

The Business Value of Workflow and BPM

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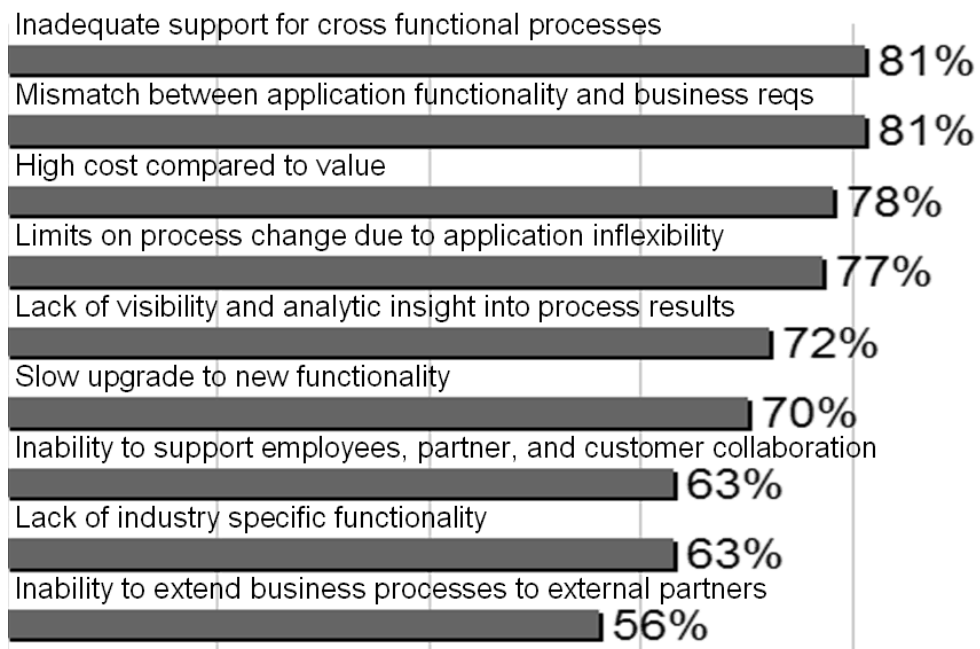
ABSTRACT

Human-Oriented Business Process Management, also called Workflow, is a critical component that allows applications to meet the agility demands of business. Service-Oriented Architecture (SOA) is an important design goal to meet the agility demands of Information Technology (IT).

IT and business users are different audiences, with very different demands, and failure to recognize this can lead to missed opportunities and unsatisfactory solutions. This paper will show how workflow can be brought together with SOA technology to form a powerful combination to meet both demands. IT can design services that are safe for non-technical people to compose into high level applications, giving them the unprecedented ability to respond to external events. Examples include a corporation that changed business process in 2½ hours in order to be in a new line of business the next day.

INTRODUCTION

In 2006, Forrester ran a poll of 146 IT Executives and asked the following question: “Considering your existing enterprise applications, how important are the following business problems?” The results of the poll are reflected in this chart:



The question does not specifically mention business process, nor was the audience selected for interest in business processes. Eighty one percent of the respon-

dents felt that inadequate support for cross-functional processes was an important business problem. Note that several other highly rated responses point to the need for business process support.

Please contact Forrester Research directly for the full details of the study and the results. This excerpt is used here to highlight that IT professionals understand that there is a divide between the business side, with its business requirements, and the support that is being provided. Those IT professionals are looking for ways to close this gap.

DEFINITION OF TERMS

Workflow is an excellent way to meet this need. Workflow allows for a better alignment of IT with business because it allows the enterprise applications to be expressed in a way that makes sense to business users. We will also see that it helps businesses be more agile by allowing business people control of the business aspects of applications, while IT people retain control of the applications' more technical aspects. Before discussing the details of how this comes about, we should start first with a definition of a few basic terms to make sure that we are talking about the same things.

