BPMN Modeling – Who, Where, How and Why

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Abstract

The Business Process Modeling Notation (BPMN) is an increasingly important standard for process modeling and has enjoyed high levels of attention and uptake in BPM practice. This paper reports on a global survey of BPMN process modelers conducted during May to August 2007. Five hundred and ninety BPMN modelers responded and provided insights into the who, where, how and why of BPMN process modeling as well as into some of the problems users experience when modeling with BPMN.

BPMN and its Users – Friends or Foes?

Finally, we have it. An industry standard for process modeling. Something for everyone. Something with widespread support. The one-for-all solution to all our problems.

To be frank, we are happy. BPMN is indeed a rich language and allows us to define a multitude of business scenarios, ranging from internal process choreographies to inter-organizational process orchestrations, service interactions and workflow exceptions. Not bad at all. Not surprisingly, BPMN has enjoyed widespread adoption in practice, for example by tool vendors (e.g., Pega, Sparxsystems, Telelogic, Intalio, itp-commerce), education providers (e.g., Widener University, Queensland University of Technology and Howe School of Technology Management) or modeling coaches and consultants (e.g., Object Training, BPM-Training.com and BPMInstitute.org).

BPMN was developed by a consortium comprising representatives from most of exactly those players in the global BPM market. And yes, they have done a good job. Yet, the only missing puzzle piece in this enjoyable picture of BPM success is – the user! We know a lot about what BPMN can do, how it is implemented, and even how we can (finally…) build BPEL code from our BPMN models [1]. The one aspect, however, we still don't quite understand is how BPMN is actually used by those envisaged to use it – process architects, system managers, business analysts and consultants.

The Survey

It is only fair to say that, so far, organizations seeking to adopt BPMN were a little shorthanded in terms of experience reports available. Only few cases are reported about how BPMN is actually used in practice – notable exceptions include [2] and [3]. Our research group at Queensland University of Technology was thus interested in finding out about the 'real' use of BPMN in practice on a large, global scale. We designed and administered a world-wide survey with BPMN modelers. Over four months during 2007, 590 BPMN users responded from all over the globe.

In conducting the survey, our effort was generously supported by the wider BPM community. We received sponsorship and help not only from community forums (such as ABPMP, BPTrends, BPM-Roundtable.com, BPM-Netzwerk, XING, Tibco Community, Eclipse Newsgroup, but – as can be seen from Figures 1 – also from tool vendors and training providers, as well as universities (e.g., Howe School of Technology Management) and blogs including BPMS Watch (http://69.36.189.101/wordpress/), BPM Research (http://bpm-research.com), Phil Gilbert's blog (http://blog.lombardicto.com/), ITRedux (http://weblog.itredux.com/), Go Flow (http://kswenson.wordpress.com/), or eBIZQ (http://www.ebizq.net/blogs/column2/). It seemed

that everyone had a profound interest in the study and its outcomes. At this stage, we would like to thank all those who helped us in disseminating and advertising the survey.

Figure 1. BPMN survey supporters

Who's Using BPMN – and Where

In total, data was collected from BPMN modelers from over thirty countries world-wide. The geographic distribution of these respondents mirrors the general distribution of BPM practitioners world-wide. Not surprisingly, Europe, North America and Oceania account for almost three quarters of all responses (see Figure 2). Almost 60% of respondents work for private sector companies. More than 40% of respondents work in large organizations with more than 1000 employees, while 22.7% and 26.8% of respondents work for middle- and small-sized organizations, respectively. The size of the process modeling team, in which respondents work as process modelers, ranges from less than 10 members (64.4% of respondents) to more than 50 members (3.8% of respondents). It would appear that even in large corporations, the team of employees dedicated to BPMN modeling is small.

It further appears that BPMN is popular both in business and IT communities. 51% of respondents stated to be using BPMN for business purposes (process documentation, improvement, business analysis, stakeholder communication and the like) while the remaining 49% used BPMN for more technical purposes (such as process simulation, service analysis and workflow engineering). The popularity of BPMN in both camps can further be seen by looking at which BPMN sets are being used in practice: 36% of respondents rely on the core BPMN set to develop their (rather basic) process models. 37% use an extended set of BPMN symbols and the remaining 27% use all the functionality BPMN has to offer.

