

The Comparison of the Workflow Management Systems Bizagi, Arabdox, Bonita and Joget

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ABSTRACT: This paper aimed to provide comparison study among four of the most famous Business Process Management Systems, Bizagi, Arabdox, Bonita, and Joget. Bizagi and Arabdox are close source, while Bonita and Joget are open source. The comparison framework has developed based on the plurality features that needed to be interacted when developing workflow system. Simple business process was used as case study that describes a small account payable BPM system. Systems have been developed and measured using those tools. After that the comparison was done according to the framework. In the end the results are pointing according the given measurement. According to our framework and selected features the study found that the Bonita has the best performance and the second is Bizagi. However, this by no means is a complete comparison. In business process modeling Bizagi and Bonita outclasses the other tools. However in form aspects Bonita and Joget excels to Bizagi and Arabdox.

Index Terms: Bizagi, Bonita, Joget, Workflow, BPM, WFMS, Arabdox, Comparison, BPMN, Performance.

I. Introduction

WFMSs are president tool for organizations motive for improvement competitive advantage, customer, service, productivity, and according to standards. A workflow system is consists of a set of applications and tools that allows for the definition, setting up, and the administration of the various activities associated with workflows (business processes). Workflow instances are running on one or more workflow engines, which are able to interpret workflow definitions, interact with workflow participants, and, when they are needed, protest the use of external tools and applications [19].Nowadays there are many of Workflow Management Systems (WFMS) with different capabilities and features. The first goal of this comparison study is to know how these systems are different. The second goal is about the current status of these four WFMS[18].According to Kmpf and Gromann there are four generations of WFMS, the first generation is application specific and the workflow possibilities are expressed in certain applications like e-mails and document management. In the second generation the workflow possibilities are factored out from application domains and thus workflows are separate applications. The third generation has an open standard-based structure and can be completely integrated in 3rd party tools. In the fourth generation the workflow management systems are fully integrated with other middle-ware services like e-mail, desktop management, have unified interfaces and exchange formats[8][18].P. Nie et-al, proposed a Workflow Management System comparison framework. In this paper we adopt them with some modification. The framework includes the most important features that needed to interactive when developing workflow systems [16][18].Part 2 in this paper gives overview for the Workflow Reference Model that evolved by Workflow Management Coalition. Part 3 briefly over views workflow patterns. Part 4 over views tools that we used. Part 5 discusses the used case study. Part 6 contains the comparison and discussion. Part 7 contains conclusion and future work.

1. Workflow Reference Model

In 1995 The Workflow Management Coalition (WFMC) was evolved. The Workflow reference model from the general workflow application Architecture by identifying the interfaces within this Architecture which enables products to interoperate at a variety of levels. It consists of five interfaces as below [7] [18].

1.1 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 [7] [18].

1.2 Work Client Application Interface (Interface 2)

It is used to map between work list and engine. The workflow engine is used to enforce the workflow definition and execute workflow procedures.

1.3 Invoked Applications Interface (Interface 3)

It is intended to be applicable to application agents and applications which have been designed to be workflow enabled [7] [18].

1.4 Interoperability (Interface 4)

Used as common interpretation of the process definition and Runtime support for the interchange of various types of control information.

1.5 Administration & Monitoring Interface (Interface 5)

Shows an independent management application interacting with different workflow domains.

II. Workflow Patterns

Workflow Patterns are a catalog of various building blocks for workflow execution [15]. Workflow Patterns Identify the flow of execution control: sequence, selection, parallelism and concurrency. Patterns as way for comparison workflow engines [17]. 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 the workflow eight has patterns [20].

III. Overview of the Tools

This section introduces briefly the tools used in this Study.

3.1 Bizagi

Bizagi is Business Process Management software (BPM software) which provides leading process automation and workflow automation solutions to customers in all industries worldwide [4]. Bizagi BPM Suite (BPMS) supports the business process life cycle through modeling, execution, management and continuous improvement, with the minimum amount of programming. Bizagi also supports intelligent BPM, iBPM, and is considered an intelligent BPMS, iBPMS [1]. 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].