The term *Business Process* is used a lot today, but often loosely to mean several different things. The origin of the term is generally attributed to Michael Hammer and his seminal work in the area of Business Process Reengineering. When Michael Hammer talks about a "Business Process" he uses the term to distinguish a "Business Process" from a "Manufacturing Process" or a "Chemical Process." The distinguishing characteristic of a Business Process is that it involves people doing office work. The point of his work was to get people to stop thinking about office work as being organized along functional lines, and to start thinking about the chain of different functions that must be strung together to accomplish a business goal. He was very successful in getting people to think along these lines, and today no serious business analyst would approach an attempt to improve the way an office works without starting by drawing out the process. Oddly, some people use the term business process for things that don't involve people or office work. I prefer the WfMC definition which has been stable for ten years now:

Business Process—A set of one or more linked procedures or activities which collectively realize a business objective or policy goal, normally within the context of an organizational structure defining functional roles and relationships.

Workflow—The automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules.

Process Definition—The representation of a business process in a form which supports automated manipulation, such as modeling, or enactment by a workflow management system. The process definition consists of a network of activities and their relationships, criteria to indicate the start and termination of the process, and information about the individual activities, such as participants, associated IT applications and data, etc.

The WfMC Glossary does not include a definition for "Business Process Management" but recent discussions within the Coalition have centered on the following proposal which highlights management aspect of the term:

Business Process Management—The practice of developing, running, performance measuring, and simulating Business Processes to effect the continued improvement of those processes. Business Process Management is concerned with the lifecycle of the Process Definition.

As office work has been traditionally supported through the use of paper documents and folders passed from function to function, many of the early workflow products focused on routing documents through a group of people. More recent systems are quite a bit more sophisticated, offering not only documents, but structured information handling, complex event processing, programmatic manipulation of information, and the ability to exchange information with web services and other external information sources. These newer capabilities allow the workflow systems to integrate into the modern IT infrastructure. At the same time, the workflow systems have not forgotten the human aspect, which give workflow a unique capability to bridge the gap between the business world and the IT world.

TWO DIFFERENT AUDIENCES

We talk about the gap between business and IT, but what do we mean? Businesses run on their information systems, but there are two distinct audiences.

The first audience we call *business users*. These are the people in the organization who are doing the work that directly accomplishes the goals of the organization. In most ways, these people are “users” of the information systems. The business side also includes management, who is interested in how well their organization is running, and might be interested in optimizing the way that people work. The CEO, CFO, and Line of Business manager are roles that are well known. We now talk more about the Business Analyst role. People in this role specialize in the organization of tasks into processes. The Business Analyst is not normally technical, but instead someone who understands the business and the goals of the business, as well as how to accomplish those goals with a team of people.

The second audience we call *Information Technology (IT) professionals*. This side of the business is responsible for providing the information systems. Sometimes this means developing custom applications for the enterprise, and in other cases it includes only installation and management of package applications.

The reason for considering these as two distinct groups is because they often look at the same problem with different goals and desires. The business side is concerned with business goals which are both manual and automatable, while the IT side is concerned with only those goals that can be translated into tested, reliable, and secure systems. While the IT side is organized around system structure and values 7x24 operation and scalability issues, the business side is organized around social structures with the complexities of working hours, vacation schedules, skills training, and changing positions.

Both business and IT users need agility, the ability to respond to change. But the rate and scope of change are different between the two groups. Not counting emergencies such as production server outages, there are usually weeks or months needed to plan the addition of a server or a new application to the system. The business user, on the other hand, needs to be responsive to competitors, the market, and personnel changes, on a week or even daily basis. If a competitor comes out with a challenging new product, you need to respond immediately. The typical average turnover across all US businesses is 20 percent. This means that if you are running a 1000-person organization, you will have on the average one

person leaving and joining every day. Your personnel change internally is much greater than that, because you have people learning new skills, moving into new positions, as well as taking and returning from vacations. Running a business is a matter of accommodating change on a daily basis.

Process support for humans is also very different than process support for IT systems, and this difference can be categorized as a difference in the handling of *time*. Making a process which routes information through a set of servers is a matter of identifying the servers and transforming the data as required by each, along with any conditional logic to determine what happens next. The servers are generally available 7 x 24, so when you have a job for a server to do, it can typically be given the task immediately. There are details for scalability and robustness being glossed over here, like retries for those rare cases that the server is down, or queues for the cases where a server is given multiple tasks at the same instant, but it is fair to generalize by saying that servers spend most of their time sitting and waiting to be given a task, and when given a task they take those tasks in the order given. They generally complete the task almost instantly.

