# BPM and Data

When I first started working with business process improvement, in the mid-Sixties, there weren't many computer systems. When a company hired me to fix a sales process, I would study what people did, and then suggest changes in the way people performed that would make things more efficient or effective. In that world, data was maintained by writing things on forms and storing them in filing cabinets. Today, data is mostly associated with digital information stored in computer databases and retrieved through some form of electronic device. Computers and associated technologies allow us to capture data orders of magnitude greater than we could in the past and to search and display that data in myriad ways on a wide variety of devices—from wall-sized screens in operations centers to PCs and smart phones.

At the bpmNEXT conference in March, I heard speakers talk about chips embedded in a wide variety of devices that serve as sensors relaying information to larger machines that apply rules to decide whether or not to forward the data to still larger machines with smarter systems, or humans capable of evaluating the data.

After the 2012 US presidential election I read articles about how the Obama campaign organization gathered huge amounts of information from emails, tweets and sites like Facebook, and analyzed it to identify supporters. Using data mining techniques the campaign team was able to target specific individuals who would be receptive to their campaign message, and, later, to target their supporters to get them out to vote.

Given the pervasive use of data in many processes, one speaker at the bpmNEXT conference urged that every process developer define the data used by any process they analyzed. I've thought about that and tried to decide how useful I thought that would be. My first response was to think the individual was an IT person thinking about automating specific processes.

My own work is often with senior managers, and I tend to focus on how to redesign processes to incorporate new business models or technologies that will radically change the nature of the process. Or, I tend to work at the business architecture level and help organizations define their broad process relationships and needs.

Figure 1 is a figure I used in my March 11, 2013 Advisor. At the time, I used it to explain the difference in focus between a project involving business architecture development, a major redesign project, and a project designed to generate a software application to automate a specific activity. It is all process work but the focus changes depending on what level of process work you are doing.

Primary focus of Enterprise Business Process Architecture work

Primary focus of Business Process Redesign work

Primary focus of Software Automation efforts & of human job redesign & training efforts

**Organization contains Value Chains (Level 0)**
Company: Computer Chip Manufacturer

Value Chain Manufacture Computer Chips

**Value Chain contains Level 1 Processes**
Level 1 Process Procure Materials

**Level 1 Process contains Level 2 Processes**
Level 2 Process Acquire (Source) Parts/Assemblies

**Level 2 Process contains Level 3 Processes**
Level 3 Process Plan/ Manage Acquire (Source) Parts/Assemblies

**Level 3 Process contains Level 4 Processes**
Level 4. Identify Acceptable Vendors

**Level 4 Process contains Level 5 Processes**
Level 5. Establish Part Vendors List Subprocesses

Level 6. Tasks within any one of the Activities shown on this diagram

If this process was not automated, this is the level at which employees would be seen performing tasks

**High Level Business Process**

At this level one is not contained with data. One knows it will need to be maintained, but it isn't as important as simply figuring out what the major processes are and how they relate to each others and to stakeholders.
You might seek to capture very high level information about data you need from a customer or need to provide a stakeholder.

**Mid Level Business Process**

At this level one is focused on redesigning a business process. You will definitely be interested in sources and flows of data within the process, but not in the details of how IT will actually handle the data – unless you already know that you will be automating all or most of the process in scope.

**Low Level Business Process**

This is the level at which one gets concrete. Here one writes a Requirements Document to define how IT will need to support the business process.

