



## Class Notes: BPM Research and Education

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## A Little Knowledge is a Dangerous Thing: Building Business Process Management Skills

Business Process Management skills are a hot commodity these days. When I searched for “Business Process Management” on HotJobs recently, the query returned 50,000 job openings that required some degree of business process expertise. But what exactly is the skill set of a BPM expert? Here’s a hint: Not everybody needs to be fluent in BPEL. And how many different flavors of BPM experts are there? Those who build and implement process support systems require a different focus from those who evaluate and design work processes. And where can you hone your BPM skills? If you have attended a BPM-oriented conference in the past few years your inbox has probably seen its fair share of BPM training offerings, ranging from ½ day to week-long training courses. In addition, there are BPM courses as part of MSc and MBA programs, and some dedicated certificate and degree programs. How much can you expect to take away from 4 hours of BPM training? And what skill set can you expect from a graduate with academic BPM coursework? It’s time to give these back-to-school offerings a closer look.

### Classmates

Knowledge about processes comes in useful at different levels of the corporate hierarchy. So who are your classmates?

*Executives* are concerned with issues of corporate performance and compliance. They need to know how the operational processes of their organization feed their measurement tools (Balanced Scorecards and Strategy Maps). They need to be able to identify strengths and weaknesses in the process portfolio of the organization. And they need to understand what process governance structure is appropriate for their organization and how it can be implemented. Executives are not necessarily interested in high fidelity process maps, but need to understand the position of their organization in the value chain that reaches from suppliers to customers. Process analytics capabilities are becoming a sought-after feature, and an understanding of what you can do with the insights gathered from BAM and BI tools will make a difference at this level.

*Business Analysts* analyze, document, and improve processes. They need to understand the needs of the business unit they work with, how the objectives of the process under evaluation align with overall corporate goals, and what process improvement patterns may be applicable in the current situation. Business Analysts use formal process maps to document as-is and to-be work processes, so they need to be conversant in process mapping techniques such as BPMN. They need to understand how the diagrams that they create can be organized to form a process architecture, both in terms of hierarchy (from value chain to workflow) and landscape (from supplier-facing to customer-facing processes). At the same time, they need some technical understanding of the capabilities that process support systems provide, and how these capabilities can be leveraged to triage processes into straight-through processing branches and

human interaction branches, create work support systems, and leverage emerging technical architectures such as an enterprise service bus.

*Systems Analysts* create solutions around the to-be processes documented by Business Analysts, and they maintain and design solutions around existing processes. Their skill set is dominated by a deep understanding of the technical capabilities of BPMS and ancillary technologies, such as document management systems, messaging infrastructures, and portal technology. Like Business Analysts, Systems Analysts work with a formal documentation of the process being supported, and they may embellish the BPMN diagrams from the Business Analyst with constructs that relate to technical implementation details, such as messaging interactions, and automated steps that are outside the view of business users. In addition, Systems Analysts need to understand how to translate these specifications into a running implementation, using whatever platform their company has available. So in addition to a generic BPM skill set, Systems Analysts require vendor-specific education about the features and deployment guidelines of their technical BPM platform.

*BPM Vendors and Systems Integrators* need to understand the context of their solutions. Their professional services organization often works with their client's Systems Analysts to deploy specific BPM solutions. In addition to the requisite technical skills to design and implement BPM systems, vendors increasingly develop methodologies for the deployment of their systems, which are based on a set of project management and product-specific skills. In addition, vendors need to build an understanding of the vertical industries that they serve. Part of this industry-specific knowledge is an understanding of vertical integration standards in domains such as finance, healthcare, or insurance, which their systems need to conform to.

Group	Responsibilities	Required skills	Domain of Skills
Executives	Ensure process performance and compliance	Process Analytics Process Governance Process Portfolio Management	Business Administration / Information Systems
Business Analysts	Process Analysis and Documentation Process Improvement	Process Modeling Process Analytics Process Improvement Patterns	Information Systems
Systems Analysts	Process Implementation Systems Integration	Process Modeling Workflow Implementation User Interface Design Systems Integration	Information Systems / Computer Science
Vendors & Systems Integrators	BPMS design and implementation Process Implementation	Deployment Methodology Systems Analysis, Design and Implementation Vertical Domain Standards	Computer Science / Project Management / Business Administration

**Table 1: Required Skills of different BPM Constituents**

## A Taxonomy of BPM Knowledge

There are plenty of BPM program offerings to date, ranging from ½-day BPMN modeling workshops to fully accredited academic programs that provide Master's and MBA degrees with concentrations in Business Process Management. A good way to evaluate the content of these programs is to study the outcome, i.e. what skills you will have acquired once you go through one of these educational offerings. An established standard for learning goals is Bloom's Taxonomy, first published in 1956.<sup>1</sup> Bloom states that an educational program should specify to what extent the following skills are built (in order of complexity): Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.