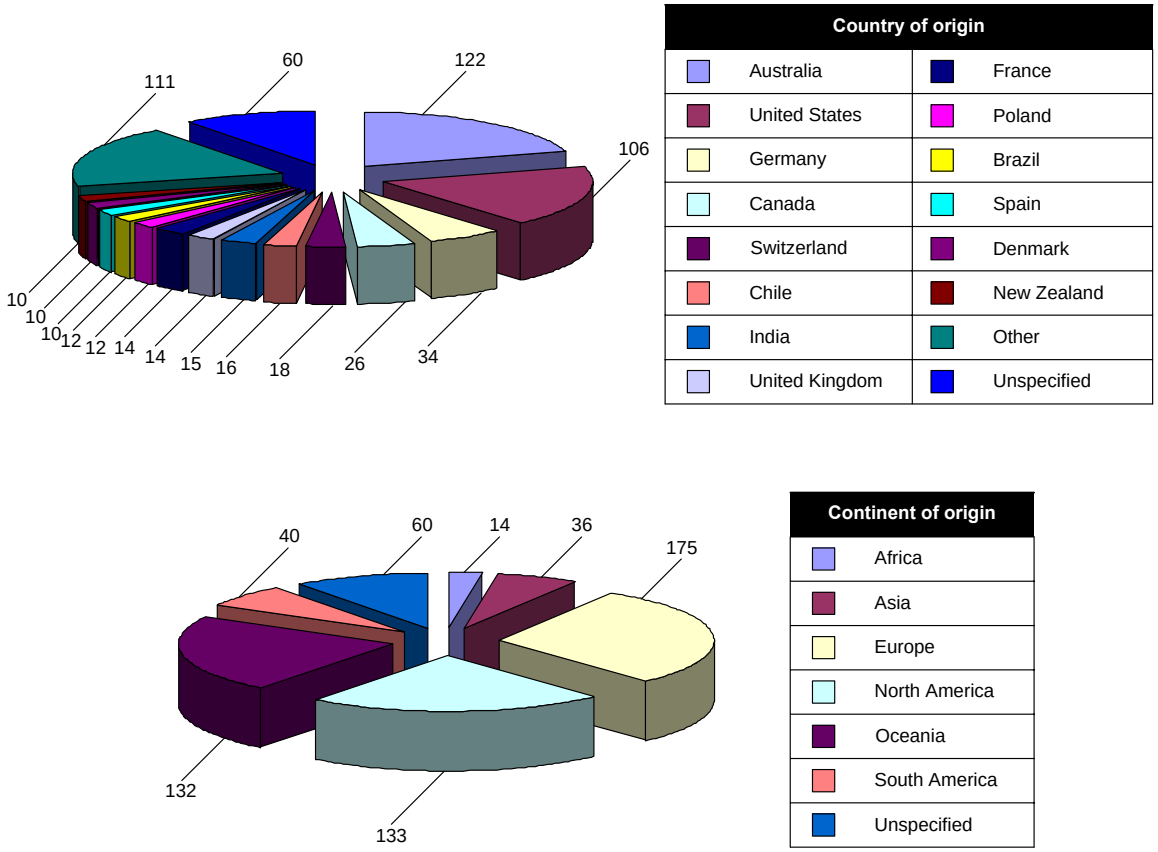

Figure 2. Participant country and continent of origin

Respondents were also asked to comment on the type of training received. Only 13.6% of respondents received formal training in process modeling with BPMN (e.g., by means of a licensed professional training provider or as part of university studies in business process management-related courses). Of those that were trained, certified courses through vendors and training providers are the most popular options (9.5%), followed by in-house training (5.1%). In contrast, roughly 70% of respondents learned BPMN process modeling through self-education or working on the job. What does this tell us? We are not very well educated in process modeling with BPMN. Yet, BPMN is arguably complex and not easy to learn. Just read some of Bruce Silver's blogs on BPMN training (http://69.36.189.101/wordpress/) and you will agree (even if you don't believe me here and now).

Process modeling success very simply depends on qualified people doing a good job. So, people, go back to school! In other words, to fully leverage the opportunities and chances offered by an advanced language such as BPMN, formal education is needed – and users need to attend to theses classes. And since we know that there is simply no substitute for modeling expertise, it's paramount to spend some time and effort on BPM education (how this could work is explained here: [4]).

Regarding tool support for BPMN, Table 1 lists the most popular tools in use and also the type of functionality that users expect in a BPMN tool. As can be seen, Microsoft Visio with the freely available BPMN stencils (http://www.bpm-research.com/downloads/bpmn-stencils/) denotes by far the most popular way to model BPMN. But – let me stress this point again [5]: Microsoft Visio is a nice drawing tool – not a BPM workstation let alone engine. There is no user management,

attribute management let alone model repository. It may well help users to familiarize themselves with the basic idea of process modeling and BPMN – but that's about it.

