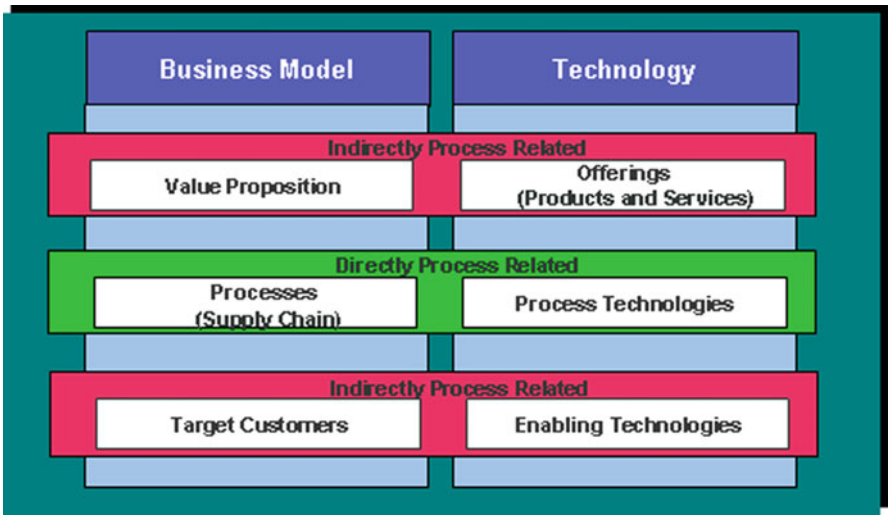

Fig. 2 Levers of innovation and the relation to processes

require appropriate business processes. A product innovation generally leads to new production or distribution processes. The result is an indirect link between "business processes" and "innovation." Basically, any form of innovation requires new or modified business processes and needs business process innovation: processes with new structures, more accurate, granular or timely data, new organizational responsibilities, new functions or superior process deliverables. MPE supports innovation by encouraging an innovation focus in each phase of the process life cycle: the process management is organized in a way that it makes the changes required by innovation easy, for example, by identifying the innovation areas already in the process strategy, applying the concept of the process factory in the design, using flexible automation architectures like SOA, or measuring processes effectively through BAM.

The levers of innovation are shown in Fig. 2.

But how does an enterprise organize innovation? Once again, the answer is BPM: the management of innovation within an enterprise is a business process in and of itself. This process must be defined, implemented, executed and controlled just like any other business process. It goes through the same process life cycle. The "innovation process" has to be a key process to be managed by MPE.

An example of one such innovation process is shown in Fig. 3. The process develops from the preparation of an innovation initiative, to the "idea finding" activities, and finally to the execution of the innovation idea. The innovation manager identifies relevant mega trends and, based on those, the relevant innovation fields. These innovation fields guide the definition of the company-specific innovation focus. This focus directs the "idea finding", using internal and external resources. The innovation ideas are evaluated, and the most interesting ones become innovation projects. These projects develop prototypes and business

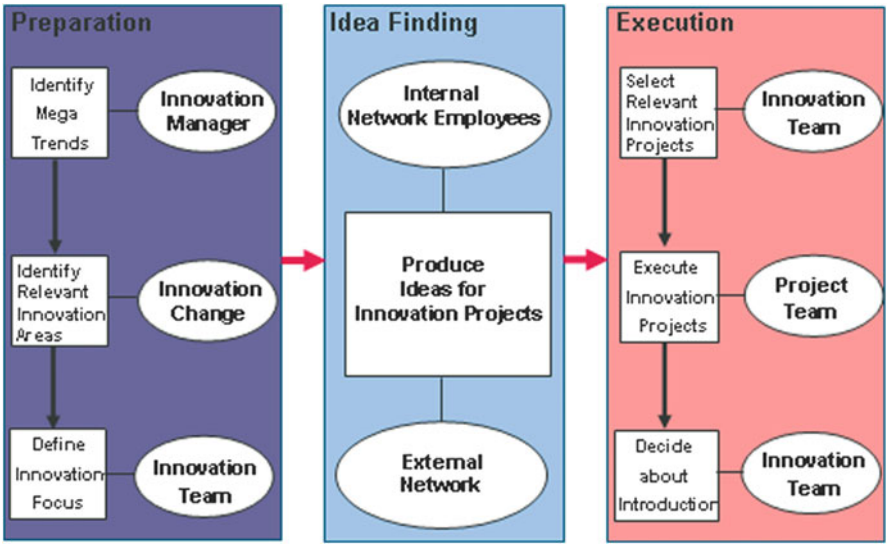

Fig. 3 Example of an innovation process

cases based on the innovation idea. Then, the innovation team can decide which innovation ideas will be brought to market, or the ideas that will actually become innovations.

Owing to the importance of process innovation, the innovation process must support this form of innovation effectively. For many traditional companies, this will require a big shift because they formerly thought of innovation in terms of technology innovation, especially product innovation. This shift can be supported by selecting the appropriate external partners, like universities or research institutions, to participate in the innovation process.

When implementing and improving an innovation process, it is of highest importance to accelerate the time until the innovation can be introduced into the market. This reduces innovation cost and increases the probability of high-revenue effects (George et al. 2005; Johnson and Suskewicz 2008). An MPE approach has to optimize the innovation process regarding cycle times.

Hammer, the renowned BPM thought leader, recognized that operational innovation, or business process innovation, is not easy to achieve. For a successful innovation process, he recommends six key factors (Hammer 2005):

- Business process focus, from the beginning of an innovation initiative
- Definition of process owners, including a senior executive who can make change happen
- Full-time design team
- Managerial engagement, ensuring the implementation of the innovation
- Building buy-in
- Bias for action

Once a process innovation has been implemented, one must recognize that the interrelation with other processes may require additional change. Therefore, one process innovation initiative may immediately trigger the next process change project.

The innovation process can be centralized in an organization or carried out in decentralized units. The more effective approach has to be defined based on a company's specific strategy. This is especially true for organizations working in a global business environment an important topic (Bartlett and Ghoshal 2002).

MPE provides a business infrastructure with the flexibility necessary to facilitate innovation, especially business process innovation. It sets the parameters so that an organization is able to react to change efficiently and effectively. Process innovation is simply a special driver of such change.

3 Information Technology Enabling the Execution of MPE

Most business processes within an organization are at least partially supported by IT. The IT support influences the management of those processes and can encourage or hinder innovation and agility. ERP, CRM, SCM, or similar systems are present in one or the other way in almost every enterprise. Some executives are already considering new IT architectures based on SOA or are in the midst of such an implementation. Some companies even take these ideas to the next level, such as those working toward the use of Web 2.0 applications and acquiring "Software-as-a-Service" (SaaS) or through "the Cloud". But what does it all mean? How do these IT components fit into MPE – or better, why does MPE require their use?

During the last 15–20 years, an increasing number of business processes have been supported by standard software packages, such as ERP, SCM or CRM systems (Kirchmer 1999). The most popular are ERP systems, covering the majority of a company's operational activities, such as sales, material management, production planning and control, maintenance, asset management, finance, financial controlling, human resources, etc. The use of standard software has numerous advantages when compared to individually developed software systems.

A key advantage of these "traditional" standard software solutions is that they not only deliver technology to execute a specific process but also provide best or at least common business practices. The software reflects its vendor's business knowledge regarding a certain topic or industry, as well as the experience of the vendor with other customers in the same area. Hence, the software can deliver common industry practices on which to standardize the 80–85 % of commodity processes of an organization.

The successful use of standard software, such as ERP systems, implies the design and execution of business processes according to the delivered best or common practices of the software solution. If you buy an ERP system, you don't just purchase a piece of technology; you also buy a set of predefined business processes. In turn, you have to adapt at least part of your organization to the

requirements of the software-based business processes. For example, you may be forced to create some material master data before you send out a procurement order. ERP systems include a process definition that is more or less coded in the software. The software only allows very limited changes or adjustments of its process definition. These adjustments can be done during the software configuration through the setting of specific parameters. This is a key task of ERP implementation activities, together with the people change management, discussed later. The configuration of such systems is also more and more simplified through the use of pre-configured component and related assets.

Modifications to the delivered process logic often result in modification to software that lead in most cases, to tremendous cost. Many of the advantages of standard software are lost if you decide to modify that software. However, most of the standard systems allow the integration of "add-on software" through predefined interfaces. But this is, in many cases, insufficient, especially for the support of a high impact process that is critical to achieving competitive advantage and that is important for process innovation. As a result, new business processes are not adequately supported by traditional software solutions, which leads to negative impacts on the overall process performance. This is obviously not consistent with an MPE approach.

Key processes tend to be strongly influenced by a company's specific offerings (products or services) and the related customer and channel demands, so standard software applications such as ERP cannot deliver the required best-possible IT support because they reflect the needs of wider user communities. SOA and its process orchestration capabilities as well as next generation process automation systems (to be used for specific processes or as part of an enterprise wide SOA architecture), so called Business Process Management Suits (BPMS), offer a solution for those needs. They enable separation of the business process design and support through appropriate software applications or application components delivered as so-called services (we will use "service" as synonym for an application software component, delivering specific results needed to support one or several functions of a business process). This means that application software can be used exactly as required by business processes. SOA and BPMS provide the environment to link the required application components and exchange data as necessary to support the overlying business processes design (Kirchmer and Scheer 2004; Woods 2003; Kalakota and Robinson 2003; Woods and Mattern 2006). This enables the execution of "next-practice" business processes, that of business process innovation. In other words, it is IT for business process innovation, as Woods and Mattern, some of the first authors of a book about SOA, describe SOA (2006) – a perfect fit to support the goals of innovation and agility of MPE.

The use of SOA can lead to significant reductions in IT maintenance costs because expensive program-to-program interfaces of traditional software environments are avoided. All software components are simply linked into the integration environment of the SOA (Woods and Mattern 2006). This resolves many of the issues of extending ERP systems through add-on applications supporting enterprise-specific processes or sub-processes.

These integration capabilities are also the basis for the reuse of software components in the case of custom developments, thus resulting in cost savings. Once a software component or service is developed, it can be used to support several processes. It can be part of another integrated process-oriented software system.

The true value of SOA, however, is only delivered when the environment is used to support business change, to enable agility and process innovation. It can help to build "process to change". MPE enables this business-driven use of SOA and BPMS by integrating it in the "process factory" and use the process models stored in the repository to drive the SOA configuration. The process design can be improved and cost and time efficiently implemented, through the selection and adjustment of the application components needed to support the specific processes. New "services" can be added, and others deleted or modified, according to the requirements of the business processes. These services can mow more and more often be acquired through the internet as "software-as-a-service" (SaaS) or even be hosted outside the organization in the "Cloud". These concepts are widely discussed and have great potential although the current use in practice is still limited.

The same procedure can be used to realize completely new or strongly modified processes, thus enabling business process innovation. SOA can be used to support the fast execution of process designs, reflecting strategic directions. Thus, SOA plays a critical role of transferring strategy into execution and operational performance through MPE.

New IT architectures are clearly driven by the World Wide Web (WWW). The common opinion that the Internet hype would end after the burst of the dot-com bubble in 2001 has been proven wrong. On the contrary, Web capabilities have continuously improved, and the ability to bring people and organizations together in communities has become more important than ever (Fingar 2006). The new generation of WWW capabilities is often called "Web 2.0." Web 2.0 can be perceived as the second generation of Web-based communities and hosted services, which aim to facilitate creativity, collaboration, and the sharing of ideas and data between users. The term was created and promoted in a conference organized by O'Reilly Media in 2004 (O'Reilly 2005).

There are already many current initiatives to transfer the capabilities of Web 2.0 into the business world, targeting enterprise clients. The result is the "Enterprise 2.0" (McAffee 2006). Enterprise 2.0 is a company using the capabilities of Web 2.0 for its business purposes (Kemsley 2014). A large retail chain has for example built and internal web community to collect all the information about the BPM experts across the organization and their capabilities. Employees interested in that topic grow the content accessible and help building BPM assets necessary to keep MPE alive.

The Enterprise 2.0+ is highly integrated with the business environment, as shown in Fig. 4. A company may be member of many online communities. Imagine using an environment like Youtube to exchange business process models. Instead of posting videos, companies could post process models representing their organization's best business practices or other interesting process ideas. This could facilitate

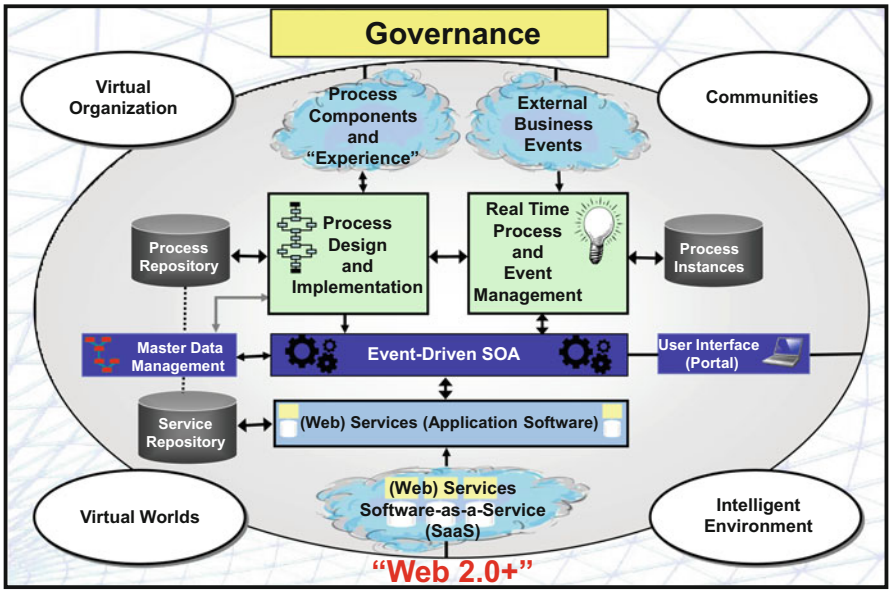

Fig. 4 Enterprise 2.0 + – Integrated with business environment

the exchange of business experiences within and across specific industries – which would become an important factor to support MPE's design of innovative processes. Many organizations already use Facebook or Twitter to support their marketing and customer care activities. An airline, for example, provides special services to their frequent flyers who are identified when they are active in Twitter at the airport.

The Web 2.0 environment could be utilized to make the Enterprise 2.0+ part of a powerful virtual organization. For example, one could create an innovation network around the company, including customers, partners, research institutes, universities, etc. The exchange of ideas could be organized through blogs.

Until now, most information systems received necessary data through human interaction. For example, a person enters the shipping data of orders. This is often very costly and leads to delays. New technologies, such as radio frequency identification (RFID), enable the automated creation of that data. For example, once containers are loaded into a ship, this information is automatically transferred through RFID into a software system and from there becomes available through the Web. The result is an "intelligent environment" or the "internet of things" (Fleisch et al. 2005; Mattern 2005), which ultimately leads to business processes that enable innovation and high performance.

This intelligent environment closes the gap between the real and the virtual world step by step. Once you have more and more information about the real world digitized, you can start using this information as building blocks for a virtual world,

allowing the realistic test of new business process as described above. And, the boundaries between the real and virtual worlds then begin the blur.

The Enterprise 2.0+ is clearly a perfect environment for MPE. It permanently delivers the information necessary for timely decisions and supports the almost real-time execution of the resulting actions. Strategy and its execution are closely integrated. Agility and innovation are strongly encouraged. Therefore, MPE requires an early adaptation of the Enterprise 2.0 approach.

A key challenge of Enterprise 2.0+ is finding the appropriate governance model. Web 2.0 empowers people and encourages creativity. But how do you ensure that they still work toward the company's goals? A traditional governance model, consisting of many inflexible rules and policies, does not work in such an environment. The Enterprise 2.0+ could utilize a governance model similar to that of the online encyclopedia Wikipedia. Users are guided through common goals and control themselves. However, it is clear that an enterprise is more complex, so the governance has to be more refined. But the direction is demonstrated by Web 2.0 communities like Wikipedia.

4 Business Process Governance for MPE

Business process governance (BPG) is a set of guidelines focused on organizing all BPM activities and initiatives of an organization in order to manage all of its business processes (Kirchmer 2005; Kirchmer and Spanyi 2007; Markus and Jacobson 2014). The core of BPG is the "process of process management" (Franz and Kirchmer 2012a). The resulting governance framework provides the frame of reference to guide organizational units of an enterprise and enable responsibility and accountability for adhering to the BPM approach, thus to follow the MPE philosophy. Therefore, the definition of appropriate governance and governance bodies is a key element of MPE and a differentiator to other approaches. Scheer and Brabander (2014) suggest an alternative view on business process governance by proposing an "accountability framework". This view is included in our approach of BPG for MPE.

BPG involves the following components:

- A high-level model of an organization's key processes
- Clarification of high-level goals to frame the definition of KPIs that will be used to monitor the performance of these business processes; this includes innovation-related goals
- Accountability for the innovation, improvement, and management of business processes
- A clear formal structure for the description of business processes and the related aspects (enterprise or business architecture) to transform processes into assets
- An outline of the infrastructure necessary for MPE and the related process of process management

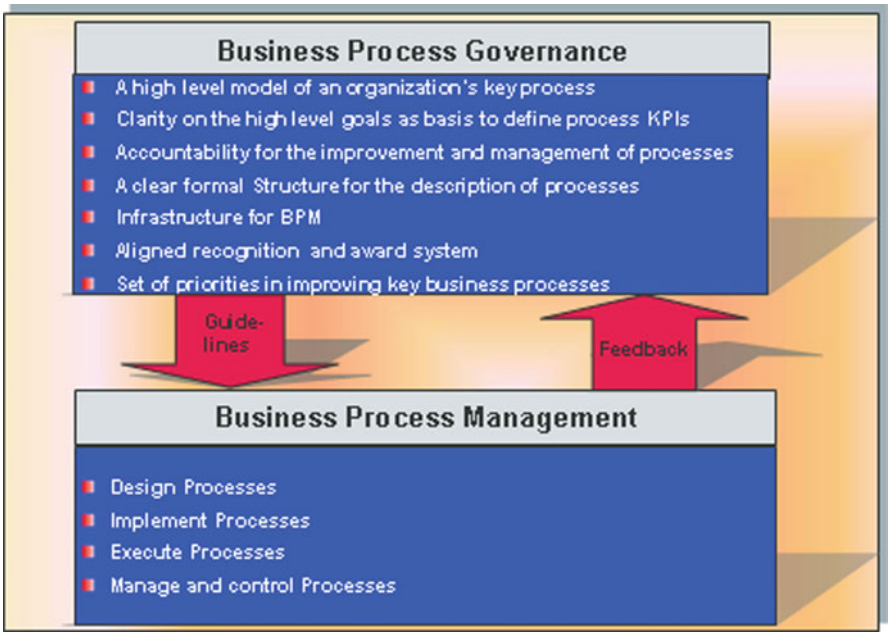

Fig. 5 Relation of BPG and business process management

- Aligned recognition and reward systems
- The set of priorities in innovating and improving key business processes

The primary objective of BPG is to set the stage for the effective deployment of BPM to create value for customers, shareholders, and other stakeholders. BPG ensures that BPM delivers consistent business results to satisfy and exceed the expectations of an organization. BPG is responsible for the management of the BPM process. This means you implement MPE through BPG (Kirchmer 2008; Franz and Kirchmer 2012a). MPE again drives the success of all other business processes, specifically high impact processes relevant for a company's competitive positioning. The relation between BPG and BPM is explained in Fig. 5.

BPG is relevant for all phases of MPE: design, implementation, execution, as well as monitoring and controlling of processes. Hence, it includes the entire "BPM delivery". Each phase of MPE is guided by BPG, leading to its overall orchestration. These guidelines may target the content of process models (e.g., identifying and mitigating risks) or purely formal aspects of BPM (e.g., each function of a process model must be assigned to the responsible and accountable organizational unit) or they define how decisions around the process are taken.

An example of a BPG guideline for process design is "graphically identify operational risk in process models" "or use Lean and Six Sigma as analysis and design principles." A process implementation example is "deploying the related business application software (ERP, SCM, CRM, etc.) to support the business

processes" (Kirchmer and Scheer 2004) (resulting in a "process-oriented implementation"). "Any change of the process workflow must be approved by the process owners" is an example of a guideline for process execution. "Benchmarks for process KPIs have to be checked and, if necessary, updated every 6 months" guides the CPI in the controlling phase of MPE.

What is the broader background of BPG? BPG is the required foundation to assure the sustainability of process innovation and improvements and the continuous focus on creating value for all stakeholders, such as customers, business partners, employees, and shareholders. The importance of governance has already been recognized in one-time improvements to individual business processes, such as order to cash, source to pay or new product development. Its importance increases significantly when an organization decides to deploy MPE on an enterprise level for competitive advantage, hence when MPE becomes a real management discipline.

BPG enables and guides the enterprise-specific execution of MPE. It is an essential component of leadership; therefore, general principles for execution of strategies and management tasks must be considered when defining BPG for an organization (Bossidy and Charan 2002):

- Know your people and your business
- Insist on realism
- Set clear goals and priorities
- Follow through
- Reward the doers
- Expand the capabilities of your employees

To develop BPG for an organization, it is crucial that the leadership team knows the people and the business of an enterprise within the context of key business processes. A focus on realism and achieving a shared understanding of the organization's business processes are required when developing BPG guidelines; otherwise, the guidelines are worthless. At a minimum, the leadership team must have a common understanding of the high-level business processes, including clarity on organizational responsibilities, deliverables, inputs, outputs, key functional steps, dependencies, and KPIs. Within BPG, clear goals and priorities must be set so that people's efforts in executing MPE activities are as effective as possible and that appropriate attention is set on innovation and agility. BPG ensures that business performance management activities create value, and the "doers" or people, who get them done, are rewarded. This really makes BPM a part of the how the organization completes work. BPG should include guidelines for training and education to expand the capabilities of employees, and call attention to the importance of cross-functional collaboration to properly equip people involved in BPM.

The leaders of organizations that chose to deploy MPE as a management discipline appreciate that value is created and work is accomplished via the organization's business processes. They recognize the importance of MPE to topics, such as execution of strategy, growth, and the integration of mergers and acquisitions. These topics typically preoccupy the thoughts of leadership teams –

the people of an organization responsible for making MPE happen – in high-performance businesses.

Thoughtful leaders recognize that MPE enables the clearer formulation and especially execution of strategy. As far back as 1985, Michael Porter emphasized the concept of the value chain and noted, "Activities, then, are the basics of competitive advantage. Overall advantage or disadvantage results from all of a company's activities, not only a few" and then went on to say, "The essence of strategy is choosing to perform activities differently than rivals do" (Porter 1996). Organizational strategy drives the design of BPG and MPE enables the execution of strategy. This aspect supports MPE's key role as the link between strategy and operations, which will drive high performance for the organization.

When it comes to sustainable organic growth and innovation, leaders also recognize that MPE is equally important. Rapid, sustainable growth requires a systemic view of the business and broad collaboration, which requires immense effort from many firms. The design of BPG must recognize that focusing on goals, such as flawless delivery responsiveness, is essential in providing existing products or services to existing or new markets.

When growth is planned through mergers or acquisitions, the integration phase is essential to success. Perceptive leaders appreciate that an important reason for the success of mergers or acquisitions is the ability of the merged firm to perform for and meet the needs of their customers. It is in the "integration phase" that MPE can play an enabling role. This is related to the fact that merged firms often have an opportunity to gather specific information on comparative core business processes and their relative health, and address customer facing issues in the premerger due diligence period. MPE makes M&A initiatives innovation projects, creating a new organization that uses systematically synergies between the merging companies by providing the transparency, for example, though the process repositories used in the process factory.

BPG plays a key role in MPE and enabling high performance for an enterprise. Organizations elect to invest energy in establishing BPG because it is the management infrastructure that enables them to address critical topics, such as strategy, growth, and the integration of mergers and acquisitions through the improvement and management of the corporation's core business processes. BPG sets the stage to achieve competitive advantage through MPE. It moves MPE to a consequent support of innovation and agility.

In the previously described concept of the Enterprise 2.0+, BPG must be adapted by focusing on goals and general directions regarding the MPE activities, while still addressing the aforementioned topics. BPG has to offer sufficient freedom – and also sufficient direction – to people to truly use the benefits of Web 2.0 capabilities. Creativity and collaboration need to be applied to achieve the organization's goals and provide value to the relevant stakeholders.

BPG is, in organizations, often organized through a specialized Center of Excellence (CoE) who "owns" the process of process management. The CoE delivers process management services to the organizations, provides the necessary standards, and enforces BPG rules and guidelines. The CoE organizes the process

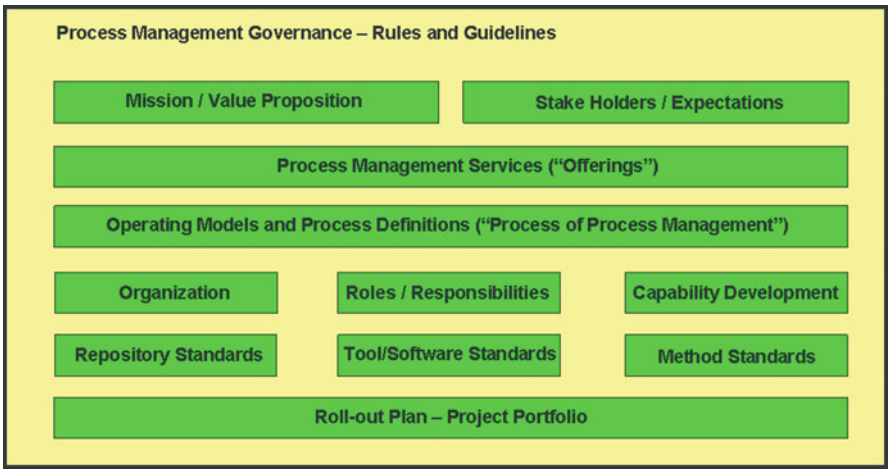

Fig. 6 Main aspects of a governance and process management center of excellence

of process management and its roll out. The main aspects to be considered while setting up a CoE are shown in Fig. 6. Rosemann provides a detailed discussion on the service portfolio of BPM centers of excellence (Rosemann 2014), and Jesus et al. show how a center of excellence has been implemented at a Brazilian company (Jesus et al. 2014). The head of the CoE is emerging as a new top management position, a Chief Process Officer (Franz and Kirchmer 2012b).

