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Analysis Fault Tolerance Facts Involve In Business Work Based On Data Mining Techniques

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ABSTRACT

In this paper focuses fault tolerance techniques provide certain mechanisms to decrease the risk of possible faults in systems. Organizations must ensure that their business processes are as dependable as possible before they are automated. Nowadays, business processes of an organization use external services which are not under its jurisdiction, and any fault within these processes remain uncontrolled, thereby introducing unexpected faults in execution. This paper focuses on the area of fault tolerance for physical system. The main goal is to propose an architecture that offers business process continuity even in the presence of faults, by means of the high availability of critical situation to take good decision to identify and isolate the reason of any unexpected behavior, or in other words, to identify which parts are failing in a business process.

Keywords:- Business process, Fault Tolerance, Business process life cycle, Data mining blend in multiple disciplines

I. INTRODUCTION

Business intelligence (BI) refers to a managerial philosophy and a tool used to help organizations manage and refine business information with the objective of making more effective business decisions. Business intelligence systems combine operational and historical data with analytical tools to present valuable and competitive information to business planners and decision makers. The objective of Business intelligence (BI) is to improve the timeliness and quality of information, and enable managers to be able to better understand the position of their firm as in comparison to competitors.

Business intelligence applications and technologies can help companies to analyse changing trends in market share; changes in customer behaviour and spending patterns; customers' preferences; company capabilities; and market conditions. Business intelligence can be used to help analysts and managers determine which adjustments are most likely to respond to changing trends.

Fault diagnosis have been analysed, the transformation and adaptation of Artificial Intelligence techniques used in classic diagnosis to process business management is not automatic [1]. Fault tolerance is an important requirement for critical system. One of the most important problems in diagnosis of business process is derived from the distribution of the model and that there is no a global knowledge of the system behaviour. One of the most important goals of BPM is the better understanding of the operations that a company performs and the relationships between these operations. BPM also aims at narrowing the gap between business processes that a company performs and the implementation of these processes in the BPMS. Our approach proposes to improve dependability properties in the execution of business processes based on techniques for automatic identification of faults by means of model-based diagnosis which helps to establish specific fault tolerance mechanisms.

II. BUSINESS PROCESS LIFE CYCLE

A. Roadmap to Developing a Workflow Process

BPM paradigm, it is necessary to show the typical business process life cycle as shown in fig.1. The life cycle consists of different stages:

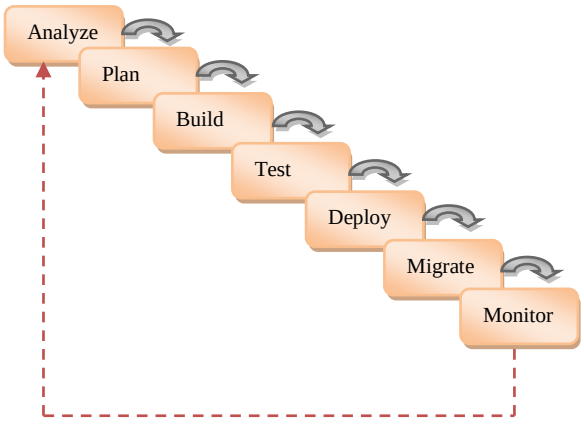

Fig.1 Roadmap to Developing a Workflow of Business Process

In stage of analysis, starts at the top and begin with an enterprise wide view. From there strategic plans are created for the business units or functional units. Through conduct the

current situation analysis, the company's current situation and establishes a baseline, as well as key trends for financial performance and operational performance.

In planning horizon, the time horizon is determined by volatility and predictability of the market, product life cycle, and the size of the organization, the rate technological innovation and the capital intensity of the industry. An environment scan is a standard strengths, weakness, opportunities and threats assessment of the company. An organization strategic vision provides a picture or mental image of what the organization should look in the future the shifts in its products and markets.

A strategic goal is a quantification of an objective for a designed period of time. Build the process by defining workflow objects. For example objects include the workflow process object definition, process properties, and workflow steps.

In Testing, the workflow process to check that the objects and exception handling you defined meet the business requirements. This includes validating and simulating the workflow process, then verifying functionality. In Deployment, the workflow process by publishing the workflow's object definitions from the repository tables to the run-time tables, then activating the workflow. Migrate the tested workflow process to monitor and troubleshoot the migrated workflow process in the production environment [3].

