IBM FileNet Business Process Manager

Version: 4.0

IBM Corporation

3565 Harbor Blvd, Costa Mesa, CA 92626-1420
Tel: 714-327-3400 or 1-800 FILENET
Web: www.ibm.com

1 Product Overview

IBM FileNet Business Process Manager (BPM) suite is an essential part of FileNet P8 ECM (enterprise content management) platform which provides extensive content management and compliance solutions. Figure 1 below shows FileNet P8 logical architecture and where FileNet BPM fits within it.

Figure 1. IBM FileNet P8 ECM platform

FileNet BPM provides a comprehensive set of capabilities for the end-to-end automation, management, and optimization of content- and human- centric, information-rich business processes that involve people, content, and systems. As Connie Moore of Forrester put it, "FileNet is virtually unbeatable when enterprises need event-driven BPMS with active documents and e-forms, and collaboration tools, to support document-intensive and people intensive processes..." (Feb. 2006).

FileNet BPMS consists of an integrated suite of BPM products that enable organizations to manage the full lifecycle of their content-centric business processes—from modeling and design to execution, monitoring and optimization. Figure 2 provides an overview of FileNet BPMS, which consists of various core components (in light blue) and a number of integrated add-on products, including:

- ***Process Engine*** *(PE):* FileNet's scalable Process Engine that is at the core of FileNet BPM.

- ***Content Engine*** *(CE):* FileNet's enterprise scale CE accompanies the PE as an object and content repository.
- ***Application Engine (AE):*** FileNet P8 Web layer functionality; P8 portal, Workplace, which provides repository browsing and includes Web applications such as Process Designer and Process Simulator all based on AE.
- ***Process Designer***: Web-based graphical design tool for defining executable processes in XPDL that is accessible from P8 Workplace; with the new FileNet Connector for Visio, customers can import process models from Microsoft Visio to Process Designer.
- ***Connector for Microsoft Visio***: includes a BPMN Stencil and a BPMN Template for Visio, and a mapping facility from Visio to Process Designer. Business analysts can model processes based on BPMN process modeling standard in Visio, then import them into FileNet Process Designer in XPDL. The mapping tool is general enough so that any Visio process diagram, even if not based on BPMN, can be mapped to XPDL once a mapping is defined.
- ***Process Tracker***: provides basic monitoring and tracking of in-flight (active) processes.
- ***Process Simulator***: for simulating processes and performing what-if analysis to improve and optimize processes. It includes a design tool for defining simulation scenarios.
- ***Process Analyzer***: Online Analytical Processing (OLAP)-based reporting engine with an Excel-client for data analysis. It can analyze process execution data as well as simulation data to help identify opportunities for optimizing processes and their resource usage.
- ***Business Process Framework*** *(BPF) (*add-on product): provides a user interface framework for rapid development and deployment of BPM applications by means of configuration. Ideal for case-based applications, it supports complex task management and provides a role-based, customized, and personalized user experience.
- ***eForms*** *(*add-on product): for creating high-fidelity, smart, easy-to-use electronic forms (eForms) with sophisticated internal logic and integration to back-end data. eForms can be used to define the user interface for every human activity within a process.
- ***Business Activity Monitor (add-on product)***: provides functionality for real-time business activity monitoring (BAM) and business performance management. It features a highly customizable Web-based dashboard framework with visual metrics and alerts tied to various events coming in from Process Engine as well as other sources. Business rules can be defined so that certain event patterns or threshold crossings can result in visual or audible alerts, invoke a Web service, or launch a business process back in FileNet BPM.

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Figure 2. FileNet BPMS components

The FileNet P8 platform also features other relevant products, including:

- ***Team Collaboration Manager*** *(TCM)*: supports ad hoc activities that cannot typically be captured in a structured process; provides features such as chat, live meeting, polling to support collaboration, and information sharing across teams.
- ***Records Manager***: securely capture, declare, classify, store, and dispose of both electronic and physical records according to fiscal, legal, and regulatory requirements, thus helping with compliance issues and avoidance of litigation.