CoE in an MPE environment enforces the consequent realization of agility and innovation. For example, it selects and enforces standards around the process life cycle, supporting the "process factory", such as an enterprise wide repository, or provides flexible process execution and controlling solutions to the entire organization.

BPG provides to an MPE environment enough freedom to achieve innovation and agility and combines it with sufficient structure to enable the alignment with the overall strategy. It makes MPE the key link between strategy and operations enabling sustainable high performance.

5 MPE in Practice

During the last years more and more companies have started to move towards an outcome-focused and value-driven approach to BPM. They typically see BPM as an overarching management discipline. MPE has a role in this new thinking happening. Here a couple examples of companies going that way (Franz and Kirchmer 2012a).

A major technology company won a significant new contract that allowed them to sell in 5 years ten times more of a specific product line. While this was good news

for the division head the new situation also created lots of questions and concerns. Are the supply chain and engineering processes able to handle that volume? How do we scale up our processes? Where do we have to invest? What do we have to do in detail?

The company used MPE to answer those questions. In a first step MPE provided visibility into the supply chain and engineering processes. This was achieved through a repository based modeling approach – a first step towards a process factory. The process models allowed to identify areas for improvement and launch first transformation initiatives.

In a second step the company simulated key sub-processes using the existing process models enriched through relevant process attributes, like time and cost values or probabilities. This simulation helped discovering systematically bottlenecks by showing what happens if the company has to handle twice, three times, five times or ten times more orders. It turned out that some of the already started investment initiatives could be stopped or reduced since the areas had already been improved sufficiently in the past. Other processes that were always considered simple and straight forward were identified as clear issue areas that had to be fixed. MPE helped to revise the investment plan to enable the organization to deliver on their commitments.

The approach was so successful that the organization decided to roll it out across other business units. Starting point for this initiative was a BPM maturity assessment. Then they prepared for a MPE CoE to achieve synergies and avoid that every unit re-invents the wheel. This included for example the definition of the appropriate governance and identification of company-wide standards for methods and tools. At the end they put a MPE organization in place that helped to take well informed investment decisions and execute quickly and efficiently on them. The related transparency helps identifying the right processes and sub-processes for innovation and optimization activities.

A global oil and gas company started their MPE journey to support a major post-merger integration. It was initially the goal just to standardize processes in the new combined organization to make them manageable and avoid compliance issues. Specific improvement or innovation activities were not planned.

MPE was used to define the new common processes. Starting point was a comprehensive industry reference model. In joint integration workshops this reference model was adjusted to the specific needs of the organization. The modeling activities were carried out in a process repository so that the new standards could be published easily across the organization.

This was a very successful start of the MPE initiative. The company was now ready to get even more value out of their process assets. They started to use the process models to drive their safety and compliance management. They added standard operating procedures to their process models and used a simple workflow system to move necessary information to the right people. Step by step MPE became a powerful management discipline that helped to manage safety and compliance.

Consequently the company founded a solid CoE to take care of their process of process management and continue to increase the benefits, for example by optimizing processes and identifying innovation opportunities. MPE helped to move from strategy to execution, take the right decisions and react in an agile way to business situations like changing legal compliance requirements.

MPE expands a BPM approach through a consistent focus on innovation and agility. It enables smart decisions and a fast execution of the resulting actions. It provides the appropriate insights and move quickly from insight to action. MPE is based on an industrialized management of all phases of a process life cycle in an integrated way that links business strategy with execution through a systematic use of process related assets. The focus of MPE on innovation is paramount since process innovation is of the highest importance for most organizations. Key enablers are flexible IT systems architectures like SOA including more and more SaaS and Could components. The appropriate governance for MPE delivers enough structure to focus the approach and leaves the necessary freedom for creative knowledge workers.

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Value-Orientation in Business Process Management

Jan vom Brocke and Christian Sonnenberg

Abstract The purpose of business processes is to create value, and the purpose of business process management is to support this value creation. However, the concept of value is little understood in BPM, and a number of BPM initiatives have missed the opportunity to demonstrate value creation in practice. In fact, there is little understanding in the BPM discipline concerning how business processes become valuable and what kinds of value may arise from specific BPM initiatives. This chapter structures the value discussion in BPM by elaborating on the general notion of (economic) value and providing a frame of reference. Against this background we review extant contributions on value considerations in BPM and characterize the emerging field of value-oriented BPM. As an example, we present the Return on Process Transformation (ROPT) as a measure for evaluating the monetary effects of decisions on process (re-)design.

1 Introduction

Decision-making in BPM is eminently driven by value considerations, even though many of these considerations are not explicated and some may even be processed subconsciously. Such decisions include choosing the right processes with which to support the corporate strategy, which of the alternative process designs to favor, how to improve a given process, and what process solutions are feasible from a technical point of view.

Although value-orientation is an important element for BPM decision-making, a considerable stream of research on value-orientation in BPM emerged only recently

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(e.g., vom Brocke 2007; vom Brocke et al. 2010; Buhl et al. 2011). Several notions of value have been adopted in this research stream. Some BPM studies elaborate on value-based BPM (e.g., Gulledge et al. 1997; Bolsinger et al. 2011), while others address value-oriented BPM (e.g., vom Brocke et al. 2010); cultural values (e.g., Schmiedel et al. 2014); value in the quality, time, and cost dimension (e.g., Reijers and Liman Mansar 2005); or value in the ecological, social, and economic dimensions (Hailemariam and vom Brocke 2010), and still others relate formally specified value systems to business processes (Neiger et al. 2009).

Bringing structure to the value discussion in BPM is a central aim of this chapter, since having a clear understanding of the types of value that can arise from business processes is essential in planning, encouraging, and enforcing appropriate organizational behavior. Against this background, we provide a general discussion of several notions of value, we position current evaluation methods in BPM within this discussion, and we exemplify how to assess the economic value of process reorganizations by means of the Return on Process Transformation (ROPT) measure.

The chapter proceeds as follows: Sect. 2 presents the foundations of the notion of (economic) value by synthesizing selected studies from philosophy and economics. Section 3 reviews current business process evaluation methods based on the value notions adopted by these methods. Section 4 exemplifies a value assessment by means of a generic calculation scheme to calculate the ROPT as a financial measure of business process reorganizations' performance. The chapter concludes with a summary of key findings.

2 Foundations on the Notion of Value

2.1 Value as a Metaphysical Idea

Value is central to human life, as "all deliberate, all planned human conduct, personal and collective, seems to be influenced, if not controlled, by *estimates of value* or worth of ends to be obtained" (Dewey 1939, p. 2; emphasis added). To systematically determine the (estimates of) value inherent in a thing through the process of *evaluation*, it is beneficial to be clear about what value is and when it is achieved. Common definitions of value suggest two meanings of the term (cf. Merriam-Webster 2003): (1) value as a "relative worth, utility, or importance" of something as perceived by individuals or groups, and (2) value as a "fair return or equivalent in goods, services, or money for something exchanged" meaning "the monetary worth of something." But do these definitions really clarify what value is and when it exists? For example, what is a "fair return," and when does fairness emerge? Who determines when a return can be considered fair? How does monetary worth emerge, and to what does monetary worth relate?

What can be inferred from these representative definitions is that *value means different things to different people*. What is perceived as fair by one individual

might not be so perceived by another. What has monetary worth in one situation might be worthless in another. The meaning and existence of value is bound to an individual's or group's mental states and beliefs. As a consequence, value is elusive and difficult to recognize using the human senses, so value is often referred to as a *metaphysical idea* (cf. Ramsay 2005). Given the elusive characteristic of value, one wonders whether it is even possible to find an answer to the question concerning what value is and when value exists.

A linguistic approach alone–that is, defining the meaning of value and providing a phenomenological description of the range of its referents–would establish features of awareness of value but could not disclose the conditions of the possibilities of value (cf. Compton 1958). Another way to approach the question of what value is, is through an ontological analysis. Such an ontological approach would inquire about the being-structure, the being-conditions, that make it possible for value to appear (cf. Compton 1958). The question "What is value?" is then reframed to "What is it *to be* value?"

What follows is a summary of inquiries that have been conducted in an effort to define an *ontology of value*, drawing on philosophical and economic thought. The philosophical perspective serves as our main point of departure for identifying essential ontological categories and relationships. We then transfer the philosophical thoughts on the being-conditions of value to the domain of economics in order to answer the question, "What is *economic* value?" (or "What is economic value to be?"). The section concludes by outlining how the ontology of (economic) value that is outlined in our summary provides insight into the use of the term "value" in a BPM context. In particular, we argue that the language used to describe value in the context of BPM is misleading (cf. Ramsay 2005). For example, we discuss why it is not possible for a business process or business activity to add value (instead of creating value) and why it is not possible for value to flow through a process.

2.2 Being-Conditions of Value

Our ontological argument is a summary of Compton (1958), who synthesizes and contrasts theoretical proposals about the being-conditions of value. Compton (1958) makes use of two expressions, *value statement expression* and *evaluation statement expression*. Both types of expressions play a vital role in explaining what value is and when value can be said to exist. Moreover, these expressions allow the various notions of value-orientation in BPM to be defined and characterized. (See Sect. 3.)

Compton's (1958) ontological analysis begins with a linguistic position of the meaning of value, which characterizes value as follows:

1. There is a *value dimension* of things, which is unique and cognitively apprehensible.

2. The value dimension is unique in its reference to existence, that is, it is generic to its very meaning as an *ought-to-be*[1] (Compton 1958, p. 158).
3. The value dimension of things is diverse, as *plural claims-to-be* can be distinguished with each claim competing for allegiance and appreciation.

Based on this characterization of value, Compton (1958) formulates value statement expressions and evaluation statement expressions. Let *x* stand for any center of value—any entity, single or collective—for which value may be said to arise. Let *y* represent certain relationships, states, and activities that are of some value for *x*. Assuming that there are *y*'s and *x*'s that qualify, we may say "y is of value for x" or "*x ought to be y*" (Compton 1958, p. 158). We term a value assertion of the form "x ought to be y" a value statement. According to Compton (1958), a value statement is thus comprised of three elements: a center of value (i.e., a thing denoted as *x*), a value claim (the "ought to be" claim), and a characterization of the value claim (i.e., some valued quality of *x*, denoted as *y*). For instance, the business process "goods received" (center of value *x*) ought to meet a throughput time of 10 min (valued quality *y*).

For the purpose of this paper, we expand the set of possible value claims in a value statement beyond the "ought to be" type in order to account for different intensities and levels of a value statement's normative forces. In particular, we distinguish between "could be," "should be," and "ought to be" value claims (Table 1).

We consider a "could be" value claim as the weakest of all value claims, one that exhibits no normative force. A "could be" denotes a mere possibility, the potential of some *x* to transition to a state *y* that is of value for *x*. A potential state *y* is of value for *x* simply because it signifies a technically feasible state of *x* at some point in the future. For example, when one is planning or implementing a new business process *x*, a value statement that only values the technical feasibility of *x* can be expressed as "process ABC *could be* as defined by our process model." Such a value statement is then satisfied by all technically feasible process solutions that are implemented according to an existing process definition.

The next-strongest value claim is a "should be" value claim. A "should be" denotes an objective, such as an objective in the form of advice or a suggestion. Unlike a "could be" value claim, a "should be" has a normative force, so a "should be" claim provides direction and gives meaning to "could be" states in *x*. "Should be" value claims can be formalized by means of objective functions. An exemplary "should be" value statement can be expressed as "the potentially feasible business process ABC (i.e., a process that could be) *should be* designed and implemented so as to maximize profit"; an alternative value statement is that it "*should be* designed to maximize revenue or to minimize environmental harm," which would result in significantly different directions for respective BPM initiatives.

[1] When formulating a value assertion, the uniquely valuational element in what is asserted is that something ought to exist (Compton 1958).

Table 1 Normative intensities of value claims

Value claim	Relative normative force	Description
Could be	0	Denotes the possibility of some value center x to acquire a state y at some point in the future, so the value of y for x lies in the feasibility of x to transition to some y. The normative force of "could be" reduces to make y possible for x
Should be	+	Denotes advice or a suggestion. The advice can be formalized through objective functions. "Should be" value claims give meaning to "could be" value claims. For example, a process that could be in a particular way should or should not necessarily be so. From all "could be" states $y \in Y$, a process should transition only to "should be" states $y' \in Y', Y' \subseteq Y$ because these states fulfill a particular objective, so they are more desirable in a given situation than the "could be" states $y \notin Y'$
Ought to be	++	Denotes a consensus achieved for balancing a set of "should be" value claims. This consensus implies that some state y is collectively asserted to be the right state for x to be

From our set of proposed value claims, we conceive an "ought to be" as the strongest value claim. The normative force of an "ought to be" is greater than that of a "should be" claim, as an "ought to be" expresses that something is the right thing to do. An "ought to be" claim has an ethical stance to it and can be best interpreted as a value claim that represents a consensus among a group of individuals about a collectively desired state y for a value center x. Therefore, as opposed to the singular advice or suggestion implied by a "should be" we hold that an "ought to be" denotes some consensus achieved over multiple "should be" value claims. For example, a process manager could state that "a business process ABC *ought to be* implemented so as to maximize profits," which presumes a consensus that balances a set of competing "should be" value claims, such as that a business process should be altogether profitable, environmentally sustainable, and strongly supported by the members of an organization.

Definition 1 provides a generic structure of a value statement expression:

Def. 1 A *value statement expression* specifies the being-structures in the world that must hold for value to arise. The elements of a value statement are comprised of a thing x in the world (center of value), a value claim, and a desired state y that is of value for x. The structure of a value statement expression is given by Eq. (1).

$$\{x\}\{could|should|ought\ to\}\ be\ \{y\} \tag{1}$$

According to Compton (1958), the being-condition of value (i.e., the fact that y is of value for x) is expressed in a value statement's value claim that denotes a tension between the being of a center of value x as it actually is, and y, what x could/should/ought to be (cf. Compton 1958, p. 160).

Value claims can be used to express in linguistic terms a value order related to things in the world. However, value claims, and thus value orders, exist

independently of linguistic expressions. But due to their relation to things in the world, value claims and value orders can become an "ingredient" to things in the world (Compton 1958). If a value claim becomes an ingredient to a thing x, that is, if a value claim is satisfied, then value arises and is actualized by a thing such that "x is as it could/should/ought to be" (cf. Compton 1958).

The statement "*x* is as it could be/should be/ought to be" is an *evaluation statement*, which signifies a situation in which value emerges from a thing *x*, since *x* satisfies a value claim. In BPM such statements typically relate to gap analysis, in which an as-is process (or value) is compared to a to-be process (or value).

Def. 2 An *evaluation statement expression* is used to assert meaningfully and validly that some *x* is actually of value, that is, it is here and now as it could be/should be/ought to be, wholly or in some respect (cf. Compton 1958). The assertion is valid if its three sub-assertions hold true: first, *x* is in fact, that is, *y* is now achieved and actual; second, *y* is still what *x* ought to be, that is, the value claim upon *x* still subsists (e.g., *x* still ought to be *y*); and this claim upon *x* is somehow satisfied, rendering *x* of positive value (Compton 1958). The structure of an evaluation statement expression is given by Eq. (2).

$$\{x\}\ is\ as\ it\ \{could|should|ought\ to\}\ be \tag{2}$$

Value statements and evaluation statements together define the being-conditions in the world in order for value to arise. A value statement explicates the value claim against some center of value *x*. An evaluation statement is used to assess the degree to which value is actualized by a thing *x*.

At this point, the distinction between different types of (strong and weak) value claims and between value statements and evaluation statements might appear to be artificial—something of a theoretical exercise. However, this distinction is instrumental to the ability to identify different notions of value-orientation in BPM (Sect. 3). For example, "could be" value claims and associated evaluations are typically employed in structural process analysis, where a process is valued based on some soundness criteria. "Should be" value claims are predominantly used in BPM to assert that a process is valuable according to some economically relevant evaluation criterion. (E.g., a process is operated at a cost minimum, a process creates products of a certain quality, a process does not exceed a particular cycle time.) "Ought to be" value claims are prevalent in the context of value-oriented BPM approaches (Sect. 3), and the process of achieving "ought to be" value claims is an important people- and culture-related aspect of BPM (Schmiedel et al. 2014; vom Brocke et al. 2014).

The preceding discussion sketched the general being-conditions of value of any kind to arise. Next, we turn to the being-conditions for *economic value* to appear.

2.3 Being-Conditions of Economic Value

The basic assumption to be made about the being-conditions for economic value is the existence of an *economic reality*. Whenever individuals engage in making economic decisions, they perceive things in the world as "constituents of a reality divided by and articulated through economic considerations" (Zúñiga 1998, p. 300). These constituents are *economic objects*, and the world comprised of these economic objects is economic reality. Economic objects are social phenomena that are the product of beliefs and objective properties of things, "some of which are physical and some of which are social facts" (Zúñiga 1998, p. 302).

Menger (1871) defines six categories of economic objects that can exist and relate to each other in an economic reality: economic good, commodity, money, price, exchange, and *economic value*. Building on the work of Menger (1871), Zúñiga (1998) proposes a list of conditions that apply to each category such that "the truth or falsity of a belief about an economic object can be objectively settled" (Zúñiga 1998, p. 302). For the purpose of this chapter, we focus on the economic value category. Def. 3. explicates the being-conditions for economic value to appear.

Def. 3 Economic value is the perceived significance attached to a good[2] (its putative features) based on a subjective judgment that considers personal gain (cf. Zúñiga 1998). Zúñiga (1998, p. 306) provides the specific being-conditions for economic value to appear:

1. *significance attached to a good* resulting from a conceptualization of the good in terms of desired ends,
2. *recognition of a perceived utility* stemming from concrete quantities of a good in relation to an end,
3. *instantiation of the feature of scarcity* in a good,
4. a *dependence relation* between the *assigned importance* to any one need or want and the *relative importance* of other needs or wants,
5. a *dependence relation* between the relative importance of *any need or want* and the agent's *overall degree of fullest satisfaction* expected,
6. a *dependence relation* between the importance of *higher-order goods* (stand in mediate stages toward the satisfaction of a need or want) and the importance of *first-order goods* (provide an immediate satisfaction of a need or want),
7. a *dependence relation* between the *future value* of things and the *present value* of things,
8. the nature of the significance attached to a good varies according to the *relation between wants and things* (i.e. significance of a good arises and disappears as wants arise and disappear), and
9. the *value of the services* of particular goods are subject to the same laws of value, outlined above, as for any other *economic good*." Zúñiga (1998, p. 306).

[2] An economic good "exists as such by virtue of putative features that an individual attaches to a thing in relation to an end the individual has in mind. [. . .] [T]he thing is either the mediate or immediate means" (Zúñiga 1998, p. 302).

The value statement and evaluation statement expressions specified in Eqs. 1 and 2 can be readily applied to make assertions about economic value creation. The fulfillment of a value statement of the form "*an economic good x could be/should be/ought to be in a particular state y*" can be validated through an evaluation statement of "*an economic good x is as it could be/should be/ought to be*." The difference between the generic value assertion and an economic value assertion is that the normative force in economic value claims relates to the satisfaction of an economic agent's needs.

Reference to economic value is usually made through the agency of two sub-categories of economic value: the *use value* and the *exchange value* of a thing (e.g., cf. Smith 1776; Ricardo 1821; or Marx 1867). The *use value* (or value in use) of a thing relates to subjective needs of individuals or groups and the satisfaction of these needs. Following Ricardo (1821) and Smith (1776), the value in use of a good is identical to its utility, with utility being the cause or determinant of value (a "being-condition" in the sense of Def. 3). For example, a machine in a production process has a use value as it is used to produce goods. Likewise, inputs to a production process have use value. In BPM, the use value expresses the utility provided by a process in a given design, considering the degree to which it meets operational requirements. Similarly, use value is considered in design-oriented research when methods, models, and tools designed for BPM are evaluated (Sonnenberg and vom Brocke 2012).

The *exchange value* (or value in exchange) of a thing refers to economic value in terms of monetary[3] measures. For example, the exchange value of a good lies in its ability to buy other goods, particularly its ability to acquire use value. Because of this transformation potential, exchange value itself becomes a universal value in use, motivating economic actors to increase the value in exchange under their control (cf. Bartsch and Schlagwein 2010, p. 236). A thing can be of value in terms of both categories at the same time; that is, it can be useful and it might have a price. In BPM, for instance, exchange value is apparent in business process redesign (vom Brocke et al. 2009), as investments at a certain exchange value must be made in order to conduct the redesign (and allocated resources compete with alternative investments), and the redesign aims to increase the exchange value of the process. Therefore, profitability analysis investigates the relationship between the exchange value created by a process redesign to be achieved and the exchange value sacrificed by investing in the process redesign.

Value-based management approaches, also known as shareholder value approaches (Rappaport 1986), focus on values in exchange, so a thing has economic value if it increases the exchange value (or market value) for an institution that

[3] The exchange value of goods or commodities is expressed in terms of a price that denotes a quantity of money asked for a good or commodity in an exchange. More precisely, money is defined as "a universal medium of exchange as well as a commodity for storing exchangeable wealth" (Zúñiga 1998, p. 304). The price of an economic good "is merely an objective magnitude of numerical value" (Zúñiga 1998, p. 308). The price attached to a commodity is not equivalent to its putative value as an economic good (cf. Zúñiga 1998).

owns that thing. An abstract value statement representative of a value-based management approach could read: "*{a thing x}* ***should be*** *{(transformed; used; consumed; designed; controlled; planned; operated;. . .) so as to (maximize the shareholder value or the market value of an institution owning the thing x)}*."

In contrast to value-based management approaches, *value-oriented management approaches* take into account multiple "should be" value claims, so no single objective function can be specified to formulate a being-condition of economic value. Value claims made under a value-oriented paradigm can be satisfied only if sub-ordinate "should be" value claims are satisfied and these sub-ordinate value claims are asserted based on a consensus among individuals or groups. In a value-oriented management approach, also known as the stakeholder approach (Freeman 1984), the notion of an "ought to be" is prevalent, and it stipulates that the interests and value statements of multiple stakeholders must be balanced in order to achieve a sustainable *incentive contribution equilibrium* (cf. Barnard 1938; Cyert and March 1963; Freeman 1984). A value statement in a value-oriented approach could read: "*{a thing x}* ***ought to be*** *{(so as to achieve an overall objective) and (the fulfillment of the overall objective allows for the fulfillment of all sub-ordinate objectives of relevant stakeholders)}*." Value-oriented approaches consider both use value and exchange values.

2.4 Some Intermediary Conclusions for BPM

From our discussion on the notion of value, we learned that the being-conditions of value are determined by value statements and that the satisfaction of a value statement is validated through evaluation statements. We also learned that value statements' intensity levels regarding their normative force can differ. While a "could be" value claim has no normative force, an "ought to be" value claim has the strongest normative force as it has an ethical stance. Finally, we distinguished multiple categories of value, a generic value category and the category of economic value, and further categorized economic value as "use value" and "exchange value." A thing can inhere both categories of economic value at the same time, as processes usually do. No matter how value is categorized, the conception and apprehension of value is bound to the mental states and beliefs of individuals and groups, so the existence of value is subjective. Since value is seldom perceptible through human senses, it is often referred to as a metaphysical idea. However, anything in the world can actualize value as long as the thing satisfies a value claim related to it.

How, then, can value arise from business processes? The language commonly used in the context of BPM suggests that value is a concrete thing that can be passed from activity to activity, thereby giving the impression that value can "flow" through a value chain or a value stream. In a similar vein, it is often asserted that value can be "provided by an organization" or "delivered to a customer" and that it is an inherent characteristic of a product or service (cf. Ramsay 2005) and that value

can be "added" by a process or process step. From our discussion on the notion of value, however, we can conclude that such a language may not properly describe how value arises from a process. In fact, this use of language may be misleading and may encourage inappropriate organizational behavior (cf. Ramsay 2005). We discuss some prominent examples in what follows.

First, value is not an inherent characteristic of a product or service (Ramsay 2005), that is, products and services are not valuable per se. The existence of things is a necessary but by no means sufficient being-condition that value arises in the value dimension of a thing. Instead, the existence of value is contingent on the satisfaction of value statements related to a thing. However, these value statements are made based on beliefs and mental states of individuals or groups. A thing can only inhere value if an individual or group believes that a value statement related to a thing is satisfied and that the value claim (that a thing could/should/ought to be) still exists (cf. Compton 1958). Therefore, when people refer to the value of a product, service, or process as such, they may have certain value statements of individuals or groups in mind. Still, for the purpose of deriving management decisions in BPM, it appears necessary to explicate such assumptions so that other people (who likely have other value statements in mind) can understand what is meant by the value of a process in a certain context.

Second, as a metaphysical idea, value has no substance, so it cannot be transferred (passed, provided, delivered). Value cannot flow through a process or an organization, that is, there is no such thing as a "value stream." Ramsay (2005, pp. 549–550) points out that "it is impossible for a metaphysical idea to move along a chain within a company, far less between firms and their customers." In fact, in BPM it is the work that flows according to a chain of activities, each of them contributing to the value of a process (regarding certain value statements). It may look like a value flow, but in order to manage value creation, we must understand that it is not value that is flowing but each activity contributing to the satisfaction of a specific value statement.

Third, since value is not an intrinsic characteristic of a thing but bound to subjective beliefs and value statements, it cannot be added to a product or service. From an ontological perspective it is not possible that a value chain can exist. Rather, it is a chain of activities that has been planned in order to satisfy value statements that are relevant to a business area. This difference is important because only then does a BPM initiative begin to question the value statements that are implied by a process design.

These considerations have serious consequences for reference modeling (vom Brocke 2007), for instance, since reference models intend to describe (best) practices to be applied in classes of applications (such as sectors or functions). As to the normative power of reference models, it is important to explicate the value statements for which these reference models are designed. To date, reference models that have been suggested for BPM do not make such clarifications but implicitly assume certain value statements. (See Houy et al. 2014.)

Although it is not possible for a process or activity to add value to a thing, it may be possible in a process to improve the customer's perceptions of products and

services. Therefore, value is not added to something but is a value perception (of something) *increased* by a certain *driver* that is worth specifying. In particular, while value itself cannot flow through a process, value can be *stimulated*, *prompted*, *influenced*, and *created* by a process (cf. Ramsay 2005).

A process can create value as resources are used, so processes can be perceived as sequences of resource utilizations (or resource flows). Resource flows may satisfy value statements that relate to a value in use (e.g., the use value of a raw material is instantiated once the material can be used to assemble a product), to value in exchange (e.g., the exchange value of a product is instantiated once it has been exchanged for another economic resource), or to other kinds of value outside the economic value category (e.g., the value of a process executed by an employee is instantiated when the process stimulates job satisfaction).

