HOW TO WORK WITH MATURITY AROUND BPM CONCEPTS

Introduction

In order for organizations to perform well in a global competitive world, it is important to identify the competitive advantages they can benefit from. Models to assess status of one's capabilities and identify improvement opportunities, and in particular maturity models, that can help organizations assessing their current capabilities in a structured way to implement changes and improvements, has become essential. A maturity model can be described as a structured collection of elements that describe certain aspects of capability maturity in an organization. A maturity model may provide, for example :

- a situational analysis of ones capabilities
- a place to start
- the benefit of a community's prior experiences
- a common language and a shared vision
- a framework for prioritizing actions.
- a way to define what improvement means for your organization.
- a benchmark for comparison and an aid to understanding

In this section, we will focus on maturity models, what they are, their historic development, how they can be used and where BPM can use maturity concepts. This includes a detailed BPM maturity self-assessment, a benchmark among the various aspects that are related to the BPM maturity context as well as a BPM maturity development path.

Historic Development Of Maturity Models

There are maturity models in multiple areas ranging from Software1, Organizational Project Management Maturity2, People Capability Maturity Model3, Portfolio, Programme and Project Management Maturity4, to concepts like E-learning Maturity5. Maturity Models have existed for close to forty years and are therefore not a new way of evaluating the maturity level of a business. While maturity models for the most are accredited to Carnegie Mellon University Software Engineering Institute[6] is this not really correct. The first published maturity model was developed by Richard L. Nolan, who, in 1973 published the Stages of growth model for IT organizations. It didn't take more than 6 years when Philip B. Crosby published 1979 in his book Quality is Free[7] the Quality Management Maturity Grid (QMMG), which is an organizational maturity matrix. The QMMG is used by a business or organization as a benchmark of how mature their processes are, and how well they are embedded in

[1] CMMI for Software Development. CMMI-DEV. Carnegie Mellon University Software Engineering Institute.
[2] Organizational Project Management Maturity Model (*OPM3*®) — Third Edition, 2013, Project Management Institute: http://www.pmi.org/PMBOK-Guide-and-Standards/Standards-Library-of-PMI-Global-Standards.aspx
[3] Curtis, B., W. E. Hefley, and S. Miller. 1995. People Capability Maturity Model. CMU/SEI-95-MM-02. Pittsburgh: Carnegie Mellon University, Software Engineering Institute. Available at http://www.sei.cmu.edu/cmmi/tools/peoplecmm/
[4] http://www.p3m3-officialsite.com/nmsruntime/saveasdialog.aspx?lID=456&sID=166
[5] http://www.utdc.vuw.ac.nz/research/emm/
[6] Humphrey, W. S. 1987. Characterizing the software process: A maturity framework. CMU/SEI-87-TR-11. Pittsburgh: Carnegie Mellon University, Software Engineering Institute.
[7] Crosby, P. B. 1979. Quality is free. New York: McGraw-Hill.

their culture, with respect to service or product quality management. The staged structure of the framework is based on total quality management (TQM) principles that have existed for nearly a century. The work of Frederick Taylor and Frank Gilbreth on "scientific management" and time and-motion studies in the early 1900s eventually led to the new discipline of industrial engineering[8]. In the 1930s, Walter Shewhart, a physicist at AT&T Bell Laboratories, established the principles of statistical quality control. These principles were further developed and successfully demonstrated in the work of such authorities as W. Edwards Deming[9] (1986) and Joseph M. Juran[10] (1988).

In recent years, the TQM concepts have been extended from manufacturing processes to service and engineering design processes. The software process[11] can be defined as a set of activities, methods, practices, and transformations that people use to develop and maintain software and the associated products. As an organization matures, the software process[12] becomes better defined and more consistently implemented throughout the organization. This, in turn, leads to higher-quality software, increased productivity, less rework, and improved software project plans and management. Crosby describes five evolutionary stages in adopting quality practices. As see in Table 1, the quality management maturity grid applies five stages to six measurement categories in subjectively rating an organization's quality operation.

The five stages of the Quality Management Maturity Grid (QMMG) are:

	Stage 1: Uncertainty	**Stage 2: Awakening**	**Stage 3: Enlightenment**	**Stage 4: Wisdom**	**Stage 5: Certainty**
Management understanding and attitude	No comprehension of quality as a management tool. Tend to blame quality department for "quality problems".	Recognizing that quality management may be of value but not willing to provide money or time to make it all happen.	While going through quality improvement programme learn more about quality management; becoming supportive and helpful.	Participating. Understand absolutes of quality management. Recognize their personal role in continuing emphasis.	Consider quality management as an essential part of company system.
Quality organisation status	Quality is hidden in manufacturing or engineering departments. Inspection probably not part of organization. Emphasis on appraisal and sorting.	A stronger quality leader is appointed but main emphasis is still on appraisal and moving the product. Still part of manufacturing or other.	Quality department reports to top management, all appraisals is incorporated and manager has role in management of company.	Quality manager is an officer of company; effective status reporting and preventive action. Involved with customer affairs and special assignments.	Quality manager on board of directors. Prevention is main concern. Quality is a thought leader.
Problem	Problems are	Teams are set up	Corrective action	Problems are	Except in the most

[8] Hays, D. W. 1994. Quality improvement and its origin in scientific management. Quality Progress 27, no. 6 (May):89-90.
[9] Deming, W. E. 1986. Out of the crisis. Cambridge, Mass.: MIT Center for Advanced Engineering Study.
[10] Juran, J. M. 1988. Juran on planning for quality. New York: Macmillan.
[11] Emam, K., and D. R. Goldenson. 1999. An empirical review of software process assessments. NRC/ERB-1065 (NRC 43610). National Research Council Canada, Institute for Information Tech.
[12] Humphrey, W. S. 1989. Managing the software process. Reading, MA: Addison-Wesley.

handling	fought as they occur; no resolution; inadequate definition; lots of yelling and accusations.	to attack major problems. Long-range solutions are not solicited.	communication established. Problems are faced openly and resolved in an orderly way.	identified early in their development. All functions are open to suggestion and improvement.	usual cases, problems are prevented.
Cost of quality as % of sales	Reported: Unknown Actual: 20%	Reported: 3% Actual: 18%	Reported: 8% Actual: 12%	Reported: 6.5% Actual: 8%	Reported: 2.5% Actual: 2.5%
Quality improvement actions	No organized activities. No understanding of such activities	Trying obvious "motivational" short-range efforts.	Implementation of a multi-step programme (e.g. Crosby's 14-step) with thorough understanding and establishment of each step.	Continuing the multi-step programme and starting other pro-active / preventive product quality initiatives.	Quality improvement is a normal and continued activity.
Summary of company quality posture	"We don't know why we have problems with quality".	"Is it absolutely necessary to always have problems with quality?"	"Through management commitment and quality improvement we are identifying and resolving our problems."	"Defect prevention is a routine part of our operation."	"We know why we do not have problems with quality."

Table 1: The Quality Management Maturity Grid (QMMG)

The QMMG is credited with being the precursor of all maturity models. In August 1986, the Software Engineering Institute (SEI) at Carnegie Mellon University, with assistance from the MITRE Corporation, began developing a process maturity framework that would help organizations improve their software processes. This effort was initiated in response to a request to provide the federal government with a method for assessing the capability of their software contractors. In June 1987, the SEI released a brief description of the software process maturity[13] framework and, in September 1987, a preliminary maturity questionnaire. Based on experience in using the software process maturity framework and the maturity questionnaire for diagnosing problems and improving processes, the SEI[14] formalized the concepts as the Capability Maturity Model for Software[15] (Software CMM[16]). Version 1.0[17] of the model was published in 1991[18]. Version 1.1[19] was released in 1993[20]. The Software CMM[21]

[13] Paulk, M. C., W. S. Humphrey, and G. J. Pandelios. 1992. Software process assessments: Issues and lessons learned. In Proceedings of ISQE92, Juran Institute, March, 4B/41-58.

[14] Kasse, M. D. Konrad, J. R. Perdue, C. V. Weber, and J. V. Withey. 1991. Capability Maturity Model for Software. CMU/SEI-91-TR-24. Pittsburgh: Carnegie Mellon University, Software Engineering Institute.

[15] Paulk, M. C., B. Curtis, M. B. Chrissis, and C. V. Weber. 1993a. Capability Maturity Model for Software, version 1.1. CMU/SEI-93-TR-24. Pittsburgh: Carnegie Mellon University, Software Engineering Institute.

16 Paulk, M. C., C. V. Weber, B. Curtis, and M. B. Chrissis. 1995a. The capability maturity model: Guidelines for improving the software process.

[17] Capability Maturity Model version 1.0. CMU/SEI-94-HB-04. Pittsburgh: Carnegie Mellon University, Software Engineering Institute.

was then retired in favor of the CMM Integration (CMMI[22]) model. CMMI was developed by the CMMI project, which aimed to improve the usability of maturity models by integrating 3 different models into one framework.

The project consisted of members of industry, government and the Carnegie Mellon Software Engineering Institute[23] (SEI). The main sponsors included the Office of the Secretary of Defense (OSD) and the National Defense Industrial Association[24]. CMMI currently addresses three areas of process interest:

- Development - addresses product and service development.
- Acquisition[25] - addresses supply chain management, acquisition, and outsourcing.
- Services[26] - addresses guidance for delivering services

[18] Paulk, M. C., W. S. Humphrey, and G. J. Pandelios. 1992. Software process
[19] Paulk, M. C., C. V. Weber, S. M. Garcia, M. B. Chrissis, and M. W. Bush. 1993b. Key practices of the Capability Maturity Model, version 1.1. CMU/SEI-93-TR-25. Pittsburgh: Carnegie Mellon University, Software Engineering Institute.
[20] Paulk, M. C., B. Curtis, M. B. Chrissis, E. L. Averill, J. Bamberger, T. C.
[21] SEI. 2006. Process maturity profile: Software CMM 2005 end-year update. Pittsburgh: Software Engineering Institute, Carnegie Mellon University.
[22] Chrissis, M. B., M. D. Konrad, and S. Shrum. 2006. CMMI: Guidelines for process integration and product improvement, second edition. Boston: Addison-Wesley.
[23] Humphrey, W. S., and W. L. Sweet. 1987b. A method for assessing the software engineering capability of contractors. Carnegie Mellon University, Software Engineering Institute, CMU/SEI-87-TR-23, September.
[24] DOD. 1988. Excerpts from Fall 1987 Report of the defense science board task force on military software. ACM Ada Letters (July/August): 35-46.
[25] SEI. 2007. CMMI for acquisition, version 1.2. CMU/SEI-2007-TR-017.Pittsburgh: Carnegie Mellon University, Software Engineering Institute.
[26] SEI. 2009. CMMI for services, version 1.2. CMU/SEI-2009-TR-001.Pittsburgh: Carnegie Mellon University, Software Engineering Institute.

Subject and Reference	Approach
Quality Management Maturity Grid (Crosby, 1979)	Grid, 6 issues, detailed description at each level
R&D Effectiveness Audit (Szakoryi, 1994)	Grid, 10 issues, detailed description at each level
Quality Management Process Maturity Grid (Crosby, 1996)	Grid, 5 issues, captions describing performance at each level
Technical Innovation Audit (Chiesa and others, 1996)	Grid, 8 areas, 23 issues, detailed descriptions at each level
Product & Cycle Time Excellence (McGrath, 1996)	Grid, 10 issues, detailed description at each level
Design Maturity Model (Fraser & Moultrie, 192001)	Grid, 5 areas, 21 issues, detailed descriptions and captions
Product & Cycle Time Excellence - Mark 2 (McGrath, 2002)	Grid, Revision of earlier model
Collaboration Maturity Model (Fraser & Gregory, 2002)	Grid, 7 issues, detailed descriptions and captions
Design Atlas - Design Capability (Design Council, 2002)	Grid, 5 areas, 15 issues, detailed descriptions at each level
Supplier Relationships (Macbeth & Ferguson, 1994)	Grid / Likert Hybrid, 9 issues, brief descriptions at 3 levels plus 7 point scale
Continuous Improvement in NPD (Caffyn, 1997)	Global levels defined, 6 core abilities, 10 key behaviors
ISO 9004 (EN ISO 9004, 2000)	Global levels defined, 5 questions, 11 issues
Project Management Maturity (Dooley and others, 2001)	Likert style questionnaire, 15 areas, 85 issues, no descriptions of performance
Software CMM - Staged Maturity Levels (Pauk and others, 1993)	CMM Style
Agility (change proficiency) Maturity Model (Dove, 1996)	CMM Style
Usability - Human Factors Maturity (Earthy, 1998)	CMM Style
CMMI - Continuous Capability Levels (Shrum, 2000)	CMM Style
Free (collaboration) Capability Assessment Framework (Wognum & Faber, 2000)	CMM Style

Figure 1: Overview of various Maturity Model concepts.[27]

However as shown in the figure 1, while the CMM/CMMI evolved and matured so did many of the other maturity model approaches; e.g. Agility, Usability of Human Factors as well as Continuous Capability Levels and Free (collaboration) Capability Assessment maturity models emerged.

From the described Quality Management Maturity Grid from Cosby emerged not only the maturity models but numerable other Grid approaches, such as in Research and Development, Product Cycle[28], Continuous Improvement levels and approaches, as well as Project Management Maturity. As it many times happens, does one model and framework inspire the work and content of another standards and frameworks in related engineering and/or management areas and disciplines'.

The Different Stages Of Maturity Models

In the software process maturity framework[29], Humphrey identified five maturity levels that even though they are based on the idea of Cosby are claimed to describe successive foundations for process improvement and defined an ordinal scale for measuring the maturity of an organization's software processes. The descried concepts underlying maturity levels have remained stable through the evolution

[27] LEADing Practice Maturity Reference Content [#LEAD-ES60003AL]
[28] Gallagher, B. P., M. Phillips, K. J. Richter, and S. Shrum. 2009. CMMIACQ: Guidelines for improving the acquisition of products and services. Boston: Addison-Wesley Professional.
[29] Paulk, M. C. 2008. A taxonomy for improvement frameworks. World Congress for Software Quality, Bethesda, MD, 15-18 September.

of the Software CMM. In discussions of this early work, Bill Curtis, Humphrey's[30] successor as director of the Process Program, identifies the focus on identifying and managing project commitments and on managing to a plan as one of the few differences between maturity models and Crosby's maturity grid. It also reflects Beer, Eisenstat, and Spector's[31] observation that senior managers create a climate for change in successful change programs, but this change needs to start at the grass-roots level rather than top-down.

The general idea with the maturity or grids levels is to provide possible improvement priorities or define levels of possible development - guidance for selecting levels of improvement activities:

- At **Level 1**, the initial level, the stage is typically characterized as ad hoc, not recognized, informal, uncertainty, occasionally even chaotic and no formal approach. Few activities are defined, and success depends on individual effort and heroics. The challenge with the first stage activities is that it is difficult to predict performance and value realization or learn from experience when everything is new and unique. In nearly all the maturity or grids approaches the first level is therefore more defined by the failure to satisfy the requirements for Level 2.
- At **Level 2**, which is more the repeatable level, where basic, initial efforts, regression and repeatable activities are established to track cost, schedule, and functionality. The necessary process discipline is in place to repeat earlier successes on projects with similar experience. The focus at Level 2 does for the most not explicitly include operational activities, because the major problems Level 1 organizations face are for the most managerial problems, and not operational problems. Operational activities are planned and tracked at Level 2, but they are not described in detail—or even listed in most versions of the different models.
- At **Level 3**, the awakening and defined level, both strategic (management) and operational activities are documented, standardized, and integrated into a set of standard competencies for the organization. Programs, portfolio and projects use an approved, tailored version of the organization's set of standard approaches, methods and processes. The operational processes are first explicitly addressed at Level 3, but they must be implemented at Level 1 if the organization is for example developing a product, create quality management, building software, even if those engineering processes are informal, ad hoc and inconsistently performed. The emphasis of Level 3, however, is more centered around organizational learning via competency and process definition and improvement.
- At **Level 4**, the wisdom, enlightenment, excellence, improvement integrated and/or managed level, detailed measures of the process and product quality are collected. Both the competencies, activities and thereby process and products are quantitatively understood and controlled. This implies statistical thinking[32] and evidence-based management[33], although these terms were not used in the early formulations of the different model. It also should be noted that measurement and analysis could occur at all levels of the models, although it comes to the forefront at Levels 4 and 5.
- At **Level 5**, the certainty, collaborative, enterprise wide integration, continuous improvement, culturally embedded, best in class, mastered as well as institutionalized or optimizing level, should be enabled by feedback from the competencies, its activities and process and from piloting innovative ideas and technologies. Applying statistical and analytical thinking enables

[30] Humphrey, W. S. 2002. Three process perspectives: Organizations, teams, and people. Annals of Software Engineering 4:39-72.
[31] Beer, M., R. A. Eisenstat, and B. Spector, Why Change Programs Don't Produce Change, Harvard Business Review 68, no. 6 (November–December 1990)
[32] Britz, G., D. Emerling, L. Hare, R. Hoerl, and J. Shade. 1996. Statistical thinking. A Special Publication of the ASQC Statistics Division (Spring).
[33] Pfeffer, J., and R. I. Sutton. 2006. Hard facts, dangerous half-truths, & total nonsense: Profiting from evidence-based management. Boston: Harvard Business School Press.

the organization to understand their competencies as well as their process and activities and confirm when there are measurable significant differences in performance.

As shown in figure 2, the basic level approaches are all based upon and further developed from the one grid approach developed by Cosby. Most of them have 5 levels/stages and the ones who have less or even more have split some of the stages or joined them, but all in all the biggest difference is the focus of the subjects and areas e.g. Quality Management, R&D Effectiveness, Technical Innovation, Excellence, Design, Change, Project Management and/or Relationship Management.

Subject and Reference	Maturity Levels						Approach
Quality Management Maturity Grid (Crosby, 1979)	Level 1 Uncertainty	Level 2 Awakening	Level 3 Enlightenment	Level 4 Wisdom	Level5 Certainty		Grid 6 issues, detailed description at each level
R&D Effectiveness Audit (Szakoryi, 1994)	Level A Not recognised	Level B Initial efforts	Level C Skills	Level D Methods	Level E Responsibilities	Level F Continuous Improvement	Grid 10 issues, detailed description at each level
Quality Management Process Maturity Grid (Crosby, 1996)	Level 1 Uncertainty	Level 2 Regression	Level 3 Awakening	Level 4 Enlightenment	Level 5 Certainty		Grid 5 issues, captions describing performance at each level
Technical Innovation Audit (Chiesa and others, 1996)	1	2	3	4			Grid 8 areas, 23 issues, detailed descriptions at each level
Product & Cycle Time Excellence (McGrath, 1996)	Stage 0 Informal	Stage 1 Functionally focused project managed	Stage 2 Cross functional project management	Stage 3 Enterprise wide integration of prod. dev.			Grid 10 issues, detailed description at each level
Design Maturity Model (Fraser & Moultrie, 192001)	Level 1 None	Level 2 Partial	Level 3 Formal	Level 4 Culturally embedded			Grid 5 areas, 21 issues, detailed descriptions and captions
Product & Cycle Time Excellence - Mark 2 (McGrath, 2002)	Stage 0 Informal Management	Stage 1 Functional Excellence	Stage 2 Project Excellence	Stage 3 Portfolio Excellence	Stage 4 Collaborative		Grid Revision of earlier model
Collaboration Maturity Model (Fraser & Gregory, 2002)	Level 1 None	Level 2 Partial	Level 3 Formal	Level 4 Culturally embedded			Grid 7 issues, detailed descriptions and captions
Design Atlas - Design Capability (Design Council, 2002)	Level 1	Level 3	Level 4	Level 5			Grid 5 areas, 15 issues, detailed descriptions at each level
Supplier Relationships (Macbeth & Ferguson, 1994)	Level 1 Adversarial	Level 2 Transitional	Level 3 Partnership				Grid / Likert Hybrid 9 issues, brief descriptions at 3 levels plus 7 point scale
Continuous Improvement in NPD (Caffyn, 1997)	Level 1 Natural or background CI	Level 2 Structured CI	Level 3 Goal oriented CI	Level 4 Proactive, autonomous CI	Level 5 Full CI capability		Global levels defined 6 core abilities 10 key behaviors
ISO 9004 (EN ISO 9004, 2000)	Level 1 No formal approach	Level 2 Reactive approach	Level 3 Stable formal system approach	Level 4 Cont. improvement emphasized	Level 5 Best in class performance		Global levels defined 5 questions, 11 issues
Project Management Maturity (Dooley and others, 2001)	1	2	3	4	5		Likert style questionnaire 15 areas, 85 issues, no descriptions of performance
Software CMM - Staged Maturity Levels (Pauk and others, 1993)	Level 1 Initial	Level 2 Repeatable	Level 3 Defined	Level 4 Managed	Level5 Optimizing		CMM Style
Agility (change proficiency) Maturity Model (Dove, 1996)	Level 1 Accidental	Level 2 Repeatable	Level 3 Defined	Level 4 Managed	Level5 Mastered		CMM Style
Usability - Human Factors Maturity (Earthy, 1998)	Level X Unrecognised	Level A Recognised	Level B Considered	Level C Implemented	Level D Integrated	Level E Institutionalized	CMM Style
CMMI - Continuous Capability Levels (Shrum, 2000)	Level 0 Not performed	Level 1 Performed	Level 2 Managed	Level 3 Defined	Level 4 Qualitatively Managed	Level 5 Optimizing	CMM Style
Free (collaboration) Capability Assessment Framework (Wognum & Faber, 2000)	Level 2 Repeatable	Level 3 Defined	Level 4 Managed	Level 5 Optimizing			CMM Style

Figure 2: Historic development of the maturity grids and models.[34]

The Missing Parts Of The Maturity Models

Even though the adoption rate of the mentioned models is high, is the one that is most developed and adopted the discussed CMM and then CMMI. The last years however have the CMMI approach/models been heavily criticized both in theory[35] as well as in practice. In the following we would like to summarize the criticism, which is in 6 main areas:

1. The CMM/CMMI model is based on the experiences of large government contractors and of Watts Humprey's own experience in the mainframe world. It does not represent the successful

[34] LEADing Practice Maturity Reference Content [#LEAD-ES60003AL]

[35] Besselman, J. J. 1992. A collection of software capability evaluation (SCE) findings: Many lessons learned. In Proceedings of the Eighth Annual National Joint Conference on Software Quality and Productivity, Arlington, VA, March, 196-215.

experiences of many SW companies that, as a matter of fact, would be judged to be a "level 1" organization by the CMM/CMMI levels. For example the CMM or CMMI for SW development[36] was arguably irrelevant to successful software development and therefore criticized for the applicability of the narrow capability view. For some of the most successful SW companies like Microsoft, IBM, Apple, Oracle, Google, Softbank, SAP, CSC, Yahoo, Software AG and Symantec. Though these companies may have successfully developed their software, they would not necessarily have considered or defined or managed their processes as the CMM/CMMI described as level 3 or above, and so would have fitted level 1 or 2 of the model[37]. This did not change the successful development of their software. As CMM/CMMI is not build on empirical research, but rather builds on experience, the experience/best practice would somehow have to build on the industry leaders in order to be a foundation of best practice standardization, which the CMM/CMMI isn't.

2. CMMI ignores the importance of people involved with the process by assuming that processes can somehow render individual excellence less important. In order for this to be the case, people/team tasks would somehow have to be included in the process itself, which the CMMI does not address.
3. CMMI does not effectively describe any information on process dynamics, which confuses the study of the relationships between practices and levels within the CMMI. The CMMI does not perceive or adapt to the conditions of the combined capabilities of an organization. Arguably, most and perhaps all of the key practices of the CMMI at its various levels could be performed usefully at level 1, depending on the particular dynamics of an organization. Instead of modeling these process capabilities dynamics, the CMMI merely satisfies them.
4. CMMI's focus is only on a process capabilities, which is only one side of the coin, for a company can't separate ones capabilities from the relationship of another related capability that are connected. Therefore a company should not only look at its capability maturity model of one area, but rather look at its related Enterprise Maturity. However, CMMI does not address this.
5. CMMI reveres the institutionalization of process for its own sake. This guarantees nothing, and in some cases, the institutionalization of processes may lead to oversimplified public processes, ignoring the actual successful practice of the organization. For one can't look at a process in itself, without taking into consideration which other capabilities are attached to the process and activity. In order to consider which other capabilities are attached to the process and activity, other capability maturity models would have to be interlinked and measured to the process capabilities, which the CMMI does not address. Therefore a process maturity model would have to consider the related aspects to the process, which gives it context. This includes, the purpose and goal, the organizational context (competencies and business function), the roles, owners, flows, rules, compliance aspects, automated pieces (applications), measures, channels, media, platform, infrastructure and the services delivered.
6. CMMI encourages the achievement of a higher maturity level with all aspects, in some cases by displacing the true mission, which is improving the process and overall competency in lowering the cost and increasing the revenue. In most cases the cost to achieve a higher maturity level would be far greater than the possible gain. This may effectively "blind" an organization to the most effective use of its capabilities and resources.

This narrow focus makes CMMI limited to real essential improvement that a BPM maturity model would need.

[36] Krasner, H. 2001. Accumulating the body of evidence for the payoff of software process improvement – 1997. In Software Process Improvement, eds. R. B. Hunter and R. H. Thayer, 519-539. New York: IEEE Computer Society Press.
[37] Austin, R. D. 1996. Measuring and managing performance in organizations. New York: Dorset House Publishing.

BPM Maturity Model

From the above discussion we will in this section illustrate of which components a BPM Maturity Model should consists. The Business Process levels, the description of those and the context in terms of areas that give BPM maturity context and thereby question to assess the maturity levels. We will then exemplify a BPM maturity benchmark and a BPM maturity development path.

Maturity Levels

Business Process Maturity: Level 1

The organization's process portfolio and initiatives are functional oriented and in multiple instances. The process initiatives are typically characterized as ad hoc in terms of specific for only one or few business units/departments, thereby organizational siloed, not fully recognized or adaptable by others. The process solutions are thereby more department or business unit centric, occasionally coordinated with others and sometimes even joint development. Such a coordination and joint development are initial and therefore from a enterprise perspective the process strategy is unorganized and partly chaotic in having no formal process approach. Few cross enterprise process strategies, development and improvements are defined, and success of these solutions depends on few individual heroic department coordinating or an process Center of Excellence (CoE) effort. The challenge with the first stage, is that with multiple process solutions/instances, it is difficult to predict joint value creation and or performance. At this stage it is further more difficult to learn from experience when everything is done initial in silos and if done joint, it is for the most part new (for each business unit/department). In nearly all the maturity or grids approaches the first level is therefore more defined by the failure to satisfy the requirements for Level 2.

Business Process Maturity: Level 2

The repeatable level is where basic process standardization efforts, and repeatable joint process development initiatives (workflow, programming, upgrades, blueprints etc.) are established to track process development cost, schedule, and functionality. The necessary process CoE disciplines are in place to repeat earlier successes in areas/projects with similar experience. The focus at Level 2, does for the most not explicitly include operational process system merger activities, because the major problems Level 1 organizations face are for the most multiple process managerial problems (e.g. process solution development definition, process solution development planning, process solution value identification, process solution performance measurements, process solution initiatives, joint reporting in process solutions), and not operational system problems. Joint operational process solution initiatives are planned and tracked at Level 2, but they are not described/executed in detail.

Business Process Maturity: Level 3

The defined and awakening level, both around management (strategic and tactical level) and operations, have a common documented process's. The level 2 standardizations around process are thereby documented and integrated into a set of standard joint process developments and joint competencies for the organization. process joint development programs, portfolio and projects use an approved, tailored version of the organization’s set of process/solution framework, method and approaches. The operational multi instance challenges and possible process single instance strategies and or initiatives are first explicitly defined and thereby addressed at Level 3, but they must be implemented at Level 1 if the organization is for example developing a process single instance product, create quality management, building tools, even if those initiatives are informal, ad hoc and inconsistently executed.

The emphasis of Level 3, however, is more centered around organizational learning of their pain points, challenges, goals, competencies, process definition and improvements of the standardized process's.

Business Process Maturity: Level 4

At the management level the process/solution excellence is managed across the organizational boundaries. The detailed system measures of the process's are collected in joint cockpits, dashboards and scorecards and are optimized and managed. Both the process strategy, competencies and thereby the process initiatives are quantitatively understood, monitored, controlled and managed. This implies statistical thinking (Britz et al. 1996) and evidence-based management (Pfeffer and Sutton 2006) about the process initiatives. It also should be noted that process measurement and analytical abilities could occur at earlier phases (level 1, 2 and or 3), although it comes as full cross discipline to the forefront at Levels 4 and 5, when the process solution is optimized for joint enterprise performance and value creation.

Business Process Maturity: Level 5

The organization becomes process centric in terms of collaborative developments, enterprise wide integration and most important continuous improvement, becomes culturally embedded in the organization. The continuous process improvement support the business differentiation the organizations are looking for. On this maturity level, the continuous improvement of the process portfolio is enabled by feedback from the business competencies and there functions, tasks and services. Applying strategic and analytical thinking enables the organization to understand their expert competencies as well as their process and activities that enable their process's. The organization optimizes and develops their process's when and where there are measurable significant differences in performance and value creation.

In figure 3, we see how the levels are put together with an example of a maturity journey and the statistical Ease of Adoption curve together with the Return On Investment (ROI) curve:

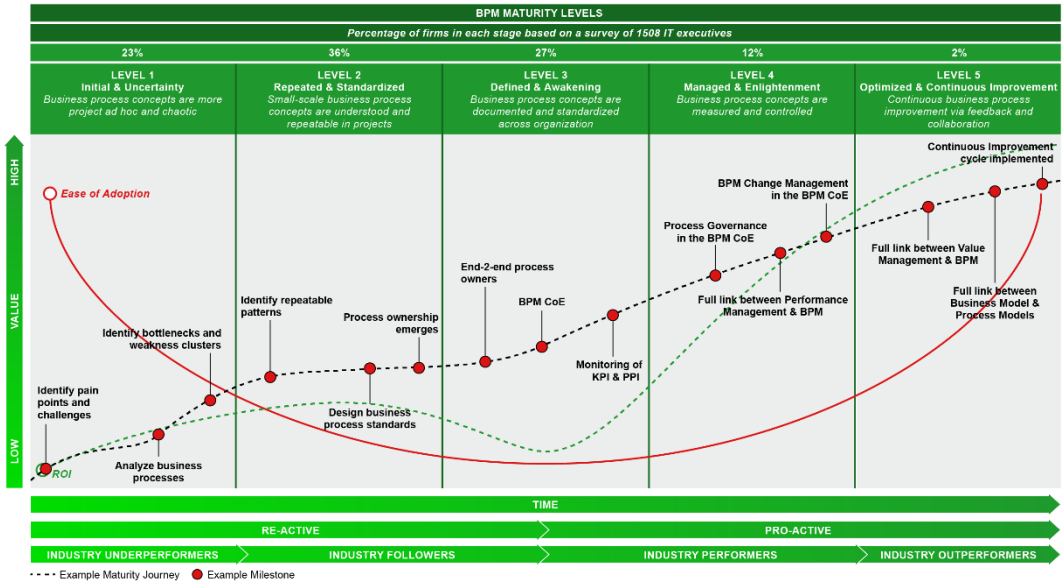

Figure 3: Example Maturity journey and the statistical Ease of Adoption and ROI curve.[38]

[38] LEADing Practice Maturity Reference Content [#LEAD-ES60003AL]

As we described earlier, CMMI reveres the institutionalization of process for its own sake. This guarantees nothing, and in some cases, the institutionalization of processes may lead to oversimplified view, ignoring the successful practice of the organization and its process context. For one can't look at a process in itself, without taking into consideration which other capabilities are attached to the process and activity. As the organization progresses and ascends through each phase of maturity, the achievement of its critical success factors must also evolve. Leading organizations take a balanced approach to managing their different critical success factors and what makes them unique. Managed together, they represent the framework from which BPM competencies are built. This includes multiple factors[39].

In order to consider which other capabilities are attached to the process and activity, other capability maturity models would have to be interlinked and measured to the process capabilities. Therefore a BPM maturity model would have to consider the related aspects to the process, which gives it context. This includes, the purpose and goal, the organizational context (competencies and business function), the roles, owners, flows, rules, compliance aspects, automated pieces (applications), measures, channels, media, platform, infrastructure and the services delivered. Therefore the BPM maturity model would have to include the context of the maturity benchmark question that enables to place one into a maturity level. In figure 4 is an example of a BPM Maturity Model with related context for BPM maturity assessment.

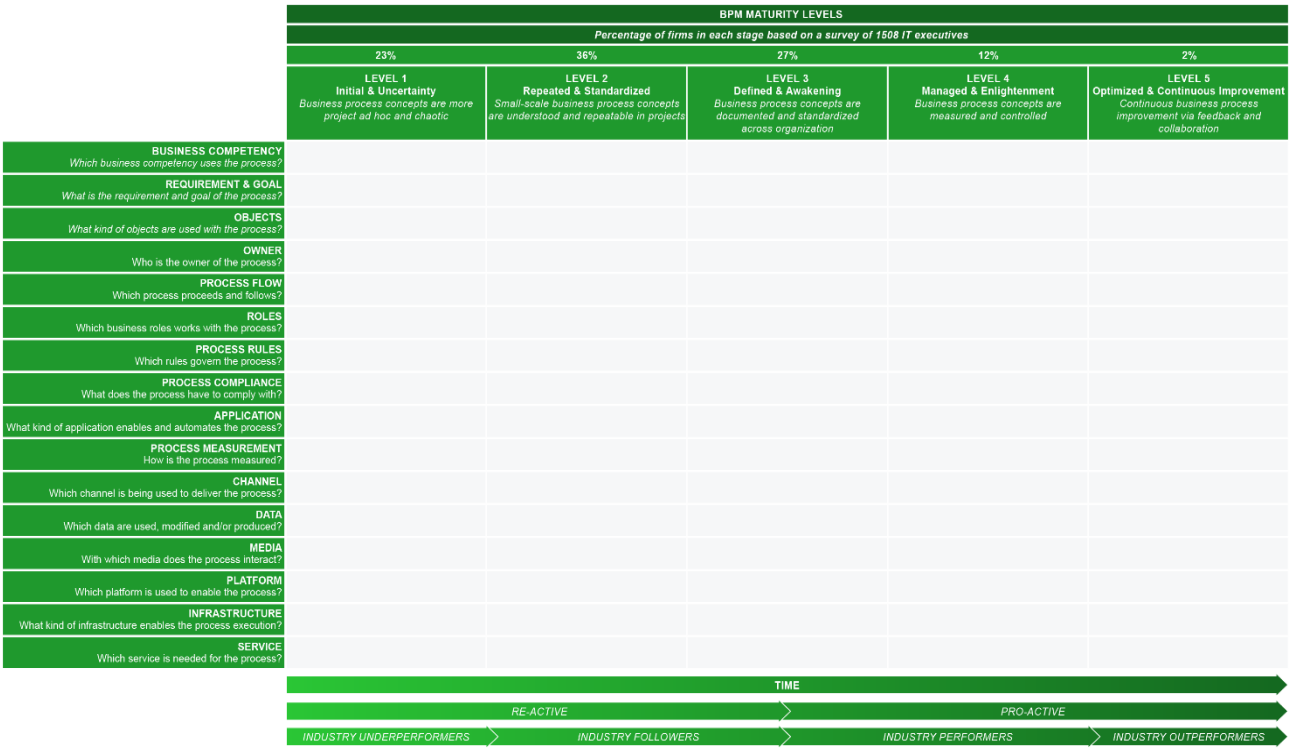

Figure 4: An example of context for a BPM maturity assessment.[40]

[39] " BPM Maturity Model is Important for Long Lasting BPM Success", Michael Melenovsky and Jim Sinur from http://www.brcommunity.com/b325.php

[40] LEADing Practice Maturity Reference Content #LEAD-ES60003AL

In the following we have listed the various aspects relevant for BPM maturity. The questions and the list do not claim to be complete, but more illustrative and representative for how such a BPM maturity benchmark and the questions that enables to place the organization into the maturity levels:

PROCESS MATURITY LEVELS OVER TIME					
	LEVEL 1 Initial & Uncertain	**LEVEL 2 Repeated & Standardize**	**LEVEL 3 Defined & Awakening**	**LEVEL 4 Managed & Enlightenment**	**LEVEL 5 Continuous Improvement**
Process	The organization's process portfolio and initiatives are functional oriented and in multiple instances. The process initiatives are typically characterized as ad hoc in terms of specific for only one or few business units/departments, thereby organizational siloed, not fully recognized or adaptable by others. The process solutions are thereby more department or business unit centric, occasionally coordinated with others and sometimes even joint development. Such a coordination and joint development are initial and therefore from a enterprise perspective the process strategy is unorganized and partly chaotic in having no formal process approach. Few cross enterprise process strategies, development and improvements are defined, and success of these solutions depends on few individual heroic department coordinating or an process Center of Excellence (CoE) effort. The challenge with the first stage, is that with multiple process solutions/instances, it is difficult to predict joint value creation and or performance. At this stage it is further more difficult to learn from experience when everything is done initial in silos and if done joint,	The repeatable level is where basic process standardization efforts, and repeatable joint process development initiatives (workflow, programming, upgrades, blueprints etc.) are established to track process development cost, schedule, and functionality. The necessary process CoE disciplines are in place to repeat earlier successes in areas/projects with similar experience. The focus at Level 2, does for the most not explicitly include operational process system merger activities, because the major problems Level 1 organizations face are for the most multiple process managerial problems (e.g. process solution development definition, process solution development planning, process solution value identification, process solution performance measurements, process solution initiatives, joint reporting in process solutions), and not operational system problems. Joint operational process solution initiatives are planned and tracked at Level 2, but they are not described/executed in detail.	The defined and awakening level, both around management (strategic and tactical level) and operations, have a common documented process's. The level 2 standardizations around process are thereby documented and integrated into a set of standard joint process developments and joint competencies for the organization. process joint development programs, portfolio and projects use an approved, tailored version of the organization's set of process/solution framework, method and approaches. The operational multi instance challenges and possible process single instance strategies and or initiatives are first explicitly defined and thereby addressed at Level 3, but they must be implemented at Level 1 if the organization is for example developing a process single instance product, create quality management, building tools, even if those initiatives are informal, ad hoc and inconsistently executed. The emphasis of Level 3, however, is more centered around organizational learning of their pain points, challenges, goals, competencies, process definition and improvements of the	At the management level the process/solution excellence is managed across the organizational boundaries. The detailed system measures of the processes are collected in joint cockpits, dashboards and scorecards and are optimized and managed. Both the process strategy, competencies and thereby the process initiatives are quantitatively understood, monitored, controlled and managed. This implies statistical thinking (Britz et al. 1996) and evidence-based management (Pfeffer and Sutton 2006) about the process initiatives. It also should be noted that process measurement and analytical abilities could occur at earlier phases (level 1, 2 and or 3), although it comes as full cross discipline to the forefront at Levels 4 and 5, when the process solution is optimized for joint enterprise performance and value creation.	The organization becomes process centric in terms of collaborative developments, enterprise wide integration and most important continuous improvement, becomes culturally embedded in the organization. The continuous process improvement support the business differentiation the organizations are looking for. On this maturity level, the continuous improvement of the process portfolio is enabled by feedback from the business competencies and there functions, tasks and services. Applying strategic and analytical thinking enables the organization to understand their expert competencies as well as their process and activities that enable their process's. The organization optimizes and develops their process's when and where there are measurable significant differences in performance and value creation.

	it is for the most part new (for each business unit/department). In nearly all the maturity or grids approaches the first level is therefore more defined by the failure to satisfy the requirements for Level 2.		standardized process's.		
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Business Competency	Business competencies share only sporadic and ad hoc relation to business processes, and knowledge of this relation is not shared across business units, making the relation entirely silo-based. Furthermore, business competency potential is not fully recognized nor adaptable to changing business requirements.	Business competencies and their connection to the business processes across business units is now part of basic standardization projects and initiatives. Successes from earlier initiatives have now become repeatable in future process-oriented projects and development initiatives.	Business competencies are now being defined and documented in detail. This knowledge is shared across organizational boundaries at both the strategic, tactical and operational management levels, and is centered around the learning of how competencies can be used within the existing process portfolio in future process-oriented projects and development initiatives.	All business competencies of the enterprise now share a direct relationship to all of the business process across the organizational boundaries. Business competencies and their relation to business processes are now fully understood, managed, controll and monitored during process-oriented projects and development initiatives.	Business competencies play a significant role within the collaborative feedback loop of continuous business process improvement and optimization projects and initiatives. The relation beween value creating business processes and business competencies of the organization helps build business differentiation on the market.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Purpose & Goal	Few to none value-centric aspects of what can, or does, give the business processes a purpose and goals - in terms of both forces (external and internal), drivers (external and internal), value indicators, value proposition, performance indicators, strategy, goals, objectives and quality thereof - exist as concepts in the organization, and value-centric aspects such as these often remain locked in silos, and is rarely shared across organizational boundaries. Furthermore, the aforementioned value aspects are rarely, if ever, linked to processes, and if so, only applied in an ad hoc manner during	Some value-centric aspects around that which gives the business processes a purpose and a goal - in terms of both forces (external and internal), drivers (external and internal), value indicators, value proposition, performance indicators, strategy, goals, objectives and quality thereof - have become repeatable due to successful integration in previous process-oriented project initiatives that has been performed within individual business units. These successes are shared across organizational boundaries, and some of these value-centric aspects around the business processes of each business unit are now standardized and allows for repeatable development initiatives	Most value-centric aspects around the purpose and goals of business processes - such as forces (external and internal), drivers (external and internal), value indicators, value proposition, performance indicators, strategy, goals, objectives and quality thereof - are explicitly defined across the organizational boundaries of all the business units, and share a common documentation point of reference at both the strategic, tactical and operational levels within the organization.	All value-centric aspects around the purpose and goals of business processes - such as forces (external and internal), drivers (external and internal), value indicators, value proposition, performance indicators, strategy, goals, objectives and quality thereof - are quantitatively understood, controlled, monitored, measured and managed across organizational boundaries of the enterprise.	The enterprise-wide organization has become purpose and goal-centric - in terms of forces (external and internal), drivers (external and internal), value indicators, value proposition, performance indicators, strategy, goals, objectives and quality thereof - around the continuous improvement of business processes. The development, improvement and optimization of business processes around value-adding aspects is now the central focus in process-oriented project initiatives across the enterprise. This development is

	process-oriented projects and initiatives within each individual business unit of the organization.	during process-oriented projects and initiatives.			supported by a collaborative feedback loop of the organization at both the strategic, tactical and operational levels.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Objects (Business, Information and Data)	Business, information and data objects exist only in silos and - apart from data objects - share little to no coherency nor affiliation with the business processes of the organization. In the case that business and/or information objects are part of a business process, it's participation is largely initial and sporadic in context.	Business, information and data objects are gradually being implemented across business processes in the organization. This allows for repeating earlier development successes and makes room for basic standardization upon implementation across business units.	Business, information and data objects are now being addressed and explicitly defined for use in process-oriented projects and initiatives. Furthermore, the objects share a common set of documentation standard across both the strategic, tactical and operational management levels across organizational boundaries.	All business, information and data objects are now being individually mapped and related to all process-centric meta objects during process-oriented projects and development initiatives. This allows for a much higher degree of object management and control as well as continuous object governance and monitoring.	Business, information and data objects is a central part of business process development and optimization during process-oriented projects and initiatives across organizational boundaries. Furthermore, the collaborative environment across all business units becomes "object"-centric during process modelling in a continuous effort to improve organizational business processes.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Process Owner	Few to no process owners exist around the current process portfolio within each individual business unit. For the process owners that do exist, their responsibilities and accountability remains largely ad hoc and their roles are neither fully understood nor recognized during process-oriented projects and initiatives.	Process ownership is being established across the organizational boundaries, which allows for the repetition of earlier successes from previous process-oriented projects and initiatives. This allows for a basic standardized incorporation of process ownership in both new as well as in existing projects and initiatives.	Process ownership has become explicitly defined and is fully standardized and incorporated in process-oriented projects and initiatives across the organizational boundaries. The role and purpose of process ownership is fully documented and shared across both the strategic, tactical and operational levels of the enterprise.	Process ownership and their relation to the other owners - such as the business, service, application, data, platform and infrastructure owners - is being managed across the enterprise. Their role and responsibility is fully understood and controlled and their results are monitored and measured during process-oriented projects and initiatives.	Process ownership - including their collaboration with the other business, service, application, data, platform and infrastructure owners of the organization - plays a fundamental role within the enterprise when it comes to the development and optimization of both new as well as the existing business processes across the organizational boundaries. They play a key role in the collaborative feedback loop around the continuous improvement of business processes.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Process Flow	Process flows are the natural part of all business processes in the respective business units, although they exist only	Process flows have become and increasingly larger part of basic business process standardization across organizational units, and	Process flows are now being defined and documented in detail. This information is shared across all	Process flows have become quantitatively understood, monitored controlled and are being managed across	During process-oriented projects and development initiatives, process flows play a significant role in the

	in silos. Thus, knowledge of them is not shared across organizational boundaries (ie. between business units).	are now used in repeatable process-oriented projects and development initiatives.	organizational units and on both the strategic, tactical and operational management levels of each business unit.	organizational boundaries. They also share a direct relationship to all other flows of the organization, such as the business workflows, service flows, other process flows, application flows as well as data flows.	collaborative feedback environment because of their direct relation to to all other flows of the organization, such as the business workflows, service flows, other process flows, application flows as well as data flows. They also represent an important aspect of continuous business process improvement initiatives across organizational boundaries.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Process Roles	Process roles largely works ad hoc on an initial basis during all process-oriented projects and initiatives. Their role, responsibilities and overall purpose within the organization is not fully recognized nor understood. Their work is also only carried out in silos - and the results is knowledge that is retained and static, and not shared across business units nor across organizational boundaries.	Process roles are now being established across all business units, as earlier successes from process-oriented projects and development initiatives allows for being repeated in new projects and initiatives. Process roles have also become part of basic business process standardization initiatives across business units.	Process roles has become explicitly defined and is fully standardized and incorporated in process-oriented projects and initiatives across the organizational boundaries. The role and purpose of process ownership is fully documented and shared across both the strategic, tactical and operational levels of the enterprise.	Process roles and their relation to the roles owners - such as the business, service, application, data, platform and infrastructure roles - is being managed across the enterprise. Their role and responsibility is fully understood and controlled and their results are monitored and measured during process-oriented projects and initiatives.	Process roles - including their collaboration with the other business, service, application, data, platform and infrastructure roles of the organization - plays a fundamental role within the enterprise when it comes to the development and optimization of both new as well as the existing business processes across the organizational boundaries. They play a key role in the collaborative feedback loop around the continuous improvement of business processes.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Process Rules	The process rules of each individual business unit share no relation or connection to the other rules of organization (ie. business, service, application, data, platform and infrastructure rules). This makes the process rules function only in silos, and their influence upon other business units is not fully understood.	Process rules share little to no connection to the other rules of the organization (ie. business, service, application, data, platform and infrastructure rules), but previous successful business process implementation initiatives allows for repetition. Process rules is now a natural part of business process standardization across organizational boundaries.	Process rules and their connection to business, service, application, data, platform and infrastructure rules have become explicitly defined and documented for future development and implementation projects. Their definitions and the documentation thereof allows for knowledge sharing and use across organizational boundaries in all process-oriented projects and initiatives.	Process rules and their relation to business, service, application, data, platform and infrastructure rules is now being efficiently managed, controlled and monitored across organizational boundaries.	Process rules have become a central part of all process-oriented development and continuous improvement initiatives across all organizational business units. They also represent an important aspect of the enterprise-wide collaborative feedback loop.

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
Process Compliance	Process compliance is entirely silo-based and shares no relation to any other form of compliance, regardless of which business unit in which the associated business process is a part of.	The successful implementation of process compliance during earlier process-oriented projects and initiatives allows for basic process compliance standardization across organizational boundaries.	Process compliance is now standardized, defined and fully documented. Process compliance is furthermore being addressed during all process-oriented projects and development initiatives across organizational boundaries.	Process compliance now share a direct connection to business, application, data, platform and infrastructure compliance. These connections are now fully understood, and their usability is managed, controlled and monitored during all process-oriented projects and development initiatives.	Process compliance, along with process rules, have become a central part of all process-oriented development and continuous improvement initiatives across all organizational business units. They also represent an important aspect of the enterprise-wide collaborative feedback loop.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Application	Logical and physical application components as well as application modules, features, functions, tasks and system reports support the execution of business processes, although only in silos, and performance and implementation knowledge is not shared across organizational boundaries.	Using logical and physical application components as well as application modules, features, functions, tasks and system reports to successfully implement and run business processes is not repeatable across organizational boundaries and allows for basic business process standardization.	Logical and physical application components as well as application modules, features, functions, tasks and system reports are now being clearly defined and documented across organizational boundaries. Knowledge sharing happens across both the strategic, tactical and operational management levels across business units.	Logical and physical application components as well as application modules, features, functions, tasks and system reports share a direct connection to all business processes, and are managed, controlled and monitored during all process-oriented projects and development initiatives.	Logical and physical application components as well as application modules, features, functions, tasks and system reports and their connection to business processes have become a part in collaborative feedback loop of continuous business process improvement and optimization across organizational boundaries.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Process Measurement	Process measurements are carried out largely sporadically and only in an ad hoc manner. Process measurement results and reporting is also entirely silo-based, which prevents knowledge sharing across business units.	Drawn from the successes of previous execution and implementation, process measurements is now being done on all executed business processes and allows for basic standardization across organizational boundaries.	Process measurements are explicitly defined and documented for how they should measure executable business processes. Process measurement results and reporting happen across business units to enhance organizational learning.	Process measurements are being efficiently managed, controlled and monitored in correspondence to relevant business measures, service measurements as well system measurements, and reporting is afterwards delivered to all relevant processs owners and stakeholders.	Process measurements are used as a central part in the collaborative feedback loop of continuous business process improvement across organizational boundaries. The process measurement results in combination with business measures, service measurements as well system measurements allows for a much higher degree of knowledge-based business process development and optimization during process-oriented projects and initiatives.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Channel	Business, service, application, data, platform and	Business, service, application, data, platform and infrastructure channels	Business, service, application, data, platform and	Business, service, application, data, platform and	All business process operations make use of both business, service,

	infrastructure channels are used only sporadically and largely ad hoc during business process execution. They are used only in silos, thus preventing knowledge sharing across organizational boundaries.	have become standardized and are now repeatable due to earlier successful implementations in process-oriented projects and development initiatives.	infrastructure channels are defined and documented in detail across organizational boundaries on the strategic, tactical and operational management levels and are central to knowledge sharing and learning across the enterprise.	infrastructure channels are directly related to all business process operations and are managed, controlled and monitored across organizational boundaries during process-oriented projects and initiatives.	application, data, platform and infrastructure channels in the collaborative feedback loop during process-oriented projects and development initiatives. They also represent an important aspect of supporting the continuous improvement and optimization of existing business processes.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Data	Data components, entities and tables are used actively throughout all business process operations, although only in silos (ie. in single business units), preventing knowledge to spread throughout the organization.	Data components, entities and tables are being utilized across organizational boundaries during business process implementation. The data components, entities and tables are fully understood, and are now repeatable for standardization projects around business process implementation.	Data components, entities and tables has become clearly defined and documented across all strategic, tactical and operational management levels to help support organizational learning around business process operations.	Data components, entities and tables have a direct relationship to all relevant process objects, and their purpose is fully understood across the organizational business units.	The organization has become explicitly data-centric and data-driven in the collaborative feedback loop during business process implementation, development and improvement projects and initiatives. Data aids in supporting business differentiation and supports enterprise-wide integration.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Media	The use of business, application, data, platform and infrastructure media during business process operations often occurs ad hoc and delivers performance on an initial basis. The usage also only happens in silos, so knowledge is never shared amongst business units.	Business process operations during implementation phases make use of business, application, data, platform and infrastructure media under more standardized yet basic circumstances.	Business, application, data, platform and infrastructure media has now been explicitly defined and documented in how they support business process operations and development, and the knowledge thereof is shared across organizational boundaries for an increased strategic, tactical and operational management agility.	Business, application, data, platform and infrastructure media relate to all relevant process objects, and supports business process execution across organizational boundaries. The use of media is fully understood by the organization. They are also managed, controlled and monitored across the enterprise.	All business process operations make use of both business, application, data, platform and infrastructure media in the collaborative feedback loop during process-oriented projects and development initiatives and are of high importance in the support of continuous business process improvement and optimization.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Platform	Logical and physical platform components as well as platform devices and functions effectively support the development and execution of business process operations, although their use is largely ad	Logical and physical platform components as well as platform devices and functions support implementation of standardized business process developments and installments.	Logical and physical platform components as well as platform devices and functions are being clearly defined and documented across the organization in order to support organizational learning of business	Logical and physical platform components as well as platform devices and functions are efficiently managed and controlled across organizational boundaries. The platform objects are also directly	Logical and physical platform components as well as platform devices and functions serve as important aspects to support the continuous business process improvement and optimization during the

	hoc and occurs only in silos within the organization.		process operations and development.	related to all relevant process objects.	collaborative feedback loop.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Infrastructure	Logical and physical infrastructure components as well as infrastructure devices, functions and features effectively support the development and execution of business process operations, and helps support the organization in doing so through networking capabilities.	Logical and physical infrastructure components as well as infrastructure devices, functions and features aids the platform components in supporting the implementation of standardized business process developments and operations.	Logical and physical infrastructure components as well as infrastructure devices, functions and features are being clearly defined and documented across the organization in order to support organizational learning of business process operations and development.	Logical and physical infrastructure components as well as infrastructure devices, functions and features are efficiently managed and controlled across organizational boundaries. The infrastructure objects are also directly related to all relevant process objects.	Logical and physical infrastructure components as well as infrastructure devices, functions and features serve as important aspects to support the continuous business process improvement and optimization during the collaborative feedback loop.
	LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Service	Business processes are directly supported by application, data, platform and infrastructure services, however, they share no connection to the business services of the organization. Service delivery of executed business processes are not measured, nor controlled, and appear largely ad hoc and initial in their behavior.	Application, data, platform and infrastructure services are used to support basic business process standardization across organizational boundaries due to the repetition of earlier successes in previous process-oriented projects and development initiatives.	Application, data, platform and infrastructure services has been defined and documented in detail in order to support and enhance organizational learning of their function and purpose around business process operations and development.	Business, application, data, platform and infrastructure services are now all directly related to all relevant process flows. Their function and purpose is fully managed, controlled and monitored across organizational boundaries of the enterprise.	Business, application, data, platform and infrastructure services are used as a central part in the collaborative feedback loop across organizational boundaries. The services also aid in supporting the organizations during continuous business improvement and optimization.

Table 2: The BPM Maturity self-assessment

From Maturity Level Assessment To Maturity Benchmark

A BPM Maturity level assessment is essentially a way of describing the extent to which a process or function exists in context to the rest of the organization. This is important because when the process activities and its context is the relationship that relate to the:

- Effective way of working
- Efficient operation
- Consistent performance
- Reliable value creation and realization

Since the early 90's in order to develop new strategic direction and to improve performance organizations they have analyzed their as is situation and tried to figure out what they need to change to reach the desired To Be stage. Once the organization has finished the BPM maturity self-assessment and understand their BPM maturity of their As-Is situation, we have found out that the various organizations spend a tremendous amount of time, resources and money to understand and benchmark the different aspects. We have therefore developed a standard BPM maturity benchmark that enables to compare the different areas against each other. Given an immediate overview of the specific maturity level of the different areas and where the lowest maturity within an area is. This enables to see the weakest maturity

and how it impacts the other areas. In figure 5, an example of such a BPM Maturity Benchmark is illustrated:

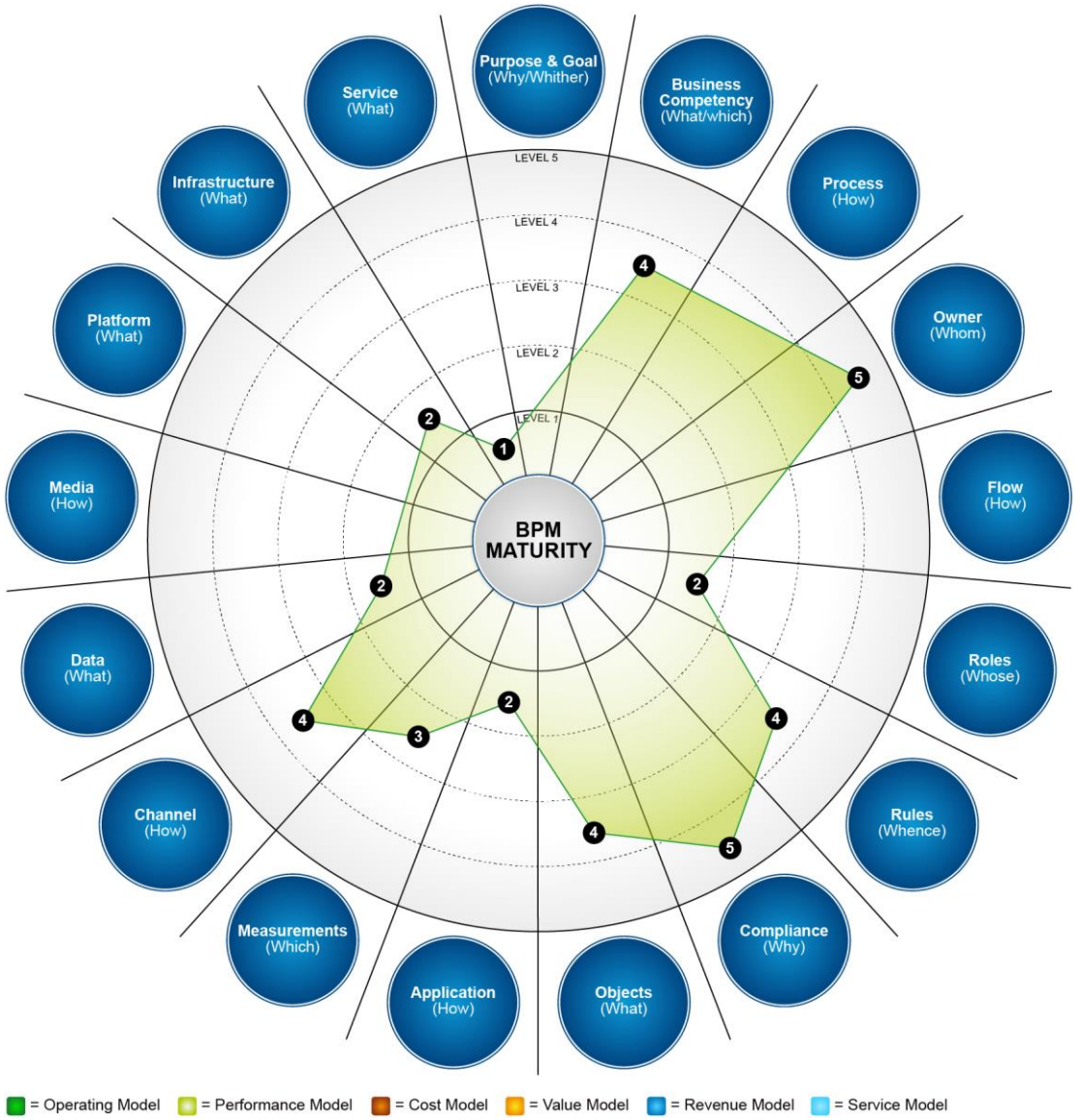

Figure 5: Example of a BPM Maturity Benchmark.[41]

There are two main reasons why organizations and people want to know the maturity and benchmark them against the various functions related to processes. The first is to establish a baseline, i.e. Where are we now? The second is to understand the potential for improvement and development. If the self-assessment generates a maturity value of less than 4 or 5, one could say that there is scope for improvement and development. Likewise in a benchmarking exercise of the various maturity assessments against each other reveal a huge gap, an organization can assume that there is scope for improvement and development. It is however vital to understand that such a benchmark cannot answer the following important questions:

- What should the maturity value be for this process in our organization at this point in time?
- What could a possible maturity development path look like?
- Which areas are impacted and improve when increasing the maturity in this specific area?

[41] LEADing Practice Maturity Reference Content [#LEAD-ES60003AL]

In addition to the above, one of the greatest challenges in such a process is the impact to the business in terms of the impact to the operating model, performance and cost model as well as the service, value and even revenue model. This is seen as very relevant since the various context areas assessed impact the business in different ways. In Figure 6 is an example of a BPM Maturity Development Path illustrated that specifies the existing maturity, which in this example is level 1, the identified impacted business aspects. In this example the impacted business aspects of the low maturity in the mentioned area effects the revenue model, the value model as well as the daily performance model. In addition to that is the timeframe for development through the maturity levels specified.

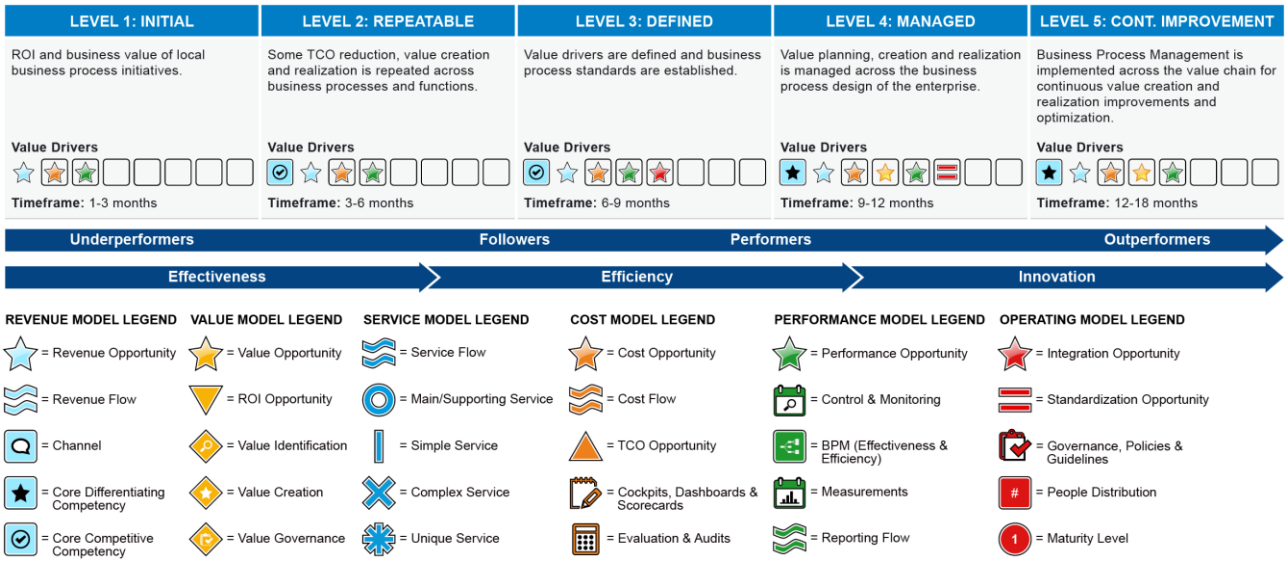

Figure 6: Example of a BPM Maturity Development Path complete with value drivers and timeline for each maturity level.[42]

Such a specific development path is seen as very vital for any organization, especially since this is one the weakest points of general maturity models e.g. CMMI. General maturity models encourage the achievement of a higher maturity level with all aspects. We see this as absolutely wrong and actually more hurting the development of the organization than helping them. An organization will and needs to have different levels of maturity in their various areas. While for example core differentiating aspects and the value creating aspects of an organization needs to be at maturity level 4 and 5. However, the non-differentiating, non-competing aspects of the organization, should not be at maturity level 4 and 5, the cost to achieve a higher maturity level than 3 would be far greater than the possible gain. The best maturity could be level 2 were it needs to be repeated and standardized; anything higher might not have the cost/value trade off. Such a cost/value trade off, obviously needs to be closely analyzed by the organization and this is exactly what the BPM Maturity Development Path is about.

Conclusion

In this section, we have focused on maturity models, what they are, their historic development, how they could be used, and where BPM can use maturity concepts. We illustrated a detailed BPM maturity self-assessment, a benchmark among the various aspects that are related to the BPM maturity context as well as a BPM maturity development path. All to enable hands on practical guidance, to assess ones maturity and to develop it. Without such a BPM Maturity assessment and a connected benchmark, the journey to BPM maturity will be difficult and frustrating. What we have provided here is a starting point for

[42] LEADing Practice Maturity Reference Content [#LEAD-ES60003AL]

organizations to map out their development journey ahead of time and determine the proper number of rest stops along the way to the ultimate destination, which may or not be level 5. We believe this is a start of a great journey and wish you luck with your maturity development journey.