FileNet BPM combines notions of Process with *Active Content* management. This combination facilitates a variety of process management scenarios. Active Content can represent literally anything that is of interest to the business–from unstructured documents through to LOB applications and customer cases. Each piece of content has metadata which may include information about its creation date, owner, keywords, etc. Any change in that content or its metadata is an event which can be captured and acted upon. For example, such a change can cause a process to launch. The process in its execution may in turn cause other changes to the content. Content provides a context for a process in which better decisions can be made. Furthermore, metadata such as process, rule, and forms definitions (which may be in XML or other formats) are themselves content that can and should be managed as such.

FileNet P8 uses a *publish and subscribe* event based model. As *Business Objects* in the repository change state (i.e., as they are created, modified, or deleted), the system can automatically launch the appropriate process or make a behavioral change in an in-flight process. For example, once a mortgage application is created, the process for managing that application instance is immediately created and executed. If the mortgage were subsequently modified (say, by raising the amount to be borrowed), then this event would automatically invoke the appropriate review processes, as required.

Having a reliable method to link changes in business processes to changes in content provides a realistic approach to ensuring regulatory compliance. This is, in fact, the foundation for FileNet compliance solutions such as Records Manager and Email Manager.

FileNet BPM also provides various Web services capabilities, such as the ability to consume Web services in processes and publish processes as Web services, as well as Web services (WSDL based) APIs. These enable FileNet BPM to support Service Oriented Architecture (SOA) initiatives and inter-operate in an SOA environment.

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FileNet BPM also benefits from tightly integrated business analytics and simulation capabilities aimed at business analysts and managers. This enables reporting and analysis of historical process data, performing what-if analysis by running simulations on a given data set, and in turn, improving the process performance by making changes to it. FileNet BPM also provides extensive BAM functionality, allowing for pro-active, real-time and actionable monitoring of key business metrics. These capabilities support FileNet's support for full process lifecycle – modeling, analyzing, simulating, deploying, and optimizing business processes – on a continuous basis.

In short, FileNet BPMS, with its broad range of functionality around process, fully integrated with content, event-based architecture, support for Web Services and SOA, provides a comprehensive platform for building highly flexible and adaptable process- and content- enabled applications.

2 BPM Engine

At the core of FileNet BPM is the Process Engine (PE) which is a state machine and executes the processes that are designed in FileNet Process Designer. FileNet BPM is unique in the sense that PE is tightly integrated with FileNet Content Engine (CE), the content and object repository in FileNet P8. This tight integration enables FileNet P8 to capture and leverage the full synergy between process and content. P8 Application Engine (AE) leverages the APIs of CE and PE to implement Web based application services for P8. PE provides both Java as well as Web services (WSDL) APIs to provides process services. These APIs can also be used by customers to build custom content and process applications. Figure 3 below shows the three engines and their relationships.

Figure 3. FileNet P8 Engines in BPM

The Content Engine is the core repository where virtually all items of interest are stored and managed as a series of Business Objects. It also manages process definitions (stored as XML documents in XPDL) and related information on work items in the system. Focusing on Business Objects (and their state) allows the environment to directly reflect business transactions, their associated events, and the

processes that relate to them. Business objects are arranged in an object-oriented hierarchy allowing attributes to be inherited, specialized, and reused. Event subscriptions are also part of this hierarchy.

For example, a Loan business object can act as a container for those data fields which are common to all loans, such as Loan Amount, Loan Term, and Interest Rate. It would also contain objects for integration with other business applications and updates to the Credit System; customer details; loan lifecycle management options for origination and closing; relationship information such as agents or brokers involved; functions for loan approval, closing and exception handling; loan documentation such as credit reports; event definitions to trigger interactions and procedures; and rules related to procedures and credit scoring reports. The various types of loans and the different loan-related transactions are then developed as subsets of the Loan business object, inheriting its attributes and incorporating additional attributes for particular loan types. (See Section 11 on how FileNet BPF leverages business objects to impelement case management.)