Coming back to the initial question, value arises from a process when economic resource and business process states (potential or actualized) satisfy one or more value statements that are subject to a particular value claim.

3 A Review of Value Considerations in BPM

Based on the conceptualization of value introduced in Section 2, we now review extant contributions in BPM that include value considerations. We focus on three steam of research: evaluations of formal and structural process characteristics, economic evaluations of processes, and value-oriented BPM. Then we summarize the intermediate findings from our review.

3.1 Evaluations of Formal and Structural Process Characteristics

In Sect. 2 we discussed how the intensity of value statements' normative force can differ. Of the three types of value claims (could be/should be/ought to be), only the "could be" type is seen as having no normative force. The value asserted by a "could be" value claim lies in its bearing on a thing x that some state y can be actualized in x.

"Could be" value claims in BPM relate to structural characteristics of a process. For example, in a process design phase it is useful to know whether a process design is feasible, that is, whether a process *could be* according to some formal correctness criteria. It is also useful to know about the possible "could be" states of a process in order to determine, for example, whether a process is free of deadlocks. An important influence on the "could be" value derives from the technological frame of the process, since these frames largely determine what "could be done" in a process design. The business process reengineering literature has presented a

number of examples on the enabling role of information technology in process design (Hammer 2014).

In light of "could be" value claims, value arises for a process if the process fulfills a minimum set of correctness criteria.[4] Evaluation statements concerning the correctness of a process or process model are typically of the form "*a process model for a process ABC is {syntactically correct; free of deadlocks; otherwise sound; complex; coherent; modular;. . .} such that the process ABC* ***could be***."

Many studies in the BPM field are concerned with various notions of process correctness and evaluations of structural process characteristics. For example, van Dongen et al. (2006) proposes structural patterns for process soundness, van der Aalst (1993) discusses algorithms for sate space analysis and reachability graphs based on a formal process description, and Vanderfeesten et al. (2007) propose metrics for describing process models in terms of size, complexity, coupling, cohesion, and modularity.

It can be argued that correctness criteria for processes do have a normative force, so value statements have to be in the form of "a process ***should be*** correct." While this normative force can be assumed to be present outside an economic reality, within an economic reality there is no reason that a process *should be* correct since no economic value would arise from the correctness of a process alone. For example, it is not valid to asserted that a sound process has significance in satisfying the needs of economic actors. Fulfillments of correctness criteria, that is, fulfillments of "could be" claims, are not sufficient for economic value to arise. Therefore, even if a process designer arrives at a sound process design, the designer may not be able to argue from the correctness criteria alone why a process *should be* the way it has been designed; a process designer may only assert that the process *could be* as designed. There may be sound processes that satisfy no economic value statements at all; such processes would be very sound in doing the wrong thing.

Figure 1 exemplifies the meaning of "could be" value claims by showing three process variants that have been specified as petri nets (Petri 1962). Out of these variants, only processes b) and c) *could* possibly be, since process a) would run into a deadlock (after the transition sequence $<T1, T2, T4, T3>$). While processes b) and c) are free from deadlocks, a structural process analysis could not disclose or suggest which one of the feasible process variants *should be* considered for implementation or execution. However, both processes b) and c) have already actualized value (by fulfilling a correctness criterion) since they both qualify for implementation or execution. In choosing a process variant that can potentially instantiate economic value, one must subject the processes to "should be" value claims. The example is extended in subsequent sections to demonstrate that decisions about a process design particularly include accounts of statements pertinent to the economic value attributed to a process variant.

[4] That a process fulfills a minimum correctness criterion is the *soundness* of the process (cf. van Dongen et al. 2006).

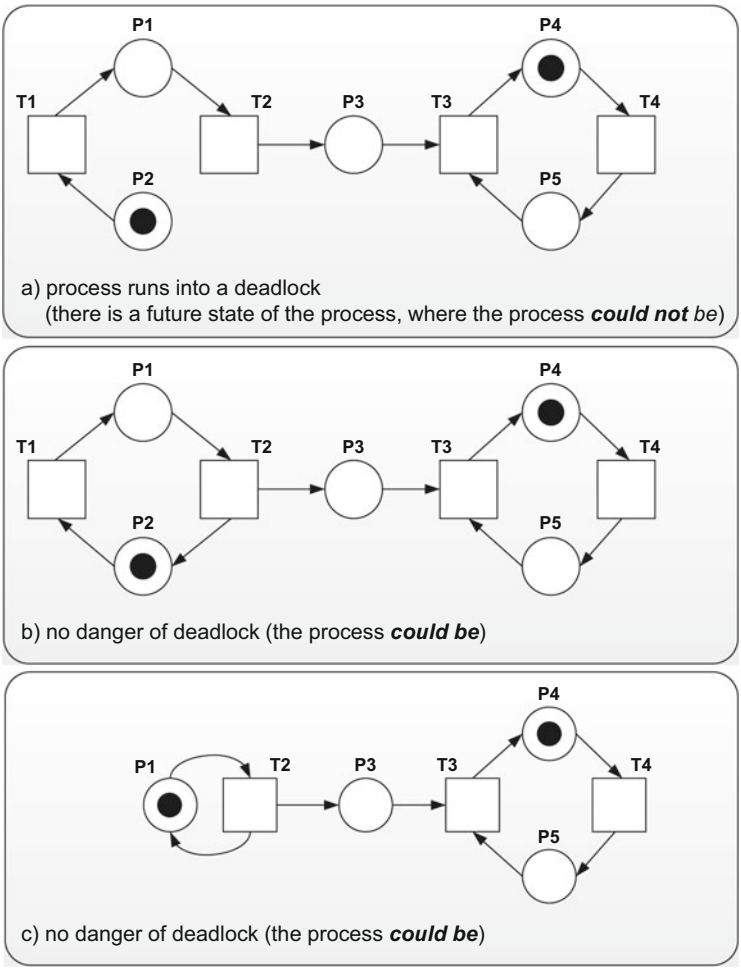

Fig. 1 "Could be" value claims and processes

3.2 Economic Evaluation of Processes

Whenever a business process is to be redesigned or improved, the resulting to-be process is not primarily valued because of its correctness but because of its ability to actualize economic value or to actualize a higher economic value than a current as-is process can. Not surprisingly, the prevalent and most commonly applied type of value claim within BPM decisions is of the "should be" type. "Should be" value claims imply a normative force that directs BPM decisions toward creating economic value. Therefore, a typical value statement in BPM may read: "a business processes ABC *should be* planned, designed, and controlled so as to create economic value."

In BPM value claims about economic value refer to both economic value in use and value in exchange, while value statements in BPM predominantly focus on a process's use value on an operational level along the dimensions of time, quality, flexibility (Reijers and Liman Mansar 2005), and costs, with costs belonging to the exchange value category. Key measures of process evaluations on an operational level are flow times, flow rates, and inventories (cf. Anupindi et al. 2011). Quality control approaches like total quality management (TQM) (Sinclair and Zairi 1995) and Six Sigma (Conger 2014) evaluate processes with regard to their variability and disposition of risk, that is, their tendency to deviate from "normal" process flows or their tendency to deviate from desired performance levels, respectively. Processes actualize value in a quality dimension if, for example, they are subject to a minimum number of errors or if the number of errors falls within a defined range.

There is no single value statement that determines when economic value arises from a business process. The actualization of a process's economic value depends on what an economic actor considers important and significant regarding the satisfaction of an economic actor's needs in a particular situation. (See the discussion on the being-conditions of economic value explicated in Def. 3) Figure 2 provides an example, by means of the "could be" processes b) and c) from Fig. 1, of how "should be" value claims compete against each other. The decision about which process *should be* implemented depends on what state or characteristic is considered to be of value in the situation shown. In Fig. 2, value statements relate to process flow times and process quality. If fast process flow times are valued, then process b) should be chosen over c). However, process c) is assumed to have a quality control mechanism in place, so this process should be chosen if quality is valued over short process flow times.

This example shows that there is no single, optimal way a process should be designed because value means different things to different individuals, groups, and organizations, and depending on the being-structure in an economic reality, different kinds of value may arise in different situations for the same process. Therefore, from an ontological perspective, *there is no such thing as an optimal business process*, and business process optimization is simply not possible.[5]

Typically, the actualization of a process's economic value requires *tradeoffs* to be accepted between or among value claims. (See Reijers and Liman Mansar 2005, who discussed several tradeoffs along the value claims related to time, cost, quality, and flexibility that are pertinent to particular business process design patterns.) For example, a process that produces quality products might have long cycle times and relatively high costs, whereas a process with low cycle times might have moderate costs and a low quality level.

Anticipating and explicating acceptable tradeoffs between or among multiple (competing) value statements relating to a business process is supported by *goal-oriented business process modeling* approaches (e.g., Kueng and Kawalek 1997;

[5] In our terminology it *could not be* that a process is optimal regarding its ability to instantiate economic value.

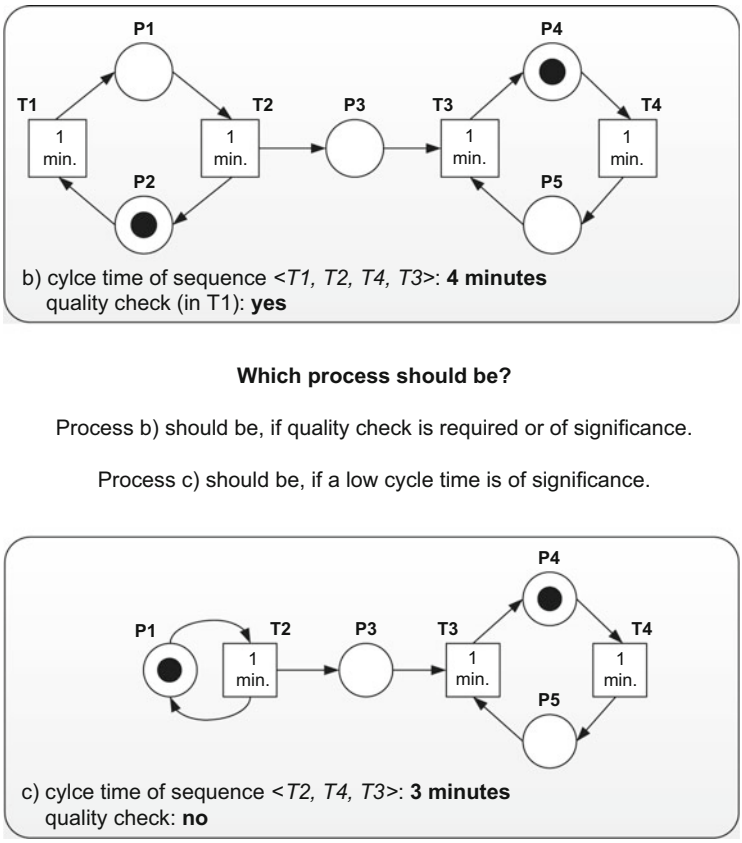

Fig. 2 "Should be" value claims and processes

Neiger et al. 2009; Nurcan et al. 2005; Soffer and Wand 2005). The idea behind goal-oriented process modeling is to associate value statements (expressed as goals) with elements of a process (model). Like process elements, the value statements (goals) can be connected with each other in order to denote hierarchical, cause and effect, or means-end relationships. With goals mapped onto processes and process elements, the process variant can be analyzed regarding its consistency and the tradeoffs that have to be accepted if particular goals are valued over other goals of the goal system.

Figure 3 exemplifies how value statements can be mapped onto process elements in order to assert how a business process *should be* in light of multiple (potentially competing) value statements. The process structure is described by means of an event-driven process chain (EPC) (Keller et al. 1992).

Figure 3 shows that value statements, expressed as objectives, are not an intrinsic part of a business process but are used to describe the being-conditions necessary for economic value to arise from a process. In the example, a "payroll

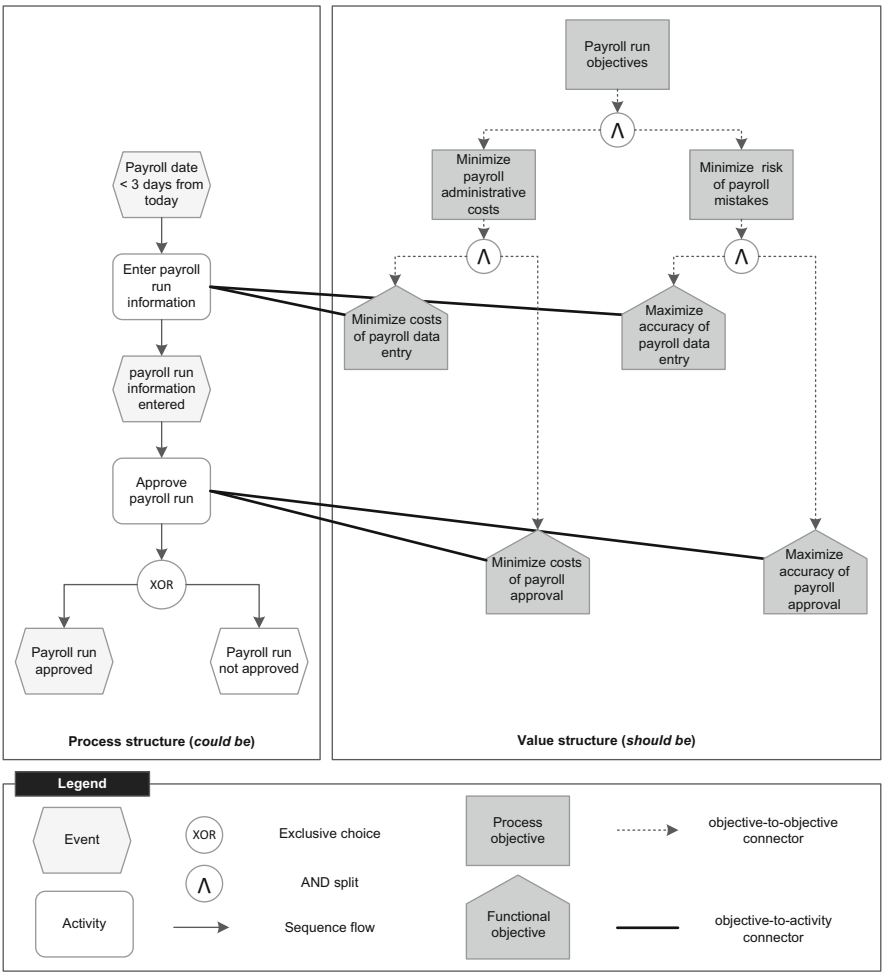

Fig. 3 Mapping "should be" value statements onto process elements (Adapted from Churliov et al. 2006, p. 8)

process" is considered valuable if it minimizes administrative costs and the risk of payroll processing errors. In order for the process to satisfy these value statements, it should be designed so its elements (process functions) contribute to maximizing the accuracy of data entries and minimizing the costs its functions incur.[6]

Being able to map value statements onto business processes and business process elements allows the potential loci of economic value creation to be

[6] Figure 6 (Sect. 5) illustrates how costs can be calculated on the function/activity level of a business process.

identified systematically. However, such a mapping does not fully reveal how the objectives assigned to a "should be" process translate into a value in exchange.

The value in exchange is usually articulated as an amount of money (a price) to be paid for a thing. A price, as opposed to measures of use value, is a measure that allows the economic value of things to be compared, particularly if the things are different in nature and satisfy different needs. For example, let a bicycle have the same price as some piece of furniture (e.g., a couch). Although these things serve different needs and although their use value may be assessed differently by different individuals, it is fair to assume that both things have the same economic value in exchange; that is, if someone owns a bicycle, he or she could sell it on a market, obtain an amount of money in exchange, and then buy the piece of furniture. Due to the fact that things can be exchanged for other things with possiby different use values, the exchange value of a thing can be regarded as a universal value in use (Bartsch and Schlagwein 2010).

In this sense, a BPM decision-maker may well be convinced that some process has a use value but would also want to know what a business process would be worth in terms of economic value in exchange, that is, the return (in monetary units) from a business process if that process could be sold on a (fictitious) "process market." Having the information about the exchange value of a business process may allow the ownership of a particular process to be justified. For example, if a process generates profits (i.e., it has a high value in exchange), then it would be a good advice to take care of that process and maybe to allocate financial resources to further improve it. However, if the process is losing money, that is, it has a negative economic value in exchange, then a decision maker might contemplate whether the process should be abandoned in order to acquire other kinds of use value with the financial resources that the process would otherwise consume. Also, the decision maker might consider investing resources in order to improve the process (if possible) so that its economic value in exchange increases.

The general approach to managing organizations with the objective of increasing their value in exchange (the market value) is known as *value-based management*, often referred to as the shareholder value approach (Rappaport 1986). In the context of BPM, this management approach is referred to *as value-based business process management*, signifying that BPM decisions should contribute to increasing an organization's market value. Value-based BPM (to which the literature also refers as value-oriented BPM) requires that the economic consequences of business processes be expressed in terms of long-term financial measures that are calculated based on cash flows (cf. vom Brocke 2007; vom Brocke et al. 2009). Despite the significance of value-based performance measures for decision support in organizations, and despite the increased adoption of process-oriented management approaches, the literature has proposed only a handful of value-based BPM approaches. We consider Gulledge et al. (1997), vom Brocke (2007); vom Brocke et al. (2009, 2010), Braunwarth et al. (2010), Buhl et al. (2011), vom Brocke and Grob (2011), and Bolsinger et al. (2011) as representative of the state of the art in value-based BPM approaches. We return to the evaluation of processes in terms of

their value in exchange in Sect. 4, where we present an evaluation approach to calculating the *return on process transformation* (ROPT).

A main barrier to the adoption of value-based BPM approaches in practice is that relevant *process-oriented accounting information* is not readily available in many organizations (Sonnenberg and vom Brocke 2014). To facilitate the provision of process-oriented accounting information in organizations, Sonnenberg and vom Brocke (2014) propose a *process accounting model* (PAM) that is capable of tracing the flow of economic resources along an organization's business processes. By applying the PAM, process managers can determine where exchange value is created or destroyed in an organization, which processes contribute to increasing the market value of an organization, and which resources are exchanged for other resources (cf. Sonnenberg and vom Brocke 2014). Used in combination with recent developments in process technologies, such as in-memory technology (see Plattner and Krueger 2014), the PAM can provide real-time information on the value creation of business processes (vom Brocke et al. 2013).

3.3 Value-Oriented BPM – Balancing of "Should Be" Value Claims

We have discussed value statements that are concerned with appreciating feasible process alternatives ("could be" value claims) and with the conditions that determine when economic value can arise from a business process ("should be" value claims). We also learned that there can be multiple competing "should be" value claims pertinent to a process, so decision-makers have to accept tradeoffs when deciding how a business process should eventually be.

However, accepting tradeoffs does not imply that all value claims about a process are balanced, as a particular tradeoff may be acceptable to only one stakeholder of a process, while value statements that are significant to other process stakeholders might not be fulfilled by such a tradeoff. Thus, a business processes may not be equally supported by all parties involved.

Value-oriented BPM accounts for the fact that organizations—and processes in particular—are cooperative social systems and that people are willing to contribute to such a cooperative system only if they perceive their participation to be personally beneficial (cf. Cyert and March 1963). Therefore, organizations should offer incentives to stakeholders in order to "secure efforts necessary to its existence" (Barnard 1938, p. 142). In the sense of our value discussion, incentives and contributions represent (prospective) fulfillments of stakeholder-specific value statements. For example, an employee might be induced to contribute by attractive work conditions (i.e., a process's value for an employee arises if the process contributes to establishing attractive work conditions), as the employee's contribution (e.g., a process output) is valued by the process owner and contributes to the fulfillment of the owner's value statement related to the process output. In order to

sustain such a cooperative system in the long-term, stakeholder incentives and contributions must be delicately balanced in a way that the exchange of all stakeholders' contributions offers all stakeholders the necessary incentives. Such *balancing of value statements requires negotiation among stakeholders*, which can be conducted through contracting or persuasion. Therefore, we propose distinguishing between *value-based* and *value-oriented* BPM.

It is the distinctive feature of a value-oriented BPM approach that value statements are balanced and traded off based on negotiations between process stakeholders. The resulting *balance of values* can be said to be socially acceptable—which is not necessarily the case in, for example, a value-based BPM approach that focuses solely on the financial perspective—so high-level value claims under a value-oriented BPM paradigm are conceived as having the strongest normative force (Table 1). Instead of asserting that a process should be, a business process's value is asserted by stating that "*a process* ***ought to be***." In BPM this notion has been put forth in the area of Green BPM, where sustainability as a management paradigm has been characterized by (a) balancing the views of all relevant stakeholders (b) over a long-termed planning horizon (Alemayehu and vom Brocke 2010).

In order to achieve a balance between value statements, both cause-and-effect and means-end relationships between individual value statements must be identified and weighted in a business process context. Techniques from goal-oriented process modeling (Fig. 3) can be employed for this purpose. Two goal-modeling techniques appear to be particularly useful in the context of value oriented BPM approaches: the *value-focused business process engineering approach* (Neiger et al. 2009) and the *i** goal modeling approach (Yu et al. 2011). There are also less process-oriented approaches that can be adapted for the purpose of balancing value statements in BPM, such as the balanced scorecard proposed by Kaplan and Norton (1992).

Whatever approach is chosen for defining value statement relationships, each resulting value system must account for the organization-specific context. Different organizations may arrive at different value systems since value means different things to different stakeholders and in different cooperative systems.

Despite the particularities of individual value systems, some basic patterns can be identified that can be considered in the formulation and adaptation of organization-specific value systems. Figure 4 provides an abstract example of such a value system.

The value perspective that is most frequently referred to in BPM is the operational perspective, which focuses on the key performance measures of time, quality, and costs (Reijers and Liman Mansar 2005). From the operational perspective, a process should be designed to fulfill quality, time, and cost objectives.

Under a value-oriented BPM paradigm, however, other perspectives must be considered as well if the needs of all relevant process stakeholders are to be satisfied. In addition to satisfying operative results, a business process should satisfy the conditions that secure processes' ability to operate in the long term. In particular, the interests of employees as members of a cooperative system must be addressed. Processes in this sustaining perspective are valued, for example, if they

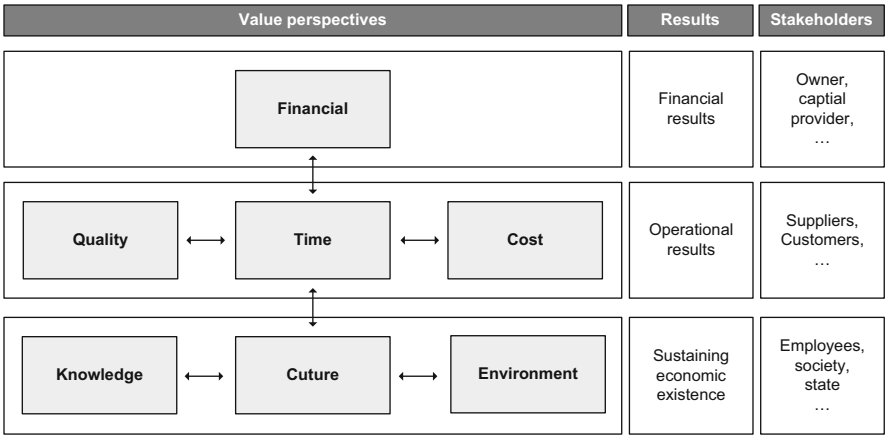

Fig. 4 Value-oriented BPM – exemplary perspectives on a multi-dimensional value system

positively affect the process culture (Schmiedel et al. 2014). Other kinds of value related to process sustainability can also be considered; for example, the state and society may demand that a process be designed so it leaves a minimal carbon footprint or produces minimal waste of natural resources (cf. vom Brocke and Seidel 2012; Seidel et al. 2012).

The process alternatives that satisfy the "should be" value claims pertinent to the operational and sustaining perspectives have different effects on an organization's financial results. From the financial value perspective, relevant stakeholders are interested in the exchange value that arises from particular process alternatives. (See the discussion on value-based BPM in Sect. 3.2.) For example, owners and capital providers expect financial returns on their investments, the government expects taxes to be paid, and shareholders expect the organization's market value to increase. As opposed to the operational perspective, the financial perspective requires process evaluations that account for long-term economic effects. The value of a process is assessed not only on short-term operational performance but also on the financial effort required to implement and migrate the process, on the effort required to maintain its technical infrastructure, and on its prospective returns.

Eventually, an organization can exist in the long-term only if it is successful in achieving positive financial results. Therefore, the balancing of stakeholder value statements should ensure long-term financial success (cf. Kaplan and Norton 1992; vom Brocke 2007; vom Brocke and Grob 2011).

3.4 Further Intermediary Conclusions for BPM

The framework in Fig. 5 illustrates the differentiation of the three types of value statements in BPM.

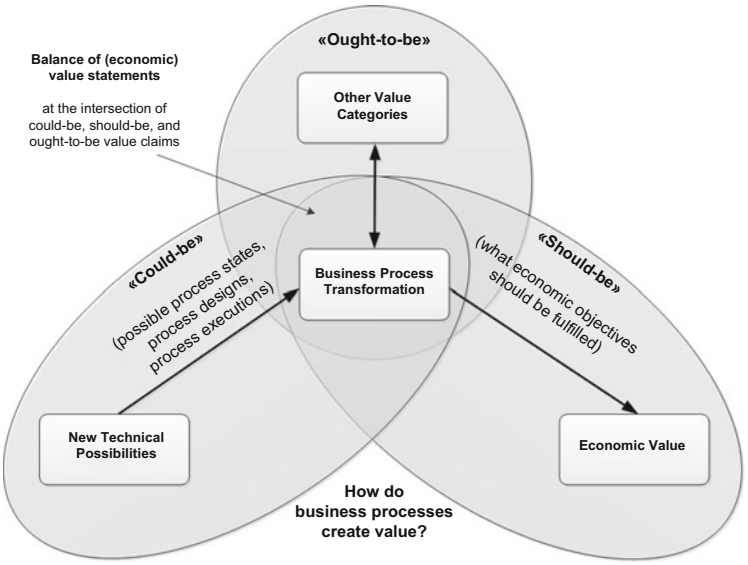

Fig. 5 Three types of value statements in value-oriented BPM

A "could be" value claim pertains to evaluations of structural process characteristics and asserts that the value of a process lies in its ability to be possible, to be feasible, and to actualize several process states. However, "could be" value exerts no normative force, so structural process analysis and evaluations would not disclose whether a possible process alternative is of economic value.