<sup>1</sup> If you are a regular reader of this column you may be led to think I have a thing for 1950's literature, but this is really just a coincidence.

*Knowledge* is concerned with the observation and recall of information. A simple example in the context of BPM would be that a student can define what a process, an activity, a value chain, or a gateway is. Knowledge may extend to dates, events or places. For instance, students may learn the historical origins of BPM technology and the different milestones that led to today's generation of BPM systems. Another category of knowledge is the recall of major ideas, which would allow students to understand the nominal differences between technologies such as BPM, BI, SOA, and ERP systems. At the highest level of this category is the mastery of the subject matter in terms of definitions and specifications.

*Comprehension* is concerned with understanding of information, having a grasp of its meaning, being able to translate knowledge into a new context, and being able to predict consequences. Beyond a basic recall of facts (which means simply memorizing definitions), comprehension takes this knowledge to a usable level. Students should be able to put concepts they know into their own words. In the context of BPM, understanding information could mean that a student understands the semantics of BPMN symbols and is able to read the structure of a BPMN process diagram. At the next level, he or she will grasp the meaning of the diagram, i.e. understand its context. One step further is the translation of knowledge into new context, for example the use of process design patterns on a new process. The comparison, interpretation and contrasting of facts allows students to use process metrics to make analytical decisions, and to order a set of processes according to their degree of structure (i.e. from ad-hoc to production processes). At the highest level of comprehension, a student will be able to predict consequences – for instance, he or she may be able to infer the performance of a process from its design.

*Application* moves the skills acquired as knowledge and comprehension to situations outside the classroom. Students at this level are able to use information, methods, concepts, and theories in new situations. For example, a student that is able to use BPMN to model a previously undocumented process has reached the level of application. Solving problems using the requisite skills or knowledge signals the mastery of the application level.

At the level of *Analysis* students should be able to compare two related concepts and point out their similarities and differences. This includes the identification of patterns in data, for example the documentation of process patterns or best practices, and the development of reference models. Students should be able to organize parts of a system. In the context of BPM this means that they can create process frameworks or architectures that place individual company processes in a larger context. Up one level from this is the recognition of hidden meanings. This skill implies that students can recognize hidden meanings, an important skill for business analysts. An example would be the evaluation of interview transcripts to identify causes of change resistance in an organization. Finally, students should be able to independently identify components of a system, for instance by using a structured approach to process identification and documentation.

*Synthesis* skills enable students to develop their own models of the world. They can use old ideas to create new ones. For example, they can apply reengineering patterns to an existing process design to come up with new designs. They should be able to generalize from given facts, extracting patterns and reference models from a collection of industry processes. They should know how to relate knowledge from several areas, e.g. by combining business rule modeling and business process modeling. Finally, students should use all the previously mentioned skills to predict and draw conclusions. For example, a student at this level can use a simulation to forecast the impact of process changes on organizational performance.

The highest level of Bloom's Taxonomy is *Evaluation*. Given a particular situation, students should be able to choose an approach or model and explain their choice. They should be able to compare and discriminate between ideas, such as modeling techniques, BPM standards, or tools. They know how to assess the value of theories and external presentations, separating hype from reality. For example, students should be able to critically evaluate a newly proposed BPM

standard. Students should be able to make choices based on reasoned argument, for example, select a documentation standard or integration technology based on the context of their project or organization. They need to be able to verify the value of evidence, e.g. they can assess whether the current documentation of a process sufficiently represents organizational reality. Finally, students should be able to recognize subjectivity and act accordingly.

