# IBM FileNet Whitepaper for Business Process Manager: Business Process Optimization

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***Introduction***

*"In first generation BPM technology, the analysis step was basically skipped…we are now seeing a new emphasis on spending time on analyzing the business, trying to figure out where the savings are before going into the process."*

*- Gartner Group, 2003*

Companies across all industries have recognized that implementing Business Process Management (BPM) software can provide a true competitive edge by automating, integrating and optimizing business processes to speed critical business decision-making, increase operational efficiency, lower the cost of doing business, and improve customer service.

Many organizations, however, have implemented subsets of BPM technology, such as process modeling tools or content approval workflow, and believe they have a complete BPM solution. This is not the case! A competent and comprehensive BPM solution must include a complete set of integrated capabilities offering process automation, application integration and optimization services.

Process Optimization technologies must be incorporated as part of an organization's BPM infrastructure to extract the most value from the software investment. Through such technology, BPM is further extended to allow an unprecedented level of self-awareness of how a company runs its business. Processes can be tuned to their optimal level, providing companies the means to react to issues before they become problems and identify opportunities with increased speed and agility, thereby maximizing the value that employees deliver to customers.

FileNet Business Process Manager is a comprehensive BPM solution suite based on the FileNet P8 architecture that uniquely combines content, process and connectivity as core components. The FileNet Business Process Manager suite includes the Process Optimization Services needed to provide the visibility to an organization's core business processes, and ensure that processes can be continually modeled, simulated, and tested. Two unique software components, FileNet Process Analyzer and Process Simulator, are incorporated into the BPM suite to allow organizations to continually refine and improve the way they run their operations.

The FileNet Process Analyzer uniquely delivers dynamic reports with historical and real-time data that enable organizations to monitor and analyze processes, optimize operations, and proactively address business trends. Built on powerful Online Analytical Processing (OLAP) technology, it tracks performance of key enterprise processes with pinpoint accuracy to make comprehensive business visibility and agility a reality.

The FileNet Process Simulator enables business analysts to model business processes and then simulate them under real world conditions. By taking the "as-is" way of running the business and enabling "what if" analysis of multiple simulations, organizations can discover how to remove bottlenecks, align resources and reduce overall costs. In addition, the ability to test a process in the simulation environment before deploying it into production is a critical benefit, as it vastly reduces the likelihood of implementing poor process designs.

***Business Challenges***

Lack of process visibility can manifest in a variety of business problems for an organization, including:

- Little understanding of the impacts of a rapidly-changing business environment to the business' operations
- Declining productivity with equal or greater numbers of staff
- Inefficient resource utilization and skill-set alignment
- Poor enforcement of new industry regulations and compliance requirements, increasing an organization's risk of litigation and punitive actions
- Spiraling costs without equivalent level of new business
- Increased cycle times to process work and make critical decisions – negatively impacting customer service and loyalty

The ability to track, monitor, measure and optimize processes in real-time is vital to quickly identify operational bottlenecks and fine-tune processes "on the fly" for optimal results. Reporting and analytics capabilities enable companies to audit processes to account for how decisions are made, providing enhanced levels of corporate accountability.

***Framework for Enterprise Process Optimization***

*Process Optimization Cycle*

First-generation BPM implementations typically involved deploying workflow on a departmental basis to automate an existing process. Under such implementations, important process efficiencies were gained and costs were reduced. However, this deployment model was difficult to scale across an enterprise, due to the inherent complexity of modeling, simulating, analyzing, and testing processes that cross functional boundaries.

The latest generation of Process Optimization technologies enables organizations to deploy BPM enterprise-wide, by providing a superior level of visibility into cross-functional processes, including the ability to analyze, simulate, and test complex processes to implement improvements while reducing the overall risk of deployment.

As part of any BPM implementation, organizations must implement a process optimization framework to ensure that the business operations are running at maximum efficiency. Process optimization can be thought of as requiring a perpetual cycle of activities, as depicted in the Process Optimization Cycle (Figure 1), and described below.