The existence of economic value can be asserted by means of "should be" value claims, which are prevalent in process evaluation approaches that focus on the satisfaction of a superordinate objective (e.g., a process should be designed so as to incur minimal processing cost). However, a number of "should be" value claims fail to be realized in practice because of lack of support from a wider range of stakeholders.

"Ought to be" value claims consider the need to balance multiple viewpoints on business processes and process transformations. These value claims take into account that there can be different objectives for a process that are significant to multiple stakeholders. Therefore, to assert that a "process ought to be" implies that the multiple process objectives are balanced in order to create an incentive-contribution equilibrium (cf. Barnard 1938). These value claims are pertinent to what we term a "value-oriented BPM approach."

In practice, an "ought to be" value claim might not be fully satisfied, and the resulting tensions and frictions among process stakeholders have to be resolved. BPM capabilities (Rosemann and vom Brocke 2014), such as a process-friendly culture (Schmiedel et al. 2014), might mitigate the risk of frictions among stakeholders. In light of the difficulties inherent in achieving an appropriate balance of value statements, we see an "ought to be" process as an ideal process that

instantiates value for all of its stakeholders. We refer to such a process as one that has the maximum "support" of all stakeholders.

"Ought to be" value statements may come with the price of limiting the satisfaction level of some "should be" value statements, but the balance of value statements is essential to realizing long-term economic value. In this regard, we perceive the negotiation and achievement of "should be" value claims in an organization important predecessors of economic value creation through BPM.

Because of the significance of the financial perspective in the context of a value-oriented BPM paradigm, we present a method for measuring the *return on process transformation* (ROPT) in the next section. While the ROPT evaluation method is used to calculate a financial-process performance measure, it interfaces with the other value perspectives. For example, the application of the ROPT allows the effort required to establish a desirable degree of process-friendly culture or for inducing employees to participate in process transformations to be explicated in financial terms. Moreover, detailed information about the operational process behavior is required in order to calculate the ROPT. Finally, relevant types of stakeholder value can be accounted for in the ROPT method by specifying cash flow categories that represent (virtual) financial rewards or financial penalties that are incurred if stakeholder value statements are satisfied or violated to a given degree. For example, if environmental goals are not met, a financial penalty can be specified and considered in the calculations.

4 The Example of the Return on Process Transformation

4.1 Introducing the Return on Process Transformation

In many practical cases, the question arises concerning whether it is worth re-organizing or transforming a certain process. In terms of an evaluation statement expression introduced in Sect. 2, the question is whether a transformed process is as it "should be" in financial terms or as it "ought to be" in terms of a balanced set of multiple stakeholder value.

We propose a method for evaluating the exchange value of a process in terms of a *return on process transformation* (ROPT). Although focusing on the financial perspective, for two reasons the ROPT represents a value-oriented measure of a process's value: its calculations require consideration of other value perspectives, and its use is meant to complement further value considerations. In practice often the strategic and qualitative effects of alternative process redesigns are considered first, and then the ROPT is calculated in order to put a "price tag" on each alternative so decision-makers can balance both the quantitative and qualitative effects of process redesign.

The basic idea behind the ROPT measure is that a business process transformation is considered beneficial if the investment into the process transformation "pays

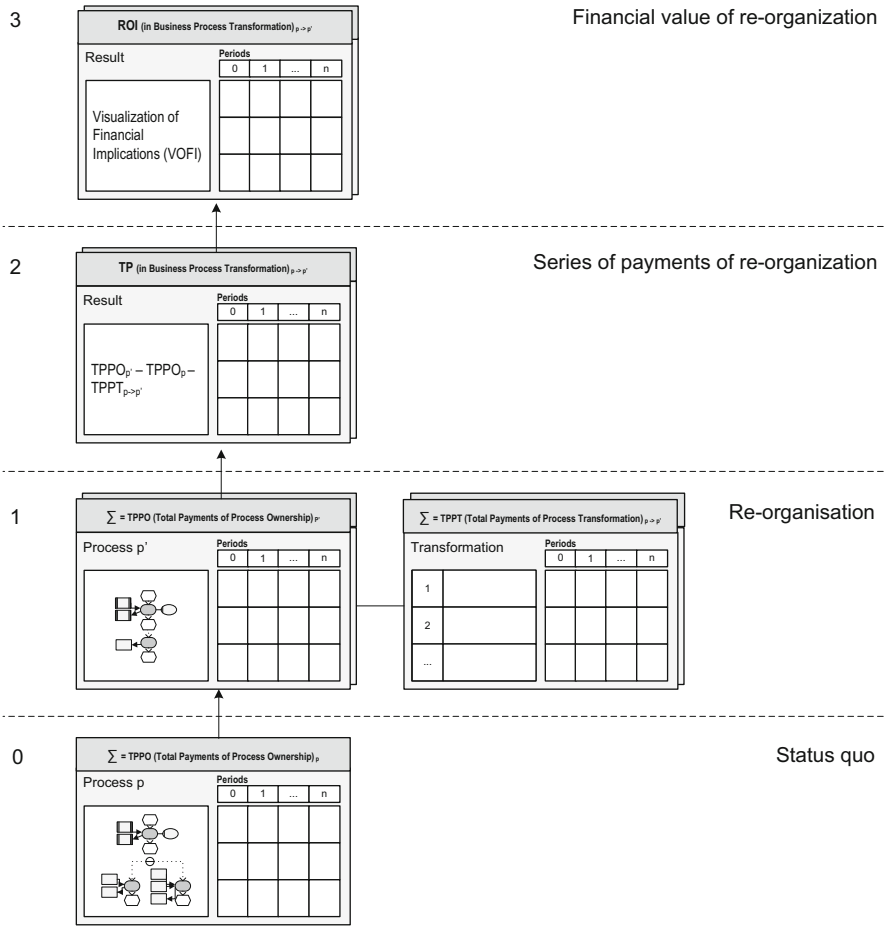

Fig. 6 Return on Process Transformation (ROPT) – calculation scheme

off".[7] The benefits of a transformation can be calculated by simply subtracting the cash flows of the as-is process from those of the to-be process, which should yield a cash flow surplus large enough to compensate for the financial investment in the process transformation. Figure 6 shows the calculation scheme for determining the ROPT.

[7] The ROPT does not report a payoff period but a net present value measure. In fact, payoff periods are not a useful criterion for evaluating financial investments, since an investment can be unprofitable even if it has a payoff period. Consider, for example, the case of a long-term (20–30 years) investment. In the first 10 years the investment could generate excess cash flows, so that the investment initially pays off after 10 years. However, then the investment could create only negative cash flows, leading to a negative terminal value. Although it has a payoff period, the investment would still be unprofitable.

The *benefit* of a process re-organization or a process (re-)design is calculated by comparing the *Total Payments of Process Ownership (TPPO)* of the reorganized to-be process (process p′) with the TPPO of the as-is process in status quo (process p) (level 1 and level 0 in Fig. 6). The benefit resulting from the transformed process is expressed as a positive difference between the $TPPO_{P'}$ of the new process p′ and the $TPPO_P$ of the process in the status quo (process p).

The investment into the process transformation, which represents its *price*, is the sum of all the payments that are required for the transformation, referred to as *Total Payments of Process Transformation (TPPT)*. TPPT is typically comprised of payments for investments into the technical process infrastructure (like new information technology), for the development of process knowledge, or for training employees affected by the new process design.

Long-term economic consequences of the process re-organization should be taken into account in calculating the TPPO and the TPPT, which is why the planning horizon for the payments should span multiple time periods (e.g., 5 years). By netting the TPPO ($TPPO_{P'} - TPPO_P$) and the investment in the process transformation (TPPT), one can calculate the total expected payments resulting from the process re-organization.

The sequence of direct payments provides the basis for taking into account additional financial consequences, including indirect (derived) payments, such as interest and tax payments. Various standard methods for investment controlling can be used to calculate the derived payments. Instead of using classical methods for capital budgeting, such as the net present value (NPV) or the internal rate of return (IRR), we use Visualization of Financial Implications (VOFI) (Grob 1993) to aggregate and calculate the financial consequences of a process transformation.

VOFI is suitable for making the financial consequences of a particular investment transparent (Grob 1993) since it discloses how the funding and taxation conditions affect the financial performance of an investment. vom Brocke and Grob (2011) show how the transparency feature of VOFI is used to analyze the interdependencies between business process design decisions and financial consequences.

Identifying the TPPO (on level 0 and level 1) can be done on a different levels of detail. On a high level, payments can be roughly estimated by asking decision-makers to specify the top 3–5 cash flow positions that they consider relevant to the as-is and the to-be processes. On a detailed level, however, the TPPO can be identified based on information on process structures, which can be obtained from process models (vom Brocke and Grob 2011), and operational process behavior, which, in turn, can be obtained by process-oriented accounting information systems (cf. Sonnenberg and vom Brocke 2014).

Identifying the TPPO based on process models necessitates that the process models be annotated with financial information, as illustrated in Fig. 7.

Figure 7 shows an exemplary calculation scheme for identifying and calculating payments related to a process design alternative on an activity level. The notation used in Fig. 7 is the BPMN (OMG 2010). Out-payments are calculated based on the use or consumption of input objects and resources objects, respectively. All

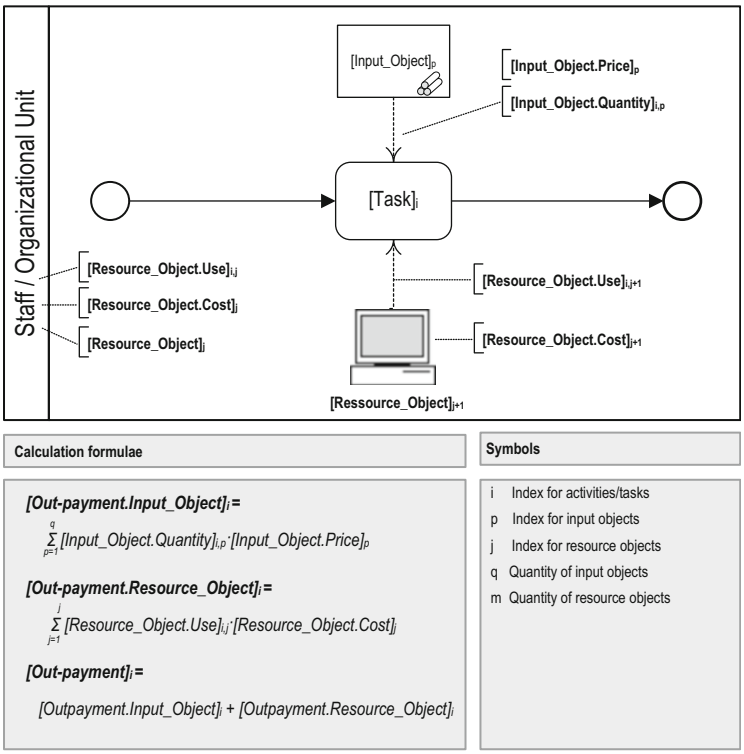

Fig. 7 Exemplary scheme for calculating out-payments on an activity level

payments calculated for each activity (or task) are then aggregated according to the process structure. This payment aggregation is then conducted for each period of the planning horizon, which can be facilitated by defining trend rates (e.g., out-payments for a particular resource or activity increase by x% each period).

The payments related to the investment in the transformation (the TPPT) can be specified based on calculation templates that contain pre-defined payment positions for typical transformation tasks. An exemplary calculation template is shown in Fig. 8.

− Integration infrastructure	0	1	2	...	5
− Development of a wrapper service	-20.000 €	-700 €	-700 €		-700 €
− Development phase	-20.000 €	0 €	0 €		0 €
- Requirements analysis	-8.000 €	0 €	0 €		0 €
- Implementation	-7.500 €	0 €	0 €		0 €
- Testing	-5.500 €	0 €	0 €		0 €
+ Operating phase	0 €	200 €	200 €		200 €
+ Adaptation phase	0 €	500 €	500 €		500 €
+ Human resource development	-1.500 €	-1.200 €	-600 €		-200 €
Payments (total)	-21.500 €	-1.900 €	-1.300 €		-900 €

Fig. 8 Exemplary calculation template for determining the TPPT

The approach to calculating the return on process transformation is subsequently illustrated by means of a real-world application example.

4.2 Calculating the ROPT in a SOA & BPM Case

A medium-sized logistics company uses a web-based enterprise portal to support its business processes.[8] In the case at hand, management is considering integrating a route-planning process into this portal. Two route-planning types are distinguished: detailed planning and ad-hoc planning. Prioritization policies have been defined in order to determine the planning type for each delivery order. High-priority delivery orders are subject to detailed planning, but if there is not enough time for detailed planning, ad-hoc planning is applied instead. The drawback of ad-hoc planning, however, is that routes may turn out to be inefficient, and the delivery may not be made in time, leading to contractual penalties, so the truck fleet may not be deployed efficiently.

As route-planning has been conducted manually in the past, which is time-consuming, a drastic increase of ad-hoc route plans has been noted, even for high-priority deliveries. By integrating the route-planning process into the enterprise portal, the company hopes to reduce errors, meet delivery schedules, and increase the efficient allocation of resources. The technical implementation of the solution is to be done on the basis of a Service Oriented Architecture (SOA) (e.g., Cummins 2014). Prior to the implementation, several design alternatives must be assessed:

1. *GlobalRoutePlanning* – an IT solution by means of which route plans can be created over an online interface and saved to the company's database. Using the service requires specific information, such as delivery orders, truck fleet capacity, order prioritization, delivery addresses, and delivery dates. With this solution, the process of route-planning is fully "out-tasked."
2. *GeoDataForLogistics* – an in-house solution by which internal routing rules and customer data are enriched by external route information provided by a special geographic map service that is particularly suited to the needs of logistics companies. While this service can substantially reduce the planning effort, it also requires the development of a number of data services (wrappers) in-house.
3. *IntelligentRouting* – a web service by which fully fledged route plans can be created. This design alternative is similar to *GlobalRoutePlanning* but is used only for a particular geographic region. As the geographic data of this service is up to date (e.g., providing information on construction sites or blocked roads), the planning quality is likely to be significantly improved by this solution.

[8] The example is taken from vom Brocke et al. (2009).

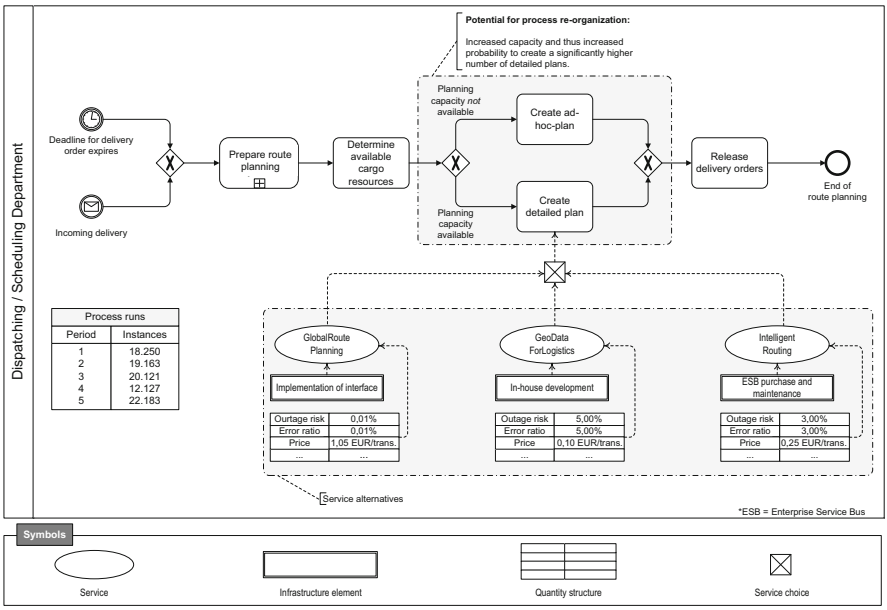

Fig. 9 Business process diagram for the process "Route planning" (vom Brocke et al. 2009)

The internal route-planning process is modeled by a BPMN process model (see Figure 9). In order to indicate process alternatives and specify the quantity structure of the process, company-specific notational elements (BPMN artifacts) are integrated. (See the explanation of symbols in Fig. 9.) Calculation of payments is done according to the calculation scheme illustrated in Fig. 8. Two resource object types are relevant: organizational unit ("dispatching / scheduling") and the services to be integrated. The quantity structure that is relevant to the calculation of the use of resources is specified in the process diagram by means of custom table artifacts.

The design alternatives of the process are considered based on a partial calculation (see vom Brocke et al. 2009) in Fig. 9. Various infrastructure requirements (e.g., purchase and maintenance of an Enterprise Service Bus (ESB), implementation of interfaces, in-house developments) are needed in order to integrate the services into the process. Deciding in favor of or against a certain service in this example is expected to have a local impact only, as there are no structural or institutional interdependencies with other process elements.

The process diagram illustrates the design alternatives as they are given in a particular case. Selection of a *to-be* model here is made on the basis of a comparison of the financial value of alternative process configurations. The calculation is shown in Fig. 10 and is explained in more detail for the *IntelligentRouting* alternative process configuration.

As the impact of the design decisions is only local, the calculation of the differences between alternative process configurations and the status quo can be conducted by means of a partial analysis for determining the direct payments.

Direct Payments

Period	0	1	2	...	5
— *IntelligentRouting*	**–25.000 €**	**11.431 €**	**12.422 €**	...	**16.463 €**
— **Activity level**		**22.356 €**	**24.569 €**	...	**29.614 €**
— **Savings**		**22.356 €**	**24.569 €**	...	**29.614 €**
(1) *CA*		1.825	1.825		1.825
(2) *PE*		18.250	19.163		22.183
(3) $PT_{as\text{-}is}$		10	10		10
(4) $PT_{to\text{-}be}$		5	5		5
(5) $ER_{as\text{-}is}$		0,2	0,2		0,2
(6) $ER_{to\text{-}be}$		0,03	0,03		0,03
(7) $OR_{to\text{-}be}$		0,03	0,03		0,03
(8) $pDP_{as\text{-}is}$ = (1) / (3)		10.950	10.950	...	10.950
(9) $pDP_{to\text{-}be}$ = [(1) / (4)] · [1 – (7)]		21.243	21.243		21.243
(10) $rDP_{as\text{-}is}$ = MIN [(2) ; (8)] · [1 – (5)]		8.670	8.670		8.670
(11) $rDP_{to\text{-}be}$ = MIN [(2) ; (9)] · [1 – (6)]		17.703	18.588		20.606
(12) ΔrDP = (10) – (11)		8.943	9.828		11.846
· Savings per detailed plan (€)		2,50	2,50		2,50
= Total savings (€)		22.356	24.569		29.614
— **Infrastructure level**	**–25.000 €**	**–6.500 €**	**–7.500 €**	...	**–8.000 €**
— **Template [Payments ESB]**	**–25.000 €**	**–6.500 €**	**–7.500 €**	...	**–8.000 €**
Initial expenditure	–25.000 €				
– Maintenance		4.000 €	4.000 €		4.000 €
– Adaptation		2.500 €	3.500 €	...	4.000 €
Depreciations		5.000 €	5.000 €		5.000 €
— **Service level**	**0 €**	**–4.426 €**	**–4.647 €**	...	**–5.151 €**
— **Service payments**	**0 €**	**–4.426 €**	**–4.647 €**	...	**–5.151 €**
Service charge rate (price per transaction)		**0,25 €**	**0,25 €**	...	**0,25 €**
· $rDP_{to\text{-}be}$		17.702	18.588		20.606
= Service payments		**–4.426 €**	**–4.647 €**		**–5.151 €**
— *GlobalRoutePlanning*	**–1.000 €**	**3.060 €**	**5.183 €**	...	**9.349 €**
+ **Activity level**		**23.720 €**	**26.001 €**	...	**32.839 €**
+ **Infrastructure level**	**–1.000 €**	**–1.500 €**	**–700 €**	...	**–500 €**
+ **Service level**		**–19.161 €**	**–20.119 €**	...	**–22.990 €**
+ *GeoDataForLogistics*	**–32.500 €**	**11.770 €**	**13.229 €**	...	**16.814 €**

Formulae for evaluating the economic potentials

- $pDP_{as\text{-}is} = \frac{CA}{PT_{as\text{-}is}}$
- $mDP_{to\text{-}be} = \frac{CA}{PT_{to\text{-}be}} \cdot (1 - OR)$
- $rDP_{as\text{-}is} = MIN\ (PE\ ;\ pDP_{as\text{-}is}) \cdot (1 - ER_{as\text{-}is})$
- $rDP_{to\text{-}be} = MIN\ (PE\ ;\ pDP_{tp\text{-}be}) \cdot (1 - ER_{to\text{-}be})$
- $\Delta rDP = rDP_{to\text{-}be} - rDP_{as\text{-}is}$

Symbols

CA	Capacity (hours/period)
PE	Process executions (#)
PT	Processing time (min.)
ER	Error ratio (%)
OR	Outage risk (%)
pDP	Possible detail plans (#)
rDP	Realized detail plans (#)

Fig. 10 Calculation of TPPO and TPPT for the process re-organization (vom Brocke et al. 2009)

Therefore, in order to calculate this difference, the expected *additional payments* compared to the status quo level (*as-is*) of each design alternative (*to-be*) must be determined.

Using the *IntelligentRouting* service for the route-planning process promises both a higher number of detailed plans that are possible (*pDP*) and a better quality of realized detailed plans (*rDP*). It is expected that the processing time (*PT*) of the activity "Create detailed plan" will be reduced from 10 min to 5 min and that the error ratio (*ER*) will be reduced (from 20 to 3 % in case of the *IntelligentRouting* web service). Taking into account an available capacity (*CA*) of 1,825 working hours per period, a process execution frequency (*PE*) of 18,250, and a 3 % outage risk (*OR*) of the web service, direct cost savings of 22,356 € can be expected in period 1. The calculation is based on the assumption of an average advantage of 2.50 € for creating a detailed plan compared to creating an ad-hoc plan.

For the *IntelligentRouting* web service a transaction-based pricing model is assumed, with an average calculation rate of 0.25 € per transaction. The payments per period are calculated on the basis of the expected execution frequencies for the task "Create detailed plan" ($\approx rDP_{to\text{-}be}$). In period 1, for example, 17,702 detailed plans are expected to be created, so the service payments amount to −4,426 €. If the route-planning process is out-tasked, the calculation rate, with a lower risk of outage risk, is 1.05 € per transaction, so the expected payments increase accordingly (−19,161 €).

In addition to the activity-based payments ($TPPO_p$ and $TPPO_{p'}$), the payments for the process transformation (TPPT) must be taken into consideration. In this case, most of these payments result from investments in the technical infrastructure. Using the *IntelligentRouting* web service requires the implementation of an enterprise service bus (ESB) solution. The case example assumes that the company pursues an incremental implementation strategy, so a decision in favor of the *IntelligentRouting* web service brings about all payments for purchase of technical infrastructure (25,000 €), as well as all follow-up payments for maintenance and adaptation that occur periodically. If the *GlobalRoutePlanning* service is used, with activities for detailed planning being out-tasked, payments for the technical infrastructure are substantially lower. If *GeoDataForLogistics* is used, higher payments for the technical infrastructure are expected because of the comparatively high implementation and development effort required.

With direct payments being consolidated by means of the VOFI capital budgeting method (Grob 1993; vom Brocke and Grob 2011), the future value of investing into the re-organization of the process is: 30,379 € (*IntelligentRouting*), 25,424 € (*GlobalRoutePlanning*), and 26,235 € (*GeoDataForLogistics*). Compared to the future value of the opportunity of an alternative financial investment on the capital market, which amounts to 11,425 € (own equity compounded with an interest rate of 6 %), implementing any service can be considered beneficial to the company. The *IntelligentRouting* web service is the design alternative that generates the highest additional future value, so the route-planning process should be transformed based on the *IntelligentRouting* web service.

5 Summary and Outlook

This chapter provides fundamentals on the notion of "value" and its role in BPM. Despite the important role that value considerations play in BPM, the extant literature reveals a limited understanding of the concept of (economic) value in BPM. We fill this gap by discussing the concept of value in general and in relation to BPM. The chapter highlights three types of value claims in BPM—"could be" value claims, "should be" value claims, and "ought to be" value claims—and distinguishes between the two notions of "value in use" and "value in exchange." Against this background we synthesize prior research on value in BPM and characterize the concept of value-oriented BPM, illustrating it by means of the ROPT, a measure for evaluating the economic consequences of any business process design activity. This measure can be used to complement further value considerations by putting a price tag on design activities that considers the specific contextual factors of the related design decisions. The measure expresses the exchange value of a process design, thus helping to balance different value dimensions in order to define "ought to be" processes that are meaningful and supported in an organization. The differentiated understanding of value creation in BPM can support practitioners in decision-making, and researchers in developing complementary knowledge on value-oriented BPM.

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Process Capital as Strategic Success Factor

Markus Brenner, André Coners, and Benjamin Matthies

Abstract The high importance of processes regarding a company's success has been known for a long time. However, the level of importance of processes, especially in comparison with other success factors, has not been in focus in a consequent matter yet. The research regarding "intangible assets" now provides a new perspective. According to recent research findings, "process capital" is one of the most important assets of a company. In consequence, process capital has to be built up and managed and has to be a major focus of corporate strategy. On the one hand, the process capital can be the basis for strategy development. On the other hand, process capital is essential for strategy implementation. Process capital management (PCM) is the concept that, in addition to a "classical" process management, also focuses on developing and preserving intangible assets. This chapter gives an introduction to process capital. Then, the correlation between process capital and strategy is analyzed. Furthermore, a suggestion is made regarding the further development of process management toward PCM. Finally, the importance of process capital is illustrated by means of a real-life example from Lufthansa.

