

WHAT STANDARDS REALLY MATTER FOR BPM

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Introduction

Motivated by the dramatic success of the internet, the software industry has become obsessed with standards. The general premise, which is valid, is that standards can accelerate market adoption. At the same time, we are seeing efforts to define standards earlier and earlier in market lifecycles. These standards, typically driven by vendors or research organizations, are not based on proven customer requirements. Instead, they are based on trying to anticipate what those requirements will be. Historically, standards developed in this manner have failed (Has anyone in the computing industry talked about OSI in the last 10 years?).

The BPM industry has its share in the standards debate. Multiple standards bodies and offshoot organizations are proposing a range of standards – sometimes in conflict with each other – for solving a wide range of real or perceived issues and problems. Customers are asking for these standards, sometimes without having a clear idea how adopting these standards will benefit them in practice. Many vendors are trying to sort through the standards to determine if they should invest their R&D dollars in supporting more pressing customer requirements or supporting the proposed future standards. The end result is a tremendous amount of discussion, confusion, and bureaucracy, with papers presenting alternative points of view (this is one of them!).

The objective of this paper is to evaluate and understand the role of BPM standards in the present state of the evolution of the BPM industry. Our strong belief is that the current standards efforts are misguided and will not lead to the realization of the benefits touted by their advocates. Through a comparison with other industries, we also present our assessment of the type of standards that will further the cause of BPM and also produce tangible benefits for customers.

Standards Efforts in the BPM Industry

There have been several attempts at introducing BPM/workflow standards, starting with the establishment of the Workflow Management Coalition (WfMC) in 1994. WfMC was established during the peak of the client/server era before the Internet boom hit the software industry. Thus, the early versions of the WfMC standards had a distinctive client/server flavor. Later on, when XML gained momentum, WfMC adapted, introducing XML-based standards. As soon as they made some progress on that front, Web Services came on the horizon and the standards had to be revisited again. WfMC never gained traction, even among the vendor community that sponsored it. It always appeared that WfMC standards were lagging behind the technology waves that were creating a sea change in the software industry.

WfMC was followed in 1997-1998 by SWAP (Simplified Workflow Access Protocol), which was championed by Netscape, among others. SWAP never gained any traction either, other than appearing in some RFIs and causing consternation to some vendors and customers alike.

A similar pattern has emerged within the EAI side of BPM with efforts ranging from Microsoft's XLANG to BPML, WSCI, and others. The latest hot standard is BPEL4WS, which goes by BPEL for short. BPEL has the backing of major industry influencers like IBM, Microsoft, and BPM. At the same time, it only addresses a fraction of the BPM market, as it does not have any facilities for human involvement in processes. Additionally, BPEL is still evolving, making it very risky for vendors and customers to commit significant resources to its implementation.

A quick review of these attempts to create standards leads to the following observations:

- i. None of the BPM standards have achieved any traction among customers.
- ii. Current standards such as BPEL are based mostly on theoretical concepts, with limited real deployments and field validation of their benefits.
- iii. The underlying infrastructure and technology of BPM is evolving quickly and is too young to derive benefits from the proposed standards.
- iv. The standards change dramatically from version to version to address new requirements. Rapid change in software technology makes previous versions obsolete. This makes investing in development around these standards a high-risk proposition.
- v. In almost 10 years of trying, practical examples of how any of these BPM standards have benefited customers in practice are non-existent.

The Case for Standards

The proponents of BPM standards tout many benefits that could result from the wide adoption of standards in the industry. The major benefits can be broadly classified into the following six categories:

*i. **Further the Understanding of BPM:***

The first benefit of standards is that they promote the use of standard terminology and definitions. This accelerates the understanding and adoption of a new technology such as BPM by reducing confusion and making it easier for customers to compare competitive products.

*ii. **Make it Easier to Develop Business Processes:***

Proponents of BPEL claim that by developing a standard language that is widely used, it will be easier for companies to develop, maintain, and upgrade business processes. The often-quoted example is that of HTML, and how the adoption of HTML standards has tremendously increased the availability of information to consumers worldwide at a fraction of the cost as compared to the pre-internet days. The argument follows that the adoption of a standard language will propel the use of BPM in a similar fashion.