Figure 1: Process Optimization Cycle

***Analyze:*** Process analysis provides insight to how the process is functioning. Analysis can be performed during any part of the process lifecycle.

***Identify:*** Through analysis, one can identify process trends, monitor levels of performance, and decipher ways to realign resources and other means to lower the cost of doing business.

***Simulate:*** After potential changes are identified, simulations of potential changes can be run to ensure optimal resource utilization and perform "what if" analysis of various iterations.

***Validate:*** One must validate the simulated processes to ensure predictable results and minimize business risk. The simulated environment can be run through the Process Analyzer engine, for example, to ensure the assumptions are valid and business metrics are met.

***Deploy:*** Take the validated process to production and the cycle begins anew.

A closed loop process optimization cycle must be continually practiced and enforced. This will ensure that the organization is effectively monitoring and enhancing its processes and resource alignment to effectively accommodate fluctuating internal and external inputs, and an ever-changing macro-business environment.

*Process Optimization Cycle & Six Sigma*

The Process Optimization Cycle can be implemented as a primary component of an organization's quality improvement efforts, such as Six Sigma. The diagram below (Figure 2) illustrates how a closed-loop optimization process can directly support the Six Sigma performance improvement framework known as DMAIC (Define, Measure, Analyze, Improve, and Control).


Figure 2: Process Optimization Cycle Supports the Execution of Six Sigma Processes

***Process Analysis – Awareness, Insight and Intelligence***

*FileNet Process Analyzer*

Data analysis forms the basis of process optimization, as without it there is no way to measure the results of the optimization efforts. Reporting and analytics is therefore a vital part of FileNet Business Process Manager. FileNet provides this capability with FileNet Process Analyzer, a reporting and analytics tool designed to help enterprises optimize business operations and increase returns from their BPM investments.

The Process Analyzer resides on a separate server with its own separate database (Figure 3). This separation is vital in order to ensure that overall performance of the FileNet Process Engine is not affected by the activities of those users accessing the database for reporting and analytics purposes.

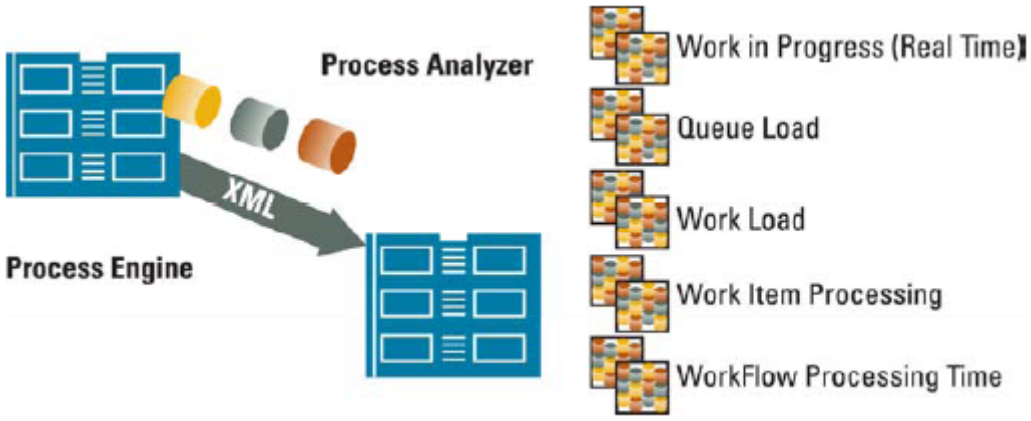


Figure 3: Process Analyzer Configuration

The data is transported from the Process Engine to the Process Analyzer via a continuous XML data stream, containing a variety of information including:

- System configuration information
- Process definitions
- Process event data

The Process Analyzer itself consists of 5 OLAP data cubes, described in more detail in the next section:

1. Work In Progress (Real Time)
2. Work Item Cycle Time
3. Workflow Cycle Time
4. Queue Load
5. Work Load

*Process Analyzer & OLAP*

The Process Analyzer provides visibility into business processes through comprehensive tracking metrics and reports. It collates and leverages both historical and current information held in the system, and increases the level of process visibility by continuously updating a series of OLAP data cubes with metrics related to the processes being managed.

