

Comparative Analysis of Different Tools Business Process Simulation

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Abstract:- Business process modelling is an increasingly popular research area for both organisations and enterprises due to its usefulness in facilitating better planning of resources, business reengineering and optimized business performance. The modelling and simulation of Business Processes has been able to show Business Analysts, and Managers where bottleneck exists in the system, how to optimize the Business Process to reduce cost of running the Organization, and the required resources needed for an Organization. An important part of the evaluation of designed and redesigned business processes is Business Process Simulation (BPS). Although an abundance of simulation tools exist, the applicability of these tools is diverse. In this paper we thrash out a number of simulation tools that are applicable for the BPM field, we estimate their applicability for BPS and formulate recommendations for further research. This paper is limited to analysis three tools that is IBM WebSphere, FLOWer and FileNet (process management); and Arena and CPN Tools (discrete event simulation)) are compared based on the capabilities of modelling, support of simulation and output analysis.

Keywords: Business Process, Modelling Requirements, Simulation, Petri nets.

1. INTRODUCTION

As business process management is playing more and more important role in business then more companies are trying to satisfy the need of process management tools. Today the business processes and the forms of business are changing very quickly and the tools must apply changes and conform to new requirements. There are lots of different applications in the market. These business modelling tools can divide in different ways, but the most basic way is divide by the groups of users. For example, some are designed to support a specific group of users – say business managers – while others are intended for more technical users like business analysts or IT developers. Setting up a realistic simulation requires a significant amount of specialized skills in order to collect the required input data and to appropriately assign values to all simulation parameters.

Business Process Modelling is not an improvement tool; it is simply a means to an end. It outlines the activities carried out in the organisation, providing a framework for improvement to be carried out. Business Process Modelling techniques are used to design of the process model; and are implemented using software tools.

The field of BPM now supports the design, enactment, control, and analysis of business processes [6]. Companies are improving their performance by a constant evaluation of the value added in all parts of their processes. Business processes are in a continuous improvement cycle in which design and redesign play an important role. Various possibilities to change a process are present and the best alternative design should replace the current process.

Making an intuitive choice may lead to unpleasant surprises and lower process performance instead of yielding the expected gains.

2. LITERATURE REVIEW

In this paper, we aim to evaluate several software packages for suitability of BPS. almost not a few package plainly advertises as BPS tool, however, numerous of them supply simulation functionality and may be appropriate. Bradley et al defined seven unlike categories to evaluate business process re-engineering software tools [8]. The seven categories are as follows:

1. Tool capabilities, including a rough indication of modelling, simulation and analysis capabilities.
2. Hardware tool and software, with, e.g., the type of platform, languages, external links and system performance.
3. Tool documentation, covering the availability of several guides, online-help and information about the learning curve of the tool.
4. User features: amongst others user friendliness, level of expertise required, and existence of a graphical user interface.
5. Modelling capabilities, such as identification of different roles, model integrity analysis, model flexibility and level of detail.
6. Simulation capabilities, abbreviation the temperament of simulation (discrete vs. continuous), conduct of time and cost portion and statistical distributions.
7. Output analysis capabilities such as output analysis and BPR expertise.

In this paper we elaborate on the categories as defined by Bradley et al in the direction of BPS. Especially the last three categories are of interest when evaluating BPS.

Law and Kelton They identify the following groups of features:

1. General capabilities, including modelling flexibility and ease of use.
2. Hardware and software considerations.
3. Animation, including default animation, library of standard icons, controllable speed of animation, and zoom in and out.
4. Statistical capabilities, including random number generator, probability distributions, independent runs (or replications), determination of warm up period, and specification of performance measures.

3. AVAILABLE TOOLS FOR BUSINESS PROCESS SIMULATION

3.1 IBM WebSphere

IBM WebSphere Business Modeler (WebSphere) is a comprehensive tool for business process modelling, analysis and process deployment focused on supporting business process improvement. In WebSphere it is possible to model, assemble and deploy business processes, then monitor and take actions based on key performance indicators (KPIs), alerts and triggers to continually optimize these processes. WebSphere also supports the capabilities of simulation, analysis and redesign. WebSphere offers robust functions for business process analysis as well as modelling capabilities for business processes, enterprises, essential data, artifacts, organizations, resources, timetables and locations. The WebSphere simulation engine enables simulation of the dynamic behaviour of processes and analysis of workloads and bottlenecks. It is possible view analyses on the process, resources, activities and queues in real time during simulation or after completing the simulation. Also it includes report templates and a designer for customized reports. Built in reports can give a precious guidance and present a detailed analysis helping validate and optimize business processes [8].

