

DEVELOPING A HOLISTIC BUSINESS PROCESS MANAGEMENT MATURITY MODEL (BPM3)

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Abstract— Nowadays, with the fierce competition, increasingly more companies begin to pay more attention to efficient management which can help companies to make quick decision, fast information transfer and shorter cycle times. In order to achieve this, many companies start internally to improve their business process continuously in different aspects to respond the changes in environment and customers' needs. So business process management (BPM) becomes the most popular business and technology management method in the recent years, it is important for Business Success and improving organizational performance, to identify current Status of BPM and its weaknesses and strengths. In this paper, we developed a holistic BPM maturity model (BPM3) by analysis BPM maturity models. This model provides a framework for the detailed evaluation of BPM capabilities and achievements within organizations and better BPM implementation in the future.

Index Terms— business process management, business process management maturity, maturity models.

I. INTRODUCTION

Business Process Management is a widely known approach focused on aligning processes of an organization in order to achieve improved efficiency and client satisfaction. BPM is the combination of measures, tools and technologies to design and govern business process [16]. In recent years we have witnessed many studies about the importance of BPM that have expressed BPM as a dominant approach for organizational success in today's business environment and have mentioned the benefits of BPM [16]. However with BPM adoption, organizations aim to generate high-value business benefits via increased efficiency, visibility, and agility, BPM can be a risky proposition with potential for large investments and uncertain outcomes. there are BPM studies and reports that have pointed out inefficacy and high failure rate of these measures in different organizations and have shown that a large percentage of BPM projects, programs, or initiatives have been unsuccessful [22], [5]. An extensive review of current literature into BPM has confirmed BPM as a complex management practice that many organizations find difficult to implement and progress to

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higher stages of maturity. Maturity models have been developed to assist organizations in this endeavor. These models are used as an evaluative and comparative basis for improvement [12], [19], [37] and in order to derive an informed approach for increasing the capability of a specific area within an organization [3], [17], [30]. Maturity models have been designed to assess the maturity (i.e. competency, capability, level of sophistication) of a selected domain based on a more or less comprehensive set of criteria [31], [11]. In this study, based on research related to BPM maturity and critical success factors, we are going to develop a conceptual model of BPM that achieves three primary aims: enable organizations to assess their current strengths and weaknesses in BPM; enable organizations to determine their desired maturity stage with respect to key factors within BPM; and to assist organizations in developing a BPM progress road-map to move from their as-is to their desired to-be positions. In continue of this study, we present an overview of the related literatures on BPM and BPM maturity models and develop the conceptual model and finally, present a conclusion.

II. LITERATURE

Curtis & Alden estimate that there are over two hundred maturity models [9]. Existing models are applied within a variety of industries, mainly for IT application. Since the Software engineering Institute at Carnegie Mellon University proposed the Capability Maturity Model (CMM), which illustrates five maturity levels to access the process of the software development, many researchers focus on how to evaluate the company's maturity level. The concept of process maturity becomes very important in adopting process management [27].

So many authors such as Paulk et al, Fisher, Rosemann & Bruin and Sinur & Melenovsky, begin to introduce maturity into BPM model to help the company know BPM-maturity level of organizations [30], [12], [31], [25]. Maturity models have been designed to assess the company maturity level from the different factors and each factor's criteria in different maturity level [31]. Harmon has developed a maturity model for BPM maturity assessments, which is based on the CMM model [18]. The Harmon model used the same five stages for maturity assessment, but the focus lies with Business Process Management .Harmon states that a small group assesses one sub-process. If multiple processes are to be assessed on their maturity each process should be assessed individually rather than assessing the whole.

Fisher combines five factors into the five stages of maturity which really gives a clear picture of the different maturity levels' characters by providing a two-dimensional model [12]. The model incorporated the so-called 'five levers of change' (strategy, controls, people, technology) that represent the core of most organizations. The five levers of change provide the components about which one can assess the capabilities of an organization. As the capabilities advance, an organization can progress through the second dimension of the model: the 'states of process maturity'.