The use of OLAP technology ensures information can easily be reoriented to provide the required representation on demand. The data cubes are extendable to ensure information is presented in the appropriate business context resulting in more rapid, accurate business decisions.

This extensibility includes the addition of associated cost information, facilitating true quantitative cost-based analysis, a crucial component in any drive to reduce operational expenditures.

The OLAP cubes use an open data model, and therefore can be accessed by any third- party reporting tool capable of connecting to an OLAP data source. This enables the information to be seamlessly integrated into an organization's pre-existing business reporting framework.

The data can also be presented and manipulated using Microsoft Excel, for which the Business Process Manager provides over 20 report templates.

*Mortgage Processing Example*

As an example, the Process Analyzer can dramatically increase the insight into the way in which a mortgage vendor processes applications. What follows is a description of the Process Analyzer's key capabilities, set in the context of a mortgage lending environment.

*Breakdown of Mortgages In-Process*

The Work In Progress cube is a real-time cube providing up to the minute information as to the different types of mortgage applications currently undergoing processing (Figure 4).

By publishing the “Mortgage Type” data field as a user defined field using the Process Analyzer configuration console, the volume of work in progress can then be automatically categorized and presented.

By providing such information in real-time, organizations can react quickly and ensure that available resources are optimally aligned with the current workload.

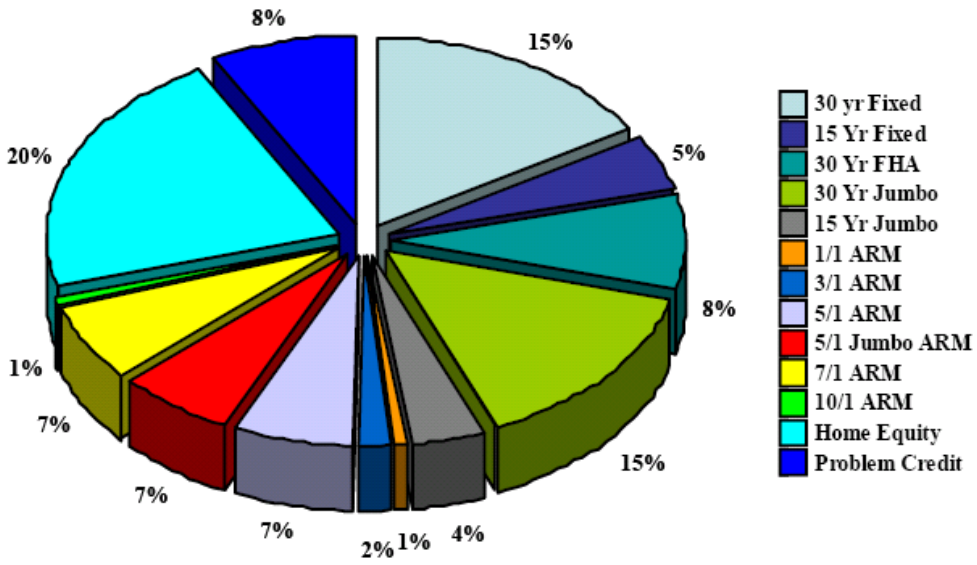


Figure 4: Process Analyzer Chart with Real-Time Mortgage Data

*Quantitative Cost-Based Analysis*

The Work Item Cycle Time cube provides cost-related information regarding the various tasks that make up the process under analysis. The addition of a calculated measure based on the time taken to complete the task and the cost of the resources responsible for execution, results in a complete picture as to where and when operational expenditure is being spent (Figure 5). This allows organization to easily and rapidly identify areas to focus when striving to reduce operational expenditures.