People, on the other hand, work in a very different manner. A human process system (workflow) will offer tasks to people. Those people are not generally sitting around with nothing else to do, and do not take up the task immediately upon being assigned. Generally a person has a worklist with a variety of things “in progress” which can be sorted and completed in a more efficient manner. Tasks assigned during off hours will wait until opening hours to be considered. The assignment of a task to a *system* is very concrete; if a system is set up to handle a task by the installation of software, it is immediately able to handle all such tasks. Assigning tasks to *people* on the other hand is a much more complicated thing. People will have varying levels of particular skills, and are often specialized in certain ways. Two salespeople may have equivalent skill to close deals, but one of them may be more suitable for a particular job because of having more experience with, say, defense contractors. It may not be possible to express the criteria, so such systems need the ability to manually reassign tasks. Human process systems generally offer an ability to send reminders or escalate the task when it has not been completed within a certain time. Whereas, there is no point in sending a reminder to a server that has for any reason failed to complete an activity.

When IT professionals talk about process support (even *business* process support) they often are referring to this system to system process support which forms an important part of meeting their needs to create robust, scalable system. But when business users discuss process support, they usually refer to *human* process support, or workflow, which includes these human features, but at the same time can provide connectivity to the backend information systems. It is this unique ability for workflow systems to bridge between the human and system realm that makes them key in providing business value to the organization.

PURPOSE OF WORKFLOW

I have pointed out how workflow offers unique features that allow for the coordination of human work during the running of a process, but there is another key aspect of workflow which is critical to bridging the business IT gap. The business processes themselves must be able to be designed and modified by business people. Here are some comments that reflect this:

The ultimate goal of workflow is to place in the hands of business professionals the ability to modify their processes, with no involvement from the IT organization.—Michael Melenovsky, Gartner BPM Summit, 2006

... process changes are made by business professionals who need only limited knowledge of IT systems. In a growing number of cases, changes such as work item routing, business rule overrides, and parametric changes to approval levels, are made in real time to executing process.—Janelle Hill, Gartner BPM Summit, 2006

These ideas are very uncomfortable for most IT professionals. That is because they know that with traditional programming practices, if you let an untrained person modify the code it is far more likely to break the application than to improve it. I think most people would agree that, for a non-programmer, opening up Java, C++, or Visual Basic code would be dangerous. To complete an application, a programmer must apply many rules and practices in a correct manner to result in a reliable and safe application.

What these industry experts are saying is not that we want business people playing with the guts of the application developed along the lines of traditional programming, but rather that applications must be structured in a specific way that isolates the business process from the programming logic. The more technical aspects of the application need to be wrapped up into reusable chunks. Those chunks need to be robust and not sensitive to erroneous input. They need to be more like plugging a power adapter into your cell phone, and less like soldering a printed circuit board.

Business side retains control of:

- Assignment of responsibility because this depends strongly on who is in the organization.
- Groups, Roles, and Skills because these change on a monthly, weekly, or even daily basis.
- Deadlines, Alerts, Reminders, and Escalations because they depend on the culture of the organizational unit
- Order of tasks and addition of new manual tasks because this is critical for agility to be able to respond to market and legislative changes.
- User Interface because this is effected by the level of training or experience of a particular organization

IT retains control of:

- Computational logic and data representations because there is little or no dependency upon the culture of the organizations
- Scalability and performance because this requires significant specialized expertise in the working of information systems.
- Interoperability because this requires extensive knowledge of the operating infrastructure
- Master data management because this is constrained by highly specialized requirements

The business processes need to be abstracted out of the application, and represented as a structure separate from the more technical aspects. The business process is simply used to sequence the chunks into an integrated whole in a way that is safe for a non-programmer to edit.