1 Process Capital as driver of corporate success

It is almost general knowledge that processes are important to a company's success. However, it is rare to focus attention on the level of importance of processes. Therefore, a systematic approach to processes, in part regarding their impact upon corporate success, is necessary in order to manage process potential to its full extent. In order to analyze the role of processes regarding corporate success, research regarding resources as well as regarding success have to be considered. Besides Porter's market-based approach (cf. Porter 1998), the resource-based approach of Prahalad and Hamel

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(cf. Prahalad and Hamel 1990) became one of the two main perspectives of corporate strategy and success. "Establishing competitive advantage involves formulating and implementing a strategy that exploits the uniqueness of a firm's portfolio of resources and capabilities" (Grant 2005, p. 136f). It became mainstream that resources are a source of creating competitive advantage and success. Analyzing the determinants of corporate success – known as success factors – is part of success research (e.g. Rockart 1979). We distinguish between two types of success factor, internal factors such as resources and external factors such as market share. When looking at company resources, we distinguish between three categories: financial resources, material resources and immaterial resources (known as intangible assets). Empirical testing has shown that intangible assets induce significant reactions on the capital market (cf. Lev and Sougiannis 1999). Intangible assets can be defined as "the non-material and non-financial resources a company can exploit for longer than the current reporting year" (Günther et al. 2004, p. 162). In the following definition from the Schmalenbach Gesellschaft, which is derived from the basis of Edvinsson's and Malone's system (cf. Edvinsson and Malone 1997, p. 65), intangibles are broken down into seven categories (cf. WGARIA 2005, p. 68). Within this definition, process capital is exemplified as a category of intangible assets (see Fig. 1). Accordingly, process capital is understood as "Intangible values that relate to an entity's organization, primarily in terms of structure and process" (WGARIA 2005, p. 69). "Examples include a well-functioning distribution and/or communication network, as well as effective quality management processes" (WGARIA 2005, p. 69).

In another definition, processes are seen as a main component of 'organizational infrastructure'. This organizational infrastructure embodies "business processes and systems that transform 'lifeless things', tangible and intangible, to bundles of assets generating cash flows and conferring competitive positions" (Lev and Daum 2003, p. 7). These authors attach great importance to organizational infrastructure: "[. . .] organizational infrastructure, when operating effectively, is the major intangible of the firm" (Lev and Daum 2003, p. 7).

In consequence, process capital is created by the existence or development of processes which represent economic advantages. As a result the company's intangible assets are increased.

A detailed definition of process capital distinguishes between the two components of *process structure* (cf. Becker and Kahn 2003) in the sense of an operational structure and *process performance* (cf. Leyer et al. 2014). From the perspective of a company, the existence of defined processes which conform with corporate business targets represents a "value". Based upon the business model a company chooses, the aim is to have and to develop the 'right' processes in terms of strategic and operative efficiency and effectiveness targets. Thus, for example, HAMMER stresses the effectiveness target: "Processes are what create the results that a company delivers to its customers" (Hammer 2001, p. 53). The existence of the 'right' processes enables the company (cf. Mayer 2005, p. 2)

- to recognize the relevant market trends and to translate these into products faster than the competition,

Fig. 1 Process capital as a category of intangible assets based on: WGARIA 2005, p. 68

- to recognize its target markets and target customer groups and to address and coordinate them appropriately,
- to establish support processes which provide effective support for the business model and demonstrate benchmarkable efficiency,
- to manage the value-adding processes in such a way as to ensure an optimal division between which activities are carried out internally and which are outsourced, and
- to organize the collaboration with value-adding partners along commercial aspects.

The existence of a defined and (ideally) well-documented process structure alone does not suffice to ensure corporate success and 'sustainability' or whether process capital retains its value over time. Rather, the important aim here lies in shaping the processes to conform with the targets they must achieve in terms of costs, time and quality. This is known as Process Performance Management. Process performance has a direct impact upon the central key performance indicators of turnover and costs (cf. Mayer 2005, p. 5). Defined processes which satisfy their performance targets are the embodiment of sustainable process capital. If we understand process capital in these terms, it becomes "[. . .] a sustainable strategic competitive advantage, a dynamic core competency of a company" (Osterloh and Frost 2006, p. 7).

As such, process capital is seen as an extremely important success factor – based on its contribution to company success – compared with the other categories of intangible assets, as shown in empirical studies (cf. Günther et al. 2005, p. 101ff). Against this background, value-based corporate management should go beyond material assets (e.g. management and controlling of fixed asset investments) and focus on managing and controlling intangible assets, especially process capital. One key aspect should not be ignored: according to OSTERLOH/FROST, process capital only exists when process structure and performance can be deployed to create value, or at least to preserve it. This is the case when processes are aligned with corporate strategy in terms of structure and performance. This then gives rise to the question of how to design and shape processes so they help the company to

reach its strategic financial and customer targets. Consequently, these targets should form the starting point for designing all processes – from the innovation process, through the processes for supply chain, operations, market and customer relationship, to the processes for internal services. With Business Process Management (BPM), a management concept already exists to this end. However, BPM lacks the goal of preserving and further developing process capital as an intangible asset.

The main focus of this essay is to describe the correlation between process capital and strategy. This correlation will be illustrated by means of a real-life example from Deutsche Lufthansa AG (hereafter Lufthansa). Furthermore, a suggestion regarding the further development of BPM towards Process Capital Management is made.

2 The Correlation Between Strategy and Process Capital

2.1 Overview

If we look at the plethora of publications on strategic management (cf. Mintzberg et al. 1998 for an overview of the different schools of thought), we can identify two main questions: How do we substantiate strategy content and how do we implement the defined strategy in the company's daily business? A company's existing process capital, or that which needs to be built up, plays an important role in answering these questions. As Chandler said, "Structure follows strategy" (Chandler 1962, p. 14), and this is often used to exemplify how interdependent strategy and organization, and hence processes, are. If we see strategy as the means of implementing corporate goals, then it becomes clear that we need processes with which we can plan, execute and monitor measures towards strategy implementation (Burlton 2014). Consequently, processes and process targets must be derived from strategy. An empirical study gave a fitting summary: "Get your strategic objectives aligned with business processes" (Hung 2006, p. 37).

However, processes should also be seen as strategic success factors when substantiating the content of strategies. Indeed, it is often the case that the key success factor for business models is the company's ability to master core competencies. Amongst other things, running a successful 'no-frills' airline depends on efficiently mastering aircraft turnaround and thus reducing ground time. Numerous other examples in industry could be given here to prove the hypothesis of a positive correlation between corporate success and process capital, where processes are seen as core competencies (one prime example would be Google's internet-based search process). Thus, existing and future process capital must be taken into consideration when formulating strategy. Figure 2 summarizes the interrelationship between strategy and process capital.

On the one hand, the process capital, which consists of processes that are part of a company's core competencies can be the basis for strategy development. On the

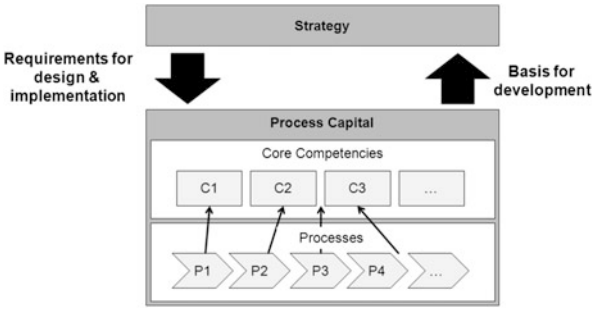

Fig. 2 The interrelationship between strategy and process capital

other hand, the defined strategy gives rise to parameters for process structure and performance. We can talk about an interdependence.

Based on the literature cited here, we can assume that both the ability to regard processes as an organization's core competency when formulating strategy, especially the processes which are 'visible' for the recipient, and the ability to accurately design and shape process structures and process performance based upon the strategy a company chooses, represent success factors. We explain these success factors in more detail in the following chapters.

2.2 Core Competencies in Process Capital

The underlying idea of aligning strategy with the strengths of a company in the sense of *core competencies*, for example certain processes, results from the resource-based approach to strategy. Core competencies can be processes which will play a central role in the future due to the company's strategic orientation and are already well-established in the company – or can be developed to be so. As a rule, it is difficult for other companies to create or acquire these processes in terms of their structure and/or performance. These limited resources are difficult to imitate and cannot be substituted (cf. Barney 1991, p. 105f.) and as such are particularly valuable. Consequently, they are also called strategic resources or strategic success factors. Generally, not all of a company's processes fall into this category. Hence, support processes are regularly well-documented and described by standard IT applications. These outsourceable processes have little impact upon strategy development and implementation.

What do impact upon the development of core competencies, however, are the so-called *core processes*. "Core processes are processes that cross functional boundaries, produce an output that is strategically important to the organization's success, and have a high impact on customer satisfaction" (Hung 2000, p. 4). Insofar as the process capital which exists in an organization is unique, cannot be imitated and comprises processes which generate value (core processes), we can consider the idea of aligning strategy with this process capital.

In the following section, we take a look at how process capital can be used to implement strategies.

2.3 Strategy Implementation Using Process Capital

The strategic level represents the "initiating and shaping factor in corporate management" (Ahlrichs and Knuppertz 2006, p. 23). Successful strategy implementation requires its prior operationalization. This, in turn, raises the question of which processes contribute to reaching targets and realizing the strategic plan, and to what extent. This can be seen in the fact that processes are one of the four perspectives of the Balanced Scorecard, which is used as an instrument of strategy implementation (cf. Kaplan and Norton 1996).

However, there is a major deficit in traditional corporate management: Strategic and operative planning are usually separated and lack rigorous and consistent linkage. As such, the strategic plan is developed as a requirement for annual operative planning (budgeting) and for mid-term planning in the form of planning premises and target values. While the operative planning budgets and financial performance indicators focus on *individual organizational units,* in terms of strategic targeting we often focus on quantitative and qualitative indicators variables at *overall company level*. This schism in organizational bearing within the planning system can lead to operative plans being developed whose contribution to strategy implementation cannot be measured. In contrast, however, we can use a process orientation to combine the strategic and operative planning levels by focusing on *processes which cross functional and organizational boundaries* from strategic targeting all the way through to operative realization (cf. Ahlrichs and Knuppertz 2006, p. 21). The processes are aligned with both strategic and operative targets.

When it comes to implementing strategies, the strategies themselves should be used to derive process-related target values. Hence, if a company decides to pursue the strategy of quality leadership, all its processes must focus on securing the desired level of quality. The operational processes work towards creating a top-quality product. For marketing and customer relationship processes, this desire for quality must be reflected in customer dealings. Within the innovation process, all efforts should be focused on developing top-class products which are difficult for competitors to imitate in terms of the degree of novelty. Since the mid-nineties the *Balanced Scorecard* has become an established instrument for deriving requirements from strategy. By using the Balanced Scorecard in combination with a further tool known as the *Strategy Map*, it becomes possible to substantiate strategies and to document the specific target values which act as yardsticks for the implementation phase. From the aspect of processes, the process perspective defined in the Balanced Scorecard, together with the targets it stipulates, is of particular importance for the strategic fields of action. Companies which use the Balanced Scorecard already have a first focus on processes for the KPI-based implementation of their strategies.

This, however, does not appear to suffice as only the main targets with strategic relevance are considered in a Balanced Scorecard. It is precisely that focus on few targets which KAPLAN/NORTON see as a success factor of the Balanced Scorecard. Yet, when we derive the strategic demands upon processes, we actually want to define comprehensive targets for all strategically relevant processes and be able to measure the extent to which those targets are reached. To do this we need to use KPIs to determine the contribution of process capital to strategy implementation, or the extent to which strategic goals are reached, and to compare this with target values.

It is for this reason that we wish to introduce an instrument known as the *Strategic Process Alignment matrix* (SPA matrix) as a method of aligning processes with corporate strategy. The SPA matrix establishes formal, KPI-based relations between strategy and those processes with strategic relevance. Thus, strategic requirements upon process performance should be portrayed and made measurable. To do this, we use a matrix to systematically compare the strategic goals, which for example can be taken from a Strategy Map, with the core processes. In this way, we can assess the contribution of process capital to strategy based on the criteria of 'process relevance' and 'degree of target achievement'. Process relevance represents a weighting in percent of how relevant a process is for reaching the strategic goal. As several processes are relevant for achieving a specific strategic goal, we have to weight the impact of the different processes upon the goal as whole when estimating the percentage values. Hence, we analyze and estimate the extent to which a process should contribute to reaching a specific strategic target.

Subsequently, the demand upon the process is specified in the form of a performance indicator, which measures target achievement, and a target value. This is done for each strategic target and 'relevant' process. By comparing actual and target values and carrying out deviation analyses, we can monitor and manage the conformity of process performance with strategic targets. Thus, the SPA matrix provides management with a strategy-based process cockpit. In the example SPA matrix portrayed in Fig. 3, the strategic goals were developed in Balanced Scorecard workshops. After finalization of the company's Strategy Map, another accompanying workshop was initiated: Within 'SPA' workshops, executed with the management team, the implications for each process regarding each strategic goal were discussed. As an example, the advisory process of a bank which has a relatively high relevance for the strategic goal 'Free up front office' fails to meet strategic requirements. This might be due to the fact that this process still has too many high-maintenance communication interfaces to the back office, which in turn might be measured using the performance indicator 'Number of interfaces in process'.

By using the SPA matrix companies are able to track process performance from a strategic point of view. Nevertheless, the following question still remains: how can companies design their management system so it systematically creates process-based values?

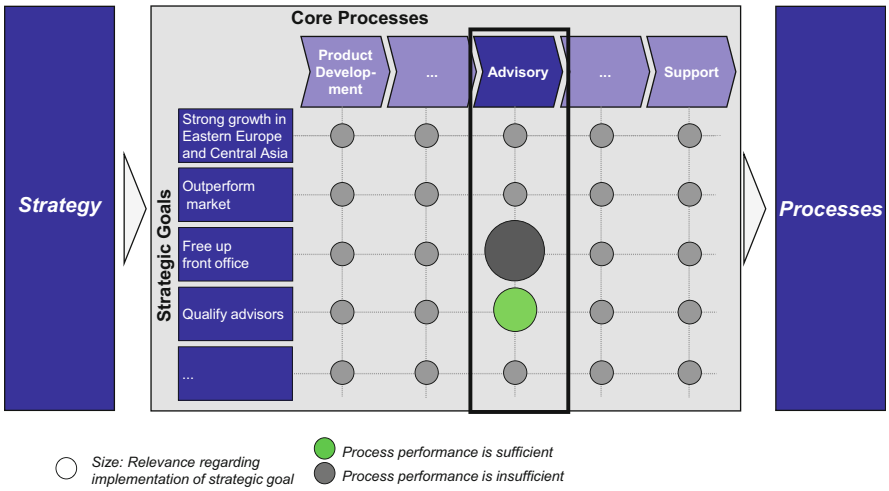

Fig. 3 Example depiction of the SPA matrix

3 Process Capital Management

3.1 Overview

After the previous chapters focused on the importance of process capital, we shall now show how process capital can be built up and managed systematically. Before presenting and detailing the necessary tasks and activities, we first need to analyze the term *Process Capital Management* (PCM) in terms of what is commonly called *Business Process Management* (BPM). 'Traditional' process management (BPM) represents a management approach which describes how to manage processes using strategic and operative targets. The same applies to PCM. In addition to the classical 'management' of processes, however, PCM goes one step further by also focusing on developing and preserving intangible assets. This means that also and especially the relationships of process capital to the other intangible asset categories, for example human capital, are considered and controlled using an integrative management approach (Fig. 4).

Once the concept of process capital has been firmly anchored in strategy, one of the major tasks consists of actually building up that process capital. Subsequently, we need to implement an appropriate management control system to secure the long-term existence of the process capital stock. These tasks have to be substantiated and shaped in the form of a PCM control loop. This control loop should ensure process capital is involved in planning, developing and managing the process capital stock, and ensure that those developments are fed back retrospectively into the planning process. On a sideline note, the tasks of PCM should be

Fig. 4 Tasks of PCM

institutionalized in the company's organization (e.g. by a process management unit in collaboration with the controlling department) in order to secure the sustainability of PCM.

In the following subsections we describe the tasks mentioned here in more detail.

3.2 Anchoring Process Capitals in the Strategy

One of the first tasks we need to carry out is to integrate a 'perspective' focusing on process capital into the strategy development and planning process. To do this, we must first know and formally describe the company's processes. Explicit steps aimed at checking the process-based core competencies and their impact upon related financial and market performance indicators must be included in the strategic planning process. On the one hand, the *strategy development* phase involves testing the extent to which core competencies arising from the process model might support the strategic options being evaluated. The objectives underlying this step are first to prioritize potential strategic actions based upon an analysis of the existing process capital in connection with the strategic options on hand. Second, we need to find out which elements of process capital can be developed using specific measures so as to provide process-based support for the prioritized strategic options.

One further aspect of integrating process capital into the company's strategy can be found in the phase aimed at *operationalizing strategy*. By using the SPA matrix described above, we can substantiate the strategy by capturing the requirements for each strategically important process. This then results in performance indicators and target values which are used in the next phase of strategy implementation to track progress at process level. Should deviations from target values occur, these can be recognized at an early stage and we can take the appropriate decisions to modify *strategy implementation*. Special attention needs to be paid to the company's core processes. If there is not enough de facto mastery of these processes in terms of target values, we need to build up the appropriate process capital needed for strategy implementation.

3.3 Assessing Process Capital

Intangible assets that cannot be identified, transferred, sold or measured independently are accounted as a part of the goodwill (cf. WGARIA 2005, p. 75). Generally speaking, goodwill can be defined as the excess of a company's actual market value over the carrying value (book value) according to the balance sheet. As such, the goodwill could be seen as "[. . .] a catch-all residual category, a label given to the going concern value of assets in the target company over and above those that can be kicked, or counted, or weighted, or valued with some precision" (Blair and Wallmann 2003, p. 455). This raises the question of how these intangible assets, such as process capital, can be assessed individually, and to what extent.

Generally, individual intangible assets and their values are inherently difficult to measure and to quantify. Due to the fact that intangibles cannot be seen, touched, or weighted, they need to be assessed by using appropriate proxies and measurable variables that can be compared (cf. Blair and Wallmann 2003, p. 454). Besides that, intangible assets can often not be identified separately. For example, the success of a customer goods company can be derived from good customer relations and well established brands (*customer capital*), from high-developed and efficient processes (*process capital*) as well as from permanent product innovations (*innovation capital*) (cf. Gladen 2011, p. 136). Therefore, a unique identification and allocation to a specific category of intangible assets is both difficult and very often impractical (cf. WGARIA 2005, p. 89). In addition, traditional accounting standards cannot be very helpful in providing information about intangible assets. In most cases, accounting rules do not allow a capitalization of internally generated intangibles in a company's balance sheet and "generally require that internal expenditures on intangible assets [. . .], treated as expenses in the period in which they are incurred and charged against current earnings" (Blair and Wallmann 2003, p. 455).

Nevertheless, in order to manage a company's intangible assets and their development, it is of high importance to find solutions for assessing intangibles with appropriate methods and measurable figures. Accordingly, for example, KAPLAN/NORTEN point out the importance of considering the contribution of intangible assets to performance targets as the "holy grail of management accounting" (Kaplan and Norton 2004, p. 52). Indeed, appropriate information could help a company's management "to make resource allocation decisions and to engage employees, business partners, and other participants in value-creating activities" (Blair and Wallmann 2003, p. 458). This can be illustrated by taking the example of banks again. In banks, especially in their back-offices, most core competencies can be characterized as intangibles, such as save and efficient processes. In recent years, there has been a trend of industrialization in banking (cf. Loos and Coners 2006, p. 204). This means, briefly worded, that bank's revise their operation models by simplifying and standardizing products, processes and technologies. This initiates many optimization projects with high cost impact and strategic relevance. Against this background, decision making attaches a vital importance to reliable information about intangible assets in order to evaluate these optimization projects.

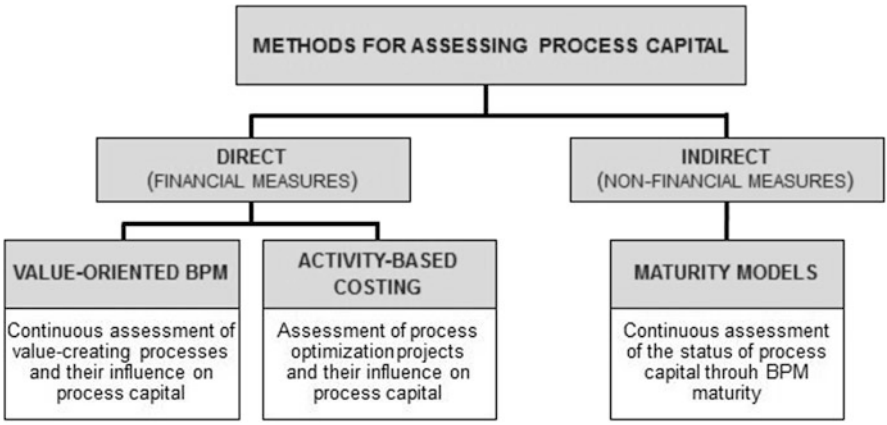

Fig. 5 Indirect und direct methods for assessing process capital

This leads to the initial question: how can process capital be assessed? In general, we distinguish between direct and indirect methods here (as portrayed in Fig. 5 "Indirect und direct methods for assessing process capital"). Direct methods reveal efficiency changes directly at process level and quantitatively assess their influences on the existing process capital. While indirect methods qualitatively assess the general state of process capital through comparable indicators.

The direct methods described here are based on LEV, who proposed an assessment of process capital by quantitatively measuring efficiency before and after optimization efforts (cf. Lev and Daum 2003). In this way, value-creating improvements could be revealed and their impact on process capital could be assessed quantitatively. One corresponding approach for measuring changes in process capital could be a value-oriented BPM, which reveals the value contribution of processes by determining changes in their payment surpluses (cf. vom Brocke and Grob 2011; vom Brocke et al. 2010; Buhl et al. 2011, p. 169). This could be used for valuing process efficiency and optimizations with financial measures. This means processes could be assessed quantitatively with their impact on a company's value, and, in addition, on the process capital. Another direct quantitative approach could be Activity-based Costing (ABC), which assigns related costs to each activity in a process. In this way, process optimization projects could be valued by determining their cost saving potentials, which represent economic advantages and therefore the creation of process capital. But, however, these results only cover the cost saving potentials for single optimization projects and can only be used for assessing the changes in process capital. Neither a value-oriented BPM nor activity-based costing could make an assessment of process capital in total.

This raises the question of how process capital can be assessed as a consistent unit. In this context, maturity models provide an applicable approach for the assessment of a company's capability in Business Process Management (BPM). Thus, considering that process capital is correlated with a company's BPM

capability, maturity models can be a method for assessing process capital indirectly from a qualitative point of view.

The main purposes of maturity models are to answer the question of how advanced a company is in their BPM development, to guide process improvement initiatives, and to control progress (cf. Iversen et al. 1999). For this reason the general concept of maturity models contains a sequence of maturity levels, which represents the typical evolution path of BPM improvement. The lowest level stands for an initial state that indicates little BPM capabilities. In contrast, the highest level represents a stage of total maturity. Each level provides essential criteria and elements of effective and efficient processes, which need to be fulfilled to reach the next maturity level on the evolution path. Hence, an improved maturity results "in an increase in the process capability of the organisation" (Paulk et al. 1993, p. 5). As an example of BPM maturity models, the Capability Maturity Model Integration (CMMI) (SEI 2011) could be considered. CMMI "is an internationally recognized model for process improvement and is used worldwide by thousands of organizations" (O'Regan 2011, p. 44). The CMMI consists of five maturity levels (see Fig. 6). The lowest level of maturity is level 1 and the highest level is maturity level 5. Each maturity level contains several process areas, which describe specific and generic goals for improvement. For example, the maturity level 2 contains the process area "Measurement and Analysis", which determines specific management information needs and measurement objectives that need to be fulfilled to reach the

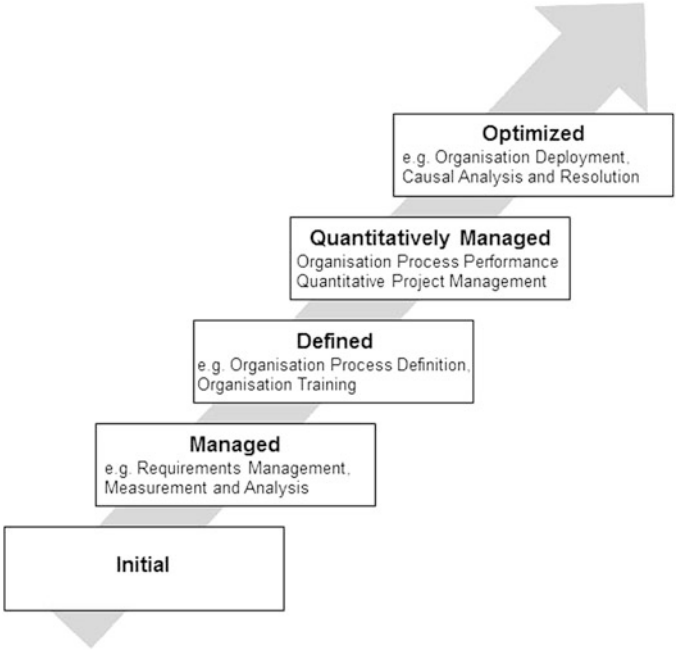

Fig. 6 BPM maturity levels (CMMI) (Based on O'Regan (2011), p. 50)

next level of maturity. In this way, CMMI provides an instrument for the assessment of BPM capabilities as well as for the improvement of process performance. In addition, CMMI allows organizations to benchmark themselves against similar organizations (cf. O'Regan 2011, p. 46ff.).

Taking into consideration that process capital is correlated with a company's BPM capability, maturity models such as CMMI, provide a practical approach for an indirect assessment of process capital. This means, for example, that an improved maturity level indicates a growing process capital. Thus, maturity models allow assessing the state of process capital, evaluating its general contribution to strategic goals as well as identifying possibilities for its further improvement. However, with regard to a sufficient determination and interpretation, two key aspects should be noted. First, as outlined before, process capital is created by the existence or development of processes which represent economic advantages. Consequently, only value-creating processes (core processes) which represent these advantages, should be taken into account when assessing a company's BPM maturity in terms of process capital. The second aspect is that the different intangible asset categories are closely connected to each other and difficult to separate. Therefore, comparable measures are required, which allow a more comprehensive analysis of all intangible asset categories and their relationships regarding an integrative performance measurement (cf. Gladen 2011, p. 136). In order to create comparable measures of process capital, maturity states could be the basis for further enhancements with financial and non-financial measures.

It should not be ignored, that the existing approaches cannot measure the value of process capital to its full extent. Taking into account that other intangible assets can be measured with some precision (e.g. customer capital by using the customer lifetime value), particular needs for research into the assessment of process capital can be demonstrated.