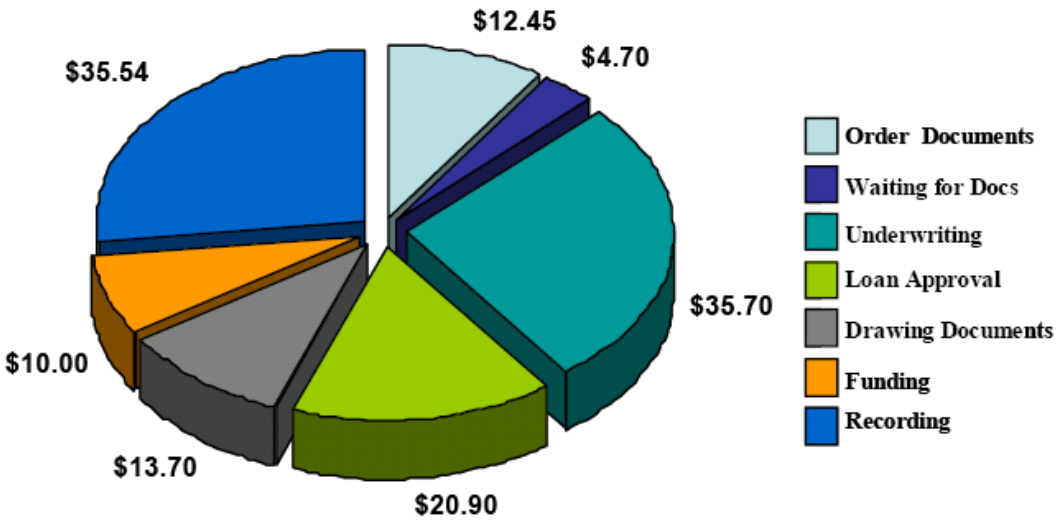


Figure 5: Process Analyzer Chart with Operational Cost Data

*Quantitative Performance Assessment*

One of the key differentiators in providing home loans is the ability to process the loan applications both accurately and rapidly. With consumers increasingly embracing the Internet as a vehicle for performing transactions, there has been a dramatic increase in the level of expectation associated with the speed of transaction completion. Consumers now demand that transactions that previously took days or even weeks, be completed in hours or minutes.

Therefore, the time taken to complete business transactions will have a significant impact on an organization's ability to compete, and on the level of customer satisfaction achieved. A mortgage lender will need to continually assess the time it takes to process each of the various home loan products it offers.

The Workflow Cycle Time cube tracks the performance of the processes, i.e. how long they take to complete. This information could be broken down further by extending the cube to include other user defined parameters such as loan type (Figure 6), regional variations, loan amount and credit rating.

This information is tracked historically, so organizations can easily assess whether they are improving their performance, or meeting specific performance goals as defined in Service Level Agreements or by regulatory authorities.

This information can also be used to help gauge the success of specific process improvements following their deployment.

