

Operations

Research and Advisory Services

Business Process Management RESEARCH PAPER

Fujitsu i-Flow

Abstract

Fujitsu, through the deployment of its Business Process Management (BPM) Platform, i-Flow, provides organisations with the ability to address the ever changing business needs of the corporate enterprise market place. This functional arena, embodies a highly complex trading area, where the fragmentation of IT systems is an ever-growing and continual problem. It is also an area, where day-to-day processing requirements constantly change, and one where the end-users have an urgent need for tools that have the agility and flexibility to respond to their ongoing requests.

i-Flow was developed to integrate the needs of an organisation's people, information, and technology processes. It uses an operational methodology that allows it to be responsive to change, whilst retaining the ability to drive end-to-end business processes. i-Flow is a 100 per cent Java and browser-based BPM solution, and one that Butler Group feels has been developed to the stage where it has the maturity to address the real needs of enterprise-level businesses today.

STRENGTHS

- i-Flow has been designed specifically to provide BPM capability within a browser-based environment.
- Its open architecture allows integration with a diverse range of architectures, and encourages client and server platform independence.
- Fujitsu has a mature, but up-to-date, product offering, and has established sales and support channels in place.

WEAKNESSES

- The brand image of Fujitsu's BPM products is somewhat understated, and does not appear to reflect its record of accomplishment within the European and North American software markets.

FUTURE POTENTIAL

The i-Flow product suite continues to evolve to meet the changing needs of its core markets. i-Flow currently supports Fujitsu's INTERSTAGE and BEA's WebLogic application servers. The next release (available in January 2002) will see the product become EJB-based (Enterprise JavaBeans), thereby enabling i-Flow to utilise application servers for features such as clustering and failover. Support for other J2EE technologies such as Java Message Service (JMS), JSP/servlets and the calling of other Java objects over RMI will be enhanced. i-Flow will also support mobile users through Short Messaging Service (SMS).

► FUNCTIONALITY

Product Analysis

One of the major challenges facing businesses in the information age is how to grow and expand their trading opportunities, whilst maintaining and developing IT systems to keep pace with their operational needs. Over the years, many organisations have grown up with a disparate range of legacy systems to deal with their current corporate requirements. In addition, growth through acquisition, alliances, and partnerships has meant that systems and business processes that were developed in isolation, now have a need to be brought together, to support the extended enterprise.

From the IT vendor's perspective this means that there are fewer and fewer green-field development opportunities presenting themselves. However, fragmentation of IT systems, along with the need for end-to-end business processes and a lack of process controls, remain as a common problem. Fujitsu has developed its i-Flow process management engine to deal with just these circumstances. Its Business Process Management (BPM) platform has been designed specifically to manage both the people and systems automation and management issues.

i-Flow enables data and documents to be passed between business users based on a graphical process model. It has the ability to apply business rules and regulatory requirements to complex processes, and provides its users with the opportunity to respond to change when and where it occurs. All of this is achievable without the need to resort to the effort of re-programming each time an individual task or event is changed.

Effectively, the customers that make use of i-Flow are business users who have a need to increase the elements of human collaboration within processes, but also need to have the ability to do this in a positive way. Their requirements are to work with documents and information flows in a flexible manner so that these can be adjusted in real-time, whilst maintaining an adherence within the processes to any regulatory requirements against which the processes must conform. Also, because the i-Flow development model has been designed with browser-based end-users in mind, it can be used to generate processes and business logic without the need for change at the desktop end of the operation.

Part of the role of i-Flow is to enable application-to-application integration, irrespective of the individual application's origins, and to bring about user-driven flexibility within the processing of business processes and their internal actions. Integration is the key, and i-Flow has the capability to bring together the information flows from disparate systems and technologies, from both inside and outside the boundaries of the enterprise. It can also be used to automate and improve processes that were previously dealt with on a manual basis, and has audit trail facilities that can be deployed to ensure that the effectiveness of processes can be measured, tracked, and reported upon.

Fujitsu's i-Flow product has been designed to be highly adaptable, and can be used to provide integration for and between both packaged and custom-built software applications. The product is 100 per cent Java-based in its architecture, and is 100 per cent browser-based and exploits XML for business process templates.