3.4 Building Up Process Capital

We can build up the process capital needed to secure strategy implementation by carrying out process design and optimization measures (*business process optimization*). In this way, the process structure and performance required (usually at short notice) for strategy implementation can be created. However, this is not enough to secure sustainable process capital, since carrying out process transformations is not only extremely resource-intensive, it also represents a considerable burden upon the company's employees. For this reason it is advisable to create an environment which is conducive to systematically developing process capital as a permanent core competency for the company. Several factors play an important role here: process culture, change management and human capital. *Process culture* should be seen as taking overriding priority and should be closely connected with the company's organizational structures, in the sense of being the "complete and self-evident classification and execution of all business activities in the form of

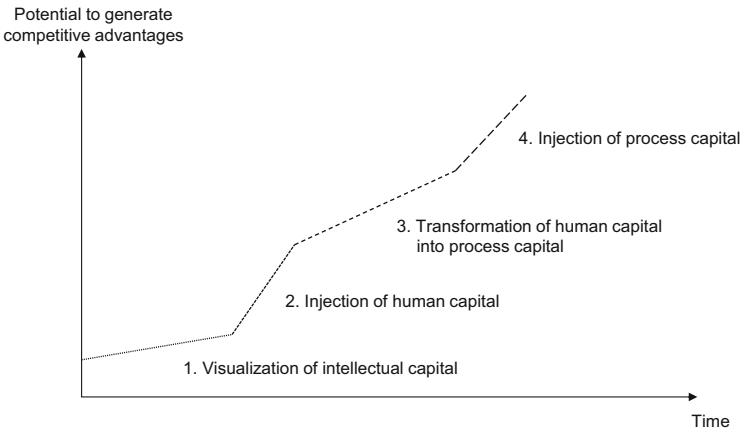

Fig. 7 Generating process capital (Based on Edvinsson (2000), p. 15)

processes" (Ahlrichs and Knuppertz 2006, p. 43). In this way, employees are not connected with one another primarily through the company's hierarchy, but rather through the processes. The resultant reduction in the number of organizational interfaces can lead to more efficient communication and a more flexible corporate structure. Alongside process culture, *change management* represents a significant contribution to establishing process capital. On the one hand, building up process capital involves changing 'hard facts', such as the structure of processes and the organizational structure. On the other hand, 'soft factors' also change, for example the behavior of employees as process owners. Special importance is attached here to processes of learning and change which focus on ensuring an organization is capable of adapting (for example by employee multi-skilling) to dynamic changes in the conditions affecting process execution (for example change in strategy, collapse in demand etc.). This also makes another category of intangible assets particularly important for sustainable process capital: *human capital*, insofar as this shapes, executes and controls the processes. A reduction in the number of hierarchy levels, accompanied by a focus on end-to-end processes, can for example strengthen the employees' personal sense of responsibility, which ought to result in the creation of creativity potentials due to the existence of a common mindset. Against this background, raising innovation capital can in turn lead to the development of new, innovative processes (cf. Becker and Kahn 2011, p. 8). Human capital is a major platform for building up process capital, as can be seen in Fig. 7.

Initially, we need to establish an awareness of the existence of intellectual capital in the organization ('Visualization of intellectual capital'). We must create an in-depth understanding among staff about actual and target processes using employee programs and change management methods. This will enable process capital to develop into practical and applicable knowledge which can be used to create value in the company. By combining this with human capital ('Injection of human capital'), the organization's processes can be enhanced and improved. These

newly (documented and) acquired skills and knowledge result in actual process capital as a core competency firmly anchored in the organization ('Transformation of human capital into process capital'). As these competencies can be traced back to methods and techniques, they are no longer tied to individual employees and are hence firmly and permanently anchored in the company (portrayed as the 'Injection of process capital' in Fig. 7).

3.5 Managing Process Capital

Companies wishing to build up process capital must permanently analyze their processes in terms of performance: process flows need to be questioned and, if necessary, modified to fit new situations. We can use PCM here to comprise planning, organizational and control measures for managing the value chain in terms of costs, time, quality, and – as a consequence – customer satisfaction.

Here, process controlling plays a central role, which can be seen as aligning planning, control and management to those processes being examined (cf. Leyer et al. 2014). The main task of process controlling is to make processes measurable and hence to provide the institutionalized information necessary for process control. To do this, process controlling instruments can be used. Depending on their specific data and analysis focus, these can be classified based on whether they serve to measure strategic or operative performance. Examples of strategically oriented instruments include the SPA matrix mentioned earlier and activity-based costing (ABC), a tool for strategic cost management (cf. Kaplan and Anderson 2004). To measure and analyze operative process performance, we could, for example, carry out business activity monitoring (cf. Wang 1999) and data mining using process-related databases (cf. van der Aalst et al. 2003). The aim here is to facilitate early recognition of problems in process flows in order to be able to initiate suitable and timely counter-measures.

The information provided should contain statements about the efficiency and effectiveness of the processes. To this end, it is necessary to define and measure performance indicators which influence the success of the processes (cf. Leyer et al. 2014). Alongside financial indicators such as process cost rates, these are mainly non-financial variables which focus on time (e.g. run time) and quality (e.g. error rate for process output). Process controlling does not only comprise measuring and reporting performance indicators, however. In fact, it actually reflects the 'classical' understanding of controlling in that it deals with planning and monitoring targets, as well as initiating countermeasures. In terms of process controlling, this means we need to define process targets, to regularly measure the extent to which those targets are reached, and, if necessary, to set appropriate reactions to deviations from plan in motion. In this way, we can firmly anchor the development of processes into the company (cf. Neumann et al. 2011, p. 234).

4 Case Study: Lufthansa AG

4.1 Example of Lufthansa's Process Capital

Case study research can be regarded as a common approach to verifying or negating scientific statements (cf. Yin 2008). In the following we try to illustrate the PCM concept by means of Lufthansa. All information regarding the Lufthansa case study is based on publicly available documents. The authors have interpreted core competencies and processes as process capital. Many of its core competencies, which are mandatory for Lufthansa's strategy, can be contributed to process capital. As the airline industry in Europe has been characterized by a movement towards concentration in recent years, one of Lufthansa's important strategic goals is to grow, either organically, or through cooperations and takeovers. Consequently, through its complete acquisition of the Swiss airline Swiss and Austrian Airlines, Lufthansa has been able to gain considerable ground in important markets. However, integrating another airline into its own network is not an easy task. Lufthansa has proven to have the right processes for such integration work. In particular, the takeover of Swiss and its subsequent integration into Lufthansa's route network can be seen as a prime example of the importance of process capital. Integrating other airlines into one's own route network is a substantial undertaking as each and every airline has its own very individual characteristics. Alongside such factors as having different aircraft types, integrating the systems (route network, IT systems etc.) represents an especially challenging hurdle. The availability of a process which can incorporate other airlines into Lufthansa's network represents a key core process for Lufthansa. Lufthansa is able to tap into prior experience. Back in 1997, the company was the initiator and founding member of the airline network Star Alliance. The skills and abilities Lufthansa developed here in a multitude of operations processes and in particular the process of integration manifest themselves as process capital. The company can now rely upon this resource for takeovers and other integration activities, using it to create value.

Besides this process capital necessary for integration work, there is another prime example for process capital in the company's daily business. Lufthansa's aircraft maintenance processes, which are core processes, are best practice in the aviation world. As one result, Lufthansa has one of the highest reputations regarding safety in the market and is considered to be quality leader. As another result, Lufthansa's strategy is influenced by these maintenance processes. These processes are not only used to maintain its own fleet. Instead, Lufthansa formed a separate unit, Lufthansa Technik, which offers maintenance services to the market.

4.2 *Strategy Implementation at Lufthansa Based on Process Capital*

Let us now use the example of Lufthansa to demonstrate how process capital can be used to implement strategy. One of the most important strategic goals for Lufthansa is quality and innovation leadership. First we must check to see which processes are relevant to achieve these goals and to determine the requirements towards these processes. As an example, the processes 'Passenger handling', 'In-flight service' and 'Operations' are used. These processes all contribute significantly to the strategic goals of quality and innovation leadership. In a second step, the goals have to be specified for each process and changes or improvements defined. Regarding the processes used as example, based on the SPA-Matrix the following process changes were defined by Lufthansa (Fig. 8).

4.2.1 Passenger Handling

Handling passengers consists of all land and airside processes until the passenger has boarded the aircraft. Lufthansa has derived measures from strategy to significantly improve this process. Regarding quality, the company has designed a top-class product. Specific services for top customers, such as special lounges and limousine transfer to the aircraft (for first class passengers and members of the HON level in the frequent flier program) mean Lufthansa now leads the industry in this field. Regarding innovation, homeprint boarding passes and check-in by mobile phone offer convenient ways to check in. It is obvious that in order to be able to offer the same high-end travel experience for all customers worldwide, or at least for customers to feel this is what they are receiving (service quality), the

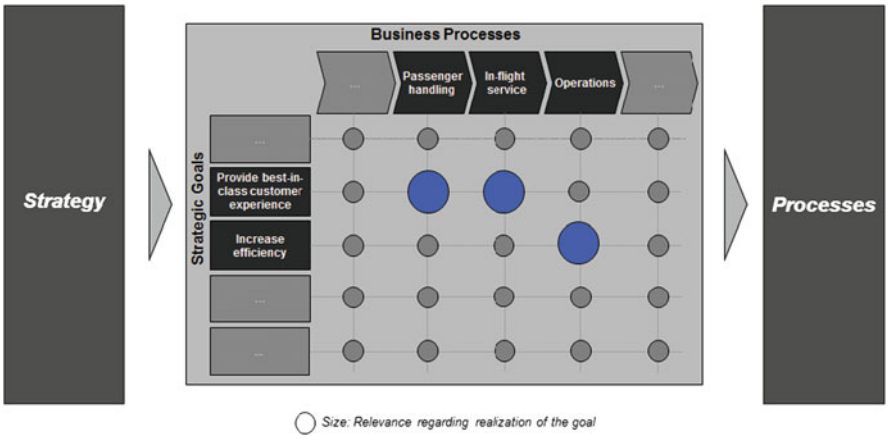

Fig. 8 SPA-Matrix of Lufthansa (exemplary)

appropriate processes must be defined at every individual stage (process structure) and carried out in the same way (process performance). This means the current strategy is implemented by setting up a suitable process structure and by monitoring process performance. After successful implementation, these processes form key factors which distinguish Lufthansa from its competitors and the process capital represents a corresponding value for the company.

4.2.2 In-flight Service

Another example is the in-flight service process. Lufthansa invested huge amounts of time and money on improving seating. The airline recently introduced a new first class as well as a new business class product for international services. The seats allow travelers to sleep more comfortably and better. Another innovation regarding customer experience was the introduction of in-flight internet access.

4.2.3 Operations

Not only in passenger-related processes is innovation a goal which Lufthansa implements in its processes. Several process innovations have been introduced: By the use of the "Aircraft Addressing Communication and Reporting System", data of aircrafts operating worldwide is sent to the Traffic Control Center in Frankfurt and analyzed. Potential faults can immediately be detected. Lufthansa also introduced what is known as the 'electronic flight bag'. This system, developed by the subsidiary Lufthansa Systems, replaces lots of paper-based documentation which has to be available in the cockpit (e.g. maps). Each year, up to 16 million pieces of paper can be replaced with up-to-date information.

All these examples improve Lufthansa's processes significantly with goals out of strategy. Lufthansa can increase quality and customer satisfaction. Innovative processes also result in higher efficiency.

Finally, in order to secure the process performance and the sustainability of process capital, a Process Capital Management has to be established. As described in Sect. 2.3, a set of performance indicators is used in order to specify the goals to be achieved. The "increase" in process capital can be measured by the change of these indicators.

5 Summary and Outlook

Countless publications from both academia and industry deal with the importance of *processe*s for corporate success. In most cases, selected examples of process optimizations and process management success stories are described without really proving which share of corporate success can actually be attributed to processes.

This essay looks at this topic from a different perspective: using intangible assets – which have come to the fore in recent years – as a starting point, the intangible category of process capital is subjected to close scrutiny.

Based upon a definition of the term process capital and a description of the correlation between process capital and strategy, this essay shows how process capital can be built up as a strategic success factor and managed permanently and consistently. Here it is important to remember that while extensive literature can be found on other areas of research into intangibles, such as human capital, to date there have been very few investigations into process capital. As such, this article should demonstrate the need for further research and provide impulses for a more detailed analysis of the topic. There is particular need for research into the positive correlation between process capital and PCM and corporate success postulated in this article. The use of empirical research methods (e.g. interviews with experts) would lend itself to this end.

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Business Process Frameworks

Constantin Houy, Peter Fettke, and Peter Loos

Abstract In Business Process Management (BPM) research as well as in practice, a whole host of different Business Process Frameworks supporting various tasks connected with BPM in organizations have been introduced and further developed. However, the term Business Process Framework is ambiguous and has been used for different BPM-related systemization approaches concerning BPM methods and techniques. Against the background that so far no attempt to systemize the different meanings and understandings of the term Business Process Framework is known, this article aims at clarifying this term by analyzing and systemizing its different facets giving an overview of available understandings and usages of the term. The identified facets are investigated and several different classes of Business Process Frameworks are described and explained in more detail. In this context, one predominant class of Business Process Frameworks summarizing business process reference models is presented in more detail.

1 Introduction

Business Process Management (BPM) gains more and more importance for practice and an increasing number of organizations use BPM methods and techniques in order to support their operations (Fettke 2009). This makes BPM a highly relevant object of study and development for researchers and practitioners who strive for designing new and innovative BPM approaches and, furthermore, investigate their effects in real world application. In this context, BPM research and practice has created a whole host of so called Business Process Frameworks supporting different tasks connected with BPM in organizations. However, the term Business Process

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Framework is ambiguous and has been used to denominate different BPM-related systemization approaches, BPM methods and techniques etc. The term has not been consistently defined and various understandings can be identified in literature until now. This word sense ambiguity has already been mentioned before, e.g. by Harmon (2014) and process frameworks have been identified an important element of strategic alignment in BPM (Rosemann and vom Brocke 2014). However, so far no attempt to systemize the different meanings and understandings of the term Business Process Framework is currently known and so the term has remained ambiguous.

Against this background, this article aims at further clarifying the term Business Process Framework by means of an investigation and systemization of its different facets and an overview of a selection of different understandings and usages of this term in literature shall be given. Another goal of this article is to clarify the various facets of the term Business Process Framework and the different classes of Business Process Frameworks by means of a more detailed description and explanation of several Business Process Framework instances.

In order to reach the goal of further clarifying the term Business Process Framework, a review and investigation of selected articles referring to Business Process Frameworks is our research approach. We report on different usages and understandings of the term Business Process Framework in literature and systemize different identifiable instances into consistent classes of Business Process Frameworks.

This article is structured as follows: after this introduction, the second section analyses the ambiguity of the term Business Process Framework in more detail based on an investigation of frameworks in the context of BPM research and the clarification of different possible facets of the term *business process* as well as the term *framework*. A classification of identified understandings of the term Business Process Framework is given. In Sect. 3, each of the different Business Process Framework classes are described in more detail and explained by means of according framework instances. In this context, we especially focus on some Business Process Framework instances *in the sense of business process reference models* and also report on empirical insights concerning real world effects of using reference models in practice. Section 4, discusses the findings of our investigation before the article is summarized and concluded in Sect. 5.

2 Business Process Frameworks: An Ambiguous Term

2.1 Frameworks in Business Process Management Research

Frameworks in general are highly relevant in the context of Information Systems (IS) research as they commonly provide a systemization or overview of relevant objects or phenomena in a certain domain of interest. The general term *framework* has, furthermore, quite often been used in the context of BPM research addressing a

whole host of different aspects of BPM, e.g. Rosemann and vom Brocke (2014) develop a framework for the description of Six Core Elements of BPM which supports structuring BPM as a holistic approach; Tregear (2014) introduces a *Global BPM framework* for process standardization supporting BPM in globalized organizations; Bhat et al. (2014) differentiate several classes of *Business Process Management Frameworks*, e.g. maturity models with according assessment tools as well as BPM lifecycle methodologies (pp. 333f.) and use a specific *Business Process Management Adoption Framework* in order to investigate Business Process Outsourcing effects. In summary, frameworks play an important role in BPM research and the term *Business Process* Management *Framework* has been used for the description of many different aspects of BPM.

This plurality of meaning can also be observed for the term *Business Process Framework*. In literature, the term Business Process Framework is used very differently, e.g. Harmon (2014) mentions this ambiguity but predominantly understands Business Process Frameworks as reference process models or organizational best practices like the *IT Infrastructure Library* (ITIL) or the *Enhanced Telecom Operations Map* (eTOM), while Scheer (1998) uses the term Business Process Frameworks in the sense of methodical engineering approaches for business processes and process-oriented IS addressing technical infrastructure, organizational aspects as well as existing business objects. Table 1 gives an exemplary overview of different usages and understandings of the term Business Process Framework in literature.

This exemplary enumeration of different usages of the term Business Process Framework illustrates the mentioned term ambiguity in literature. We assume that this ambiguity is related to two different aspects: the ambiguity of the term *business process* as well as the ambiguity of the term *framework*.

2.2 Term Clarification "Business Process"

According to the Cambridge Dictionary[1] a *process* in general is "a series of actions that you take in order to achieve a result". The term *business process* can accordingly be understood as a sequence of actions carried out in a business context for the creation of goods and services. In common speaking as well as in literature the term business process can occur in different contexts. For the clarification of its meaning it is important to ask, whether (a) a business process in the *real world* or in the *model world* is addressed and, furthermore, (b) if we are talking about a business process *instance* or a business process *schema*. The influence of these two dimensions will be explained in more detail in the following.

As already mentioned, the term business process can address both sequences of executions which can be observed in the *real world* and sequences of intended

[1] http://dictionary.cambridge.org

Table 1 Different usages of the term *Business Process Framework*

Source	Underlying understanding of the term *Business Process Framework*	Given examples
Scheer (1998, pp. 109ff.)	Engineering approaches for process-oriented IS adressing technical infrastructure (e.g. workflow systems), organizational aspects (systemization of relevant domains) as well as existing business objects	Architecture of Integrated Information Systems (ARIS), Zachman Framework, CIMOSA
Otto and Wäsch (2003, pp. 427ff.)	Standardized technical interchange infrastructures for inter-organizational business process models supporting reduction of complexity and costs of process modeling	ebXML, RosettaNet, WSCI, BizTalk, WSFL, BPEL4WS
Pickering and Wynn (2004, pp. 377ff.)	Reference business processes and relevant views and functions for the support of team collaboration and project management in organizations. The term describes a systemization of processes in a domain	Business Process Framework for Global Team Collaboration
Barros (2007, pp. 47ff.)	The term *Business Process Frameworks* appears in this article's title. However, in the text, the author mostly uses the term *business process pattern* or *structure*. Nevertheless, Business Process Frameworks in the sense of best practice process models or reference models are mentioned	Supply Chain Operations Reference (SCOR) Model, enhanced Telecom Operations Map (eTOM)
Hrastnik et al. (2007)	The term *Business Process Framework* is used as a synonym for a *Business Process Knowledge Framework*. This framework represents a systemization of relevant knowledge for different central roles and perspectives in a business process	A new Business Process Knowledge Framework
Yuan and Shen (2007, p. 676)	The term *Business Process Frameworks* appears in this article's title. It is not clearly defined in the text but can be interpreted based on the context. It is used in the sense of a technical infrastructure for the management of workflows	SwinDeW, SwinDeW-B as decentralized workflow management systems
Boukhebouze et al. (2009, pp. 502ff.)	Technical infrastructure for business integration and the support of flexible and reliable workflows	Business Process Framework for Agility of Modelling and Analysis (BP-FAMA)
Harmon (2014, pp. 60ff.)	"Business Process Frameworks (also called Operation Reference Frameworks) [. . .] provide a quick way for a company to establish a high-level process architecture"; best practice process models or reference models	SCOR Model, Information Technology Infrastructure Library (ITIL)

(continued)

Table 1 (continued)

Source	Underlying understanding of the term *Business Process Framework*	Given examples
Karagiannis and Woitsch (2014, pp. 466ff.)	"A set of assumptions, concepts, values, and practices that constitute a way of viewing BPM" referring to four concepts: (1) business models, (2) regulations, (3) domain and (4) model processing	Detailed explanations and many examples for the four concepts are given
Vo et al. (2011, p. 990)	Technical and organizational reference structure (technical infrastructure and business processes) for a certain domain in organizations (asset management)	RFID-based business process framework for asset management

executions documented in the form of a process model (*model world*). A clear differentiation between the term *business process* related to the real world on the one hand and related to the model world on the other hand seems highly important as this term indeed has different meanings depending on the context. As far as the *model world* is concerned, a business process can be represented in different ways and using different types of methods and techniques (Desel and Juhás 2001). In literature, a common classification differentiates (I.) *informal*, (II.) *semi-formal* and (III.) *formal* representations of business processes. However, there are also different opinions in literature concerning how these classes of representations can be distinguished in detail and what the exact criteria for this differentiation are.

The mentioned (I.) *informal* representations are typically considered to comprise business process description in free prose (Markovic 2010), e.g. a transcript of an interview with an employee concerning the sequences of executions commonly performed at her workplace for the documentation of as-is processes.

As natural language can be ambiguous and is likely to be interpreted differently, there have been several initiatives towards the development of formalized business process representations. A first step towards a more formal and standardized representation of business processes has been the introduction and usage of graphical elements and symbols with a standardized meaning in graphical business process models. This resulted in methods and techniques which support – besides several other tasks – the development of technical drawings of processes, e.g. *Event-driven Process Chains* (EPCs), the *Business Process Model and Notation* (BPMN) or *UML Activity diagrams*. In literature, such representations are often considered to be (II.) *semi-formal*. One important purpose of these modeling techniques is the graphical representation of business processes.

However, in the meanwhile several of these business process representation techniques have been further developed and stronger formalizations have been proposed in order to have a (III.) *formal* representation of business process models, e.g. for EPCs by van der Aalst (1999) or Nüttgens and Rump (2002). In this context, two different types of formalizations can be distinguished: (*a*) formal

representations by means of mathematical expressions and structures based on set theory or first-order logic, and (*b*) formal representations by means of a formal language in the sense of the field of theoretical computer science. A formal language in the sense of theoretical computer science is a finite set of strings of symbols (Davis et al. 1994). In this context, formal languages can support several different purposes: (1) the provision of a machine-readable representation of a process model in order to make them interchangeable, e.g. the *Event-driven Process Chain Markup Language* (EPML) or the *ARIS markup language* (AML) for EPC models, and (2) the provision of a machine-readable representation of a process model in order to make them executable by means of a process engine (*execution semantics*).

Furthermore, as already mentioned above the exact meaning of the term business process also depends on the differentiation between process *instances* (tokens) or process *schemata* (types). This results in the following classes of business processes (represented in Fig. 1):

1. According to the above definition of a business process, a *business process instance* in the *real world* describes a unique and singularly happening sequence of executions in a business context, e.g. production process #1111 concerning article #2222 performed on the 1th of July 2013 in the Example Company's plant #15. Its existence is actually independent of the existence of a process model or an information system.
2. A *business process schema* in the *real world* is the common schema of execution steps which all the production processes in an organization typically follow, e.g. concerning the article #2222 produced by the Example Company. This schema does not necessarily have to be documented by means of a process model and is actually also independent of an IS.
3. A *business process instance* in the *model world* is the unique graphical or informal representation (e.g. EPC diagram or a textual description printed on one particular sheet of paper), or a formal representation (EPML code running on one particular computer) of a sequence of executions in a business context. The latter example typically represents a process instance in the real world, e.g. a currently running workflow instance. However, as already mentioned above, a process model can exist independently of a business process in the real world and vice versa.
4. A *business process schema* in the *model world* is a graphical (e.g. EPC diagram), a formal (e.g. EPML code) or an informal (e.g. prose) representation of a documented, intended or suggested sequence of executions, e.g. a business process model which is contained in the SAP reference model.

In conclusion, it can be stated that the term business process can have several different meanings. Thus, the underlying understanding of business process is likely to influence intended meanings of the term Business Process Framework, which will also be indicated in the following sections in more detail.

	Model world	Real world
Type	graphical, formal or informal representation of an intended sequence of executions, e. g. business process reference model	common execution steps which all the production processes in an organization follow
Token	unique graphical, formal or informal representation of a sequence of executions, e. g. an EPC diagram printed on one particular sheet of paper	unique and singularly happening sequence of executions in a business context

Fig. 1 Different meanings of the term *business process*

2.3 Term Clarification "Framework"

As already mentioned, the development of frameworks plays an important role in IS research. However, the term *framework* is generally used in many different senses in IS research and, as has been shown, especially in the context of BPM research. This is probably also related to the fact that the general English term *framework* has several different meanings. Besides other meanings which are probably less important for IS research, e.g. *the parts of a building or an object that support its weight and give it shape*, framework – according to the Cambridge Dictionary[2] as well as the Oxford Advanced Learner's Dictionary[3] – can have the following meanings:

1. *a set of beliefs, ideas or rules that is used as the basis for making judgements, decisions, etc.* and
2. *the structure of a particular system.*

Both interpretations are valid for BPM research compared to the different usages and understandings of the term Business Process Framework which we have seen in Table 1. This will also be shown in more detail after the introduction of our classification of the usages and understandings of the term Business Process Framework in literature by means of a mapping of these two meanings of the term *framework* onto our Business Process Framework classes in the following section.

[2] http://dictionary.cambridge.org

[3] http://oxfordlearnersdictionaries.com

2.4 A Classification of Business Process Frameworks

As we have already seen, several different classes of Business Process Frameworks can be identified in literature. During our investigation, we discovered that in some of the contributions the term Business Process Framework has been used as a shorter form for unique and specific frameworks in the context of BPM like the Business Process Knowledge Framework by Hrastnik et al. (2007) or the Business Process Framework in the sense of a set of assumptions, concepts, values, and practices for BPM by Karagiannis and Woitsch (2014). Moreover, we found characteristic usages and understandings of the term Business Process Framework which can be identified significantly more often than others in literature. In the following, these serve as our Business Process Framework classes. Figure 2 summarizes these characteristic classes.