3.2 Arabdox

Arabdox workflow system helps organizations automate a range of business processes and tasks. It electronically routes the right information to the right people at the right time. With the help of Arabdox workflow software, users are notified of pending work, and help managers route approvals through the System quickly. The benefits of automatic business process management are facilitating business process efficiency, increasing business process quality and reducing operating costs [22].

3.3 Bonita

Bonita BPM is an open-source business process management and workflow suite created in 2001 [25]. Bonita BPM is a powerful BPM-based application platform for building highly engaging, personalized, process-based business applications that adapt to your business changes in real time. Bonita BPM has two parts: the development environment, Bonita BPM Studio, and the runtime environment, Bonita BPM Platform. Bonita BPM Studio is a graphical environment for creating processes and application pages. It contains two major design tools: the whiteboard, for drawing a process flow diagram and defining the detail of steps, transitions, decision points and other process elements the UI designer, which is used to create application pages and process forms. Bonita BPM Studio is the development tool for the Business Analyst and Application Developer. Bonita BPM can be used for creating high-tech workflows and spreadsheets similar to document creation using Microsoft Excel and/or Apple Automator [23].

3.4 Joget

Joget Workflow is open source web-based workflow software to develop workflow and Business Process Management applications. 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 [12] [18].

IV. Case Study

The main idea of the system as shown in figure (1) is that small account payable BPM system has been developed and measured using BPMS Tools as Shown in fig (1). The system has four pool and three phases, the Reception

receives invoice and send it to financial assistance that match the invoice with purchase order, if match then check if the product or service is approved or not, if approved send the invoice to the accounting to update ERP. If invoice not matched with purchase order or if the product or service is not approved return the invoice to the supplier. The process of approved return the invoice to the supplier is sub process that consists from three processes, first process is justify the rejection process, if the invoice is rejected, the person who executes this task must indicate, the person who executes This task must indicate the reason for rejection either because the information does not match the purchase order or because the products or Services are unsatisfactory. Second process is Inform Supplier This is done automatically by sending an email to the supplier with the reason for the rejection of the invoice and the return of products, if the products haven't to be returned then end the task, else go to Return Products and to the products are returned to the supplier's address. This case study covers many Tasks, user with different privileges, and business rules. This is appropriate for comparison of workflow Management systems tools.

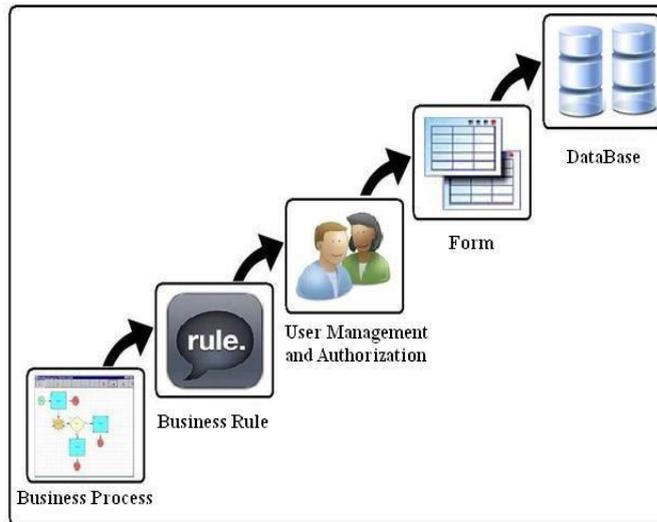


Figure 2: Comparison Framework [18] [26]

V. The Comparison Criteria

Based on the system described in the previous parts, four systems have been developed using Bizagi, Arabdox, Bonita and Joget. After implementing the systems, the paper compared the systems using the framework shown in figure (2). The following subsections reports will make comparisons between these systems according of above mentioned framework. If the tools have got the same performance for a given feature they will have 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.