III. WORKFLOW PERCEPTIVES

A process is a template specifying a set of tasks and their execution dependencies. The process template is intended to be an abstract pattern for specifying business logic. Processes may be composed of sub processes, which again consist of activities and dependencies, and possibly even further sub processes.

A. Process case

A process case is an instance of a process template. Each case has a unique identity used to refer to the case in question. Its execution follows a particular execution path prescribed by the process template. It contains the actual data, external events and consumes resources.

B. Tasks

A task is the basic unit of work of which all process cases are composed. A task is meant to be a conceptual unit of work; the actual execution of a task typically requires the execution of a sequence of activities [6]. Each activity may consist of sequence of interactions between the enterprise software, the human agents responsible for the task, and the workflow management system. If a task fails or results in a system bottleneck, the workflow system may choose to roll back the task and execute an alternative task. From fig. 3, the event manager can take the response for the required task for alternately to execute the result.

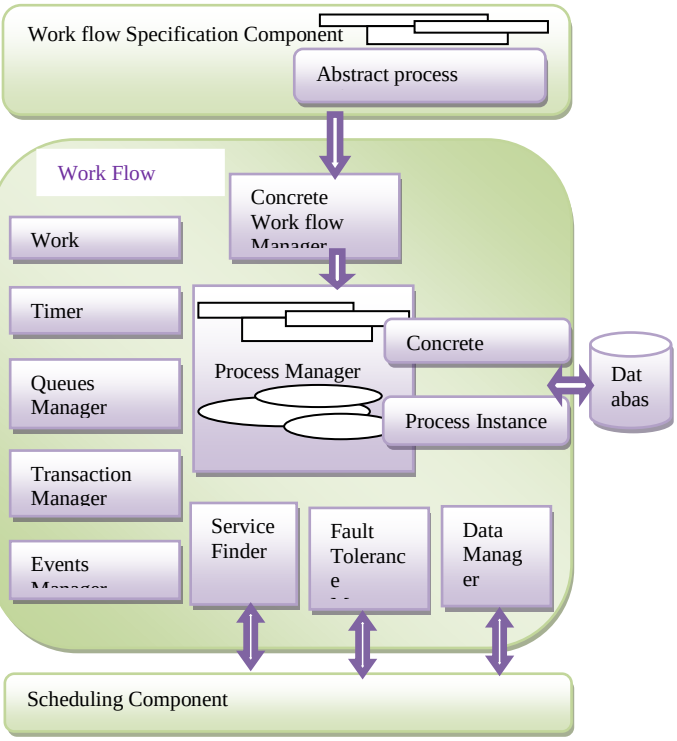

Fig.3 Architecture of Fault tolerance manager work in Work flow Engine

The Concrete Workflow Generator transforms abstract workflows into concrete workflows, the Service Finder maps service port types with sets of corresponding available services, the Data Manager Implements efficient data Handling mechanisms and the Fault Tolerance Manager, which applies the policies specified by the user for handling faults. From fig.3, shows how the task was process in the work flow environment from the work flow engine. When the task enter into the manager, work manger, timer manager, queues manager, transaction manager [3] [6], event manager assess the specific process and managing the each criteria by scheduling manner. The data base has maintain the information about the process. The service finder, fault tolerance manager, Data manager has to handling and monitoring the workflow and verifying the task of the process for attaining the goal for designed period of time. Scheduling work flow task follow decision making the current task or sub-workflow can be reduce the entire workflow performance in efficient manner.

C. Resource Management

A resource is an entity that can carry out a particular task. Resources could be human agents of the enterprise, an enterprise software application, or any other system capable of contributing to the execution of a task. A group of resources is called a resource class. If the grouping is functionally based, it is called a role, like grouping together secretaries, faculty, and system administrators. Resource allocation is critical to ensure the efficient and effective completion of processes.

D. Information Retrieval

The information retrieval task has to be mapped on to suitable resources such as static information, dynamic information and historic information. Static information includes infrastructure, configuration, QoS-related, access-related and user-related information. Workflow management system also needs to identify dynamic information such as resource accessibility, system workload, and network performance during execution time [7]. It also includes task execution information and market related information such as dynamic resource price. Historical information is obtained from previous events that have occurred such as performance history and execution history of the application components. Generally, workflow management systems can analyze historical information to predict the future behaviors of resources and application components on a given set of resources. Historical information can also be used to improve the reliability of future workflow execution.