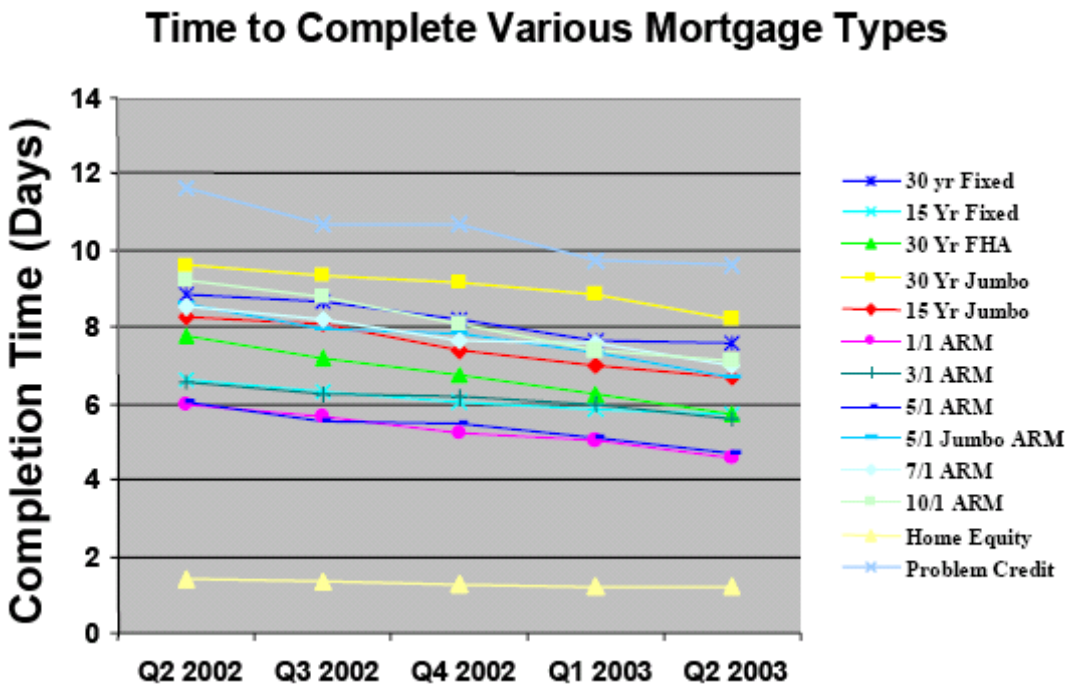


Figure 6: Process Analyzer Chart with Process Cycle Times, based on Loan Type

*Resource Planning*

In order to ensure that the available resources are deployed in the most efficient manner possible, it is important that there is an accurate assessment of the in-process workload.

The Queue Load cube tracks the volume of incoming and outgoing work, specifically:

- Queue Load – the amount of work residing in a work queue
- Incoming – the amount of work arriving for processing
- Outgoing – the amount of work leaving the queue after being completed

This information can be presented as a historical plot, to provide a model to predict the future queue loads placed upon specified resources.

The mortgage lender can use this analysis to review the workload placed on the underwriters and how it has changed over the last 12 months. The workload can be broken down further by mortgage type (Figure 7) or another sub-categorization such as state of origin.

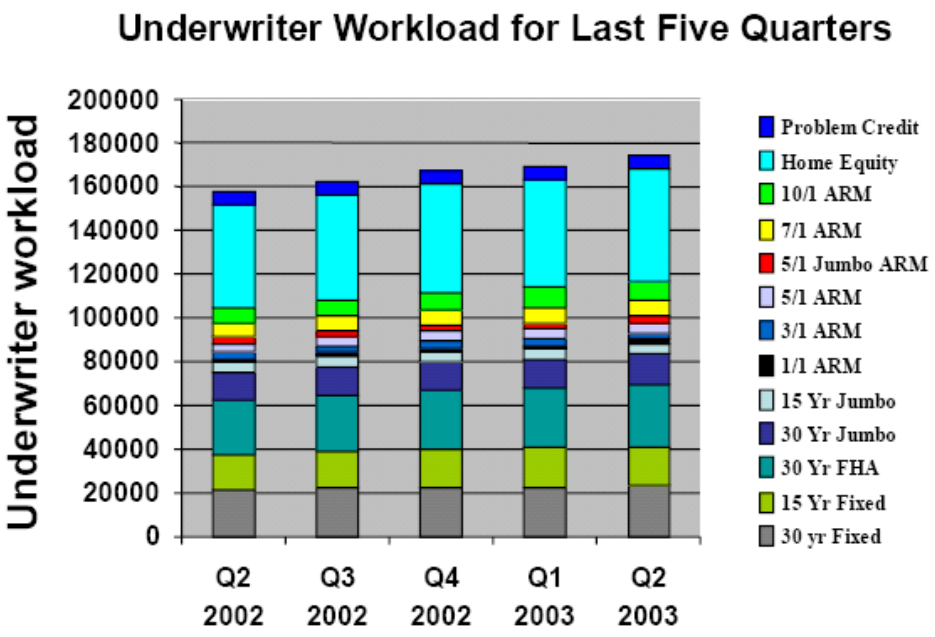


Figure 7: Process Analyzer Chart with Workload Components based on Loan Type

*Strategic Business Planning*

Understanding the nature of the work being processed is of fundamental importance in effective strategic planning.

