

## Workflow driven Process controlling for unstructured activities

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### Abstract

In the day to day business operations of the industry depend on the technology advancements, because of heavy competition between the industries such as manufacturing, sales, software development, etc. Hence a complete control is required for these business processes. This can be achieved with workflow technology. A workflow process is a collection of processing steps also termed as tasks or activities organized to accomplish some business processes. In addition to the collection of tasks, a workflow defines the order of task invocation or conditions under which tasks must be invoked that is control flow and data flow between these tasks. Therefore this paper identifies the importance of workflow and control over these business processes for unstructured activities. Hence the complete state of the art of study was reviewed.

**Keywords:** Business operations, workflow, control flow, activities.

### 1. Introduction

In every organization there must be a business process that supplies or consumes workflows typically associated with business process management (BPM), such as purchase, sales, inventory, etc. These BPM faces risky investment decisions that can have major effects on its competitive position. Many examples of emerging BPM innovations have been sold with multibillion dollar market projections but this BPM is still remain to avoid uncertainty or pestilence to their eventual effectiveness. Therefore one of the key challenges in workflow research has been traditionally explain about the effectiveness of business process. So to guide organizations and individuals in their decision making process, hence the operation of every process or sequence of process or workflow need to improved using workflow technology.

A workflow process is a collection of processing steps also termed as tasks or activities organized to accomplish some business processes. This definition may also express constraints and conditions such as when the activities should be executed, a specification of who can or should perform each activity, and which tools and programs are needed during the activity execution. Management of workflows deals with the automated coordination, control and communication of work as required satisfying workflow processes (Christoph Bussler 1996).

In simplest terms, a workflow is the movement of documents and tasks through a business process. A Workflow System provides for the automation of a business process, in whole or part, during which documents, information, or tasks are passed from one participant to another for acting, according to a set of rules. Another definition says, workflows are activities involving the coordinated execution of multiple tasks performed by different processing entities, mostly in distributed heterogeneous environments which are very common in the enterprises of even moderate complexity. These activities could be manual or automated, possibly being already-existing legacy programs. Starting with early 1990s, workflow systems have been an active research and development area with several research prototypes and commercial products in the market. Mean while, when the workflow market started to grow, other market segments started to include some of the workflow capabilities. Enterprise Resource Planning (ERP) started to increasingly support workflow capabilities. Most leading ERP systems (e.g., SAP ERP Solutions,

BaanERP, and PeopleSoft) offer a workflow component. In fact, as predicted in (Abbott 1994), currently, workflow process management functions and technology are absorbed by other technologies. Although there are stand alone workflows management systems on which workflow applications are built, the trend is to have workflow capability in critical enterprise application systems such as Enterprise Resource Planning (ERP) and supply-chain management, and E-Commerce solutions. There are many business models used in E-Commerce like e-shop, e-procurement, e-mail, electronic marketplace, virtual communities, value chain service providers, value chain integrators, collaboration platforms, and information brokerage.

In all of these models the business processes can be modeled as a set of steps that are ordered according to the control and data flow dependencies among them. This corresponds to a workflow process, where the coordination, control and communication of activities are automated, although the activities themselves can either be automated or performed by humans. New technology integration standards such as XML Schema, SOAP, and J2EE enable the convergence of legacy infrastructures toward process oriented enterprise computing. On the other side, emerging protocols such as ebXML, RosettaNet, and BizTalk support the process level collaboration among business partners. To support enterprise business processes in E-Commerce applications, workflow systems should have certain features that are of critical importance.

## **2. Related Work**

The original developments of business process modeling, workflow are biased by rationalistic approach that organizations follow their procedures on a rigid way in order to achieve their goals. The process models can also be used for process automation for example Petri Nets (Murata 1989), BPEL4WS (Andrews 2003).

### *2.1. Petri Nets*

Selecting an appropriate business process modeling technique forms an important task within the methodological challenges of business process management and workflow engineering projects. Many of the available techniques have been developed on the basis of Petri Nets, which is a popular modeling language for workflow oriented applications.

After conducting a representational analysis of Petri Nets using a representation model based on the Bunge ontology, it is identified that a number of issues related to the practice of process modeling with Petri Nets in contemporary process management initiatives. These findings contribute to the ongoing revision and extension of process modeling techniques based on Petri Nets and as such may lead to more mature solutions to business process modeling and management (Jan Recker 2007).

### *2.2. Workflow Management Systems*

According to the Workflow Management Coalition (Fischer 2001), Workflow is:

*“The automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant (a participant in this context can be either a human resource, intelligent agent or a computer application) to another for action, according to a set of procedural rules”.*

The primary aim of a WfMS is to utilize Information Technology to assist, and where appropriate automate, activities involved in a specific process. At a minimum, a WfMS should be able to facilitate, monitor and audit “who” has done, is doing, or is scheduled to do “what”, “when” and “why” to “whom”. Thus, the WfMS should be able to provide context to any particular activity. They should help to ensure the activities that should be undertaken. Workflow systems are process oriented, where a process represents a set of activities that need to occur in a prescribed sequence to achieve an outcome.

## **3. Workflow Pattern based Evaluation**

A sequence of connected steps or activities or depictions of a sequence of operations are called Workflow. It may be work of a person, a group of persons, an organization of staff, or one or more simple or complex mechanisms. It is a type of theme of recurring events or objects, sometimes referred to as elements of a set is called pattern. These elements repeat in a predictable manner. A workflow pattern is a specialized form of a design pattern as defined in the area of software engineering.