*iii. **Facilitate Interaction among BPM Systems from Different Vendors:***

A large company may use a different BPM system for different types of processes. In many cases, it is important for the business processes hosted by disparate BPM systems to interact with each other. A process hosted on one system may launch a subprocess hosted by another system. If both systems use the same underlying language for defining the processes, it will make it easier to support these interactions.

*iv. **Enable Migration and Transportability of BPM Processes:***

Another major proposed benefit of standards for defining business process is that they will allow companies to easily migrate processes from one BPM system to another. Customers are no longer tied to one vendor. If they are dissatisfied with the performance of a vendor, they can migrate their processes to another vendor whose BPM system is also based on standards.

v. **Reduce Cost for the Customer by Increasing Competition:**

By increasing understanding, facilitating interaction among BPM systems, and enabling the migration of processes from one system to another, the emergence of BPM standards will reduce cost to the customer. Standards will make BPM a commodity as the commoditization of products and services generally leads to a reduction in cost to the consumer.

vi. **Develop more Robust Processes Based on a Solid Mathematical Foundation:**

Proponents of BPEL claim that these languages for expressing processes are based on a solid mathematical foundation of *Pi Calculus*. The claim is that because of the mathematical foundations, business processes that are defined by using these languages are robust and reliable, as compared to processes that are not defined by using Pi Calculus. Math cannot be wrong, or so goes the argument (Smith & Fingar, 2003; Smith & Fingar, 2003).

While these benefits make sense, it is important to question whether they can be realized. This is a difficult thing to do. It is especially hard to argue against anything that is for the benefit of the consumer. In a world in which the customer is truly king, raising the argument against standards is tantamount to sin, especially when industry giants champion these very same standards. However, a closer look is required to ascertain whether these benefits can be realized.

Standards in Other Industries

To provide a different perspective, we explore the role of standards in three major industries – automotive, banking, and computers. These are all large and mature industries. Their size and scale are much bigger than the size of the BPM industry today. They are very different from each other, and they also exemplify industries that have grown tremendously in the last 100 years. Today no one will question the fact that cars, computers, and banks are considered de facto the originators of *standards* in the industrialized societies of the 21st century. So what are the standards that played a role in making these products an essential aspect of modern society?

- i. First and foremost, one can safely conclude that there are no “standards” or “standard bodies” that dictate the design of these products or services. When the consumer decides to purchase a car, he will most likely ask about the engine and its size. The consumer will also most likely be concerned with the manufacturer’s compliance with safety and other regulatory requirements. However, no one requires that the design of the engine or the interior of the car be approved by adherence to a specific design body. So long as the car is safe, has adequate performance, appeals to the taste of the buyer, and the price is competitive, the buyer is inclined to purchase it. Similarly, when a consumer decides to do business with a bank, he or she is concerned about the reputation of the bank, its level of service and convenience, and its compliance with federal regulations concerning banking. He or she is not at all concerned with the internal organizational design of the bank or its business structure. Computers are probably the most “standard design” driven because of the primacy of the Intel architecture. The computer buyer will most likely be concerned about the microprocessor used in the computer, seeking assurance that the programs he or she wishes to use will be able to run on that computer. However, there is no “standard design,” “standards body,” or “standard design language” that dictates the design of the computers. Even the Intel standard was driven by the ability of the company to dramatically reduce the cost and increase the performance of a microprocessor. It was improvements in manufacturing processes that drove down CPU prices to make the Intel architecture a standard. It was not the adherence by Intel or AMD to some standard design specification driven by a standards body.