The Work Load cube tracks all the work from the moment it is created until it leaves the system following its completion. This provides a historical context for that information which is presented in real-time in the Work In Progress cube.

This information provides both the necessarily high level view and the historical context required in order to give a holistic view of work being processed.

The OLAP nature of the collected data allows for the information to be presented from a variety of different perspectives, such as breakdown of work by mortgage type (Figure 8), amount borrowed, or even an applicant's credit score.

Such flexibility aids in the rapid identification of trends. By identifying trends sooner, organizations are able to react more quickly to changes in a fast moving market place thus gaining a competitive advantage.

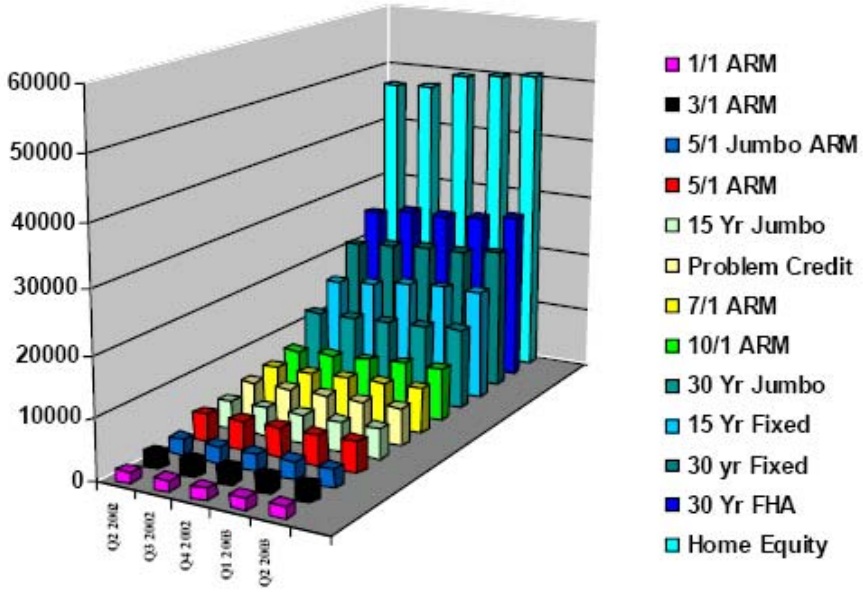


Figure 8: Process Analyzer Chart plotting the total mortgage workload by mortgage type

***Process Simulation – Driving Continuous Process Improvement, Value and Performance***

Historically, process-related projects have met the goal of improving the way organizations work, but upon project completion, the processes remained largely unchanged until the next formal project was launched.

To compete effectively in the ever-changing marketplace going forward, organizations must view the continual enhancement of existing processes as a mission-critical business function. The ability to simulate a new process or proposed enhancement dramatically reduces the implementation risks associated with the deployment of updated processes, by allowing a mechanism to validate every change before it is ever reaches production.

The focus of an optimization effort typically involves:

- Reducing process cycle time
- Reducing operational costs and cost per transaction
- Providing more efficient utilization of resources

Such continuous improvement directly contributes to the solution's overall ROI and the underlying objectives of BPM. The **FileNet Process Simulator** is a fully integrated component of the FileNet Business Process Manager suite. It allows processes to be simulated prior to their deployment to determine their effectiveness. This ensures the deployment of the best and most optimal process to deliver maximum value back to the organization.

The Simulator user interface (Figure 7) is consistent with the environment used to define the business processes (FileNet Process Designer), ensuring the process to be simulated maps directly to the representation of the current process. This is a significant advantage over less integrated analysis and simulation tools because it protects the fidelity of the underlying process, and avoids compromises being made between the design and simulation environments. Organizations using the FileNet Process Simulator can use historical data or do "what-if" analysis around specific business scenarios to develop the most effective business processes.