Business objects are also used to aggregate all relevant information pertaining to a specific type of business interaction. They can contain links to content such as electronic documents or scanned images stored in a FileNet repository or even a URL link to content stored outside the system. Cross-platform user authentication assures instant accessibility to all information, while retaining pre-existing security access controls.

2.1 Platforms

The overall FileNet P8 platform is a J2EE environment that can run on Sun OS, IBM AIX, HP UX, and Microsoft Windows 2000 Server (Server, Advanced Server) and Windows 2003 Server (Standard, Enterprise, Datacenter). Supported Application/Web Servers include IBM WebSphere, BEA WebLogic, JBoss, Oracle Application Server, and SAP NetWeaver. Standard JDBC compliant databases such as IBM DB2, Oracle, and MS SWL Server are supported. Besides support for J2EE, NET API and Web Services APIs are also available. Supported directory servers include Microsoft Active Directory, Sun Java Directory Server, Novell eDirectory, and IBM Directory Server.

2.2 User Interface

BPMS User Interface

Most FileNet BPM functionality is generally Web-based or Java applets that can run in a browser; both the application components and API are accessible via a browser. All that is required to perform any function is a browser and the appropriate security credentials. Developer and Administrative clients generally connect directly into the Services Layer. For Process Analyzer, the default reporting tool is Microsoft Excel but any other OLAP-enabled reporting tool can be used.

Process Application User Interface

Typical process application user interface is defined in **Business Process Framework (BPF)** as a process portal which is made up of a number of gadgets or portlets. BPF provides an out-of-the-box configurable and customizable process portal framework that provides rapid process application development framework. It can significantly reduce cost development cost. The individual human work steps (step processors) are either simple HTML or dynamic HTML forms, or preferably they are **eForms** applications. eForms provides sophisticated, intelligent, high-fidelity digital forms.

2.3 Scalability

FileNet BPM is an enterprise-scale BPM solution as evidenced by the many large deployments across FileNet's customer base. An independent evaluation reportedly achieved 6.32 million transactions per hour on a scaled down 8-processor machine. The FileNet P8 Process Engine extensively leverages the capabilities of the underlying database environments (i.e., Oracle and SQL Server), such that each transaction is fully journaled by the database, with no information resident in memory. This robust

architecture ensures that in the event of hardware or software failure, the current state of a transaction is known and is automatically completed or rolled back once the system is back online.

FileNet BPM 4.0 also provides Process Engine (PE) farming where a cluster of PEs as well as Application Engines (AEs) can be configured to horizontally scale PE based applications. The farmed system increases PE scalability by supporting the capability of adding more servers to the farm to increase the number of concurrent Remote Procedure Calls (RPCs) that can be executed. Servers can be added to the farm or removed from the farm while the servers in the PE farm are running. This solution is ideal for systems where an individual PE machine is bound by a particular hardware resource.

3 Process Modeling

FileNet BPM 4.0 enhances process modeling and design capabilities via enhanced Process Designer which supports XPDL process definition standard as well as FileNet Connector for Microsoft Visio which provides a BPMN stencil for Microsoft Visio. BPMN is a widely adopted process modeling notation standard owned by OMG. Now business analysts and non-IT staff can define standard process models in Visio without any concern for technical and implementation details. This provides a means for documenting processes and using them for training or for communicating process requirements to IT.

FileNet Connector for Visio also includes a mapping tool for FileNet Process Designer such that any Visio process model can be mapped to a XPDL process in Process Designer, once a symbol mapping is defined. (See Figure 4.)

FileNet BPM is also being integrated with other process modeling tools such as IBM WebSphere Business Modeler and MEGA Process so that process models from those modeling tools can also be imported into FileNet Process Designer for execution.

BPM Process Designer is a Web-based visual design tool used for designing executable business processes. Processes are designed as a series of steps (of various types) connected by transitions (Figure 5). Each step defines who will process the work, which attachments are required, the data required, what responses the participant can choose from, etc. Conditions attached to a transition define the logic of how work will move from one step to the next. Work is routed through the system through individual and shared Queues or defined Workflow Groups (Roles).