- ii. While there are no “design standards” or “design language” for these standard products and services, there are indeed “standard interfaces” or “standard components” to which all comply either voluntarily, or because of regulations. In the automotive industry, these “standards” are the type of gasoline used, the side of the road on which the car is driven, the size of tires, brake indicators, and the provision of safety belts. In the banking industry the “interface standards” are the size and format of checkbooks, ATM machines, the ability to perform wire transfers with other banks, and the check clearing systems. In computers, the “standard interfaces” are the mouse interface, keyboard interface, the hard disk interface, USB, the internet connection, etc.
- iii. In all these industries, there is a standard terminology that is widely understood and greatly facilitates the communication of ideas and values pertaining to the industry. For the automotive industry, the words “brake,” “hood,” “wiper,” “tire,” and “accelerator” are widely understood. In banking, the words “check,” “teller,” “ATM,” “interest,” “savings account,” and “checking account” are universally understood. Likewise, in computers, the youngest of these industries, the word “RAM,” “processor,” “mouse,” “keyboard,” etc., have become common parts of the vernacular.
- iv. Finally, in all these industries the cost of functionality to the consumer has dropped considerably even though there are no standard designs.

The observations we have made about standards in the automotive, computer, and banking industries apply equally well to aerospace, telecommunications, healthcare, and all other large industries.

Standards in the Software Industry

The software industry also has standard product categories. ERP, CRM, and financial/accounting software businesses are very large, and products belonging to these categories are “standard” in almost all organizations. Furthermore, these product categories have given rise to a whole array of supporting product and service companies. Again, if one analyzes the use of standards in these major product categories, one discovers the following – which it is not dissimilar to what one finds in automobiles, banking, and computers:

- i. There are no “standards” or “standard bodies” that dictate the design of ERP, CRM, or financial/accounting products. When a company decides to purchase an ERP solution, the decision makers will most likely be concerned about (a) the reputation of the vendor, (b) the fit with internal requirements, (c) the price, and (d) the compatibility of the solution with the IT infrastructure of the company. However, no CIO requires that a specific design body must approve the internal design of the solution. For these very large product categories, there is no “standard design,” “standard body,” or “standard design language” that dictates their design.
- ii. While there are no “design standards” or “design language” for these so-called “standard” software products, there are indeed “standard interfaces” and “standard components” with which they comply to varying extents. They support standard databases such as Oracle, dB2, or SQL Servers. They rely on standard operating systems such as UNIX or Windows. They use other technologies that are considered standard such as the HTML browser and the TCP/IP protocol.
- iii. In all of these industries there is a “standard” terminology that is gradually evolving and beginning to be widely understood. This facilitates the communication of ideas and values pertaining to the industry. For ERP, these include “inventory,” “backlog,” and “minimum order quantity.” In CRM, the words “account,” “contacts,” and “customer” are widely understood.

- iv. While there is an enormous amount of software engineering and logic that goes into the design of ERP and CRM systems, there are no magical mathematical formulas that have enabled these industries to be successful as well as robust. Engineering and math also play a role in the design of components used by these systems, such as the databases and communication protocols. However, there is no unified mathematical theory that describes the operation and logic of these solutions. These products have prospered without the benefit of *Pi Calculus* or its variants.
- v. ERP, CRM, and accounting/finance systems are a major investment for companies that adopt these technologies. Despite this, there are no “standards” for the migration of the data and the internal business processes from one vendor to the other. Even though customers are more or less locked down with one vendor, due to the sheer cost of the deployments, the inability to migrate to other vendors has not prevented these industries from becoming major categories, and much larger than what BPM is today.
- vi. Finally, in all these industries, the cost of functionality has dropped even though there are no standard designs.

Many proponents of BPM standards naturally point to widely used industry standards, such as HTML, in the software industry. They claim that the widespread use of the HTML standard, driven by the standards bodies, is an excellent example of how standards can propel a “language” to become one of the most widely used technologies in the world. There is no denying this fact. HTML has become the de facto method of presenting documents over the internet, and its success is directly a result of the internet engineering committees that defined the standard. Without this effort, it is highly likely that the internet would be divided among the camps of major players such as Netscape and Microsoft.