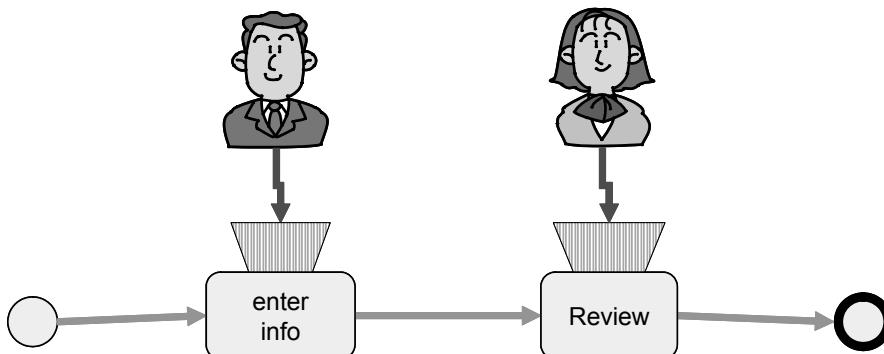
By 2009, 20 percent of business processes in the Global 2000 will be supported on BPMS[*]. These processes will be predominantly those that involve a lot of human work, that differentiate the company from its competitors and that are poorly supported by existing IT systems (0.7 probability). -- Janelle Hill, Gartner BPM Summit 2006

Gartner defines a BPMS as a suite that handles both human and system processes, which is equivalent to the definition of workflow given above. This trend is clear.

AN EXAMPLE: HUMAN-BPM APPLICATION

To illuminate how the application might be structured to allow for the different responsibilities to be split across different groups of people, consider in detail an example application for processing bank loans. It is common for the application development to start with drawing a high level human-oriented process diagram. A business analyst might start by deciding what important business activities need to take place to accomplish the goal. Imagine that people come to the bank and fill out an application which is subsequently scanned and converted to text data, and that this is the event that starts the process. In this case the business analyst determines that two people need to be involved. First, a person needs to review the input data for completeness and as a check of the character recognition. Once that has been done, a bank manager needs to make a decision on whether to grant the loan or not.

This example is simplified so it can be discussed in this article, but it is important to note that the business analyst is dealing only with jobs that must be performed only with humans within the organization. There is an implicit assumption that there will be a bunch of data processing associated with the process, but that is not a concern at this level. For example, a bank will clearly want to perform a background check on the applicant, but that is not a human activity. Since that can be completely automated, there is no reason to have a person in your office who performs background checks. Instead, it is assumed that somewhere between the first and second human activity, a call will be made to retrieve information about the background of the applicant, and the bank manager has the results of that available in order to make the decision of whether to loan the money or not. At this point, the business analyst is concerned only with the activities that will be done by office workers.



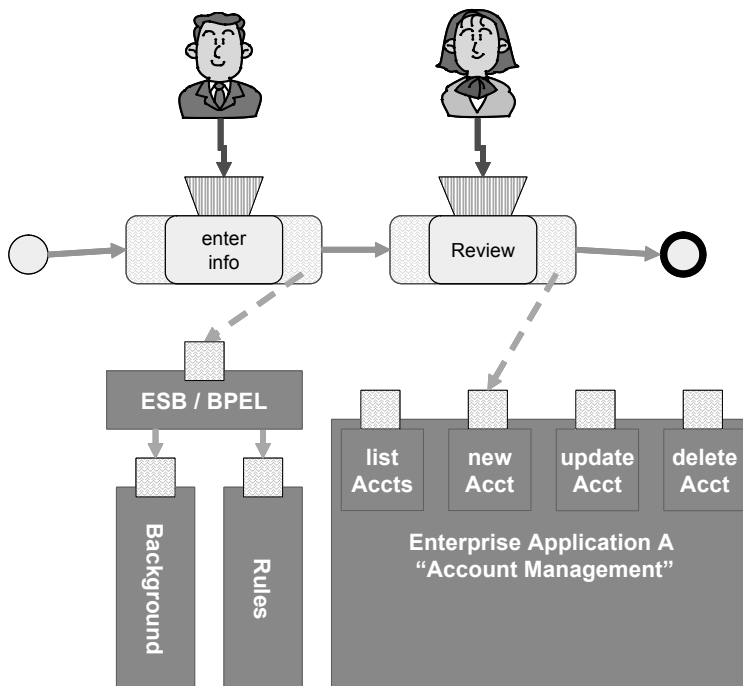
The diagram above is a conglomerate of notations. The circles, rounded rectangles, and arrows between them depict the process using a standard called Business Process Modeling Notation (BPMN). The rounded rectangles are the standard way that you represent an activity, while the circles represent the start and end events. The trapezoid shapes are not part of the BPMN standard, but instead are used here simply to represent that there will be a user interface (UI) of some sort associated with the activity. The business analyst may lay out some sort of “form” which specifies particular information values that must be made available to the user. This specification might be abstract in only specifying the quantities that need to be present, or it might be a concrete layout of precisely where such values