What will user interfaces look like? What will the data model look like?
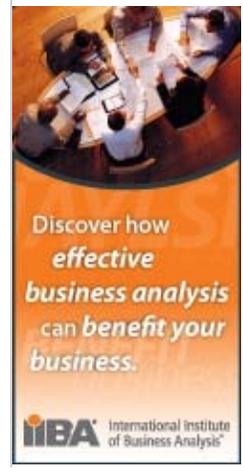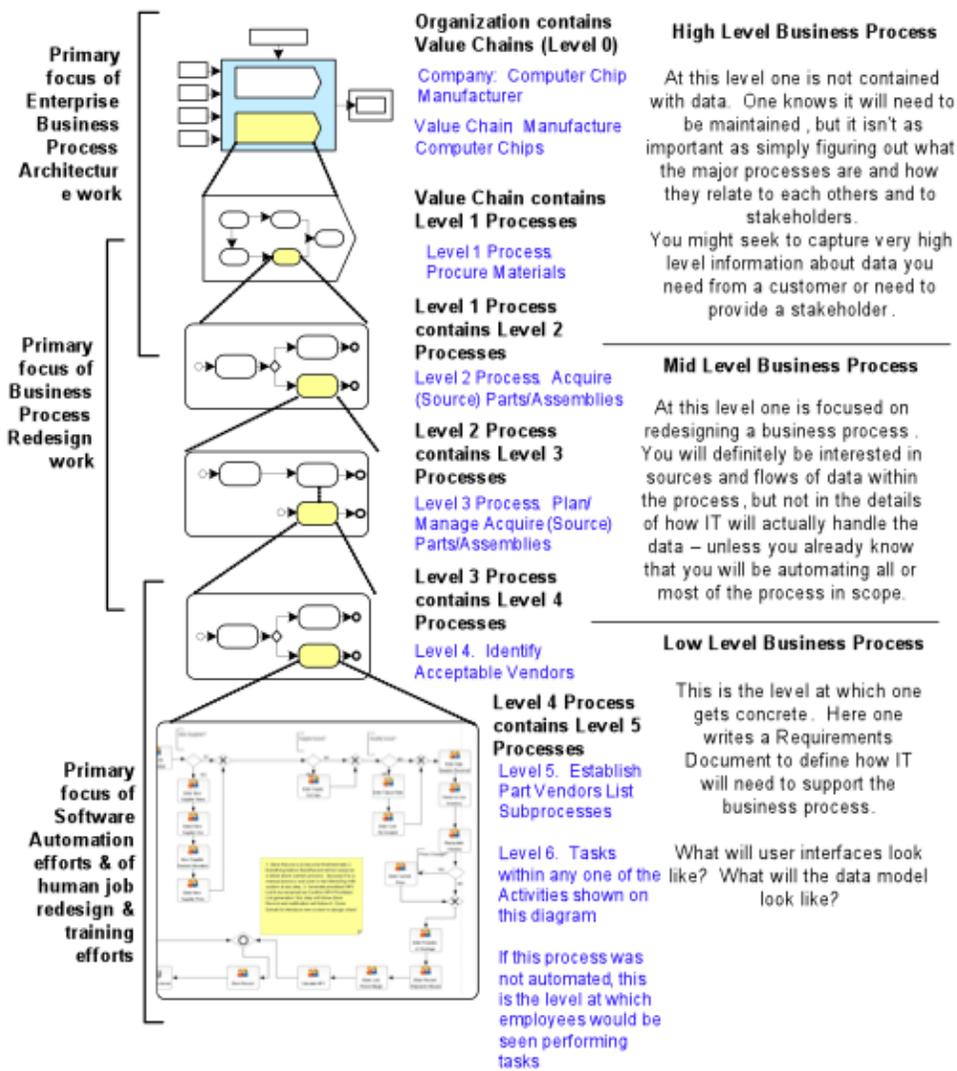
**Figure 1. Process work at various levels of detail**

Let's consider the relationship between data and process as suggested by Figure 1. If you are focused on the architecture level you are not concerned with data. You know data will need to be maintained, but at this level, it isn't as important as figuring out what the major processes are and how they relate to each other and to stakeholders.

You might seek to capture very high level information about data you need from a customer or that you need to provide to a stakeholder, but this is the kind of information you would keep in your notes rather than documenting it in a diagram.

If you are doing a major redesign you will definitely be interested in sources and flows of data within the process, but not in the details of how IT will actually handle the data—unless you already know that you will be automating all or most of the process in scope.

### Representing Data in BPMN Diagrams

A BPMN diagram can be drawn at a level of specificity required to generate software code, which would include the flow of data to and from a given activity. In most of our process work we do not seek that degree of specificity when we diagram mid-level processes. When we prepare diagrams to show how a mid-level business process works (As-Is), or should work (To-Be), we use a limited set of the BPMN notation (core notation) and we supplement the notation with additional notation that lets us track business redesign concerns. Thus, for example, we often insert red stoplights to highlight problems, or

yellow triangles to warn us that we need to gather data and investigate something in more depth.