However, the comparison between BPM and HTML is flawed, incorrect, and misleading. Drawing parallels between BPM and HTML would be akin to drawing parallels between a car and a battery. A battery is a component and may be standardized in its design and use. A car is a system, and its design cannot be standardized even though the volume of cars sold worldwide number well into the tens of millions. HTML is a technology for rendering documents, whereas a BPM system is a system and a way of conducting business. The former can be standardized but the latter cannot. There are many dissimilarities between HTML and a BPM system that make such a comparison meaningless:

- i. The number of electronic documents that exist worldwide runs into the billions; the number of BPM systems that exist worldwide probably does not exceed 5,000. It makes sense to try to standardize something that is in the billions.
- ii. Electronic documents have been around for at least 25 years. The concept of a BPM system has been around for not more than ten years, at most.
- iii. HTML has had its predecessors in SGML and UML. Prior to electronic documents the concept of document markup has existed for many, many years in the practice of editors and printers. Document markup went through stages of evolution till it finally matured. BPM systems have no such history.
- iv. Documents have had a standard terminology. Everyone understands fonts, paragraphs, indents, bullets, and pages. BPM does not have a well-defined terminology.

Therefore, it is misleading and inappropriate to compare HTML with a standard language for BPM.

The Problem with the Proposed BPM Standards

BPEL has emerged as the strongest candidate for a standard language for defining business processes. This strength is based primarily on the fact that many software vendors have backed this language, although most of them back it on paper only. BPEL relies upon the Web Services and XML standards that are fast becoming the lingua franca of business transactions.

We do not believe BPEL will become a broadly deployed industry standard for many reasons:

- i. BPM systems are systems; they are not technologies. As we have elaborated in previous sections by looking at other large non-software industries and major software product categories, it is possible and desirable to standardize on the technologies and components. However, systems cannot be standardized, nor is it desirable to standardize systems. BPM systems are very complex, and the representation of business processes is a very small part of these systems. Standardizing on the language to represent these processes will not result in the standardization of the system.
- ii. BPEL is very complex. Business people will never be able to understand this language. The vast majority of IT professionals will also not be able to understand it without extensive training.

Business processes belong to business people. If they do not understand the language, it is unlikely that the language will be of any benefit to them. Advocates of BPEL claim that the development of a graphical notation language such as BPMN will address these concerns. However, if that is the case, and if BPMN is designed for business people, then it is more important to concentrate on making BPMN a standard for business people, and to leave to the BPM vendors the underlying representation of business processes as they are defined using BPMN.

- iii. BPEL was developed and presented to the standardization committees by a group of software vendors. There was little participation by customers for the simple reason that there are (1) few customers of BPM systems, and (2) there are even fewer customers who understand BPEL. Standards that are established too soon in the market lifecycle, without strong customer and user feedback, are likely to impede, rather than promote, the growth of the market.
- iv. The purported benefits of the BPEL do not stand up under the light of scrutiny:
 - a. Standards are supposed to make it easier for the business user and the designer to understand business processes by providing a common language. The current standards are so complex that only very technical developers can understand what they really represent. Instead of promoting understanding, they promote confusion and chaos.
 - b. Standards are supposed to make it easier for business processes deployed on one vendor's BPM to be transportable to the BPM systems of another vendor, thereby giving customers freedom of choice and flexibility. This claim is highly exaggerated and unrealistic. A BPM system is much more than simple process definitions. A BPM system manages data, user interfaces, metrics, and many other aspects that are well beyond the scope of the standards. Even if simple processes can be migrated, the greater part of the migration effort will depend on other aspects that are not addressed by the standards. To date, no one has demonstrated the ability to migrate business processes from their own BPM systems to that of other vendors who comply with the standards.
 - c. It is highly doubtful that customers will want to share or open up their processes to others. Most customers think of their processes as being proprietary and guard them

jealously. What customers really need is not sharing or exposing processes, but exposing the interfaces of processes to their end-customers and partners.

- d. Attempts at standardization are too early. Market adoption of BPM is not deep enough to provide a good understanding of real requirements for standards. This means that the proposed standards will constantly evolve and change, and so they will no longer be standards.
- e. Supporters of BPEL claim that processes defined in these languages rely on *Pi Calculus*, and are therefore inherently reliable and better defined^{1,2}. However, no one has ever demonstrated how and why *Pi Calculus* helps create BPM systems that are more reliable and better defined than other systems that do not rely on it. The claim is that math cannot be wrong. The fallacy in this argument is that, indeed, math cannot be wrong, but the problem is not in the math. The problem is that math is implemented using software, and it is the software and not the math that determines the quality of the solution.

What BPM Standards are Needed

While we believe that BPEL and other current standards will not be successful, we are not opposed to any and every standard. We believe that the BPM industry does need standards that provide realistic benefits in the current state of the BPM industry. The BPM industry needs standards in the following areas:

1. **BPM Terminology:**

The BPM industry has no standard, widely accepted terminology. We believe that standard bodies should first promote acceptance of standard terminology so that business people and technologists can exchange ideas and concepts using words that are commonly and clearly understood. This must be the first step in standardization.

2. **BPM System Interactions:**

A BPM system must often be able to call processes that are managed by other BPM systems. To support this, it is essential to develop a standard methodology for one BPM system that can invoke processes managed by another BPM system. A Web Service interface is the best approach for this interface since a business process is essentially a composite of many services.

3. **Status Monitoring:**

The ability to monitor the status of a *process incident* is one of the most important features of a BPM system. (The ability to monitor is also widely used by the consumers of business processes who want to know the status of *things* and where the where things are.) Therefore, it is important to provide a standardized mechanism that can be used to investigate the status of a process incident that is being managed by any BPM system – a standard needed to define how to request status information, as well as the format of how the status information is provided. Again, a Web Services-based standard such as the proposed BPQL standard may be an ideal fit for this requirement.

4. **Process Metrics:**

This is another important aspect of BPM systems that can benefit from standardization. There are a wide variety of metrics that can be used to measure the efficiency of business processes. Some of these are generic, while others are very dependent on the application of a particular business process. Generic process metrics are excellent candidates for standardization, and such an effort will promote a better understanding about the use and optimization of BPM systems.

Recommendations for Users

At this stage in the lifecycle of the BPM market, BPM users should be wary about vendors, analysts, and consultants touting the advantages of standards before they have been validated in the field. We recommend the following to users:

1. Do not blindly include standards such as BPEL or WfMC in your requirements when you go about selecting a BPM system. Instead, focus on your actual business requirements for a BPM. If you are convinced that a particular standard would actually add realizable value, then, of course, include it in your requirements. Otherwise, concentrate on other features and characteristics that will add value to your needs.
2. Require vendors to support standard components and interfaces. These could include Web Services, XML, browsers, and the use of “standard” databases such as Oracle, dB2, or SQL Server.
3. Realize that the challenge for BPM adoption is not standards; the challenge is cultural. At a business level, it is about the company’s readiness to move to an environment where processes are better understood and accepted. At an individual level, it is about building an understanding of processes and how they provide a framework for decision-making (and not just the robotizing of work). At a technology level, it is about providing a solution that leverages the existing infrastructure, and facilitates interactions between technologists and business users to overcome hurdles. Companies should find BPM vendors who enable them to address these issues of understanding, while, at the same time, they are nimble enough to adopt standards quickly when there is a broad-based demand for them in the customer community.

Conclusion

BPM is in the early stages of evolution and is subject to rapid and ongoing changes. In addition, BPM systems are complex; they cater to how organizations run their businesses – rife with exceptions and new situations. In the early stages, it is difficult to imagine what is possible. When it is difficult to imagine the possibilities, the enforcement of standards is likely to stifle innovation. Experience from other industries, such as automotive and banking, and from other major software product categories, such as ERP and CRM, indicates that there are no standards that dictate the core design of these systems. There are, however, many “components” and interfaces that these systems use that are actual or de facto standards. Through the standardization of components and interfaces, but leaving systems flexible, these industries have grown to be very large and now are themselves de facto standards in modern societies.

For these and other reasons that we have discussed in this paper, we conclude that efforts to define standards for business processes modeling languages will continue to fail. Vendors and customers are spending too much time, effort, and marketing noise to push these standards for competitive advantage without giving serious consideration to the realizable benefits to the end customers. In the worst case, the push for standards, that dictates the core of BPM systems, is likely to stifle competition and innovation. Instead of focusing on modeling languages for business processes, it behooves thoughtful leaders and adaptive organizations in the industry to focus their energies on standardization that is possible today, namely terminology, metrics, status monitoring, and seamless interactions among the growing number of BPM systems.

References

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Howard Smith and Peter Fingar (2003) *Workflow is Just a Pi Process*, *Computer Science Corporation*