And there are other options available: Itp-Commerce's solution surely profits from being a Visio plug-in that extends the modeling capacities of Visio with a BPMN simulation engine, additional attributes and analysis options. Aside from these small-scaled solutions, a number of familiar names appear in the upper half of Table 1, e.g., SparxSystems, Telelogic, Intalio, IDS Scheer and Casewise. These vendors provide advanced BPM solutions that stretch well beyond pure modeling capabilities.

Type of tool used	Usage
Microsoft Visio	18.2%
itp-Commerce Process Modeler	7.8%
SparxSystems Enterprise Architect	6.9%
Visual Paradigm Visual Architect	6.2%
Telelogic System Architect	5.7%
Intalio BPMS	5.0%
ILOG Jviews	3.8%
IDS Scheer ARIS	3.3%
Casewise Corporate Modeler	3.3%
Holocentric Modeler	2.8%
iGrafx FlowCharter	2.4%
MagicDraw	1.9%
Inhouse solution	1.9%
Savvion Process Modeler	1.4%
Tibco BusinessStudio	1.4%
Appian BPM Suite	1.4%
Other	15.6%
Various	10.9%
Tool functionality used	**Usage**
Integrated repository for all process models	46.4%
Navigation between process models on different levels	56.2%
Additional attribute fields for symbols	42.6%
Access to other notations and modeling techniques	31.7%
Access to new symbols in addition to BPMN symbols	26.4%
Access or hyperlinks to other documentation from within the process models	41.9%
Method filter for restricting and specifying the set of symbols to be used	21.1%

Table 1. BPMN tool support

As per tool functionality, it would appear that BPMN users often use model repositories, model browsers and similar functionality implemented in modeling tools to support the navigation between large numbers of BPMN models –functionality Visio cannot deliver by the way. Also, quite often are BPMN models extended with additional symbols (e.g., to articulate process-related risks, organizational information, performance indicators and the like) or even other models (e.g., organizational charts, business rule specifications, data information or service descriptions). This refers back to BPMN being a *process* modeling language that does exactly this – model processes. A lot of organizational tasks, however, require additional information, be it for workflow specification (resources, data, objects etc.) or compliance management (risks, mitigation strategies, process owners etc.)

User Problems with BPMN – Room for Improvement

So what do the end users think about BPMN? Sure, they do use it a lot. They may not yet be overly familiar or mature with the language but BPMN is in fact quite popular. Users like BPMN because of its instrumentality – it simply performs well in process modeling projects. Users are also satisfied when it is easy to model BPMN diagrams – which, of course, is not always the case. As with any other language, some things are easier to say (or model, for that matter) than others. And BPMN, let's face it, is rich – which also means that it is not the easiest language to work with. Have you tried to digest the list of the twenty or so event types to find the one that is most suitable? Or (from my own experience), have you tried to explain the messaging concept to a group of process modeling newbies? Quite hard, indeed.

But, of course, that doesn't mean that BPMN cannot be changed or improved in a way that would make it easier for us. Being an Object Management Group (www.omg.org) standard, BPMN is constantly undergoing revisions and extensions. Some of you may have already heard of BPMN 1.1, which is about to be released; and some of you may have also heard rumors about BPMN 2.0, which will come out some years into the future.

Our endeavor was, accordingly, to gather some feedback from end users – not necessarily on the strengths of BPMN but instead on its weaknesses – where future releases of BPMN can be improved. The following loose collection of bullet points is a consolidated list of the user responses we gathered about the *problems* of modeling with BPMN. Hopefully, these user issues serve as a starting point, not only for the BPMN developers but also for tool vendors, consultants, modeling coaches and all those who want to identify – and avoid – obstacles when using BPMN for process modeling.

1) Support for Business Rule Specification

Most notably, our study highlighted a deficit of BPMN in supporting the articulation of business rules (like the scenario shown in Figure 3). Process modeling and rule modeling languages are both used in organizations to document organizational policies and procedures. However, little effort has been made to understand let alone leverage their synergies and overlap. Rule specification is in fact an essential task in understanding business processes, and it would be good to see that process modeling solutions acknowledge this a bit better and provide better (or more integrated) support for these tasks. Better support could, as one respondent put it, be as simple as an additional graphical symbol:

[…] A symbol that says something specifically is a business rule so that you know in future to look at it, mightn't be bad.