should appear on a screen. The people then use the UI in order to perform their respective tasks.

This level of the process might be designed on a graphical design tool intended specifically for business process design. It might be drawn up using a generic graphic tool, or it might simply be documented in a non-graphical way. Some workflow systems will allow a drawing at this level to be executed directly without any further technical work. Others offer powerful design capabilities, but the implementation of the automated system is left as a task for a traditional development team. In some cases if suitable web services with public interfaces exist, it is possible that a business user might be able to incorporate calls to back end system without programming. But in most cases, integration to the back end information systems must be done by a development team.

The human process design is provided to the programmer who will add integration to the back end system. In this example, immediately after the first activity of reviewing the information for correctness (which must be done by a human) the system then should automatically call a service that can perform a background check of the applicant. The bank may have rules that it will not accept certain categories of applicants, and there is no reason to force the bank manager to check this manually. Business rules can be employed to classify applicants. In this example, an Enterprise Service Bus (ESB) is used to integrate the call to the background check service, and the call to the conformance rules into a single web service which is easy to connect to the workflow. This is not meant to imply that an ESB must be used; most workflow systems will allow for multiple calls to different services. This is offered here only as an example of how IT professionals might wish to structure the back end systems to give them flexibility.

After the bank manager reviews the application and approves the loan, an additional call is used to integrate with the account management application and to cause the new account to be created.



The boxes in the lower half of the diagram represent automated services of various forms. The smaller square boxes represent web service interfaces to these capabilities. The intent is not to imply that it is necessary to use web services, but that is currently a popular approach to allow for flexibility.

Why didn't the diagram change when adding the new integration? An IT professional might want to draw a more detailed diagram, one that includes activity boxes for the background check, and the rules. This would be helpful to IT, but an important principle of support for human processes is to not clutter the diagram with details that are not relevant to the human users. The human process diagram is used for things like training people within the organization. It is important in a training scenario to show the steps that people have to do. The detail of where calls are made to back end systems is not important when helping people to understand what it is that they need to do, and how it relates to what other people do. The business users are best served by a diagram that shows what the business users are doing. This may seem obvious, but you will find a large number of IT people who find this concept surprising.