IV. DATA MINING BLENDS WITH MULTIPLE DISCIPLINES IN WORK FLOW TASKS

The workflow management technique considers with respect to enterprise transformation is workflow data mining and merging. As the importance of process-centric management increases, an organization may leverage its repository of business processes as knowledge assets for exploitation, For e.g. by reducing the time and cost of new

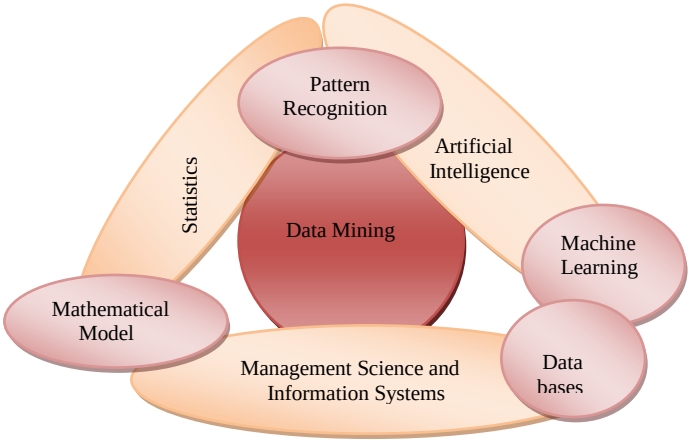

Fig.2 Data mining as a blend of Multiple Disciplines in work flow task Management

Processes by referencing existing similar processes during new process design and process improvement. Hence it is necessary to identify appropriate process definitions from the already executed process history by understanding the characteristics of the process itself.

As a result, there has been an increasing interest in applying techniques from data mining [4] [5] and machine learning to make use of workflow data as shown on fig.2, that are collected during workflow execution. This approach is referred to as process or workflow mining. Returning to the business process management lifecycle in Fig. 1, shows how the business process stages can be analyzed in the analyze phase once it have been designed and configured. The workflow management system may monitor the running workflow enactments to collect relevant statistical information and workflow logs for use in the diagnosis phase. By analyzing this data using workflow mining techniques, the workflow analyst may discover inefficiencies in the current workflow design, opportunities for overlap between various workflows, and other critical workflow information.

A. How Data mining Works in Business Process during Fault Tolerance

Data mining builds models to identify patterns among the attributes presented in the dataset [5]. Models are the mathematical representations that identify the patterns among the attributes of the objects described in the data set as shown in fig.2.

- Associations find the commonly co-occurring groupings of things, such as beer and diapers going together in market-basket analysis.
- Predictions tell the nature of future occurrences of certain events based on what has happened in the past, such as predicting the winner of the super Bowl or forecasting the absolute temperature of a particular day.
- Cluster identify natural groupings of things based on their known characteristics, such as assigning customers in different segments based on their demographics and past purchase behaviors.
- Sequential relationships discover time-ordered events, such as predicting that an existing banking customer who already has a checking account will open a saving account followed by an investment account within a year.

Most data mining software tools employ more than one technique for each of these methods. The most common two-step methodology of classification – type prediction involves model development or training and model testing or deployment. In the model development phase, a collection of input data, including the actual class label is used.

V. FAULT TOLERANCE MANAGER IN BUSINESS PROCESS

Fault-tolerance techniques are a means of reducing the risk of faults. On the whole, fault-tolerance frameworks are focused on physical systems and most applied techniques are based on replication and recovery [8]. The main characteristic is the utilization of a specific fault-tolerance layer. These layers Contains specific mechanisms in order to moderate the risk of possible process faults detected in the execution of business processes [8][9]. The process of respective several phases is

- To analysis and gathering information Phase.
- Categorization of new and already executed resources.
- Calculation of failure rate of already executed resources.
- Prioritizing the resources based on their failure rate.

- Optimal Resource Selection and Allocation Phase.
- Efficient task execution with Reduced Recovery Time Strategy Phase.

These phases are applicable in all stage of business process when risk is happened at the critical stage. By follow the fig.1, the fault tolerance may occur in each stage. To analyse the risk stage in the business process by using service finder, it can be focus such resource for recover based on several phases for attained the optimal stage.

VI. CONCLUSION

This paper helps to understand the work flow management approach for identify the risk task in the business process which can be handle by fault tolerance manager and improve the resource according to the capability and find the optimal part based on several phases for recover the critical stage of the business process by follow the frame work of work flow management are analysis, planning, building and testing. Scheduling work flow task follows decision making of current task or sub-workflow can be reduce the entire workflow in business process for attained the goal by analyse work flow engine.

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