If the simulation is being conducted before an initial deployment, the parameters added to the process definition would be based of the best information available at that time. Obviously, the accuracy of the resulting simulation will be in large part dependent on the quality of the data parameters.

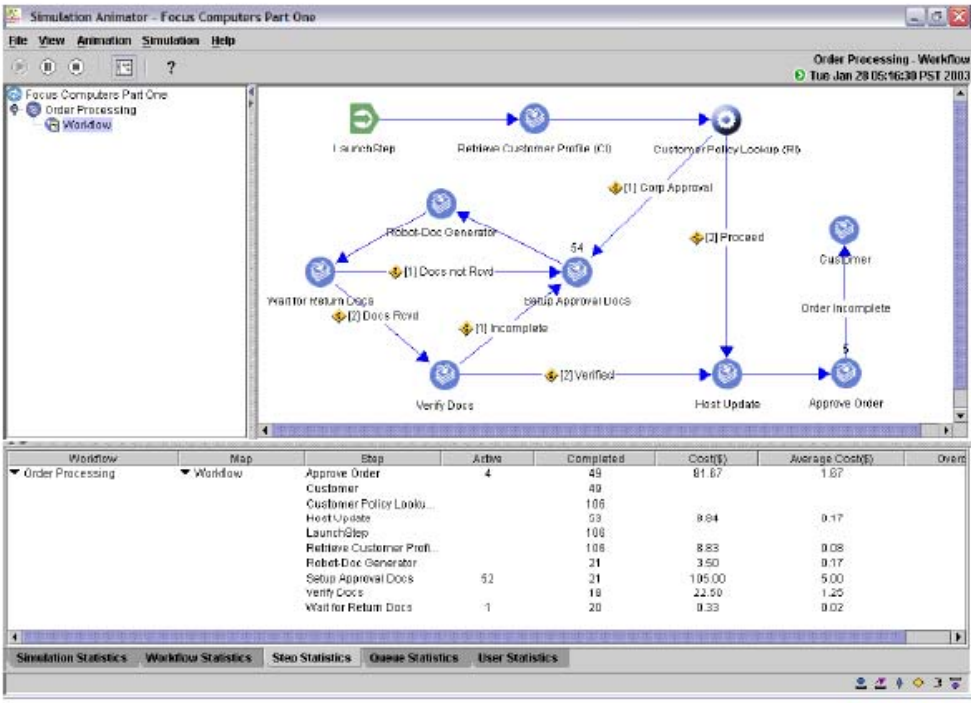


Figure 7: Process Simulation Environment

*Simulation Scenario Parameters*

The Simulation Scenario Designer allows users to take one or more defined processes (as processes do not exist in isolation), and add additional data parameters concerning their execution, including:

- Resources
- Job duties
- Shifts
- Process route distributions
- Process “arrivals”
- Task cycle times

Each parameter is described in more detail, below.

*Resources*

The process of creating a simulation scenario begins by defining resources in relation to the actions that are to be modeled. These resources are representative of the participants in the processes – including either humans or systems responsible for executing various automated transactions.

The system assigns a cost to each resource to facilitate cost-based analysis. Each resource is categorized as one of the following: Participant, Workgroup, or System.

*Job Duties*

Each resource has associated with it a collection of skills that are represented by a set of work queues. Each job duty requires various roles to be performed by the resources during the normal operation of the processes being simulated. Each defined job duty is then allocated resources that are responsible for carrying out the role.

*Shifts*

Shifts are simulated as the specified resources carry out their assigned job duties. Multiple shifts can be defined, and the resources and roles making up each shift can be individually tailored to imitate those available during actual processing.

*Process Route Distributions*

In order to simulate the various activities of users and systems as work flows through the processes being automated, it is necessary to define the behavior of work flowing through each of the processes.

This is achieved by associating percentage weighting with each decision path within the process definition (each time in the process where there are multiple pathways following a step). This ensures that work flows through the process as it would during a real-world scenario.