Rosemann & Bruin use Delphi method to identify the critical success factors which enables organizations to visualize strength and weakness [31].

Sinur & Melenovsky, who work in Gartner group and use Gartner model to name their model, use six phases to describe BPM-maturity level and also give six phases' different requirements and features. Gartner model focuses on six critical success factors which are strategy alignment, culture and leadership, people, governance, methods and IT [25].

Many researchers are focusing on these factors of BPM [12], [31], [13]. A great benefit of the Gartner model is that it contains descriptions of "triggers" that enable an organization to move from a maturity phase to a higher phase and the needed competencies for reaching an organization's goals. This model contains a number of potential challenges in achieving higher maturity levels.

At the end of 2007 the *Object Management Group (OMG)* released the Business Process Management Maturity Model (BPMM). Like CMM, the OMG BPMM consists of five levels of maturity (Initial, Managed, Standardized, Predictable, Innovating) [29], but rather than describing specific levels for the process capacity (the extent to which the consequences of achieving a higher maturity level can be predicted), the OMG BPMM will assess the process capacity directly from the process maturity. BPMM defines objectives for each process area thread. This is supplemented by practices how to reach these objectives. Overall the BPMM offers a variety of recommendations for BPM implementation. On the other hand it leaves some deficiencies in areas like process organization and process accountability. The important role of IT support for BPM is not covered in this model.

Rohloff proposes a framework for BPM implementation in large organizations [34]. The so-named "Process Management Maturity Assessment (PMMA)" has its focus on the assessment of the organizational implementation of all BPM activities. The PMMA consists of nine categories with one to three sub-categories each: process portfolio & target setting, process documentation, process performance controlling, process optimization, methods & tools, process management organization, program management, qualification, communication, data management & IT architecture. For every sub-category, each maturity level 1-5 is clearly defined in a to-be status by a set of criteria.

III. BUSINESS PROCESS MANAGEMENT MATURITY MODEL

As mentioned in the literatures, many factors are involved in effective BPM implementation. According to conducted studies, the following dimensions were identified:

1- *Strategic alignment*: Strategic alignment of BPM is defined as "the continual tight linkage of organizational priorities and enterprise processes enabling the

achievement of business goals" [25], [32]. To achieve long-term success and improved performance, BPM requires alignment with the overall strategy of an organization. Typically within the purview of operations management, processes have to be designed, executed, managed, and measured according to strategic priorities and situations [2].

2- *Culture & leadership*: Culture creates a facilitating environment that complements the various BPM initiatives, and can help BPM project progress by leading it to success [8]. The impact of culture-related activities tends to have a much longer time horizon than activities related to any of the other factors [15], [33] therefore it is an important strategic antecedent to BPM project success.

3- *Process Architecture*: Existing literature specifically recognized the vital role of process architecture in BPM efforts. The role of process architecture in structural design of general process systems and applies to fields such as computers (software, hardware, networks, etc.), business processes (enterprise architecture, policy and procedures, logistics, project management, etc.), and any other process system of varying degrees of complexity is very important [10].

4- *Methods*: It is The set of standards and methods that foster effective process management, including a glossary, modeling and notation standards, modeling and improvement methods, governance structures and practices, assessment of implementation effectiveness, and measurement of value [7]. The lack of standard guidelines or common industry practice results in repeated reinventions. Lack of standard methodology within organizational contexts for the uptake of BPM as a management approach and subsequently within technology infrastructures, results in substantial 'pain points' and unnecessary 'reinvention-of-the-wheel' situations for vendors [6].

5- *Monitoring*: This dimension includes two sub categories: Measurements and Process Optimization. Measurements refer to measurements of the processes, project and people performance and choose the suitable process for change in addition of assessment of the improvement. BPM projects need some metrics and standards to monitor the progress and ensure that the goals are achieved [6]. Process Optimization focuses on the improvement of cross functional processes. This involves continues monitoring, evaluation, measurement and process innovation [26].

