Comparison of The Workflow Management Systems Bizagi, ProcessMaker, and Joget

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Abstract: This paper presents comparison study among three of the most famous Business Process Management Systems, Bizagi, ProcessMaker, and Joget. Bizagi is close source, while ProcessMaker and Joget are open source. The comparison framework has been developed based on the most features that needed to be interacted when developing workflow system. Simple business process has been used as case study that describes the online application for master applicants at modern Arab university. Systems have been developed using those tools. After that the comparison was done according to the framework. Finally the results are pointing according the given measurement. According to our framework and selected features the study found that the Bizagi has the best performance and the second is ProcessMaker. However, this by no means is a complete comparison. In business process modelling Bizagi outperforms the other tools. However in form aspects ProcessMaker and Joget outperform Bizagi.

Keywords: Bizagi, ProcessMaker, Joget, Workflow, BPM, comparison and performance.

1. Introduction

Nowadays there are tens of Workflow Management Systems (WFMS) with different capabilities and features. The first goal of this comparison study is to find out how these systems are different. The second goal is about the current status of these three WFMS. According to Kmpf and Gromann there are four generations of WFMS, the first generation is application specific and the workflow capabilities are expressed in particular applications like e-mails and document management. In the second generation the workflow capabilities are factored out from application domains and thus workflows are separate applications. The third generation has an open standard-based architecture and can be fully integrated in 3rd party tools. In the fourth generation the workflow management systems are completely integrated with other middle-ware services like e-mail, desktop management, have standardized interfaces and interchange formats [6]. P. Nie-et-al, proposed a Workflow Management System comparison framework. In this research we adopt them with some modification. The framework includes the most important features that needed to interact when developing workflow systems [13].

Section 2 in this paper gives overview for the Workflow Reference Model that developed by Workflow Management Coalition. Section 3 briefly overviews workflow patterns. Section 4 overviews tools that we used. Section 5 discusses the used case study. Section 6 contains the comparison and discussion. Section 7 contains conclusion and future work.

2. Workflow Reference Model

In 1995 The Workflow Management Coalition (WFMC) was developed. The Workflow reference model from the generic workflow application structure by identifying the interfaces within this structure which enables products to interoperate at a variety of levels. It consists of five interfaces as follows [5].

2.1. The Workflow Definition Interchange (Interface 1)

It is an interchange format and API calls, which can support the exchange of process definition information over a variety of physical or electronic interchange media [5].

2.2. Workflow Client Application Interface (Interface 2)

It is used to map between worklist and engine. The workflow engine is used to enforce the workflow definition and execute workflow actions.

2.3. Invoked Applications Interface (Interface 3)

It is intending to be applicable to application agents and applications which have been designed to be workflow enabled [5].

2.4. Interoperability (Interface 4)

Used as common interpretation of the process definition and runtime support for the interchange of various types of control information.
2.5. Administration & Monitoring Interface (Interface 5)
Shows an independent management application interacting with different workflow domains.

3. Workflow Patterns
Workflow Patterns are a catalog of various building blocks for workflow execution [12]. The design patterns range from fairly simple constructs present in any workflow language to complex routing primitives not supported by today's generation of workflow management systems. According to [18] the workflow eight has patterns.

4. Overview of the Tools
This section introduces briefly the tools used in this study.

4.1. Bizagi
Bizagi is a software suite with two complementary products, a Process Modeler and a BPM Suite with Bizagi most of the common and reoccurring requirements in process automation have been pre-built [2]. Bizagi is BPMS solution designed to support the organizational processes and their life cycle (model, execute, and improve) [1].

4.2. ProcessMaker
ProcessMaker workflow management software allows public and private organizations to automate document intensive, approval-based processes across departments and systems. Business users and process experts with no programming experience can design and run workflows. ProcessMaker contains two main components, a design environment and a run-time engine.
1. The design environment includes tools to map processes, define business rules, create dynamic forms, and add input and output documents.
2. The run-time engine allows for cases to be started and run through the process [17].

4.3. Joget
Joget Workflow is a workflow management system that serves as a platform (a web platform that simplifies the process of developing workflow apps) for users to design, deploy and run workflows for their organization's business processes [8].

5. The Case Study
The main idea of the system as shown in figure (2) is that the student enters to the system, either by paying for the application form or filling the application form according to the program that he/she wants to take, and sends the application. The payment will be received by the accounting, when the application is sent, to check it and send payment report to the registrar. The registrar will receive the application and process it, if the student meets the admission requirements. Then the application will be sent to the Ministry of Higher Education (MHE) to check the certificate. The registrar will be informed by MHE that the certificate is either approved or not. In case that the certificate is not approved by MHE, the registrar will inform the student that his/her application is disapproved. If the certificate is approved, the registrar will send the application to the college. Then the college will consider the application in order to decide whether the application is consonant with terms of concerned program. The college will inform the registrar with its decision about the application. At long last, the registrar will inform the student that his/her application is approved. This case study was chosen because it covers many tasks, user with different privileges, and business rules. This is appropriate for comparison of workflow management systems tools.

![Figure 1: Comparison Framework]
6. The Comparison

On the basis of the system described in the previous parts, three systems have been developed using Processmaker, Bizagi, and Joget. After implementing the systems, the paper compared the systems using the framework illustrated in figure (1). The following subsections will make comparisons between these systems in pursuance of above mentioned framework. If the tools have not obtained one point for all. The tool gets zero when it does not support a given feature. The tool gets two points when it supports the feature that not supported by other tools.