Figure 4. Mapping Microsoft Visio processes to FileNet Process Designer

Attached to each node of the process definition is a Step Processor application that provides the information and resources required by the user (instructions, attachments, field values, response options, and other resources needed to complete the work). Step processors for human activities are typically handled by Business Process Framework (BPF) and eForms. (See section 3.3 and Section 10 for more on these capabilities.)

Out-of-the-box, the product comes with a number of Step types – General, System, Submap, and Component. The General Step sends work to a shared Queue, handled then by individual end-users or automated processes. At System Steps, the engine carries out one of its built-in system functions such as performing logic control or setting time limits.

Figure 5. FileNet Process Designer

Sub-processes are supported via Submap steps. A submap can be called any number of times from within a process. Dynamic binding of sub-processes is possible via the Web services interface. In such a situation, each process fragment is developed as a stand-alone entity and invoked either synchronously (triggered) or asynchronously (spawned). Moreover, process fragments developed in this way can be invoked by external applications.

A Component Step represents a call to an external subsystem. Further custom step types can be developed and then added to the drawing palette. Additionally, a range of Web Service capabilities are delivered out-of-the-box (see Section 5 for FileNet Web Services and SOA capabilities).

Process and Step Deadlines drive escalation to generate email notifications or automatically escalate the process via a configured escalation sub-process. Parameter-driven deadlines, based on the process data, specify a time limit for the Step or Process instance completion. If a Reminder is set, the Tracker assigned for this process will receive a message prior to expiration. All time is rendered internally by the software as Universal Time Coordinated (UTC) and rendered to users in their local time zone, allowing processing to cater to multiple time zones.

As far as the repository is concerned, process definitions are just another type of object and are arranged in a class hierarchy. This allows for common process attributes such as data fields, submaps, and milestones to be defined high up in the class hierarchy and inherited by those process definitions. This facilitates the development of consistent behavior across a group of related processes, expediting the overall development process.

Process models are further enhanced with checkpoints and milestones. Checkpoints provide the ability to roll-back an item of work, either partially or completely, if an error occurs. Milestones are linked to steps, both before and after execution, and can trigger events or messages. There are up to 99 levels of milestones, which may be used to drive different levels of proactive notification to different roles in the business (or into customers and 3rd parties). This mechanism can be used to facilitate self-service applications.

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3.1 Subprocesses

Sub-processes are supported via Submap steps. A submap can be called any number of times from within a process. Dynamic binding of subprocesses is possible via the Web Services interface. (See Section 3 for more on subprocesses.)

3.2 Shared Data Space

FileNet BPM supports variables of virtually any type, including array variables (composite data types). Moreover, the associated content environment could also be thought of as a powerful extension to SDS.Any complex business object (or case object) can be defined in FileNet P8 and then shared across content and process engine. FileNet Business Process Framework can use a case object as in a case management application. Such case objects in BPF are created and manipulated as a process executes but they persist past the lifecycle of a process.

3.3 Forms

Forms are typically used for human steps in any business process. For companies looking to create user-centric business solutions on FileNet P8 ECM, FileNet eForms is a forms design and automation software product that allows users to rapidly deploy highly intelligent "eform-centric" solutions (without resorting to programming) that are tightly integrated into the FileNet P8 platform. eForms can be designed and configured out of the box using tools targeted at knowledge workers and solution owners. P8 eForms 4.0 provides extensive API sets and support for offline eForms such that an eForms can be populated and saved offline and then once connected be uploaded and submitted to the system. Note that eForms itself is a type of content (with rich metadata) that can be managed in P8 Content Manager.

High fidelity, XML-based form templates are displayed in users browsers without requiring any downloads. Built-in form logic ensures that the form is completed correctly before it moves on through its associated process. Completed forms can be stored in FileNet P8 as XML data or can be rendered into static format such as PDF or TIFF for archival, thus helping companies meet regulatory requirements.

3.4 Time

As covered in Section 3, FileNet BPM supports Process and Step Deadlines, Parameter driven deadlines, and reminders. All time is rendered internally by the software as Universal Time Coordinated (UTC) and rendered to users in their local time zone, allowing processing to cater for multiple time zones.