If we know that an activity in a mid-level process is going to need data, we often do a Use Case to describe, in a general way, the data that will be needed. In our BPTrends Associates BPM Methodology we show the activity that will input or receive the data, and we show a software application or database in a separate pool that will receive or output requested data. We use Use Cases as they are popularly used in software requirements development, but simply modify the diagram a bit to fit within a swimlane format. In addition to preparing a diagram like the one in Figure 2, we would also complete a worksheet with more information, or enter the data in a software tool if we were using one in our process development effort.
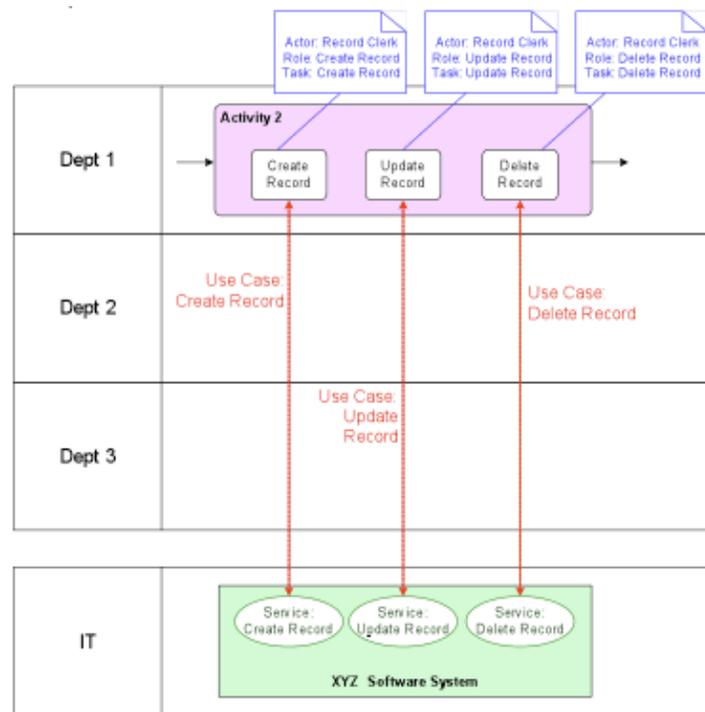


**Figure 2. Defining Use Cases for Activities in a Swimlane Diagram**

The diagram shown in Figure 2, coupled with a worksheet, usually provides the information the business process redesign team needs to understand the problem and to complete the redesign.

If the process team decides to decompose a mid-level diagram into a lower level diagram, or, more likely, if the team hands off a specific activity (activity 2 in Figure 2) and requirements to an IT team and asks them to automate the activity, then someone will need to be concrete. If you are dealing with an older IT shop, they will consider creating data models. If you are working with a group that is using a BPMS tool, they will probably create a detailed BPMN diagram of activity 2. In this case, the diagram can be concrete enough to capture all of the data flows into or out of the activity being automated. At some point, similarly, someone might develop a data model to specify the precise data being used in the process, or to design a database that will maintain the data. Similarly, actual software application interface screens will be developed.

### Data, Decision Management and Rules

If the process team had originally focused on decisions that would need to be made in the process and developed decision models and/or tables or rules to capture decisions, then they would have a different perspective on the data to be used in the activity.

In essence, a business rule takes the form: If A is true, and B is greater than 21, and C is "Tall", then Assign D the value of true.

This rule would require data (perhaps in the form of observations entered by a clerk) to ascertain the value of A, B and C, and the ability to update a record to assign the value of true to D.

If a given activity used a set of rules, then all of the data required for those rules would need to be provided for the activity to make appropriate decisions. When focused on redesigning the mid-level process the team would focus on capturing the business rules involved in making decisions. If they used a software tool to capture the rules—by far the best practice if many rules are involved—then they would have a way of tracking the data required to drive the rules. (The OMG's new Decision Model will provide explicit ways of talking about the data required by a given set of business rules.)

Returning to the original challenge—keeping track of the data used in a process—it is obviously important, but how you do it and what you do depends quite a bit on the nature of the process you are working on and the approach you are using. If you are trying to decide if you can transform your business by using a new technology, data may not be very important as you focus on the high level process you are trying to transform. If you are working on a process redesign and seek to modify a mid-level process to make it more efficient or effective, data will be involved, but in most cases, it will play a secondary role.

Certainly it will play no more important role than how people perform, how decisions are made, or whether a given activity really needs to be done, or could be eliminated. Use Cases provide a good way to capture how specific activities at this level use data.

When you shift to low level processes—especially if you are going to automate the processes - then data becomes critical, and you need to track each data flow in the process you are concerned with. Probably the best way to do this, today, is to use BPMN and a BPMS software package so that you capture the use of data in the context of the process and can generate code directly from your process model.

If you are working with decision models or business rules during process redesign then you can capture data in a slightly different way, although it all comes together when you deal with software development.

Data isn't the beginning or end of process work, but it is very important, especially as we focus on concrete processes.

Till next time,
Paul Harmon

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