6- *People*: The people in BPM context refers to the individuals and groups who continually enhance and apply their process related expertise and knowledge [25]. People are one of the most important elements in the business process change since processes should be conducted by people in organization [6].

7- *Information technology (IT)*: IT includes hardware, information systems, and communication technology, which provide individuals with the required information [1], [4] and enable and support process activities [25]. Appropriate IT is a necessary component and natural partner to BPM. IT plays a central and important role in almost all BPM projects arguably BPM's intellectual foundation is within the information systems research field [20]. IT is usually both the enabler and facilitator of changes (and sometimes an outcome) identified in BPM

projects [4]. The relationship between BPM and IT is mutually beneficial, in that successful implementation also requires effective BPM [35],[38]. Overlooking the role of IT can result in failure [35]. Appropriate IT capabilities are particularly effective in realizing the other critical success factors by integrating human, business, and organization together [14],[24].

8- *Stakeholder management & communication*: A stakeholder is an individual, or group of individuals, who have (or believe they have) a 'stake' (positive or negative) in the project. Adding value to the stakeholder management and providing the expertise necessary to ensure that stakeholders remain continually engaged and focused towards a successful BPM delivery have their needs met and are focused towards a successful BPM delivery. Communications must be targeted specifically to the various groups [21].

9- *Governance*: BPM governance is a set of guidelines and processes focused on organizing all BPM activities and initiatives of an organization in order to manage the BPM project [23]. Business process governance "governs" BPM, and its main purpose is to ensure that BPM delivers efficient results [36]. According to Rosemann and de Bruin, governance is one of key factors to build BPM maturity [31]. Good governance is necessary for the

success of business processes, which in turn, contribute to business success [28].

10- *Scope of implementation*: This dimension is the organizational context in which BPM is being used including the range of processes being addressed [7]. In implementation critical success factors and BPM maturity models studies have been proposed to this factor as automation.

These factors can be grouped into four categories namely "process cluster, instrumental cluster, organizational cluster and operational cluster". Organizational cluster includes all of dominations that are related to organizations, are necessary to BPM implementation efficiently and show Organizational readiness. This cluster includes strategy alignment, human resources, and culture and leaderships dimensions. Instrumental cluster represents tools that are necessary for taking advantage of this approach and includes three dimensions: IT, monitoring and methods. Process cluster Indicates how the use of this approach and involves process architecture and implementation scope diminutions. Eventually, operational cluster Indicates actions that are important for the management and organization of this Approach and includes Stakeholder management & communication and process management governance dimensions. Based on these four clusters and dimensions are shown in figure 1, we introduce five levels for BPM maturity.