3.5 Process Optimization and Simulation

FileNet BPM features a fully integrated Discrete Event Simulation capability designed for end-user business analysts and managers. Process models used in the simulation are the same as those used by the Process Engine, and leverage existing process audit data to ensure process fidelity. (In contrast, most BPM Suites allow export of process data to external simulation capabilities, which then leads to the maintenance of two distinct models.) The Simulation Designer is used to define scenarios that use one or more process models created with Process Designer as is, including the specification of resources availability and costs.

As shown in Figure 6, simulation output data are displayed interactively within the tool to track desired Key Performance Indicators (KPIs), and the data can be exported to Process Analyzer to get a more granular understanding of the simulation data. Users can define various simulation scenarios and then compare them—side-by-side using Process Analyzer—running against actual execution data. This exercise can help identify process bottlenecks and result in fine-tuning the process to optimize resource usage and improve process performance.

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Figure 6. FileNet Process Simulator

4 Business Rules

There are different types of business rules in the context of a business process that can be handled by different means. There are business rules that can be handled by eForms (e.g. field validation), time based rules (e.g. in an SLA) that can be handled via timers in processes, branching rules that can be handled via a logical expression in a process, or event correlation and monitoring rules that may be managd in BAM.

For more sophisticated rules and policy management, FileNet partners with the leading BRMSs (business rule management systems) such as ILog, Fair Isaac, and Corticon which must be licensed separately, which provide more sophisticated tools for rules authoring, testing, and management, typically with a centralized rule repository. Use of BRMS along with a BPM enables processes to be simpler, smarter, and more agile. FileNet BPM integrates with such BRMS either via a Rule Connectivity Framework, or using Web services and SOA principles where business rules is treated as a decision service that can be consumed by a process. BPM-BRM integration enables process designers and business analysts to create and add business rules to processes. Business rules are associated with individual steps of a process in Process Designer, but are created in a BRMS. Each step can have multiple rule sets that execute either before execution, on save, or after completion. The rules engine can assign data to a field in the work item; send a work item to a submap, skip a step, repeat a step, collect monitoring information, or generally be used to implement and enforce SLAs.

When the process definition is transferred to the Process Engine, the defined rule sets are transferred to the Rules Engine along with the data fields (system fields and user-defined fields) defined in the process. Business Analysts can then define individual rules based on the available data fields. This helps make processes simpler and smarter. While processes tend to be more structured and static, business rules can change as often as necessary without any change to the process. Having a centralized rule repository also enables sharing rules across various processes.

5 Integration and Integration Engines

FileNet Integration Services functionality sits within the Services layer and handles all interactions with third party applications. Any third party or legacy application can be integrated as long as it exposes an API via a Java Class, JMS, Web Service, COM, .NET, or XML. Additionally, fixed adapters and connectors can also be used. Then, using the Component Step, developers can make these interfaces available as custom Steps on the modeling palette.

FileNet BPM provides extensive support for Web Services and Service Oriented Architecture (SOA) through the following features:

- FileNet BPM implements a Web Services API in WSDL to its engine that complies with WS-I standard. Through this API, FileNet BPM, in effect, provides BPM services to clients in an SOA environment. This API provides interfaces for launching processes, retrieving the list of queues, the elements of a queue, and a particular step and performing it.
- FileNet BPM provides explicit constructs in design time for integration with Web Services. An external Web Service can easily be consumed in a process by use of an "Invoke" step in the process map to bind to a Web Service. The invocation may be synchronous or asynchronous. There are means for launching a submap if the called Web Service times out or returns an error. Web Services are *discovered* from within the Process Designer by direct interrogation of UDDI (Universal Description, Discovery, and Integration) registries. As a result, the execution of specific process steps can be delegated to externally developed Web Services, regardless of development environment or platform.
- FileNet BPM has explicit constructs for publishing processes (or steps within them) as Web Services. This is achieved by the use of "Receive" and, possibly, "Reply" steps. There may be several Reply steps associated with each Receive step to handle each possible reply. Each Receive step in a process corresponds to a method in the WSDL for the Web Service. When a process gets to a Receive step, it will wait until it receives a message to perform the task. If a Receive step is the first step in the process, then a message sent to it will launch the process.
- FileNet BPM complies with and implements specific Web Services standards such WS-Security for Web Services security functions. It also implements WS-ReliableMessaging which provides guarantee of message delivery between web services subject to a criteria, such as a message, must be delivered at least once, at most once, exactly once, or in order.
- FileNet BPM provides a UDDI registry so that a Web Service can be stored in the process engine. It also provides functions to update a UDDI registry by updating or deleting a Web Service. FileNet BPM is also being integrated with IBM WebSphere Service Registry and Repository (WSRR) which will provide a common repository for a wide range of services across IBM's two BPM suites.