Features used and attained results by each tool are illustrated in the following subsections.

6.1. Business Process Modeling

Process modeling is used to simulate a system using Business Process Modeling Notation (BPMN) as shown in figure (2). This modeling enabling to understand the system logic and the one in charge of every task in system easily.

For plotting BPMN, Bizagi uses BizAgi Process Modeler, ProcessMaker uses Designer and Joget uses Workflow Designer.

ProcessMaker allows piping out and rolling in processes into only .XPDL and .pm.


Joget piping out and rolling in XPDL format only.

Bizagi and ProcessMaker support the XPDL2.1, while Joget support XPDL1.0, this causes compatibility problems. In other words Bizagi rolling in the XPDL piping out ProcessMaker, and ProcessMaker rolling in XPDL piping out Bizagi but the Joget XPDL not rolling in other two tools, and the XPDL of other two tools not rolling in Joget.

Then Bizagi and ProcessMaker obtained 2 points because they support different formats, while Joget obtained one point because it supports only one format. From the experiment the Bizagi and Joget support lane, while the ProcessMaker does not support it. Then Joget and Bizagi obtained one point and ProcessMaker obtained zero point. Totally Bizagi obtained three points, ProcessMaker obtained two points, and Joget obtained two points.

6.2. Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, make a decision, or infer new data from existing data [6].

In Bizagi rules are managed independently of the individual processes in such a way that they can be shared by other processes [4].

ProcessMaker has embedded business rules engine which drives the logic behind the process. At each decision gateway, business analysts can build in logic to determine how a process should flow down one particular path instead of another in the business process [14].

In Joget the Routes are typically nodes where decisions are made and (based on the rules of your process), the flow of the application maybe be altered [9].

On the basis of the experiment and facts, Bizagi, ProcessMaker and Joget have the same performance and features so they have got one point for all.

6.3. User and Authorization Management

In workflow, it needs to assign each task to user or group of users during system execution.

An organization in Bizagi is where the user can define the hierarchical structure of the company and the association between the different people or areas that
it consists of area, location, position, role, skill, user properties, user groups, and holiday schema. In Joget once a package has been deployed, the processes are ready to be executed. However, in order for activities to be routed to the correct users, participants should be mapped to the appropriate users or group or department of users [7]. Authorization management in Joget is explained using the Userview, depending on their position and department, their requests will be automatically routed to their respective heads or persons they report to. Each group of users will see different Userview Categories, depending on their roles [10]. In contrast ProcessMaker organizes system users into users, groups, and departments. The roles can be assigned to the users. All tools provide a good user categories and authorization management, but bizagi is preferred because it provides more users categories. Then Bizagi given two points, while ProcessMaker and Joget given one point.

6.4. Form

The users interact with the system through the form and pass it to the next users. Bizagi allow creating forms and mapping form fields directly to data model. In other words when creating forms you select form fields from data model. Also you can copy many forms using copy form facility. Bizagi is not rich in form field types, as some fields like check box is absence. ProcessMaker provides DynaForms, or "Dynamic Forms", which are the familiar forms, that can be designed in ProcessMaker to interface with the user while running a case [15]. ProcessMaker is richer in form field types, as it contains many field types required by current requirements of form. The main property in DynaForms that you can view the form code as HTML or XML and easily manage and edit it. In Joget the form builder facilitates the designers to create and manage forms to be used by end users to perform their task. Form categories can be created to group related forms together. Forms can be designed and edited using the Form Builder tool, or using JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is based on a subset of JavaScript [7]. Then ProcessMaker, Joget are given two points, while Bizagi given one point.

6.5. Database

Bizagi offers 3 types of tables (entities), Master entities, Parameter entities, and System entities [3]. The ProcessMaker can manage numerous workspaces at a time. Each workspace has three MySQL databases, wf WORKSPACE-NAME, rb WORKSPACE-NAME, and rp WORKSPACE-NAME [16]. Bizagi Database can be managed through Bizagi or SQL Server Management Studio Express. ProcessMaker does not provide facilities to manage database through ProcessMaker workspace. Joget use Profile setting management for manages and to switch between different data source profiles which hold its own database settings. Only one active profile is allowed at any time [11]. The result Bizagi is better than ProcessMaker and Joget in database modeling. Then Bizagi given two points, while ProcessMaker and Joget given one point.

7. Conclusion and Future Work

This study compared three of Workflow Management Systems; namely: Bizagi (academic version), ProcessMaker (free open source version) and Joget (community version). The study focused on the developing process. It showed that all of these systems have satisfactory performance during development, as it was quite easy to conduct the case study through each tool. The study also showed that there are some differences between these tools; these differences are summarized in Table 1.

The results are the first part of multi phase’s comparison. The other parts contain: Comparing tools internal structures, activities monitoring, security measurement and process mining.

Table 1: Comparsion Results

<table>
<thead>
<tr>
<th>Features</th>
<th>Bizagi</th>
<th>ProcessMaker</th>
<th>Joget</th>
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<tbody>
<tr>
<td>Business Process Modeling</td>
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<td>1</td>
<td>1</td>
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<td>User Management and Authorization</td>
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<td>1</td>
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References