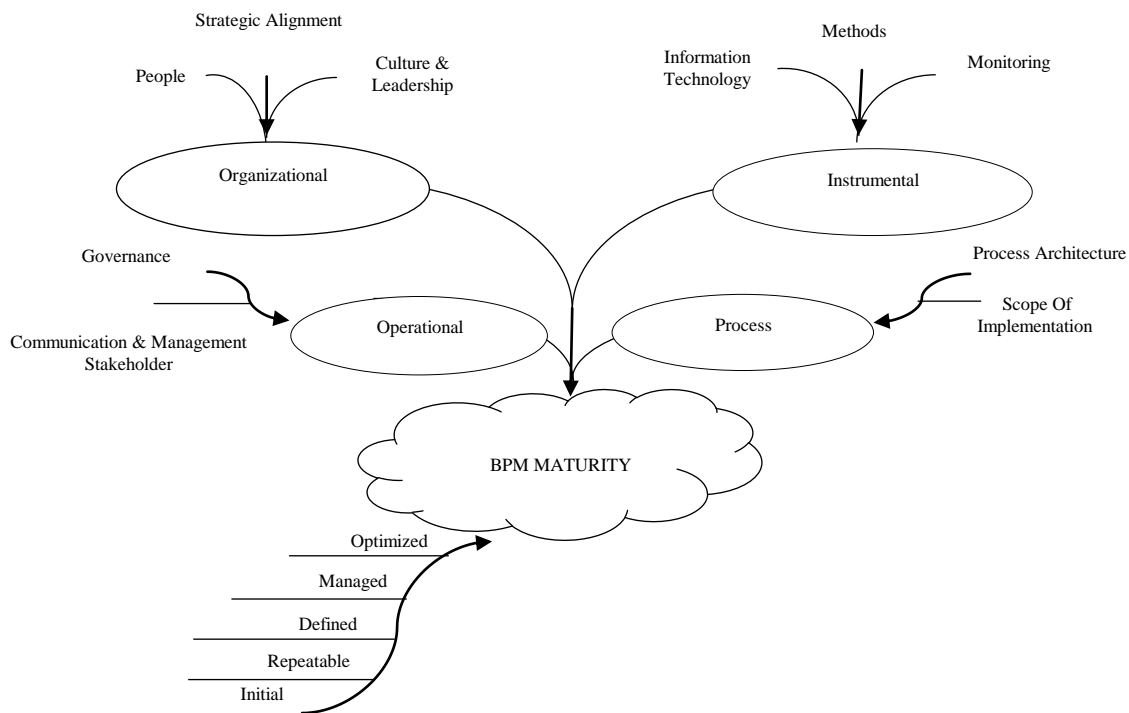


Fig 1: BPM maturity model

Each level has its own characteristics also it has its previous level attributes.

BPM maturity stages in this model have been chosen on the basis of the Capability Maturity Model [30] and Gartner model [25], and there are five of them: initial, repeated, defined, managed and sustained.:

A. initial

During this level, an organization does not take any or takes only unstructured and uncoordinated action of BPM. At this level enterprise lacks the consistent realization of processes or

practices for performing business activities. Some managers become aware of importance of BPM approach. Since there is no "organized" BPM, duplication of efforts directed to goals achievement often occurs. The most frequent problem is not connected to employees, but to managers, in the sense that managers fail to create a stable environment in which employees can perform their duties in disciplined and professional way.

B. repeated

The first documented processes appear during the repeated stage, the management and staff involvement increases, and attempts are made to structure the methodology and to find common standards. Managers understand the importance of process management, but that it is not yet accepted at the enterprise level (as a whole). Bearing in mind that local activities have been stabilized, for the enterprises at this stage can be said that they are in tactical integration. However, this refers to integration of individual activities, as part of the process, which means that this integration is still, in the majority of cases, limited by functions (organizational units).

C. defined

A wider use of technology in BPM communication, organizing comprehensive and formal BPM training sessions appear during the defined stage. This is the first phase in which the processes are managed from beginning till the end, and therefore the enterprise state during this phase may be described as process orientation. Also, standardization involves the establishment of a unified system of measures, which makes it easier for managers to identify opportunities for improvement, and learn on the basis of experience.

D. Managed

During the managed stage, organizations have established Process Governance Improvement Centres, combine business and IT during process governance and have formal process governance positions and responsible staff members appointed. BPM at this level is not only information technology, but becomes a way of enterprise management, because enterprise management is based on process

management. It can be said that the enterprise at this stage can be defined as an optimized enterprise.

E. sustained

During the sustained stage, the organization maintains a strong process governance position not only at the strategic level, but also in operational management [31]. At this stage business culture, which implies continuous change, is promoted, because the improvement of business culture or the establishment of supportive, innovative business culture (that contributes to continuous improvement activities and processes) becomes everyday job for all employees, regardless of function or organizational unit in which are engaged. Business as a whole is the subject of optimization. In addition to the enterprise’s business processes inter-relation, process approach expands outside the enterprise, above all, bearing in mind the customers (users) and suppliers, and therefore at this stage the enterprise represents the intelligent network.