Integration with WebSphere BPM

FileNet BPM is being integrated with IBM WebSphere BPM which provides extensive integration functionality and has a very rich SOA foundation with Enterprise Service Bus (ESB) and packaged integration Adapters. For business processes with heavy integration needs, WebSphere Process Server (WPS) can be used along with FileNet BPM. A process in FileNet may have service-oriented sub-processes that can be expressed in BPEL and executed in WPS. FileNet BPM integrates and interoperates with WPS through Web services.

IBM is in the process of providing several other integrations points in the areas of process modeling such that WebSphere Business Modeler can be used as the common modeling tool for both FileNet

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BPM and WPS. This will be achieved via XPDL export support in WebSphere Business Modeler. The two BPM systems are also being integrated in the area of business activity monitoring (BAM). FileNet BPM will produce Common Business Events (CBEs) so that it can be monitored by WebSphere Business Monitor besides FileNet BAM. FileNet BPM is also being integrated with WebSphere Registry & Repository (WSRR) so that both FileNet BPM and WPS can use WSRR as a common registry and repository for services and processes. This will promote reuse of services and processes across the two BPM systems. For example a composite service or a business process can be discovered and consumed by FileNet BPM and vice versa. WSRR is more than just a simple UDDI: besides being a registry (service interface and description), it is also a repository as it maintains information on service usage.

6 Organizational Structure

FileNet BPM directly reuses the functionality of external LDAP directory servers. These systems are used for authentication as well as for deriving the organizational structure for Queues. Queues typically reflect the structure of the organization (pulling that data from the Directory Server). FileNet BPM also uses *Workflow Groups* that reflect the roles of a business or some other structure (such as matrix reporting) pertaining to each individual process definition. Workflow Groups can contain other groups, although there is no formal hierarchical structuring of them and they can even be modified while the process is in flight. There is also explicit support for roles in ?

7 Process Adaptability

FileNet BPM provides some means for process change and optimization if processes are designed to be general enough through process parameters and sub-processes. In addition, FileNet BPM integrates and works with a number of Business Rules Management Systems (BRMS). BPM can outsource its complex business rules to a BRMS. This helps keep processes more flexible and intelligent. Business rules can change easily and dynamically which in effect results in more adaptable and flexible business processes.

FileNet also provides a sophisticated case management framework that allows multiple processes to be associated with a given piece of content. Moreover, suitably authorized users can decide which processes to associate with the case at runtime.

Team Collaboration Manager provides the contextual framework and a range of collaboration tools, including discussion forums, live meetings, and interactive polls, to enable group members to share information and participate in processes that facilitate group decision-making. Collaboration can make processes more adaptable because such ad hoc collaborations cannot be modeled in design time. These are ad hoc processes that take place in run-time.

8 Process Lifecycle

FileNet BPM provides support for full process lifecycle: modelling and design, simulation, deployment and execution, analytics and monitoring, and optimization. Since the FileNet BPM Suite manages both content and process descriptions together, it becomes possible to build sophisticated applications that map the lifecycle of a content object type to the processes that are used to maintain it. Given that process models are regarded as content objects themselves, it is possible to construct applications that manage the business process lifecycle.