The first major class of Business Process Frameworks in our classification subsumes methodical business process engineering approaches, e.g. the *Architecture of Integrated Information Systems* (ARIS) (Scheer 1998), the *Zachman Framework* (Zachman 1987), the *Computer Integrated Manufacturing Open System Architecture* (CIMOSA) (AMICE 1993) etc. Such engineering approaches support the development of process-oriented IS, the definition of process models and not only propose the structure of such IS but sometimes also provide according procedure models and according software implementations supporting BPM in practice. For such Business Process Frameworks the second meaning of the general term *framework* given above (*structure of a system*) is relevant in the first place as these business process engineering approaches basically provide systemizations of underlying structures of process-oriented IS. However, they also provide certain beliefs, ideas and rules for taking decisions for the design of such systems. Thus, also the second given meaning of frameworks applies for this Business Process Frameworks class.

The second Business Process Frameworks class summarizes technical infrastructures for process integration and for the interchange of business process models, e.g. XML-based approaches like the *XML Process Definition Language* (XPDL) or the *ebXML Business Process* (ebBP) OASIS standard. These technical infrastructures provide the basis for formal representations of business process models (*model world*) and the execution of singular process instances in the real world by means of workflow systems. Concerning this Business Process Frameworks class, the second meaning of *framework* which is related to structural aspects of a system is relevant.

The third major class which also represents the most common understanding of the term Business Process Framework summarizes so called business process reference models which are often representations of best practice processes, e.g. the *Supply Chain Operations Reference Model* (SCOR), the *Information Technology Infrastructure Library* (ITIL) or the *Control Objectives for Information and Related Technology* (COBIT). Reference models are process descriptions (*model world*) which can provide the basis for real world process instances.

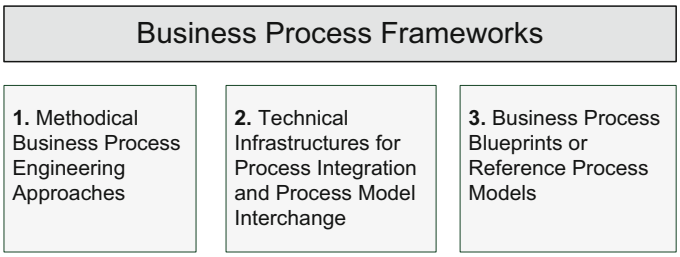

Fig. 2 An overview of different types of Business Process Frameworks

Looking at the interpretation of Business Process Frameworks in the sense of reference models, both of the above meanings of the term *framework* are relevant. Reference models are often interpreted as prescriptions of *how* a real world business processes could or should be conducted. They contain certain *believes* and *ideas* aiming at the improvement of a process-oriented organization. Furthermore, the structural aspects of reference process models are especially important as business process models represent a structure of work in an organizational system or sub-system.

In the following section, these different classes of Business Process Frameworks and selected instances of Business Process Frameworks are presented in more detail. We first introduce exemplary Business Process Frameworks in the sense of business process engineering approaches, then some exemplary technical infrastructures for process integration and process model interchange before we put a stronger focus on established business process reference models.

3 Description of Exemplary Business Process Frameworks

3.1 Methodical Business Process Engineering Approaches

A whole host of methodical engineering approaches for process-oriented IS have been presented in literature. Furthermore, several according software prototypes exist. Therefore, we can only introduce a selection of Business Process Frameworks in this sense in the following. However, these frameworks have in common that they typically provide a systemization of domain-independent approaches, methods and techniques for the development of process-oriented IS considering different views and perspectives on involved systems and business processes.

The *Architecture of Integrated Information Systems* (ARIS) is a comprehensive methodical framework for the design of process-oriented IS. It provides a holistic view on business processes comprising the *organizational view*, the *data view*, the *function view*, the *output view* and the *control view* (Scheer 1998). In addition, the ARIS phase model defines several consecutive development phases (*requirements*

definition, *IS concept* and *implementation description*) which are relevant for each view and, furthermore, necessary for a structured development of integrated IS. Besides offering an architecture for process-oriented IS, the ARIS concept provides the basis for several concrete modeling methods and techniques as well as software implementations for business process modeling. The ARIS platform offers comprehensive functionality in the context of BPM in general, e.g. the development of the business process strategy, business process implementation, business process monitoring or business process controlling.[4]

The *Zachman Framework* was initially developed in the late 1980s as a domain-independent approach providing guidelines and a systemization of roles and perspectives as well as and their specific requirements which should be considered during the development of IS (Zachman 1987). Based on the insight that the size and complexity of IS implementations as well as enterprises in general keep increasing and, furthermore, that individual perspectives on a complex system matter ("Architecture is relative. What you think architecture is depends on what you are doing", Zachman 1987, p. 291) this systemization of relevant roles (*planer*, *owner*, *designer*, *builder*, *programmer* and *user*, p. 284ff.) and perspectives (*data*, *function*, *network*, *people*, *time* and *motivation*) for individual IS development has been proposed as a two-dimensional framework and further developed into a comprehensive multi-dimensional Enterprise Architecture Framework.[5]

The *Computer Integrated Manufacturing Open System Architecture* (CIMOSA) has been developed in the early 1990s (AMICE 1993). Although the underlying research projects of this initiative focussed on the development of an open system architecture for CIM, the CIMOSA can support enterprise modeling in general and has some similarities compared with ARIS (Scheer 1998). The CIMOSA architecture (*the CIMOSA cube*) is represented by three dimensions: the "stepwise generation" dimension (*function view*, *information view*, *resource view* and *organization view*) which is comparable to the views in ARIS, "stepwise derivation" (*requirements definition*, *design specification*, *implementation description*) which is comparable to the ARIS phase concept and "stepwise instantiation" which describes the necessary individualization of concepts during the development from basic requirements (*generic*), to industry specific requirements (*partial*) to enterprise specific requirements (*particular*) (Scheer 1998). Former and current research on CIMOSA as well as software implementations supporting enterprise modeling according to the CIMOSA approach can be accessed via the website of the CIMOSA Association.[6]

Additionally, we would like to mention further examples of Business Process Frameworks in the sense of methodical business process engineering approaches which are of relevance for Enterprise Modeling and BPM such as *Multi-Perspective Enterprise Modelling* (MEMo) by Frank (1994), the *Semantic Object Model* (SOM)

[4] http://www.softwareag.com/de/products/aris/default.asp

[5] Zachman (2008): http://www.zachman.com/about-the-zachman-framework

[6] http://www.cimosa.de/

by Ferstl and Sinz (1995), *ProMet* by Österle (1995) or *The Open Group Architecture Framework* (TOGAF).[7] In the following section Business Process Frameworks in the sense of technical infrastructures for process integration and process model interchange will be treated.

3.2 Technical Infrastructures for Process Integration and Process Model Interchange

The second major class of Business Process Frameworks summarizes technical infrastructures for process integration and process model interchange. In this area, several different specifications have been developed based on the specific tasks which are supposed to be supported, e.g. process model interchange between different modeling or workflow tools, inter-organizational process integration or web service orchestration. In the following, some examples of such technical infrastructures will be presented in order to further clarify this specific interpretation of the term Business Process Framework.

The *XML Process Definition Language* (XPDL) is an XML-based standard for the exchange of business process models and has been developed and advanced by the *Workflow Management Coalition* (WfMC) since 1993. The current version 2.2 has been released in 2012 and supports a graphical representation of XPDL specifications by means of the *Business Process Model and Notation* (BPMN) 2.0 standard.[8] Furthermore, XPDL facilitates the interchange of BPMN diagrams in general, also for earlier versions of the BPMN up to version 1.2.[9] This distinguishes XPDL from similar XML-based standards like the *Web Services Business Process Execution Language* (WS-BPEL) which mainly focusses on business process execution and not so much on graphical representation aspects. WS-BPEL is a description language for business processes comprising functions and activities which are implemented as web services.[10] The WS-BPEL has been extended by the so called *WS-BPEL Extension for People* (BPEL4People) specification which additionally considers process activities conducted by humans in BPEL processes.[11]

The *ebXML Business Process* (ebBP) OASIS standard is another XML-based standard for the technical specification of business processes.[12] It especially aims at supporting inter-organizational business process integration and is based on the former process integration standard *eBusiness Extensible Markup Language*

[7] http://www.togaf.org/

[8] http://www.wfmc.org/xpdl.html

[9] http://www.xpdl.org/

[10] http://docs.oasis-open.org/wsbpel/2.0/OS/wsbpel-v2.0-OS.html

[11] http://docs.oasis-open.org/bpel4people/bpel4people-1.1-spec-cd-06.pdf

[12] http://ebxml.xml.org/bp

(ebXML) which has also been developed by the *Organization for the Advancement of Structured Information Standards* (OASIS).[13]

Besides these quite current business process integration approaches, many other technical infrastructures and approaches exist – some of them meanwhile obsolete – like *Workflow-XML* (Wf-XML) by the WfMC[14] or the *Business Process Modeling Language* (BPML) by the *Business Process Management Initiative* (BPMI).[15] In the following section, we present several Business Process Frameworks in the sense of business process reference models in more detail.

3.3 Business Process Reference Models

3.3.1 What Is a Business Process Reference Model?

The term business process reference model has not been consistently defined and there is still a lively discussion which aspects this term comprises. This discussion shall not be comprehensively recapitulated in this contribution. In general, business process reference models can be understood as business process models which should fulfil certain criteria and offer certain features. These criteria are still under discussion, e.g. in (vom Brocke 2003; Thomas 2006; Fettke and Loos 2007). Referring to Fettke and Loos (2007) and Ardalani et al. (2013), we consider the following features as important:

1. **Reusability**: Business process reference models represent business process blueprints for the development of process-oriented IS which can be reused in different IS development projects (vom Brocke 2007).
2. **Exemplary practices**: Business process reference models can provide common, good or even best practices describing how business processes are actually designed in practice or how they could or should be designed and executed in order to reach certain goals. In this context, a descriptive as well as a prescriptive or even normative connotation of business process reference models becomes apparent depending on their interpretation.
3. **Universal applicability**: Business process reference models do not only represent business processes of one particular organization but aim at providing universally applicable business process representations which are valuable for different organizations in a certain domain.

Reference models can provide benefits for both theory and practice. Besides the provision of general descriptions of enterprises, which is especially interesting from a theoretical point of view, practice profits, e.g. from decreases in modeling costs,

[13] https://www.oasis-open.org/

[14] http://www.wfmc.org/wfmc-wf-xml.html

[15] http://www.bpmi.org/

modeling time and modeling risk as reference models can represent proven solutions (Becker and Meise 2011). Moreover, increases in model quality based on the reuse and adaption of already validated process models can be expected.

Prominent examples for reference models which have been extensively used in practice in order to profit from these advantages are, e.g. the *Y-CIM Model* by Scheer for industrial enterprises (Scheer 1994) or the *SAP reference model* as a basis for the SAP R/3 system which has been partly published in (Keller and Teufel 1998). An overview of a collection of reference models is provided by the Reference Modeling Catalogue hosted by the Institute for Information Systems (IWi) at the DFKI and Saarland University, Saarbrücken.[16] In the following, we present a selection of relevant Business Process Frameworks in the sense of business process reference models: the SCOR Model, ITIL, eTOM and the APQC Process Classification Framework^{SM} (PCF).

3.3.2 Supply Chain Operations Reference (SCOR) Model

The *Supply Chain Operations Reference* (SCOR) *Model* is a process-oriented reference model for supply chain management which has been introduced in 1996 and further developed by the Supply Chain Council.[17] After several revisions, the SCOR model has been available in version 10 since August 2011. While at first only the 69 founding members were part of the Supply Chain Council, the Council now comprises almost 1,000 companies and research institutions.[18]

The SCOR model defines five different types of processes in organizations. Their relationship is visualized by means of a multi-stage supply chain in Fig. 3:

1. **Plan**: includes the planning and management of supply and demand for goods.
2. **Source**: comprises the purchase of goods, the goods receipt, pre-delivery check, storage and method of payment for any goods.
3. **Make**: covers all stages of production processing.
4. **Deliver**: comprises all the steps of the ordering and delivery of goods to the customers.
5. **Return**: includes all the steps for handling returned goods, both repairs and maintenance are taken into account.

In the study of Fettke (2008) the real world effects of using the SCOR model have been investigated based on different theoretical perspectives, such as the market-based view, the resource-based view and network theory. Moreover, the hypothesis saying that the application of the SCOR model comes with positive effects on typical supply chain management goals is supported by an empirical

[16] http://rmk.iwi.uni-sb.de/

[17] http://supply-chain.org/scor

[18] http://supply-chain.org/about/history

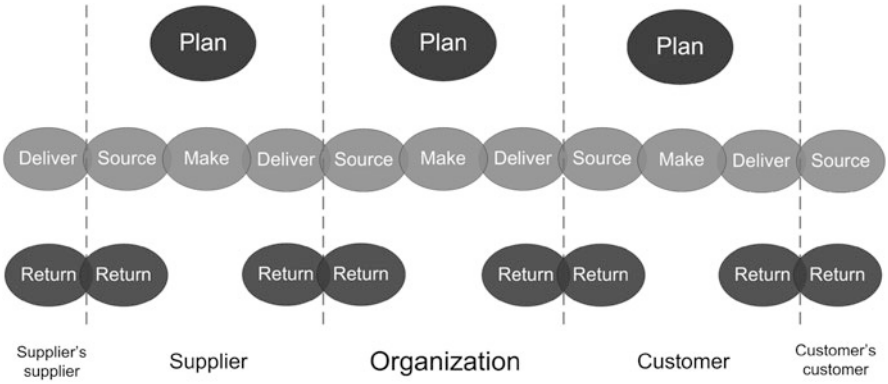

Fig. 3 SCOR model process types in a supply chain (According to: http://supply-chain.org/)

study which has addressed all members of the Supply Chain Council. Furthermore, Bolstorff et al. (2007, p. 27) report on additional experiences with the SCOR model:

1. Increase of total income by three per cent after a SCOR project through the reduction of costs and the improvement of customer services;
2. Two to six fold return on capital within 12 months after completion of the SCOR project;
3. Lower operating costs for information technology;
4. One to three per cent increase in annual operating profit.

Besides these findings, a recent survey identified positive impacts of using the SCOR model on *customer-facing supply chain quality performance* and *internal-facing business performance* (Li et al. 2011). Another survey could also confirm several positive influences of using the SCOR model on supply chain management performance (Zhou et al. 2011).

3.3.3 Information Technology Infrastructure Library (ITIL)

The *Information Technology Infrastructure Library* (ITIL) represents a business process framework for IT service management (ITSM) which is widely accepted and applied in professional IT service organizations.[19] The current version ITILv3 has been published in 2007 and updated in 2011. ITIL is considered a de-facto standard for ITSM and describes standardized *key processes*, *key concepts and principles, key roles and responsibilities* as well as according KPIs and checklists in five different areas of ITSM. Concerning ITILv3, for each of these areas one separate volume with detailed process descriptions in the following areas has been published: (1) *ITIL Service Strategy* which supports the definition of an

[19] http://www.itil-officialsite.com/

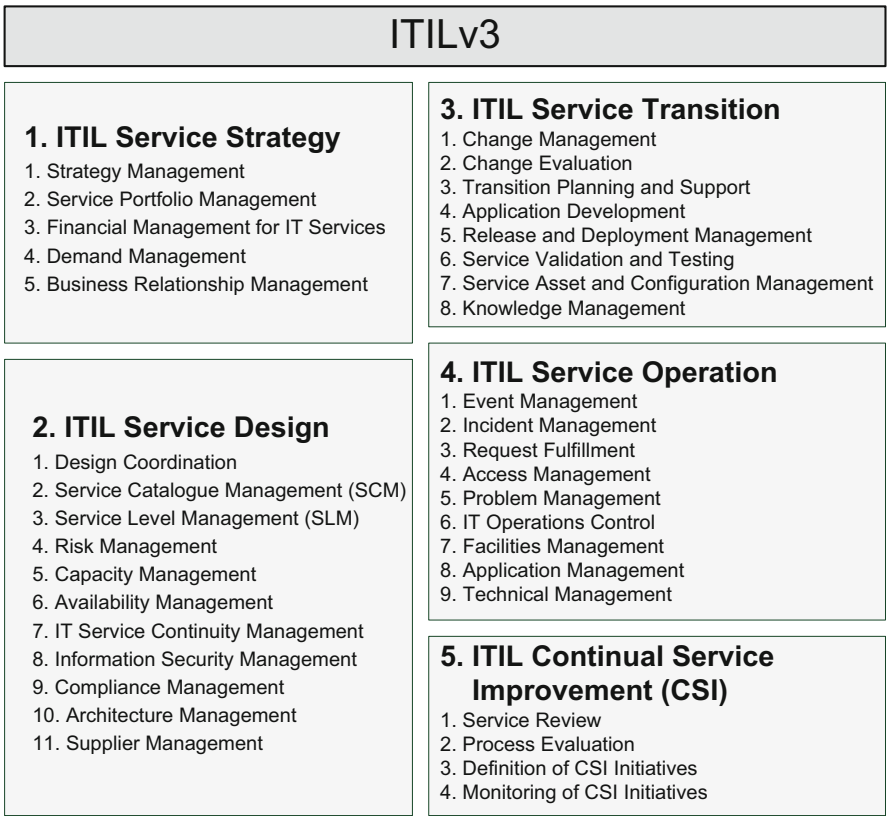

Fig. 4 ITILv3 core processes

adequate IT service strategy in the sense of a longer term development of IT service skills under special consideration of the customer requirements, (2) *ITIL Service Design* which supports the development of new IT services and solutions as well as the further development of existing services based on the service strategy, (3) *ITIL Service Transition* which supports the coordination of the IT services' development and deployment, (4) *ITIL Service Operation* which supports an effective and efficient IT service fulfillment and (5) *ITIL Continual Service Improvement (CSI)* which uses methods of quality management in order to continuously learn from success and failure to improve IT services. Figure 4 visualizes these five areas of the ITILv3 and the according core processes within these areas.

As ITIL represents the de-facto standard for ITSM, a large amount of experience with the usage of ITIL in practice exists. Furthermore, there is quite an amount of empirical studies conducted by scholars reporting on the positive effects of ITIL usage on IT service organizations' performance, e.g. Henson and Geray (2010) or Meziani and Saleh (2010) in the context of service management in public administration settings or Lapão et al. (2009) in the context healthcare environments.

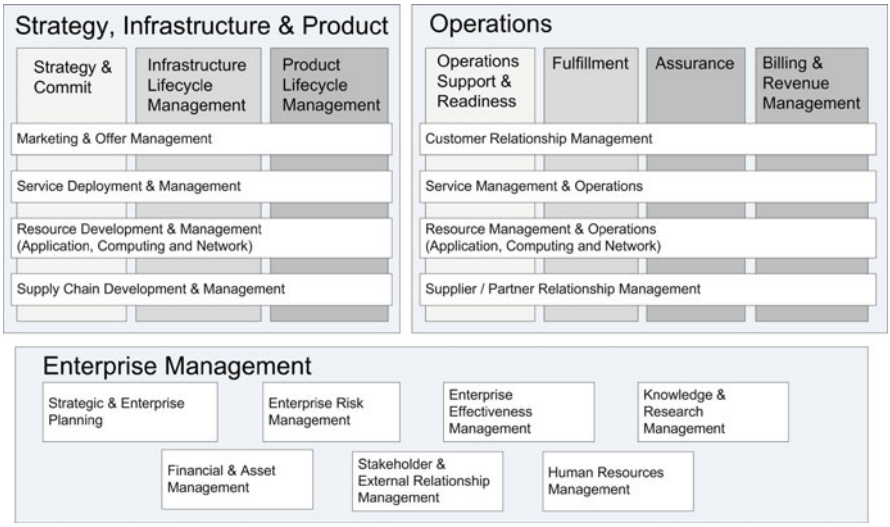

Fig. 5 eTOM architecture (Level 0 and 1) (According to: http://www.tmforum.org/Overview/13763/home.html)

Furthermore, there are some recent studies on factors influencing ITIL adoption, e.g. the contribution of Cater-Steel et al. (2009) or the comprehensive international survey by Marrone and Kolbe (2011) which reports on the ever-increasing ITIL adoption and the increasing realized operational benefits caused by the usage of ITIL.

3.3.4 Enhanced Telecom Operations Map (eTOM)

The *enhanced Telecom Operations Map* (eTOM) represents a business process reference model for the telecommunications industry which has been introduced by the TM forum as their Business Process Framework.[20] It provides a detailed description of relevant business processes for service providers based on a four-level-hierarchy. Figure 5 shows Level 0 and Level 1 within the eTOM process hierarchy.

Level 0 represents the overall enterprise level and defines the three major sections: a. *Strategy, Infrastructure & Product,* b. *Operations* and c. *Enterprise Management*. Level 1 "contains seven end-to-end vertical Level 1 process groupings in the areas of Strategy, Infrastructure and Product and Operations. These vertical groupings of processes focus on end-to-end activities [...] and each grouping includes processes involving customers, supporting services, resources and suppliers/partners. [...] The horizontal groupings represent major programs or

[20] http://www.tmforum.org/

functions that cut horizontally across an enterprise's internal business activities."[21] More detailed process definitions exist on level 2 and level 3 of the eTOM specification.

In practice, a certain amount of experience with the application of eTOM exists as it is one of the most popular standards for managing business processes in the telecommunications industry (Tanovic and Androulidakis 2011). However, so far there are only few empirical studies driven by scholars concerning the real world effects of eTOM; e.g. Chou et al. (2008) report on a successful application of eTOM especially in the context of trouble management operations in the largest Taiwan telecommunications corporation resulting in an improved performance and improved user satisfaction.

3.3.5 APQC Process Classification Framework[SM]

The *APQC Process Classification Framework*[SM] (PCF) provides a comprehensive taxonomy of operating processes as well as management and support processes. The PCF supports benchmarking of organizational performance within one or among organizations "regardless of industry, size or location" of the compared organizations by means of a common terminology to describe and compare business processes.[22] It has been developed by the *American Productivity & Quality Center* (APQC) since the early 1990s and the current version 6 comprises more than 1,000 relevant business processes. Besides the cross-industry version, several industry-specific versions of the PCF exist, e.g. for retail, automotive, telecommunications, education. The content of the PCF is organized into the following five levels[23]:

- **Level 1**: *Category,* represents the highest level of processes in enterprises such as financial organization, human resources etc. One example of a category in PCF version 6 is "*1.0 Develop Vision and Strategy (10002)*".
- **Level 2**: *Process Group,* represents connected groups of business processes within one category. One example of a process group in PCF version 6 is "*1.1 Define the business concept and long-term vision (10014)*".
- **Level 3**: *Process,* represents a sequence of interrelated activities converting input into output. One example of a process in PCF version 6 is "*1.1.1 Assess the external environment (10017)*".
- **Level 4**: *Activity,* comprises key events performed during the execution of a process. One example of an activity in PCF version 6 is "*1.1.1.1 Analyze and evaluate competition (10021)*".

[21] http://www.tmforum.org/Overview/13763/home.html

[22] http://www.apqc.org/process-classification-framework

[23] According to the framework description on: http://www.apqc.org/knowledge-base/documents/apqc-process-classification-framework-pcf-cross-industry-pdf-version-600

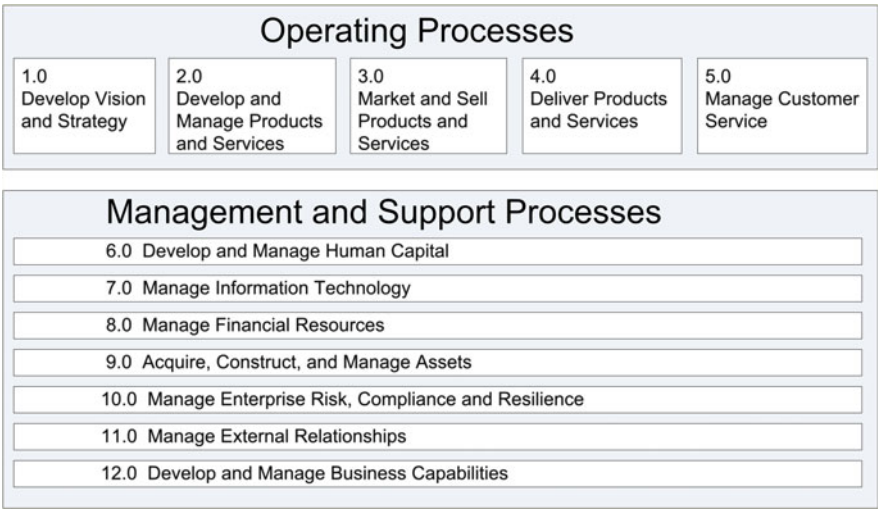

Fig. 6 Overview of categories in the APQC Process Classification Framework[SM]

- **Level 5**: *Task,* next level of decomposition after activities, more fine-grained. One example of a task in PCF version 6 is "*12.2.3.1.1 Identify project requirements and objectives (11117)*".

Figure 6 gives an overview of the process categories contained in the PCF.

According to the APQC reporting, the PCF has been used for business process management and benchmarking in many different businesses in the last two decades worldwide and several practical case studies providing detailed experiences with the PCF in renowned companies from different industries exist.[24] Furthermore, the PCF has been used as a systemization approach for business processes as a fundament for scientific empirical studies and surveys, e.g. concerning IT and business process alignment (Cragg et al. 2007; Cragg and Mills 2011) and in the context of comparing service offerings in business transformation projects (Srivastava and Mazzoleni 2010).

4 Discussion

Our investigation showed that the term Business Process Framework is ambiguous and that quite a number of different understandings and usages of this term exist. However, on the basis of our underlying definitions of *business process* and *framework* and the commonly identified understandings an expedient systemization of Business Process Frameworks could be developed. Presenting several instances

[24] http://www.apqc.org/apqcs-process-classification-framework-case-studies

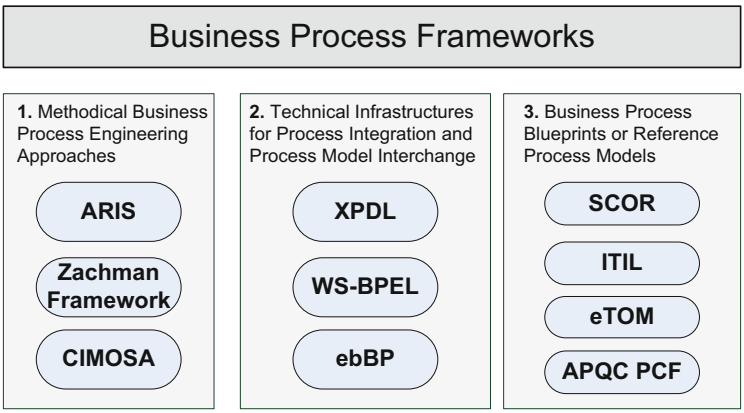

Fig. 7 Business Process Framework classes and instances

of each understanding of the term Business Process Framework could further clarify the specific subtleties of each framework class.