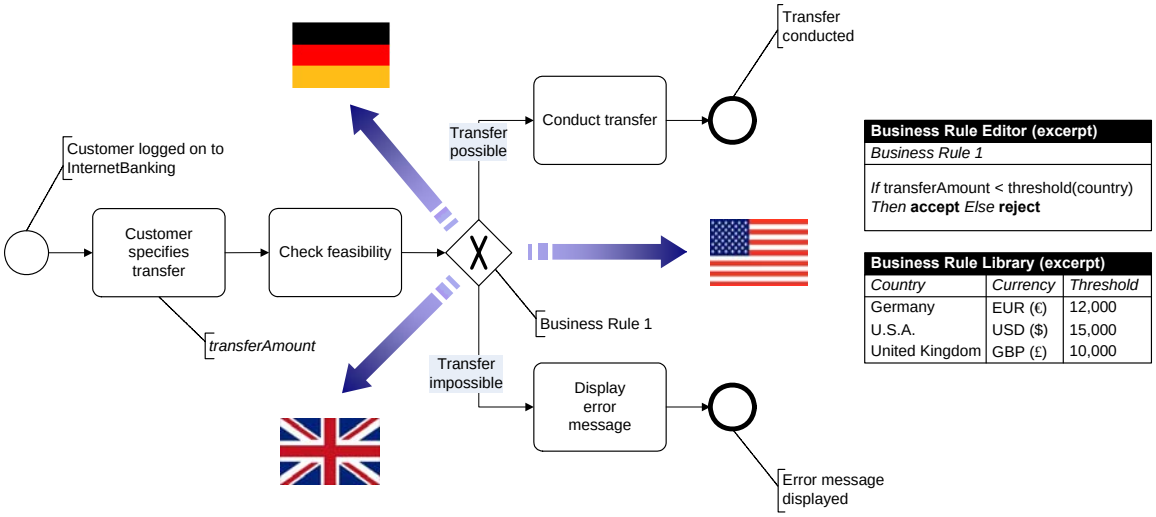

Figure 3. Process modeling and business rules

2) Support for Process Decomposition

A similar situation was found in regard to the articulation of process structure and decomposition. Process modelers often need to define precisely the scope and boundaries of the process they model, but fail to do so adequately with existing process modeling approaches. BPMN clearly lacks some advanced concepts to support this task – at least from a user perspective. What can be done? Maybe dedicated symbols for placing a process into its organizational and hierarchical context could help. Or maybe our finding is a motivation to place more effort into understanding decomposition in process modeling and to come up with better language and tool support.

3) Support for Organizational Modeling

Pools and Lanes often present a burden for BPMN users. Clearly, they have been envisaged by the BPMN designers to be flexible in interpretation and usage. However, the ambiguity that comes with their flexible semantics is contradictory to the ease with which Lanes and Pools can be used for BPMN modeling. Our responses show that the extra effort required for specifying the meaning of a Lane or Pool diminishes the ease with which we build BPMN models. A related advice would be to provide better support for differentiating the multiple purposes for which Lanes and Pools can be used (e.g., by adding different graphical markers for systems, roles, departments etc.).

4) Gateways, Off-page connectors and Groups

Another question we were interested in was finding out whether all BPMN symbols are actually used. BPMN has a number of symbols that we think are simply superfluous and unnecessary. Why do you need an off-page connector? The Grouping symbol? Should people use the empty gateway or the empty event symbol super types when there are so many sub types? Is the Multiple Instances concept important to process modeling practice? And, really, are gateways at all necessary for process modeling? In a series of interviews we asked twenty BPMN users whether they use certain symbols or not. Figure 4 shows the results.

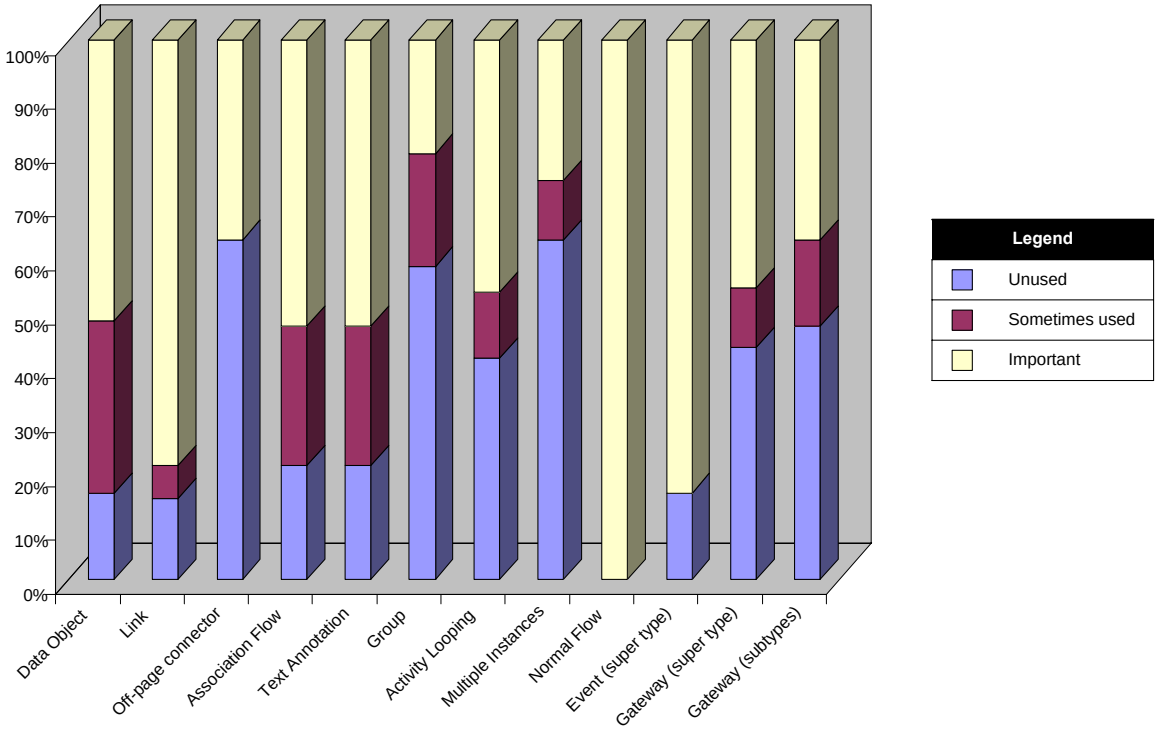

Figure 4. Use of selected BPMN symbols

The symbols Off-page connector, Group, and Multiple Instances were classified by over 50% as being 'not in use', 'not understood' or 'not aware'. In contrast, some of the other symbols in Table 2 were rated as essential for process modeling, for instance Normal Flows, Links or Text Annotations. These symbols may do little in adding expressive power to a process model, but they can help clarifying some scenarios or offering more help to the model end user. For instance, it was noted that the use of text annotations stems from a need for clarification for inexperienced model users:

[…] I think they're useful. They are essential, you need some form of clarification. Maybe not in future when everyone's used to these maps, but at the moment it's very limited.

5) Events, Events, Events, Events

The last area of concern with BPMN in this loose compilation is related to the sheer abundance of different event symbols in BPMN. The differentiation of business events into various time and type dimensions creates a long list of different symbols that could find their way into a process models. And – from the user perspective – this is simply too much. It appears to be another example where the ease of use of process modeling is sacrificed for sheer expressive power. The negative responses gathered about the complexity that comes with selecting the 'right' event symbol to use appear to say: the simpler the better. It would be important to acknowledge this user response – especially in light of the current BPMN 1.1 draft – word on the street is that even more BPMN symbols are planned. Really, is this necessary? Isn't there enough already?

The Way Forward

Our objective was to gather some user feedback on the use of BPMN. This we have done. However, the next challenge is to communicate this feedback back to those responsible for BPMN development, tool implementation, consulting and education. So what is in the box? The development of BPMN 1.1 is underway, with the intention to fix specification errors and

inconsistencies. The OMG working group is hopefully open for comments and we will seek to use our research as input to their endeavor.

It won't stop there. BPMN 2.0 is on the agenda [6], with a number of work items:

- align BPPM with the business process definition meta model BPDM (http://en.wikipedia.org/wiki/Business_Process_Definition_Metamodel)
- include some extensions such as enhancements for process choreography
- serialize BPMN and provide XML schemas for model transformation
- extend BPMN towards business modeling and executive decision support

So, BPMN still has a long way to go. We hope that in the future we will see more interaction of BPMN with its user base, to make sure that all the future versions do one thing really well: support end users in their process modeling. Because that's what everyone is looking for. Really.

P.S. Those of you interested in learning more about the survey are encouraged to check the web page http://www.bpm.fit.qut.edu.au/projects/acceptance/ for updates.

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