Stage	Example	Techniques	Typical Questions
Evaluation	Informed choice between modeling techniques, tools and methodologies	Debate successful and unsuccessful case studies and propose alternative approaches (role play)	Which tool/method/technique is appropriate for our organization?
Synthesis	Generate new process design by applying outside process improvement patterns	Discuss commonalities, underlying truth of multiple methods, techniques	How can we improve/redesign/ substitute this process?
Analysis	Be able to create process architecture for an organization	Provide organizational examples and domain context for techniques	What are the weaknesses in this process?
Application	Be able to model BPMN diagram	Teach procedure models, methodologies	How can we represent this process?
Comprehension	Be able to read BPMN diagram	Teach vocabulary of modeling techniques	What does this process do?
Knowledge	Recall the definition of "Activity"	Teach Facts, Definitions, Creation of controlled vocabulary	What is a process?

Figure 1: BPM Skill Levels according to Bloom's Taxonomy

## BPM U?

The mapping of BPM skills to Bloom's taxonomy illustrates that you cannot expect to walk away a BPM expert after taking a single day seminar, or visiting a conference. Building BPM skills is a process that starts with the basic understanding of BPM terminology, and culminates in a skillset that allows the synthesis of technical, methodical, and organizational concepts to a coherent BPM methodology for a specific organization. A workshop or seminar can build knowledge and comprehension, but to move to a higher stage, practical experience and more structured education programs are necessary.

There are hopeful signs: Many universities are including at least one course on BPM in their graduate curriculum in Business Administration or Information Systems. Examples are the University of Muenster in Germany, TU Eindhoven in the Netherlands, Bentley College's MBA program, and Indiana University, which offers a BSc major in BPM. This means that today's graduates have been exposed to process management concepts, and will have an easier time understanding and supporting corporate BPM initiatives.

For those looking for a more systematic and in-depth treatment of BPM, the following academic institutions offer specialized education in BPM, ranging from 4 course certificates to 20 course Master's programs:

Organization	Program	Level	Remarks
<b>Region: Australia</b>			
Queensland University of Technology Faculty of Information Technology Brisbane, QLD Australia <a href="http://www.bpm.fit.qut.edu.au">http://www.bpm.fit.qut.edu.au</a>	Master in Business Process Management (12 courses + project)	Graduate	New program, start in 2008
<b>Region: North America</b>			
Stevens Institute of Technology School of Technology Management Hoboken, NJ USA <a href="http://howe.stevens.edu/BPM">http://howe.stevens.edu/BPM</a>	Graduate Certificate in BPM & Service Innovation (4 courses) Masters in Information Systems w/ Concentration in BPM & Service Innovation (12 courses)	Graduate	Courses are offered on-campus, at corporate sites, and online
Widener University School of Business Administration Chester, PA USA <a href="http://www3.widener.edu/Academics/School_of_Business_Administration/Business_Process_Innovation/6715/">http://www3.widener.edu/Academics/School_of_Business_Administration/Business_Process_Innovation/6715/</a>	Certificate in Business Process Innovation (4 courses)	Graduate	Hybrid course delivery (both face to face and online), Saturday program
<b>Region: South America</b>			
Universidad de Chile Departamento Ingeniería Industrial Santiago, Chile <a href="http://www.dii.uchile.cl/mbe">http://www.dii.uchile.cl/mbe</a>	Master in Business Engineering (20 courses)	Graduate	Offered since 2003, 50 students in the program
<b>Region: Europe</b>			
Vlerick Leuven Gent Management School BE-9000 Gent Belgium <a href="http://www.vlerick.be/BPM">http://www.vlerick.be/BPM</a>	Excellence in Business Process Improvement (4 modules over 10 days)	Executive	Plans to offer a 26 day Executive Master Program

Table 2: Schools with Specialized BPM Course Offerings

### BPM Icons vs. BPM Teams

Many individual BPM protagonists in organizations have achieved the highest level of BPM skills (Bloom's evaluation level), often informed by related areas such as Six Sigma and Total Quality Management. However, if they stand alone they will have a hard time selling their good ideas to the rest of the organization. They need to be supported by a handful of employees with analytical skills and a large number of employees with at least basic BPM knowledge, as this facilitates how BPM ideas can be proselytized through the organization. A classification of BPM skills is useful in developing a staffing plan for BPM Centers of Excellence as well. Take stock: How many people does your organization have at the different levels? And how many should you have? Got you thinking? Good. Class dismissed.

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