During our investigation, several quite similar Business Process Frameworks within the different classes have been identified, e.g. ARIS and CIMOSA as methodical business process engineering approaches, XML-based process model interchange and process integration infrastructures like XPDL and ebBP or ITIL and eTOM as reference models. Figure 7 gives an overview of Business Process Frameworks within the according classes which have been presented in this contribution.

The similarity of these Business Process Frameworks makes the topic of mapping frameworks which belong to the same class an interesting subject-matter. In the above mentioned cases there are several intersections and considerable overlapping of addressed content of Business Process Frameworks e.g. comparing ITIL and the COBIT framework, another valuable IT governance framework. In this comparison also several differences in content between such Business Process Frameworks are observable. In practice, this can lead to severe problems when both frameworks could provide important functionality for an organization. In such a context, the mapping of the Business Process Frameworks in terms of terminology, procedure models etc. is highly desirable in order to be able to profit from a combination of functionalities. Such mapping initiatives exist for several Business Process Frameworks, e.g. ITIL and COBIT[25] or ITIL and eTOM.[26] Furthermore, the mapping of Business Process Frameworks in order to combine functionality and to profit from the strengths of every single approach also seems promising for the other classes of frameworks.

[25] https://www.isaca.org/

[26] http://www.tmforum.org/RelationshiptoITIL/11744/home.html

Investigating Business Process Frameworks in the sense of reference models, we found that empirical research concerning the real world effects and relevant characteristics like factors influencing the adoption of a Business Process Framework has so far only been conducted to a moderate extent. In order to assess these empirically observable effects in more detail, more empirical research into this seems to be desirable besides the design of new and innovative Business Process Frameworks.

5 Conclusion

Business Process Frameworks are of considerable importance in Business Process Management practice and research. In this contribution, we investigated the research community's underlying understanding and usage of the term Business Process Framework which showed to be an ambiguous term with different meanings. We introduced a systemization of common understandings and presented several Business Process Frameworks which have been relevant for BPM research and practice in recent years. Thereafter, we discussed our results.

Our assumption that the two central terms *business process* and *framework* seem to influence the Business Process Frameworks term ambiguity seems plausible to a certain extent. In our investigation we found that important aspects and meanings of these underlying terms can be found in the different interpretations of the term Business Process Framework and in the content dimensions of the presented frameworks.

Future work concerning Business Process Frameworks should – besides the design and further development of innovative frameworks – concentrate on the empirical assessment of the effects of existing Business Process Frameworks in the real world. A further-going investigation of the possibilities of mapping similar Business Process Frameworks could support a better understanding of how valuable functionalities could be combined and, thus, made accessible for practice. However, in this context it has to be further investigated how engineering challenges concerning the maintenance of framework mappings could be faced in order to have consistent and at the same times flexible Business Process Frameworks.

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A Framework for Classifying and Modeling Organizational Behavior

Chris Aitken, Christine Stephenson, and Ryan Brinkworth

Abstract The consistent structuring and modeling of behavioral descriptions is a prerequisite to any successful Business Process Management (BPM) initiative. This chapter presents a simple practical framework for aligning various concepts and representations of organizational behavior, which assists identifying appropriate model types. The framework is presented as a means to improve process modeling within BPM initiatives and as a guide to the development and documentation of process architectures. A set of BPMN 2.0 based templates are described which enable the modeling of the concepts in the framework. Both health sector and investment management industry cases studies are described in which the framework is used to align descriptions of organizational behavior to produce useful integrated behavioral reference models and unified process model sets. The framework is also used to analyze model and process architecture completeness and structure.

1 Introduction

The ability to readily compare models is fundamental to any BPM initiative concerned with process re-use, improvement, or integration. Business process modeling is often limited in its effectiveness by the inability to produce unified sets of process models especially where the models have been developed within different organizations or within different contexts. Although there have been approaches to attempt to address this issue (e.g. Becker et al. 2014; Houy et al. 2014), the fundamental problem is that human behavior is expressed as a

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continuum and not as discrete components of activity, consequently any partitioning or structuring is necessarily 'imposed' and to some extent arbitrary. Furthermore, there is a tendency for the term "process" to be applied to behaviors that vary significantly in complexity and scope. This lack of specificity can result in models of the same behavior that bear little resemblance to one another. Clearly, factors other than the behavior or activity itself need to be taken into account when attempting to determine appropriate representation, and when aligning these representations across levels of abstraction, organizational boundaries or project environments.

It is common for a hierarchy of business process models to be developed with a BPM initiative. Typically a "high level conceptual" model is developed to provide a context and frame of reference for "lower level" more detailed 'as implemented' process models (Indulska et al. 2006; Bandara et al. 2005; vom Brocke et al. 2012). The development of process architecture is commonly touted as the means to achieve alignment between such models, although there are few if any standardized approaches (Davis and Brabänder 2007; Stephenson and Brabänder 2007). However, without clear agreed definitions of concepts, levels of abstraction and decomposition, it is difficult to establish whether lower level models within process architecture are aligned with those at higher a level of abstraction. It is commonly assumed that core concepts such as business process, function, or service are defined and commonly agreed within the BPM community at large. However, it can be argued that this is often not evidenced in practice (van der Aalst et al. 2003). Although there are process 'meta-models' such as the ARIS business process meta-model (Scheer et al. 2005), and the Business Process Definition Metamodel (Object Management Group 2008) and while these models may enjoy some popularity in some quarters they are by no means universally agreed and adopted within the global BPM practitioner community. Furthermore neither of these approaches provides a sufficient framework to clearly delineate between the behavioral concepts of service, process, activity, task or related concepts such as capability and function, and the relationships between them. For example, within the ARIS business process meta-model all behavior is represented by the concept 'function'. While it is possible to have sub-functions the meta-model does not specifically differentiate as different classes of activity, an end-to-end service provided to a customer, and a single constituent activity or task within a single business unit.

A common problem is that of establishing an appropriate level of abstraction or decomposition for any description of organizational behavior. Although two models may have been developed to describe the same process, they may be different in scope and the level of detail they include. Combining or comparing such models often means that one of the models has to be revised in order to establish whether the scope of the individual models is compatible, and whether the same behavior is being represented. The notions of abstraction, generalization, and aggregation were identified from within the data base and data modeling perspective by John and Diane Smith in their landmark article 'Database

Abstractions: Aggregation and Generalization" (1977). The authors were amongst the first to identify the dimensions of abstraction by aggregation (i.e., composed of), and abstraction by generalization (i.e., type of). The issue of abstraction as it applies to process modeling has been dealt with extensively from an academic perspective (Polyvyanyy et al. 2014). The approach described by Polyvyanyy et al. (2014) obviously has merit as a means to reduce potentially irrelevant or extraneous details from within a complex process model. However, the concept of abstraction is to a degree arbitrary in that the target audience and viewpoint 'owner' (i.e., Becker et al. 2003) at least in part drive the determination of what constitutes 'significant detail'. Furthermore, measures such as 'frequency of use' and 'execution effort' are not necessarily measures of process or task criticality. What is required is a simple set of practical, readily applied rules to allow the practitioner to structure and develop unified models of comparable abstraction or decomposition.

Although organizational behavior can be viewed at the macro level of the services provided, it can equally be viewed from the perspective of constituent tasks and single executable steps within these. Moreover, organizational behavior can be understood in terms of the behaviors of groups of individual actors (i.e., organizational units), as well as at the level of the individual. This multifaceted and fluid nature of organizational behavior means that there are few absolute points of reference upon which to structure and compare behavioral models. Indeed, it can be argued that useful abstraction cannot be directly derived from analysis of the process model structure alone (Smirnov 2011) and that the wider contextual meaning of the model needs to be a consideration.

This problem is further compounded where process models include elements from differing levels of abstraction within the one model. Typical examples of this occur where for reasons of modeling expediency, implementation level details are mixed with logical or conceptual level descriptions. This limits the capacity for model re-use, and will inevitably mean that the model will need to be revised when there are changes made at the level of physical implementation.

The aim of this chapter is to present a framework that has been developed, refined and extended over several years, that provides a simple set of rules to guide practitioners in the structuring, partitioning and development of unified sets of process models. The framework contains a set of criteria that can be readily and applied to representations (i.e. models) of behavior or activity to more reliably identify the level of abstraction being used, the behavioral concept being represented, and to promote the development of unified process and behavioral models across modeling initiatives. The framework presented in this chapter has been applied in both the health and financial investment industries. The framework is essentially a meta-model of behavioral concepts. The framework includes some modeling constraints and rules which are particularly suited to the use of Business Process Modeling Notation (BPMN) and its use of the constructs 'Collapsed Sub-process' and 'Swimlanes'. The following section describes the circumstances that gave rise to the framework, and the process of its development.

2 Framework Development

2.1 Background and Genesis

The need for a framework arose from a requirement to develop both function and service reference models within a large health sector agency in which an ehealth initiative was to be implemented. The ehealth initiative involved providing health services using information systems and technologies which enabled improved communication and collaboration between clinicians, as well as greater participation by patients in their own care. The reference models were required to allow consistent mapping of current and future state business processes and their supporting applications and technologies to better understand the scope of required changes. In the absence of any recognized industry reference models, the models had to be derived by combining a number of existing models and standards. Some of these models were specific to the health industry while others were more general descriptions of organizational behavior. The contributing models and their respective scopes are listed in Table 1 and are briefly described in the following paragraphs.

The American Society for Testing and Materials (ASTM) has published a number of technical standards for the health care industry. Of particular interest to our modeling efforts was the Standard Specification for a Healthcare Conceptual Process Model (ASTM WK5068[1]). This was described as a conceptual level model. The model is structured using the IDEF0 format (ANSI Publications 1320.1 1998) and describes four levels of process decomposition, although not all levels are specified for all processes within the model.

The Health Level Seven (HL7) Electronic Health Records (EHR) System Model (ANSI 2007) was also described as a conceptual level view of health functions. However, the EHR system model departs from the ASTM model by focusing on those functions necessary to support an EHR system. While the scope focuses on application functionality, the model was developed to be independent of any technology solution or implementation strategy. The model had four levels of decomposition; however, not all levels are specified for all functions specified in the model.

The Australian Council on Health Standards (ACHS) is an organization responsible for assessing, accrediting, and reviewing the performance of Australian health organizations in respect to their quality and safety. The Evaluation and Quality Improvement Program (EQuIP) was developed to support the ACHS. The EQuIP requirements were used by the authors to identify a number of key process patterns. These patterns were then compiled into an overarching process model for health care treatment (Stephenson 2005).

[1] At the time of writing, this document was still in draft form and unpublished.

Table 1 Contributing models and scope

Model	Scope
ASTM standard specification for a health care conceptual process model	Health provider (enterprise wide)
HL7 EHR system model	EHR application functions
ACHS functional requirements	Australian health service provider
APQC – Process Classification Framework	Generic enterprise

The American Productivity and Quality Commission (APQC) has developed a comprehensive taxonomy of generic processes applicable in many industries. The APCQ model was the most comprehensive of the models referenced, with more than 1,000 processes and activities included. It provided a useful framework to describe and understand the nonclinical operations within the health agency. This model contains four levels of decomposition and is broadly structured according to the Porter Value Chain model (Porter 1996).

On inspection, it was apparent that the level of description and abstraction varied markedly across the selected models. In order to successfully combine the various process and function descriptions contained within the models, it was necessary to develop a core set of definitions and relationships between these (i.e. a meta-model).

2.2 A Framework for Behavior Classification and Modeling

This section describes a framework developed to categorize descriptions of organizational behavior. Figure 1 illustrates the core concepts within the framework and highlights the two distinct perspectives (i.e. functional and service oriented) for a single set of common processes. The Service perspective describes how the organization operates, the Functional perspective describes how the organization or the activities in the organization are structured and controlled.

The framework is based on the not uncommon proposition that services can be defined as sequences of processes that are in turn located within functions or capabilities within an organization. The functional view provides a means to logically group and control processes within an organization, whereas a services oriented view describes the way in which processes are actually used. The wavy colored arrow lines in Fig. 1 could be considered to represent "compositions" or "arrangements" of processes which implement a given service. Figure 1 also highlights that some processes may be used by many services, whereas a process typically only appears within a single function. The same process appearing in more than one function is an indication of possible inefficiency.

In order to develop a framework that would define these concepts, their relationships, and to provide a way to abstract (i.e., aggregate and generalize) them

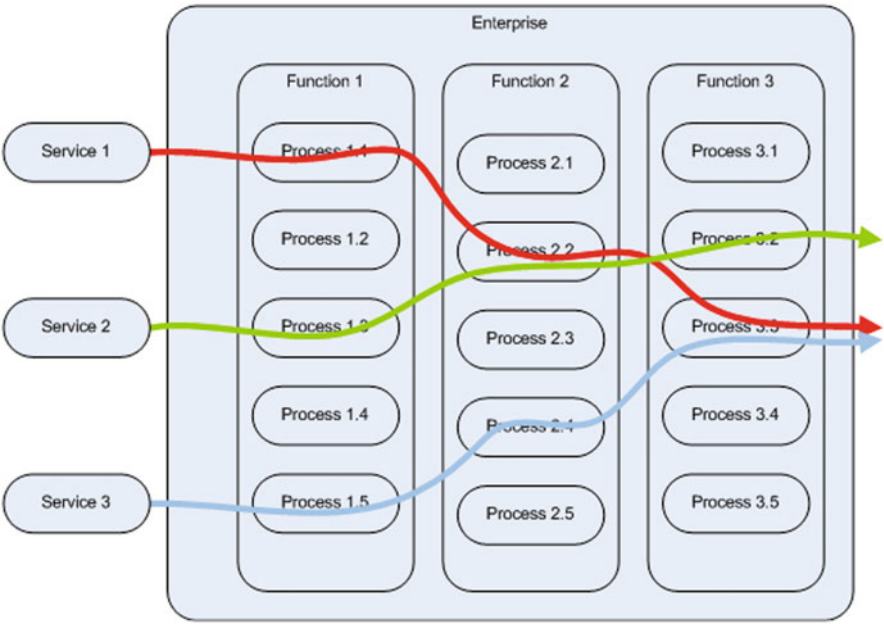

Fig. 1 Service and functional perspectives

consistently the following reference models were considered; Process Architecture Framework (Davis 2006), Supply-Chain Operations Reference-model (Supply-Chain Council 2008) (SCOR), Business Process Definition MetaModel Object Management Group (OMG) (2008), APQC – Process Classification Framework, the ARIS business process meta-model (Scheer et al. 2005), and the Reference Model for Open Distributed Processing (RM-ODP) Enterprise Language (ISO/IEC 15414:2002). Each of these frameworks and their contribution is briefly discussed in the following paragraphs.

The Process Architecture Framework (Davis 2006) consists of a descending hierarchy organizational behavior types; Business Activities, Process Groupings, Core Processes, Business Process Flows, Operational Process Flows, and Detailed Process Flows. The level of detail increases down the hierarchy. The patterns identified at each level represent the process architecture of the organization. This framework has been used extensively within British Telecom. However, the concept of 'process' seems overloaded in this framework. Furthermore framework does not appear to readily support the concept of a service that is composed of a sequence of processes. Nonetheless, the Process Architecture Framework (Davis 2006) does provide a means to identify varying levels of process abstraction (i.e., aggregation).

The Supply-Chain Operations Reference-model SCOR (Supply-Chain Council 2008) is an industry reference model for the management and planning of supply chains. SCOR includes definitions of performance metrics, processes, practices and skills and training required for the effective management of supply chains. SCOR

defines the following four levels of processes. Level 1 Processes – describe the scope and high level configuration of a supply chain (i.e., the main phases). Level 2 Processes – represent the supply chain strategy or implementation. Level 3 Processes – describe the steps to execute the Level 2 Processes, Level 4 Processes describe industry specific activities required to perform Level 3 Processes and are not formally part of SCOR. Although SCOR does promote a hierarchical structuring of organizational behavior it does not readily support the concepts necessary for a functional or capability view of processes within the hierarchy. However, SCOR does reinforce the notion of end-to-end process composition, and provides a means for decomposing these compositions into more detailed descriptions.

The Business Process Definition MetaModel (Object Management Group 2008) provides a UML based "framework for understanding and specifying the processes of an organization or community", and provides a meta-model and precisely defined semantics for BPMN concepts and process modeling in general. An important concept is that of Performer Role that has responsibility for the execution of a Process. Swimlanes in BPMN represent this concept.

It is the concept of Swmlanes that provides a mechanism to define the boundaries of a Process, and compartmentalize business activity according to the entity controlling the activity (i.e. the Performer Role). The swimlane is also likely to represent the 'viewpoint' of the entity fulfilling the Performer Role. The entity may be an organization, a business unit within the organization, or individual employees or systems. These entities can be represented abstractly as 'enterprise', 'functional area' or 'function', and 'actor'.

The American Productivity and Quality Commission (APQC) Process Classification Framework (PCF) has been described in the previous section. It provides a process reference model for a generic enterprise in much the same way that SCOR does for supply chains. The PCF consists of four levels of process decomposition across all functional capabilities.[2]

The ARIS business process meta-model and the 'ARIS House' were also considered in the formulation of the framework. Although the ARIS meta-model is popular framework and complies with the OMG MOF formalism, all behavioral concepts are encompassed in the single concept of Function. Consequently, the meta-model provides limited capacity to differentiate between behavioral concepts in our framework such as Service, Process and Task (i.e., they are all types of ARIS Functions or sub-Functions).

The Reference Model for Open Distributed Processing (RM-ODP) Enterprise Language (ISO/IEC 15414:2002) and the ISO/IEC 19793: Information technology – Open distributed processing – Use of Unified Modeling Language (UML) for ODP system specifications (2004) both contain a series of definitions of behavioral

[2] Since the time of writing the APQC PCF has improved the formalism of the four levels in the latest revision describing them as; Process Category, Process Group, Process, and Activity. This has also improved alignment between the APQC definitions and the concepts of Functional Domain and Function in the framework presented in this chapter.

Table 2 Core concepts and levels of abstraction

Core concept	Level of abstraction
Environment: the context in which an enterprise operates, which includes external parties, their relationships to the enterprise, and the requirements of these relationships	Contextual – aggregation
Community: a group of *enterprise objects* which exhibit *behaviors* and fulfill *roles* to achieve a common purpose or aim	Contextual – aggregation
Enterprise: a type of *community*, as are the organizational units of which it is comprised, as to the other organizations the enterprise interacts with	Contextual – generalization
Service: a sequence of *processes* initiated and terminated by a *client role*, delivered via an *interface role*, and controlled or constrained by a *contract*	Conceptual – generalization
Functional domain: the highest level at which Functions are grouped within an Enterprise. Usually corresponds to an implemented Division within the organization at the physical level of abstraction	Conceptual – aggregation
Function: an enterprise capability represented by a normalized grouping of *processes* which share a common objective, aim, or goal	Logical – generalization
Process composition: a sequence of *processes* which may implement all or part of a *service* and be undertaken by *actors* within one or more f*unctions* within a *functional domain*	Logical – aggregation
Process: a sequence of *tasks* undertaken by *actors* within a single *community*	Logical – generalization
Task: a sequence of *steps* undertaken by an individual *actor* that results in the change in *state* of the *object* being acted upon	Physical – aggregation
Step: a*ctivity* which results in a change to an attribute of an *object*	Physical – generalization
Organizational unit: a group of human resources, systems and business resources that implements one or more f*unctions* is responsible to execute one or more *processes*	Physical – generalization
Actor: a business resource (human or system) that performs a *task*	Physical – generalization

Italicization indicates terms with specific meaning within the framework. Further definition of some terms used can be found in ITU-T Rec. X.906|ISO/IEC 19793: Information technology – Open distributed processing – Use of UML for ODP system specification (2004), and the Business Process Modelling Notation, V1.1 OMG Available Specification (2008)

concepts that include organizational behavior (i.e. process), as well as the environment that the organization operates in. A core concept within the RM-ODP Enterprise Language is that of community.

In developing the framework it was clear that some concepts described different levels of generalization (e.g., capability vs. resource) while others addressed abstraction via aggregation (e.g., business function vs. organizational unit). This analysis resulted in the following table (Table 2) of core concepts and levels of abstraction.

The four levels of abstraction and their definitions are described in detail elsewhere (Aitken 2008; Stephenson and Bandara 2007). The framework presented in this chapter is an application of the Aitken (2008) general modeling framework

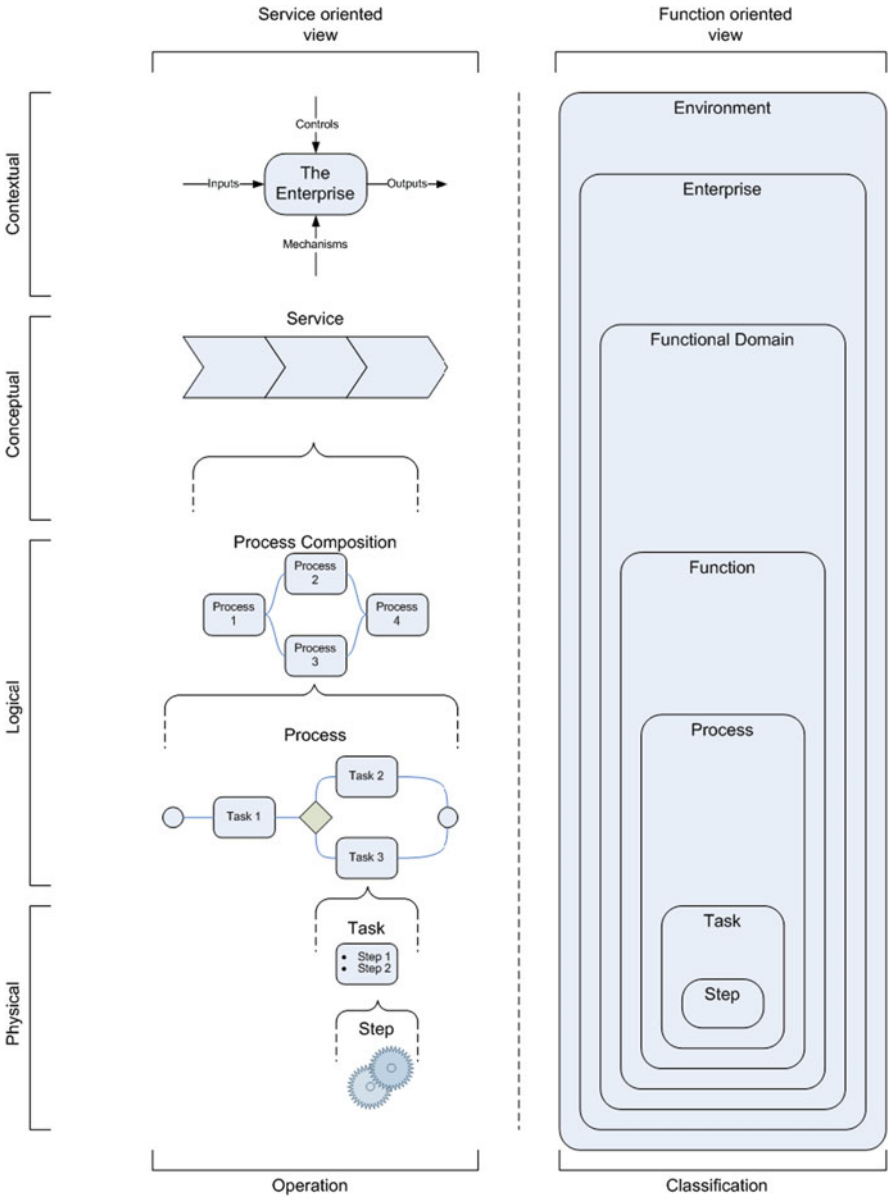

Fig. 2 An organizational behavior classification and modeling framework

within the specific context of business process modeling. Therefore, each level within the current framework is associated with a set of characteristics or criteria that apply to all representations within that level. Figure 2 provides a summary of the elements of the framework.

These concepts form a hierarchy of behavioral decomposition in which subordinate concepts elaborate a parent concept. Importantly, Fig. 2 also illustrates the two alternative views of organizational behavior supported by the framework. The service oriented view is concerned with sequencing of behavior whereas the function oriented view provides a means for behavioral classification.

Although the levels of abstraction within the framework bear a superficial resemblance to those within other frameworks (e.g., The Zachman Framework, Zachman 2005), the terms "contextual," "conceptual," "logical," and "physical" have specific meanings that have been detailed elsewhere (Aitken 2008). The application of these levels to the behavioral concepts within the framework is now discussed.

The contextual level represents the highest level of abstraction both in terms of generalization and aggregation within the framework. The concepts relevant to this level are the communities within the external environment of the enterprise or organization. The internal behavior of the organization is not described or represented by models at this level. However, the environment, external parties and customers, their relationships to the enterprise in question, and the requirements of these relationships are all legitimate behavioral components that might be represented within a contextual level behavioral model.

The criteria for models at the contextual level are that they treat the enterprise of concern as a "black box," they model the roles and relationships between the enterprise and other entities in its environment, describe the requirements of these relationships, and identify the outcomes that are the result of enterprise activity. The IDEF0 Level 0 model might be used to represent some of these components, although other models such as the RM ODP Enterprise Specification model might equally be suitable candidates (see ITU-T Rec. X.906|ISO/IEC 19793: Information technology – Open distributed processing – Use of UML for ODP system specifications 2004). Such models are used within the framework to provide a frame of reference for, and identify the overall requirements that must be satisfied by the process compositions, and processes described in subsequent levels.

The second level of abstraction within the framework is the conceptual level. This level is concerned with describing the internal behavioral constructs of the enterprise that are typically true of both current and future states. The behavioral constructs at this level within the framework are represented by the concepts "service" and "functional domain." These terms are considered conceptual level concepts in that they do not provide a description of the internal workings of the organization, but they do capture its defining behavioral characteristics and structure. Both constructs can be considered concepts that describe "what" is done or needed to be achieved without specifying "how" this is done. Descriptions concerning "how" things are done (i.e., design) are covered at the logical level. In this sense, both the functional and service views provide two separate perspectives on the same set of internal processes within an organization. The criteria for behavioral models at this level are as follows: