The Application based on the Theory of BPM Applied to CMS

Mei Feng, Kunying Li, Xiaolian Li, Ji Zhang, Xu He, Ying Shi, Xiaoqiang Nan and Yuling Jiang
Research Institute of Petroleum Exploration and Development, China

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Abstract: A large number of graphical process modeling languages has been developed to aid organizations in the documentation of their processes. These languages range from simple flowchart techniques to more advanced languages capable of capturing information required for process simulation and execution. The latest representative from the large camp of process modeling languages has become known under the acronym BPMN – the Business Process Modeling Notation. On the basis of representation above, there are a series of description in the paper written by programmers who have ever taken part in the process to make the CMS. (Contract Management System). these description has to do with something in field of BMP from developing history, commercial value, system design to the achievement from making CMS online application form. CMS created flow processes based on BPMN that clearly lays out the steps CMS's business takes to accomplish a task and these steps should construct CMS own specific diagram. The flow process has been brought more transparent management and a variety of ways to approve contracts submitted in CMS. It reduces the approved period of contract cycle and provides specific ideas to other systems.

1 INTRODUCTION

1.1 The Way to Flow Management

A new approach to process work gains attention and the corporate world experiences another burst of enthusiasm. In the early Eighties, it was Six Sigma. In the early Nineties, it was business process reengineering and then ERP. In the early zeros, it was BPM and BPMS.

1.2 The Background of Development

Based on the above, the contract project team first considered BPMN when developing the approval process of the CMS2.0. with the rapid development of business, the CMS1.0 has been unable to meet all the demands. This paper starts with the system design and implementation, expounding the whole process of CMS2.0 application based on BPMN extension and custom development process.

2 SYSTEM DESIGN AND IMPLEMENTATION

2.1 Application Architectures

2.1.1 Thinking to Flow Process Design

The Business process of CMS2.0 has the following characteristics :1. More complicated, 2. More elastic. It provides lots of graphical representation of the modeling process and character for understanding different sections as the effective means of Co-ordination. Because of satisfied standards provided by BMPN2.0, it has taken to set up the application service of flow modeling in CMS2.0 (Chang 2005).

2.1.2 Implementing architectures

Those data generated in different stages of CMS will be send to the Module of lifecycle that is responsible for driven each case of contract to different stages in running time (Chang 2005). The Engine of ruler will take action which analyzes business data produced at some stage of CMS, to get the instances of modeling process, then take them to the Engine of flow process, finally creates many waiting tasks for flowing to the contact, which given by the Engine of flow process.

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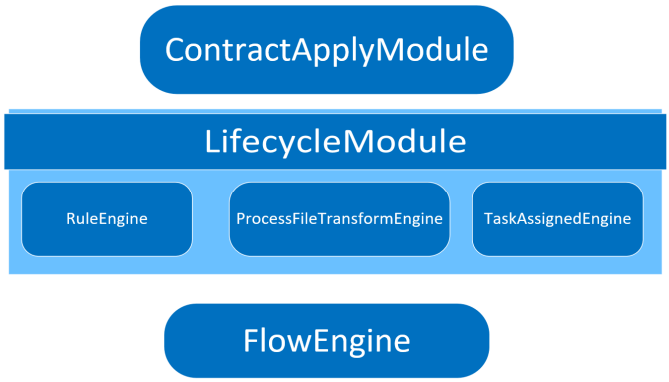

Figure 1: Process architecture diagram.

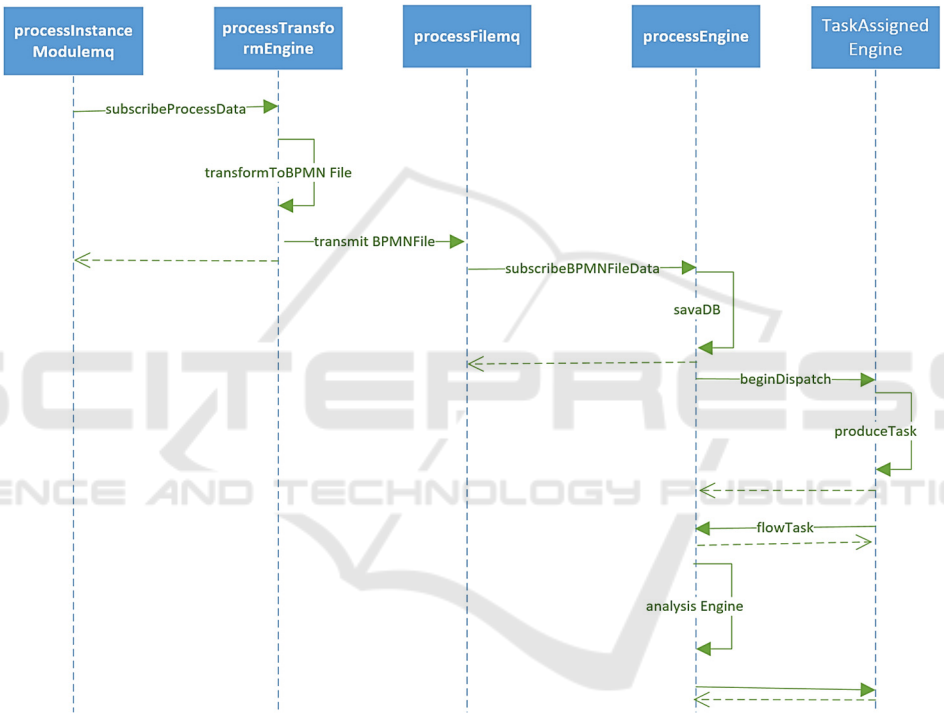

Figure 2: Process sequence diagram.

2.2 Architecture

2.2.1 The Ruler Engine

The Applications of CMS2.0 will transfer business data to the ruler engine, at this time the ruler engine takes out of data from message body, matches the process rule, finally outputs matching result (Browning 2009).

2.2.2 Conversion

The engine of conversion in CMS2.0 will converts available objects of flow process into definition followed by specification from BPMN2.0 (Penicina 2009).

2.2.3 Waiting Tasks Assignment

The waiting tasks are produced by business rules driven from the engine of flow process.

Sequence diagram as figure 2.

2.3 Design in Detail

2.3.1 The Flow Node Specification Combined with BPMN2.0

In despite of providing professional graphical symbols for five elements, which provided by BPMN2.0, it is difficult to users, who has been applied from the beginning of CMS, to make use of modeling symbols with accuracy and distinction and draw them on the chain of flow process as a big task (Correal 2007). CMS2.0 will take tasks of transformation to package into code, so users only focus on flow towards, not care of how to set the flow attributes relate to activity, event or gateway. the way enormously decreases burden in process of using.

For implementing the output standard drafted by BPMN, design as follow: the mapping between business modeling processes and flow objects

Design model as below.

2.4 Implementing Flow Engine

2.4.1 Application in CMS2.0

BPMN consists of a series of entire flow objects by self. It completely depends on those objects for creating and analysing templates. CMS does not do any changes to the objects, but extends more functions through the way of injecting. it is convenient to us in deal with flow process.

2.4.2 Driven Flow Process

Message Acceptance

The Entry of engine of flow process is responsible for receiving the data from other modules, then handling them according to orders from those data .the input parameter is` Flow Request Message <T Content>`as business object . it consists of form objects and collections. These services are not influence in workflow management system, So generic objects are used for carrying out functions. Flow Request Message as the required data handled by the engine of flow process is handed by strong type.

The Workflow Management

The Workflow Management is mainly responsible for the connection from each node. while each of the nodes have finished own work, the move of workflow would stepped into next node. Because of what is next node is unknowing, at this time The Workflow Management should be necessary. The Workflow Management also has another task that look up data in the node. the object such as Data Object or Data

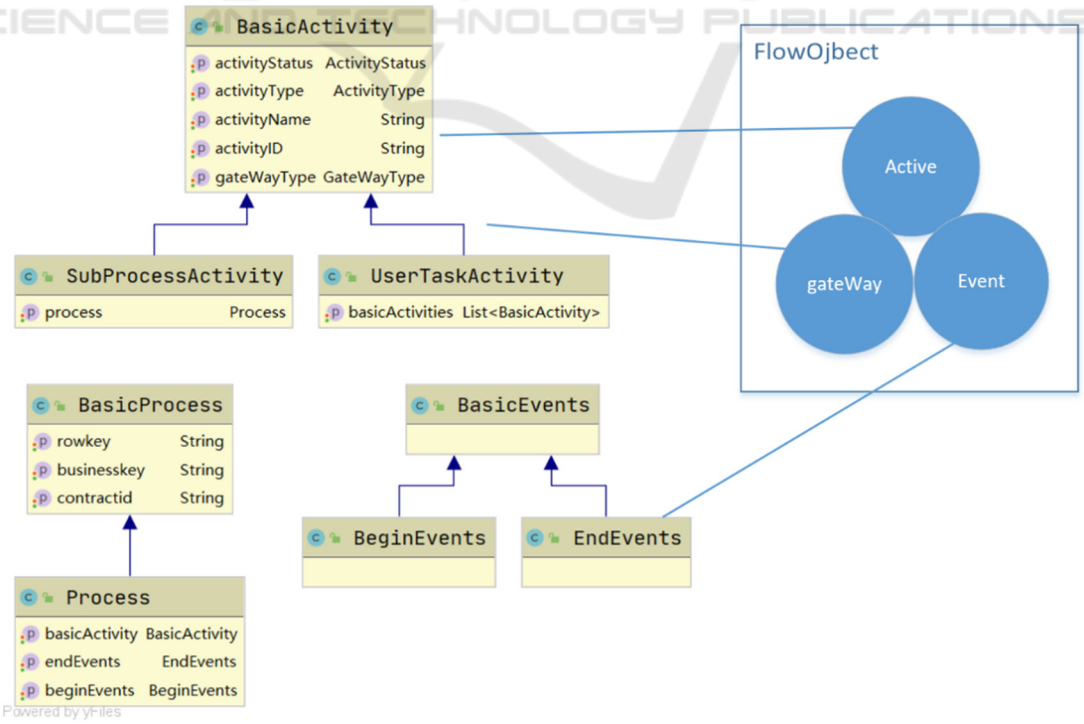

Figure 3: Flow instance module diagram.

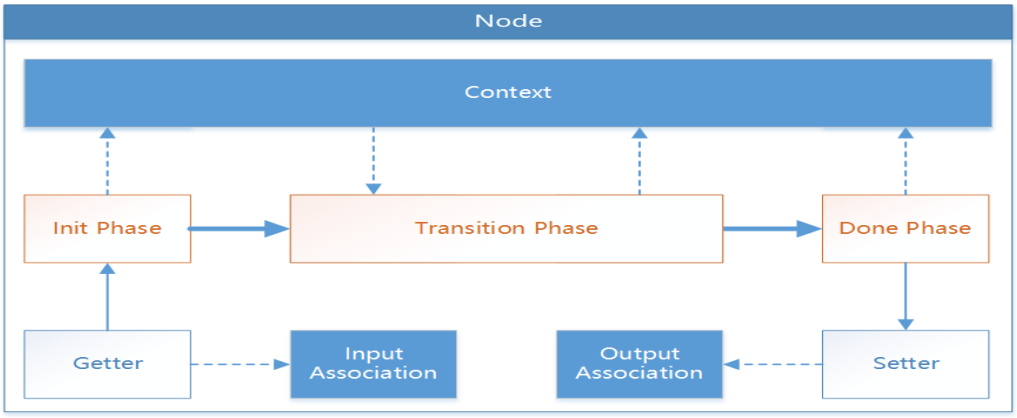

Figure 4: Node context diagram.

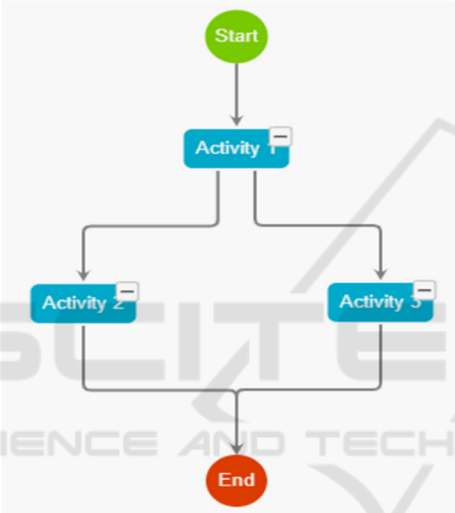

Figure 5: Predefined flow process diagram.

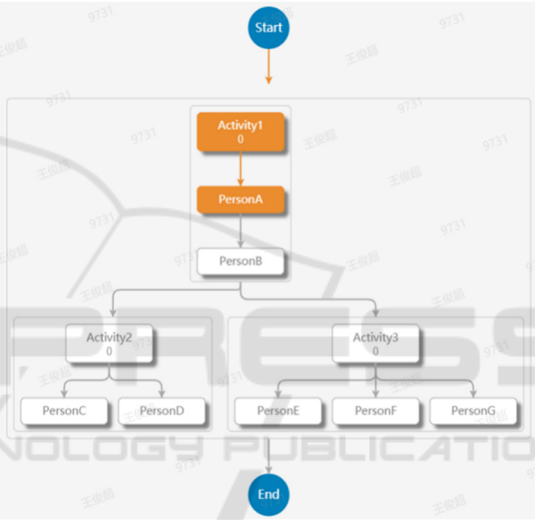

Figure 6: Process instance diagram.

Object Reference is outside of nodes, so it is necessary that The Workflow Management dispatches and inserts data.

The Node Controller

The controller of node will be in charge of functions from various nodes, for instance, the changing status inside node. it loads work instead of The Workflow Management at all.

The changing status should decide whether or not flow process will be continued. According to the proposal from BPMN, the status of active node will be divided into Inactive, Ready, Active, Withdraw, Completing, Completed, Failing, Failed, Terminating, Terminated, Compensating, Compensated and Closed. The source of Each status will be clear. The standard methods have been implemented by the way of simplicity. the class, which is extended, is overrode.

2.5 The Achievement of Development

2.5.1 The Better Transparent Workflow Management

The Flow process not only shows predefined flow process in graphical form (as shown as blow figure 5), it is convenient to administrators for modifying flow process, but also will be shown as flowchart with implementation (as shown as blow figure 6).

Each of persons who is approver all can directly view the framework of flow process, it keeps transparence in the process.

2.5.2 The Main Achievement

The coordination with persons and the multi-approval can all decrease running time in the process.

Comparison Among Different approval period (CMS2.0 AND CMS1.0), it was found out that the period has been apparently saved by one-third.

It was the first project of flow process based on BPMN within the enterprise of PetroChina. as a result, the practice taken by this project will provide new ideas and choices for other projects. it fully changed the traditional mode that has been applied within enterprises in PetroChina.

3 CONCLUSION

The flow process of CMS2.0 officially has been launched on may 2020, the numbers of flow processes in CMS2.0 have been increasing. The Flow process shows predefined flow process in graphical form, supports the better transparent workflow management and the multi-approval and the shorter period to approve. Hence one could see that it has taken a remarkable achievement in the development of flow process. It was the first project of flow process based on BPMN within the enterprise of PetroChina. As a result, the practice taken by this project will provide new ideas and choices for other projects. It fully changed the traditional mode that has been applied within enterprises in PetroChina.

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