It is not crucial for the organization to reach the last phase of maturity, but organizations should aim for the phase that is suitable and adequate for the set goals. It is advisable to achieve at least the third stage of Business Process Management maturity for process-oriented organizations.

Organizations can identify the level of BPM maturity by the shown dimensions in table 1. For each maturity level indicators have been identified. The presence or lack of them can shows strengths and weaknesses of BPM in the organization.

Table 1: Clusters And Dimensions Of Business Process Management Maturity Model (BPM3)

BUSSINESS PROCESS MANAGEMENT MATURITY MODEL (BPM3)		
Clusters	Dimensions	Indicators
Organizational	strategic alignment	<ul style="list-style-type: none"> ▪ Process communication and collaboration ▪ Aligning design strategy with the people priorities
	People	<ul style="list-style-type: none"> ▪ Training BPM skills & knowledge ▪ BPM knowledge, expertise & skills
	culture & leadership	<ul style="list-style-type: none"> ▪ Reaction to change ▪ Beliefs & values ▪ Attitudes & behaviors ▪ leadership attention ▪ BPM Social network
Instrumental	Methods	<ul style="list-style-type: none"> ▪ Quality ▪ Scope ▪ How to manage & deploy standards & methods
	Information technology	<ul style="list-style-type: none"> ▪ Characteristics of the BPM Technology ▪ How to manage and support the IT ▪ Range of used technologies
	Monitoring	<ul style="list-style-type: none"> ▪ indicators of performance assessment with objectives & standards ▪ Determine the extent of the gap between process design & implementation ▪ Predicting the change outcomes ▪ processes improvement Methods & technologies ▪ How to Identifying & select improvement Innovation
Operational	stakeholder communication & management	<ul style="list-style-type: none"> ▪ Identifying stakeholders & key people ▪ Methods used to manage stakeholder ▪ How to communicate & engage stakeholders
	BPM governance	<ul style="list-style-type: none"> ▪ how to Characterization & description of the governance structure ▪ how to Characterization &description of the roles
Process	implementation scope	<ul style="list-style-type: none"> ▪ Domain of processes that are managed ▪ Type of automated processes
	Process architecture	<ul style="list-style-type: none"> ▪ The characteristics of the architecture artifacts ▪ Ownership of Architecture artifacts ▪ How to use the Architecture artifacts

The model and the findings derived from its application can be used to identify and direct necessary BPM-related activities, i.e. it can be used to define intended to-be maturity. It enables organizations to focus on less mature areas and to develop a structured and specific improvement plan for progressing to the determined to-be situation. The model facilitates informed decisions about prioritizing areas for BPM development. The model provides a framework for understanding the relative cost-benefits of investing in proposed changes and the impacts of those changes on the realization of the organization's strategic objectives. The model can be applied over time and supports as a longitudinal study the measurement of actual progress in the BPM capabilities, i.e. it can serve as a continuous monitoring tool in the process of moving from as-is maturity to to-be maturity. Finally, the application of the model in a number of organizations will allow benchmarking studies within and across organizations, industries and countries.

IV. CONCLUSION

By review research and literature, we identified key factors for effective implementation of BPM. These key factors were grouped into four categories namely "process cluster, instrumental cluster, organizational cluster and operational cluster". Organizational cluster includes all of dominations that are related to organizations and includes strategy alignment, human resources, and culture and leaderships dimensions. Instrumental cluster consists of BPM tools and mechanisms and includes three dimensions: Information Technology, monitoring and methods. Process cluster Indicates how the use of this approach and involves process architecture and implementation scope diminutions. Operational cluster indicates actions that are important for the management and organization of this Approach and includes Stakeholder management & communication and process management governance dimensions. By employing this model, organizations can measure existing status of BPM and determine their weaknesses and strengths. This model can assess separately situation of organizational, instrumental, operational and process clusters. This ability helps to accurately determine weaknesses and strengths. Indicators were identified in table 1, can support organization efforts in order to implementation of BPM. Some actions can help organizations to effectively implement BPM.

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