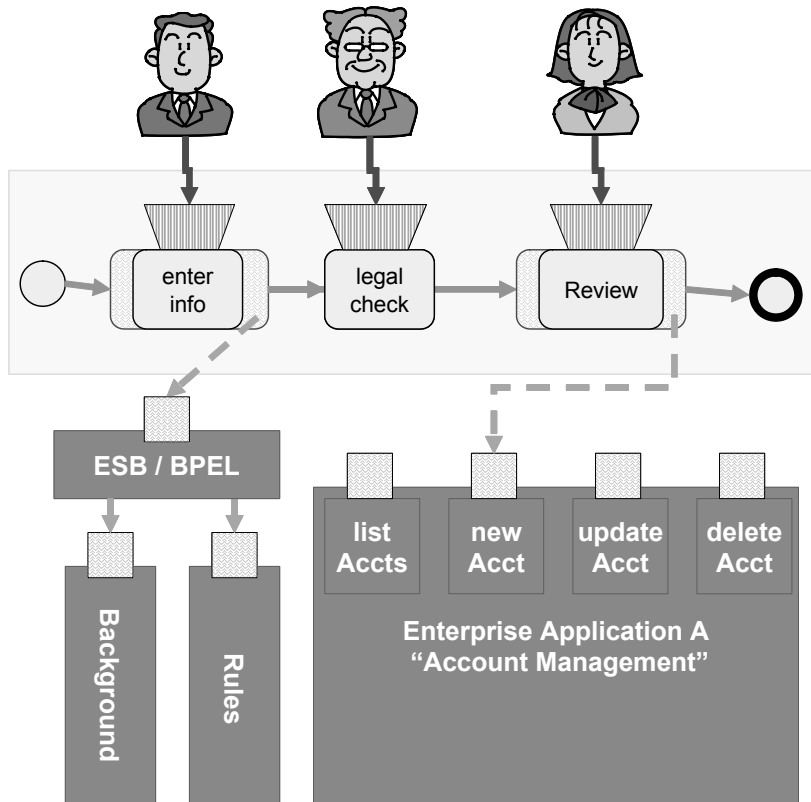
AGILITY IN THE FACE OF CHANGE

In the previous section we saw how an application might be constructed, but that is not the end of the story. Applications must evolve and change over time. The point of structuring the application in this way is to enable rapid change of some aspects of the application without breaking it.

Consider what the bank will have to do to respond to this scenario: One day, it is reported that a small bank in one part of the country is successfully sued and has to pay a huge fine for having given a loan to a terrorist. This is a purely hypothetical example, but the point is that legal precedence is set by court cases which can happen relatively suddenly without warning. If this was to happen, the precedence would be set, and it might be possible then for many other banks to be sued if they do the same thing. The bank has a huge risk, and can not afford to wait for a new "terrorist identification solution" to be developed by IT in order to check if the applicant is a terrorist. The bank must begin, the very next day, to behave under the new rule of not giving a loan to a terrorist.

The first thing to happen is that a manual check must be added to the process. A team will be identified, and every bank loan must be reviewed by that team, to assure that the current loan is not going to a terrorist. The bank will also set in motion a project to automate this, but that will take weeks or months. The bank can not afford to stop giving out loans for that time. The manual review will be expensive, but less expensive than being sued if they make a mistake.

The manual step can be immediately incorporated into the human process as a new step between the review and the approval. The huge advantage in being able to put this step directly into the process is that, at the end of the day, you are assured that *every* bank loan has been checked. Workflow systems keep a record of every activity that is completed, and it is easy to prove that every loan has been appropriately checked. The bank is able to prove compliance to the new rule (law) the very next day on every loan made, which greatly reduces risk of the bank.



The manual step is temporary. A couple of months, or possibly weeks, later there will be an automated service that will be able to reliably categorize an applicant as a terrorist or not. This can be added as another automated call between the first and final steps of the process. When this is in place, and when the bank is confident that it works correctly, the manual step can be removed from the process, and the bank can return to having two human steps in the loan process.

CONCLUSION AND SUMMARY

Agility is about responsiveness to the market. Applications that are designed using traditional programming principles cannot be modified quickly due to the technical expertise that is required. But if an application is structured from the beginning to separate the human process from the technical manipulation of the data, then it is possible for business users to be able to modify the process part of the application in a safe way.

When done right, successful BPM initiatives (herein referring to projects involving both business process analysis and the implementation of business process management software) change the entire notion of applications, by allowing core systems to respond to process context, rather than driving processes around the limits of technology.—Nathaniel Palmer, Laura Mooney, 2006

The fundamental benefit is *business level agility*, where applications are no longer monolithic blocks constructed out of third-generation languages. Instead, the user interface is separated from the back end logic. In this case, user interface means not only the visual display to the user, but the *time-oriented* aspects of offering a task to a user, and reminding that user if the task is not completed in

time. The solution is built from *applications slices* sequenced by workflow process. The workflow determines the right person for the right task at the right time.

The key difference is that the business analyst is in control of the human side of the application. The business analyst can rearrange slices, and add in manual steps quickly, without having to do any programming. This yields a form of agility that is rapidly becoming a competitive differentiator in the industry.

This is the business value of workflow and human-oriented BPM.