5.1 Business Process Modelling

Shows Process modeling is used to simulate a system using

Business Process Modeling Notation (BPMN) as shown in figure (1). 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. Bonita Studio allows the user to graphically modify business processes following the BPMN standard. Bonita allows the user to get started with processes designed with other standards and technologies such as XPD L or jBPM Joget uses Workflow Designer. Arabdox uses Arabdox Workflow Designer. BizAgi Process Modeler piping out and rolling in the process in many formats includes: XPD L, Visio, and export PDF, Word, Image. Joget piping out and rolling in XPD L format only. Bizagi and Bonita support the XPD L2.1, while Joget support XPD L1.0 and Arabdox uses XML standard fiels, this causes compatibility problems. In other words Bizagi rolling in the XPD L piping out Bonita, and Bonita rolling in XPD L piping out Bizagi but the Joget XPD L and Arabdox not rolling in other two tools, and the XPD L of other two tools not rolling in Joget and Arabdox. Then Bizagi and Bonita obtained 2 points because they support different formats, while Joget and Arabdox obtained one point for each one because it supports only one format. From the experiment the Bizagi, Bonita and Joget support lane, while the Arabdox does not support it. Then Joget, Bizagi and Bonita obtained one point and Arabdoxr obtained zero point. Totally Bizagi obtained three points, Bonita obtained three points, Joget obtained two points and Arabdox obtained one point.

5.2 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 [8]. In Bizagi rules are managed independently of the individual processes in such a way that they can be shared by other processes [6]. In Arabdox the Events give the process designer the ability to specify condition to execute actions [26]. 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 [11]. In Bonita There are two stages to specifying who will perform a step in a process (actors and users). When you define a process, you define who will carry out a step in the process by specifying an actor and user. On the basis of the experiment and facts, Bizagi, Bonita, Arabdox and Joget have the same performance and features so they have got one point for all.

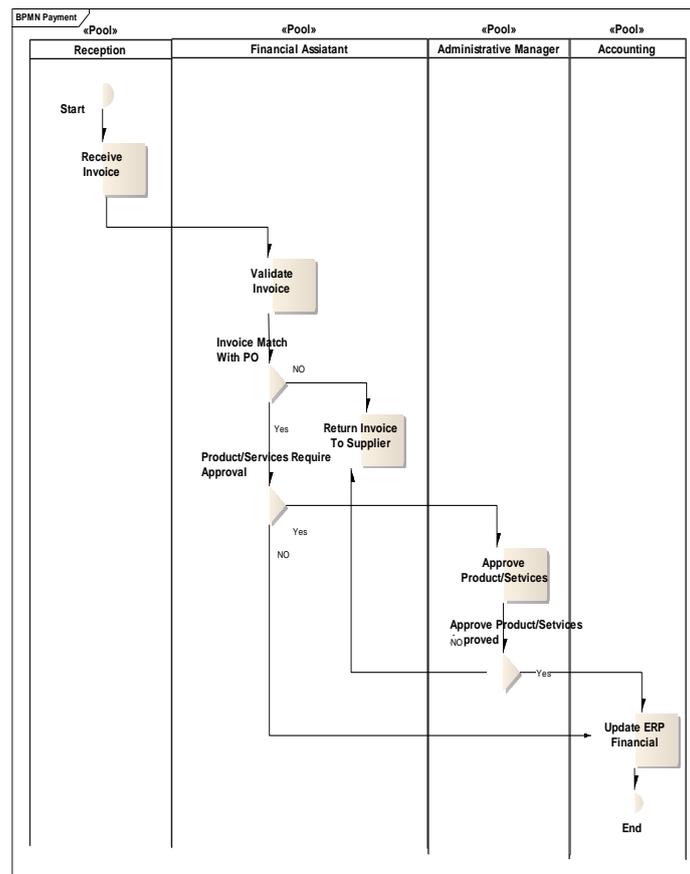


Fig (1): payable BPM system has been developed and Measured using BPMS

5.3 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 [10]. Authorization management in Joget is explained using the User view, 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 User view Categories, depending on their roles [13]. In Arabdox user described as "System Administrator", this user is the system manager of your company's or organization's domain and Arabdox system enables the access of multiple users to the system so that every user would have a user name and password to access the various components of the system The users can be sorted into groups where every group has certain permissions [21]. In Bonita the roles can be assigned to the users, an organization is a collection of users, usually defined in a hierarchical structure that is aligned with the structure of