The research work of Wil van der Aalst, Arthur ter Hofstede, Bartek Kiepuszewski, and Alistair Barros has resulted in the identification of 21 patterns that describe the behaviour of business processes. The rationale for the development of the patterns was to describe the potential capabilities that a workflow server may have during the performance of business processes. The patterns range from very simple to very complex and cover the behaviours that can be captured within most business process models (van der Aalst 2002).

### 3.1. Basic Control Patterns

- Sequence - execute two or more activities in sequence.
- Parallel Split - execute two or more activities in any order or in parallel.
- Synchronization - synchronize two or more activities that may execute in any order or in parallel; do not proceed with the execution of the following activities until all these preceding activities have completed; also known as barrier synchronization.
- Exclusive Choice - choose one execution path from many alternatives based on data that is available when the execution of the process reaches the exclusive choice.
- Simple Merge - wait for one among a set of activities to complete before proceeding; it is assumed that only one of these activities will be executed; typically, these activities are on different paths stemming from an exclusive choice or a deferred choice.

## 4. Inter Organizational Workflow Design with Exception

Process oriented techniques provide an important alternative to integrate existing information systems for the need of today's increasing complex business process. Workflow management system and web services composition are two widely known process oriented techniques.

The concept of workflow model and workflow management has come into being since 1970s, and web service is a new technique that appeared after the year 2000. Recently a number of researches have been conducted to investigate the relationship between workflow management and web services (Leymann 2002), (van der Aalst 2003), (Cardoso 2004), (Zhao 2005). On one hand the impact of web services on workflow management has become more and more significant both in academic and industrial sector's and this has made workflow management a much more important approach in information system development. On the other hand the knowledge in workflow management domain, especially workflow models, is playing an increasingly important role in the design and development of web services composition. This research focuses on how these process oriented techniques can be used in system integration and B2B scenario; in particular from an inter-organizational workflow perspective.

There are two scenarios are identified to support organizational activities. One is called the structured activities and the other is called the unstructured activities. The structured activities are traditionally followed by workflow management systems, so one of the disadvantages of using these systems has been their lack of flexibility to adjust to concrete user demand. Therefore the unstructured activities are very useful to manage any type of activities on demand (Abbott 1994).

An exception is therefore a scenario where the system is not able to support the users performing the required actions to achieve the organizational goals. It can also be said that when the plan is not able to guide actors through the tasks, i.e., organizations face the applicability limits of the plan in a concrete situation, it can be said that the presence of an exception, where the situated characteristics of actions should prevail over the prescribed ones (Blumenthal 1995). The processes carried out by organizations have been identified as belonging to a continuum from unstructured to structured behaviour (Hernani Raul 2007).

The exceptions can be classified in to three classes according to structured and unstructured exception.

1. True expected exceptions, if the event is equal to a known event, it is said to be truly expected and the organization has procedures to handle it.
2. Extended expected exceptions, when the event is similar to a known one, even though not entirely equal, and the handling procedure is applicable with some minor modifications.

3. Effective unexpected exceptions are situations for which the organization has no knowledge that may be used during the event handling.
4. Therefore user involvement in the handling procedure increases when users move from the expected limits to the unexpected limits.

### **5. Why ICT implemented on Workflow, analysis**

There is a need in day today trend or requirement is the technology support. So the information management requires the technology support for every activity takes place in the dyeing process. Since the systems need to be maintained or established in the beginning of the system implementation, later this can be upgraded with respect to changes required. So, the analysis of every activity will need a workflow, hence that workflow will decide the required changes of the Information and Communication Technologies (ICT) system support.

For example, the dyeing process of colouring in Cabinet Dyeing machine will produce a shade of every final lot. After the lot process is completed the coloured cotton yarn is checked with the order given by the customer sample, which is original order given by the customer. If it matches perfectly then it need to be send to the approval of the customer's place.

Most of the cases the customer is not available in the dyeing unit where the dyeing unit process conducted. Then a person is required to move the sample outcome to get approval to the customer place. Therefore using perfect ICT implementation, it can finish the approval process very easily without more time consumption.

A recent survey conducted by workflow management group found that, when asked the single greatest perceived benefit to be realized by a BPM solution, the largest response was for the "ability to visualize, simulate and trouble-shoot business processes before committing or deployment" (Palmer 2007). So, it is clear that organizations engaging workflow solutions seek systems that offer process modeling support for these activities.

Better acceptance of workflow support systems were easier to both design and understand. A workflow system that could construct and present all process models graphically, especially for exception handling methods, would be more benefit to system designers. In addition to this a fully graphical model would be more easily understood by those stakeholders without specialist system knowledge. Therefore a design that could be more easily created and easily understood by all stakeholders, would increase the levels of efficiency and acceptance of workflow systems.

The Workflow Management Coalition survey mentioned above also found that seventy five percent of respondents reported they were currently performing work on improving existing processes. Particularly in Finance sector ninety two percentage of improvement is requires (Palmer 2007). Therefore, such statistics allows this study is much required to build the flexibility and ability to adapt the changes in workflow.

### **6. Conclusion**

The workflow was used to control the business process. The management of workflows deals with the automated coordination control and communication and work as required satisfying workflow processes. The Petri Net is a popular modeling language for workflow oriented applications. The workflow patterns is a specialized form of a design pattern as defined in the area of software engineering, hence the twenty one patterns are available to describe the behaviour of the business processes. There are two scenarios are identified to support organizational activities. One is called structured activities and other is called unstructured activities. The structures activities are traditional followed by workflow management systems, so one of the disadvantages of using these systems has been their lack of flexibility to adjust to concrete user demand. Therefore, it is identified that the unstructured activities are very useful to mange any type of activities on demand.

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