3.2 FLOWer

The FLOWer systems consists of a FLOWer Studio, FLOWer Case Guide, FLOWer CFM (Configuration Management), FLOWer Integration Facility, and FLOWer Management Information and Case History Logging. The graphical design environment, Studio, is used to define processes, activities, precedences, data objects and forms. Work queues are used to provide work to users (defined with CFM) and to find cases satisfying specified search criteria.

Case Guide is the client application which is used to handle individual cases. FLOWer Integration Facility provides the functionality to interface with other applications. FLOWer Management Information and Case History Logging can be used to store and retrieve management information at various levels of detail. BPM systems, like FLOWer, focus on the configuration of the system, and the execution and control of the workflow. Additional features like the FLOWer Management Information and the FLOWer Integration Facility are provided. However, FLOWer does not provide explicit simulation or output analysis functionality. We will not be able to evaluate the simulation and output analysis capabilities of FLOWer, but we can evaluate the modelling capabilities [3, 5].

3.3 FileNet

The FileNet system includes a FileNet Process Designer, a FileNet Process Simulator, a FileNet Process Engine, a FileNet Process Administrator, and a FileNet Analysis Engine. First, a process structure is modelled graphically with the Process Designer and tasks are assigned to work queues. These work queues and the associated users are created outside the Process Designer. Then, the created process definition is feeded to the Process Engine to start the execution of the workflow. The effecting data for creature cases is logged by the Process Engine and can be admittance with the Process Administrator. Further, execution data is cumulative and convert to the Analysis Engine. Reporting and analysis of the cumulative data is facilitated by twenty out-of-the-box reports; each graphically presenting the data connected to one performance marker.

3.4 Arena

Arena is a general purpose simulation tool developed by Rockwell Automation. The Arena product family consists of a Basic Edition for uncomplicated processes and a Professional Edition for more complex large scale projects in manufacturing, distribution, processes, logistics, etc. The Professional Edition also provides (and allows definition of) templates for complex repetitive logic, e.g., for packaging and contact centers. When opening the tool, a number of process panels are available, e.g., for basic and advanced processes and for reporting. The model can be created by drag and drop from the process panel to the model window. By double-clicking on the icons, options for the different building blocks can be set such as delay types, time units and the possibility to report statistics. Many more building blocks are available and can be attached when necessary. When a model has been created and is completely specified (from the Arena viewpoint) and it is syntactically correct, it can be simulated. Warm-up and cooldown periods can be specified, as well as run length and confidence intervals.

3.5 CPN Tools

CPN Tools is developed by the computing science group of Aarhus University in Denmark. CPN Tools is a tool for editing, simulating and examine Colored Petri Nets. The tool pull towards you awareness with reverence to its user interface which has been intended in cooperation with leading HCI experts, and contain a number of novel interface mechanisms such as the use of two-handed input by means of a mouse and a trackball. all through suppression a net (a process model), reaction amenities give contextual error messages and point to habit relationships between net elements. The tool features incremental syntax checking and code generation which take place while a net is being constructed. A fast simulator efficiently handles both untimed and timed nets. Untimed nets are usually not

related for modelling and simulation of (practical) business processes, but several earlier projects previously illustrate that timed CP-nets can model business processes [20, 13, 22]. Correctness of the developed model can be researched by existing Petri Net techniques such as the generation of state spaces and the analysis of boundedness and liveness properties, which are all implemented in CPN Tools.

4. COMPARISON OF BPS TOOLS

In this section achieve the BPS tools for every of the assessment criteria ranging from good and neutral to bad.

Comparison criteria for BPS Tools	IBM WebSphere	FLOWer	FileNet	Arena	CPN Tools
Ease of Model development	Good	Good	Good	Good	Bad
Detail Required (Level)	Good	Good	Good	Good	Bad
Use of Resource	Good	Good	Good	Neutral	Neutral
Performance	Good	Bad	Neutral	Good	Good
Animation	Good	Bad	Neutral	Good	Neutral
What-if analysis	Good	Neutral	Bad	Neutral	Neutral

Table 1. Comparison of BPS Tools

5. CONCLUSIONS

In this paper we considered a number of software tools on their suitability for BPS. Filenet and Flower were selected because of their usage in business process management, i.e. their strong support of workflow processes. Filenet and Flower emerged to be sturdy in this esteem. Finally, CPN Tools and Arena were elected because of their admirable track verification in simulation. Arena is a strong simulation tool that verified to be suitable for BPS. The modeling with this tool is based on predefined building blocks, which can be adapted and extended if necessary. Finally, CPN Tools is based on the formal modelling techniques of Petri Nets. This opens many possibilities for the formal verification of the simulation model.

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