the business entity that the users belong to. Within the organization, users belong to one or more groups. For each group a user belongs to [23]. You can define roles as required. The combination of a group and a role for a user is called a membership. A user can have several memberships but each one must apply to a different group. In Bonita a profile is a set of access rights given to a user. Users have to be given a certain profile in order to access processes, cases or tasks [24]. All tools provide a good user categories and authorization management, but bizagi, Bonita and Arabdox are preferred because it provides more users categories. Then bizagi, Bonita and Arabdox given two points, while Joget given one point.

5.4 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. The Bonita BPM UI designer is a powerful application for designing Bonita BPM custom pages and forms. It runs in a browser. Launching it from Bonita BPM Studio starts a web server and opens your default browser at the UI designer home page, the UI designer is a graphical development environment for creating pages and forms for a Bonita BPM application[23]. It is a web-based tool that is launched from Bonita BPM Studio. A page is defined in HTML extended by the AngularJS JavaScript framework. Use the UI designer to create and update pages for business applications, forms to start process instances or execute human tasks, and application layouts that apply to all pages of an application. The UI designer is a tool for creating pages and forms for use in a BPM application. A form is mapped to process instantiation or to a human task and must fulfill a contract. A page is not mapped to any part of a process. There is real no difference between a page and a form, so the procedure for designing them is the same. Typically, a form has input fields and a submit button, though these can also be present in a page. This documentation uses the term page for both pages and forms, unless otherwise stated. A page is constructed from widgets. The behavior of a widget is determined by its properties. Any property you configure for a container is applied to all widgets in the container unless you override it with a widget-specific value. 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 [10]. Arabdox "Form Designer" is a powerful form designer with a graphical User Interface, which produces forms to be used in receiving data and variables from Arabdox Web. Moreover, it does not require any scripting or macros. Forms are made up of a group of items, such as text boxes, edit fields, radio buttons, check boxes and more. These items are connected with a group of variables or index fields through which the data is saved in Arabdox database [22]. Furthermore, the Form Designer allows the workflow designer to create Executable forms that can work with popular databases at the back end. While designing a form, its appearance and logic can be immediately tested, physically seen on the screen with its controls by clicking the Preview icon. The "Form Designer" allows using multiple pages for each step of the workflow steps; the default page is page number 1[21].Then Bonita, Joget and Arabdox are given two points, while Bizagi given one point.

5.5 Database

Bizagi offers 3 types of tables (entities), Master entities, Parameter entities, and System entities [3]. Bizagi Database can be managed through Bizagi or SQL Server Management Studio Express [5]. In Arabdox Database agent is an intelligent that will allow you to connect to an external database executes certain queries based on the process variables [26]. Arabdox Database can be managed through Oracle or SQL Server. 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 [10][14]. Bonita BPM Engine uses a RDBMS (Relational Database Management System) to store information about deployed processes definition, processes configuration, history of process execution, users, etc. One database schema is required by Bonita BPM Engine to store all information. Connection to the database is done through Hibernate library (version 4.2).This provides a level of abstraction between Bonita and RDBMS. Bonita BPM Studio, and the Tomcat and JBoss bundles come with a default h2 database included in the package, h2 is suitable for testing only. Bonita BPM Engine needs to know which type of RDBMS you are using. This is defined by setting the sysprop.bonita.db.vendor JVM system property value .Bonita uses many types of RDBS such as (PostgreSQL,Oracle,database,SQLServer andMySQL) [23].The result Bonita, Joget and Arabdox are better in database modeling. Then it's given two points for all, while Joget given one point.

6 Conclusion and Future Work

This study compared four of Workflow Management Systems; namely: Bizagi (academic version), Arabdox (close source version) Bonita (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: Comparison Results

Features	Bizagi	Arabdox	Bonita	Joget
Business Process Modeling	3	1	3	2
Business Rule	1	1	1	1
User Management and Authorization	2	2	2	1
Form	1	2	2	2
Database	2	2	2	1
Total	9	8	10	7

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