*Process "Arrivals"*

Once the process behavior is defined, the volume of work being created must also be modeled. This includes the type of work, and the point in time this work is created during the simulation.

To provide a more realistic simulation, much thought should be given to the specific points of time that work is created. For example, is work created evenly throughout the day, or will there be a peak in the morning associated the arrival of mail? Just as with work shifts, multiple arrival patterns can be defined to accurately reflect a complex business operating environment.

*Task Cycle Times*

Perhaps the most crucial aspect of the simulation is the definition of the time required to complete the various component tasks that comprise the simulated business processes. This will have a significant impact on the projected process cycle times and their associated costs. The average time taken for each task must be defined in order for the simulation to be meaningful.

***End-to-End Process Analysis and Optimization***

*"…upon completion of the simulation, the process data from the Process Simulator can be fed back into the Process Analyzer to help validate the assumptions of the simulated process before deployment, thereby reducing associated implementation risks."*

If the simulation involves an enhanced version of a process already in production, then existing data stored in the Process Analyzer can be fed directly into the simulation scenario. The ability to leverage insight into the existing process greatly improves the level of accuracy of the simulation data.

In addition, upon completion of the simulation, the process data from the Process Simulator can be fed back into the Process Analyzer to help validate the assumptions of the simulated process before deployment, thereby reducing associated implementation risks.

***Consistent Simulation Environment***

Process simulations are only worthwhile if they are both accurate and conclusive. The simulation must provide the information necessary to assess whether a given process will provide the desired results upon implementation.

Unlike many process management tools that provide an independent simulation capability, the FileNet P8 architecture helps to maximize the accuracy of the simulated processes by ensuring that the representation of the processes in the simulation environment is identical to that which will be deployed. This approach differs significantly from other vendor's workflow products that rely on 3rd party analysis tools. These tools visually represent the process maps differently from the workflow vendor's tool, creating a fundamental disconnect between the two environments.

With the FileNet Business Process Manager the Process Simulator uses the same process design maps from the Process Designer. In this way, as changes are made to the original Process Map, these changes can be directly re-instituted back into the business process.

However, is not enough to represent processes as accurately as possible. It is also vital to represent the behavior of the work flowing through them and the actions of the resources that execute them. As data relating to work volumes and task cycle time collected by the Process Analyzer is fed directly into the simulation environment, it adds an additional level of realism to the simulation, further enhancing accuracy.

The ability to simulate a process does not lose its value once the process has been implemented. On the contrary, the accuracy of the simulation can be assessed since the simulation generates exactly the same analytics data as the real-life implementation. This ensures the business intelligence upon which critical business decisions are made is continually refined and improved; assuring decisions are made with the best possible information.

***Summary***

In today's fast moving marketplaces, it is vital that organizations assess their performance not merely periodically, but as a continuous ongoing activity, allowing process modifications to be made without interrupting the processing of work.

The FileNet Business Process Manager provides a robust framework to automate, integrate and optimize business processes to speed critical business decision-making, increase organizational responsiveness and efficiency and lower the overall cost of doing business.

The fully integrated Process Analyzer increases the visibility of core business processes, thus raising the awareness of key decision maker. The OLAP architecture provides business stakeholders a new level of insight into their business operations, providing crucial process metrics for process optimization activities.

The Process Simulator's capabilities, through its consistent representation of the business process and the ability to leverage live data directly into simulation scenarios, ensures that process modifications can be fully and quantifiably validated prior to deployment, thereby minimizing the ever present risks associated with modifying business procedures.

## About IBM ECM

As the clear market leader in Enterprise Content Management (ECM), IBM's ECM solutions help organizations make better decisions, faster by managing content, optimizing business processes and enabling compliance through an integrated information infrastructure. IBM's ECM portfolio delivers a broad set of capabilities and solutions that integrate with existing information systems to help organizations drive greater value from their content to solve today's top business challenges. The world's leading organizations rely on IBM enterprise content management to manage their mission-critical business content and processes.

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