In addition because FileNet BPMS manages both process and content together, it captures the synergy and relationship between process and content: Content provides a context for decision making in processes. Changes in content can start processes or change running processes. Processes can manage

the lifecycle of a piece of content that they use and manipulate. Process models (as well as services, forms and business rules) are all content that can be managed in FileNet P8.

9 Monitoring, Measurement, and Management Information

FileNet BPM provides a variety of features and capabilities for monitoring, analyzing and reporting on process performance and status.

Process Tracking

Process Tracker (part of the core product) provides basic process monitoring capabilities to allow visual and tabular real-time monitoring of in-flight business processes. Authorized users can check on the status of each process instance in the system.

Reporting and Analysis

Process Analyzer provides a variety of chart-based reports based on statistical information gathered from the Process Engine. Under the covers is an OLAP-based repository that is used to store information about cases in the system. The Process Engines' embedded logging subsystem ensures that all event logs are recorded in the same database transaction as the activity that they relate to.

Out of the box, FileNet provides OLAP cubes on Workload, Work In Progress, Queue Load, Cycle Time, and Productivity, allowing for the capture and representation of both real-time and historical information. These are further extended through user-defined fields, which are then presented as another dimension or measure on the cube.

The presentation layer for Process Analyzer can be any tool that understands OLAP, such as Cognos, Business Objects, or Microsoft Excel. FileNet provides sample pre-configured report templates for each OLAP cube using Excel (the de facto client side business-reporting tool for many organizations). It also offers native support for Microsoft OLAP services where business users can "drag and drop" OLAP cube dimensions and measures interactively onto the graph. The graphical presentation of the reports supports user interaction in the form of drill down, rollover, filtering, and slice and dice. This allows users to start their reporting and analysis of workflow data without requiring a large investment in interface technology. Figure 7 shows an example of a Process Analyzer report.

Figure 7. Example of a Process Analyzer report

Business Activity Monitor

FileNet Business Activity Monitor provides more sophisticated and comprehensive real-time monitoring and visibility into the effectiveness of business processes and overall organizational performance as measured against KPIs. Business managers can receive alerts via customizable dashboards, and, if need be, can automatically initiate action or processes based on those alerts (Figure 7). Business managers can analyze events from business processes as well as correlate them with data from other enterprise applications to gain further insight into specific alerts and events. This provides the necessary context to make the right decision at the moment it matters most in the business process. FileNet BAM allows companies to increase organizational responsiveness and better manage and reduce risk by identifying issues before they become problems and by taking immediate action to avoid threats and mitigate risks.

FileNet BPM is also being integrated with IBM WebSphere Business Monitor (WBM) such that processes in FileNet BPM can be monitored with WBM.

Figure 8. Example of FileNet BAM dashboard

10 Templates and Frameworks

To allow customers faster BPM deployment and encourage self-sufficiency, FileNet offers an application framework: FileNet Business Process Framework (BPF). BPF provides a configurable Web-based user interface (UI) framework for BPM applications that can be customized to the requirements of a business process and personalized to the needs of the human roles that participate in that process. BPF enables rapid process application development.

BPF is useful for building case management applications where a case object is a virtual folder that may contain documents, data, and meta-data pertaining to a subject such as customer, patient, and loan. To do this, BPF leverages FileNet Content Engine (CE) functionality. Such as a case object is maintained in CE and persists beyond the lifecycle of a process that uses the case. For example, a customer might have multiple loans or refinance a number of times. A patient may have a number of hospital visits and surgeries.

BPF is built on the BPM API and provides a higher level abstraction of the common elements in a typical process application. BPF also leverages FileNet Content Engine for storing documents and case objects. Based on FileNet BPM best practices, BPF results in significant reduction in the total cost of ownership (TCO) of BPM applications and has been used and deployed by FileNet customers.

BPF also provides a framework for building industry (vertical) specific solution templates such as claim processing, loan origination, and risk management, as well as horizontal applications such as accounts payable. Although FileNet has considerable experience in building such solutions, FileNet is not in the packaged application business. Instead, FileNet relies on its partners to deliver such solutions.

11 Vendor

FileNet, an IBM company, helps organizations make better decisions by managing the content and processes that drive their business. FileNet's ECM solutions allow customers to build and sustain competitive advantage by managing content throughout their organizations, automating and streamlining their business processes, and providing a spectrum of connectivity needed to simplify their critical and everyday decision making.

FileNet ECM solutions are designed to deliver a comprehensive set of capabilities that integrate with existing information systems to provide cost-effective solutions that solve real-world business problems.

Since the Company's founding in 1982, more than 4,300 organizations, including three quarters of the *FORTUNE 100*, have taken advantage of FileNet solutions for help in managing their mission-critical content and processes.

Headquartered in Costa Mesa, California, FileNet markets its ECM solutions in more than 90 countries through its own global sales, professional services, and support organizations, as well as via its ValueNet Partner network of resellers, system integrators, and application developers.

12 Cost

Pricing is based on a per server charge, combined with an additional cost for either concurrent or named users. Production capable, entry-level systems typically start at around $120,000, while the average sale is approximately $250,000. Certain components of FileNet BPM such as BPF and BAM are add-ons that can be licensed per system for a nominal fee. FileNet also has capacity planning tools designed to help customers determine the optimal solution that will scale to meet their needs.

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FileNet Corp.: FileNet Business Process Management Suite, Version 4.0

Overview	Sophisticated Content & Process Management tool set; Object Oriented event based model launches appropriate processes in response to changes in content state; Tightly integrated Analytics and Simulation environments
BPM Engine	J2EE Server with separate engines for Process & Content
Platforms	OS: SunOS, IBM AIX, HP UX & Microsoft Windows Server; Application Servers: WebSphere, WebLogic, JBoss, Oracle App Server, Tomcat; Databases: IBM DB2, MS SQL Server, Oracle
User Interface	FileNet Business Process Framework (BPF) for end user, Workplace portal for development & administrative, BAM for business management; all are wWeb-based, deployable to any browser
Scalability	6.32 million transactions per hour on an 8-processor system; in version 4.0 Process Engine Farming is supported that provides virtually unlimited scalability, high availability, and disaster recover support
Processing Modeling	Fully supported via Process Designer and FileNet Connector for Microsft Visio; Visio based modeling tool for business (non-IT) that supports BPMN; Visual XPDL based process design with expandable and customizable node types. Support for import of any Visio-based process models as well as other 3rd party modeling tools.
Subprocesses	Submaps called anywhere from within the process model; Web Services for dynamic binding of process fragments
Shared Data Space	Variables of virtually any kind including arrays; Sophisticated repository tightly integrated with process
Forms	Integrated eForms capability; plus any HTML, JSP or ASP form
Time	Milestones & Checkpoints, multi-level escalation
Optimization & Simulation	Bundled simulation capability based on actual process models & process audit data; enabling *round-trip* optimization
Business Rules	Native support for certain class of simple rules; Integrated with BRMS vendors.
Integration	Numerous packaged adapters to 3rd party applications and legacy systems; Full range of Web Web Services functionality (both consume and pulish services); range of APIs: Java, WSDL, .NET
Organizational Structure	Re-use LDAP/AD for both queues & authentication
Process Adaptability	Dynamic binding of process fragments, integration with business rule engines (BREs), support for collaboration
Process Lifecycle	Process objects could be managed through lifecycle capabilities of content repository; for Web services that can also represent processes, there is a UDDI registry in the Process Engine
Monitoring & Measurement	Broad array of management information available through OLAP cubes & Excel reporting. Also Business Activity Monitor (BAM) offers extensive real-time monitoring and business performance management support through customized dashboards with alerts and metrics.
Templates & Frameworks	Wide range of offered via partner network – e.g., Case Management, Lending, Risk Management, Claims Management & Compliance. Also FileNet Business Process

	Process Framework (BPF) provides a foundation for industry specific solution templates that may be developed by FileNet BPM partners
Vendor	IBM Corporation, 3565 Harbor Blvd, Costa Mesa, CA 92626; 714-327-3400; www.ibm.com
Cost	Entry level around $120K, typical sale $250K