Product Operation

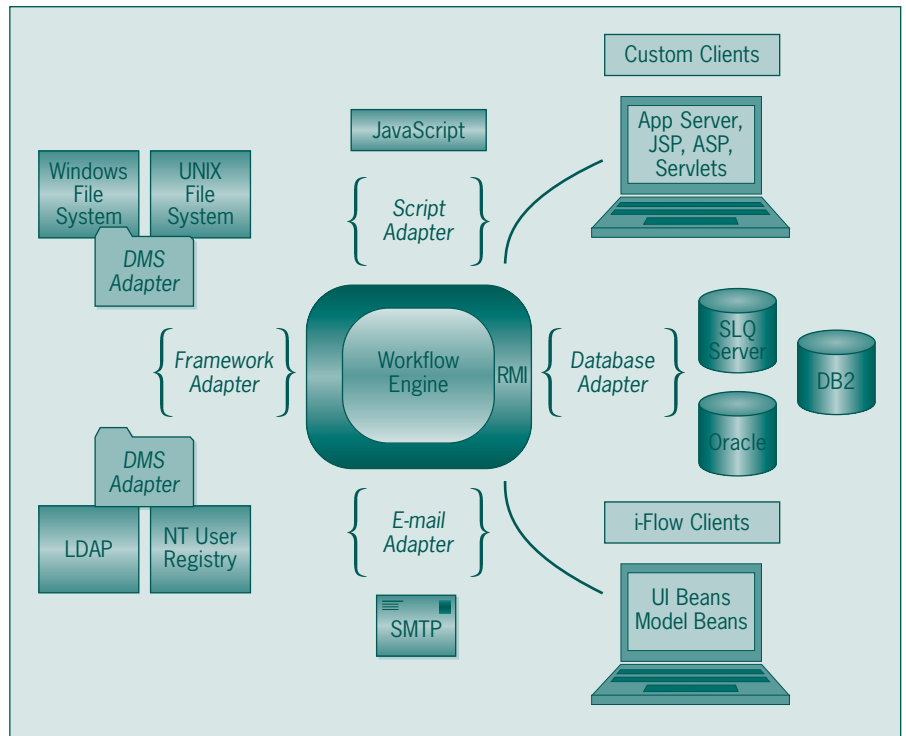
Within its i-Flow tool set, Fujitsu provides a process management engine, customisation tools, and the components to enable application-specific solutions to be deployed across the enterprise. In addition, i-Flow provides framework-based extension and customisation through its use of Application Programming Interfaces (APIs). Such extension and customisation can be undertaken using commonly available products and industry standard interfaces.

The main component of the i-Flow server is the process management engine. Its role is to negotiate and control interactions between clients, to enact processes started by the users, and to notify users when status changes occur. The i-Flow architecture is adapter-enabled to allow integration with third-party products. Adapters allow the server to communicate with other systems components, and as the adapter effectively operates as a converter, it is only necessary for organisations to employ the adapters that support their current operational environment.

The process management engine is a standalone Java server providing its services through its adaptors, of which, the DataBase Management System (DBMS) adaptor, manages the persistence of workflow processes. The Document Management System (DMS) adaptor stores the process data. The Directory adaptor manages directory services for role resolution, and the Script adaptor provides access to external applications via APIs or Java extensions. Functionally, the Script adapter interprets scripts entered through client and external server-side scripts, and allows invocation of external server-side objects such as Java objects and Common Object Request Broker Architecture (CORBA) objects.

The server updates the client with status changes, and updates template and process data as requested. In addition, it notifies users of tasks by e-mail and/or other event-driven update channels. The i-Flow multi-threaded architecture is distributed, allowing scalability from small compact systems applications, up to multiple server deployments that require collaboration across the enterprise, and therefore provides BPM at an enterprise level.

The main components of Fujitsu's i-Flow solution have been designed to support a wide range of business users, with the emphasis on speed of delivery, and change management. The front-end development processes have been predefined to a stage where a broad selection of out-of-the-box, browser-based clients, are available. These clients are constructed with reusable components that can be taken as standard, or extended and enhanced to deliver the required business processes.

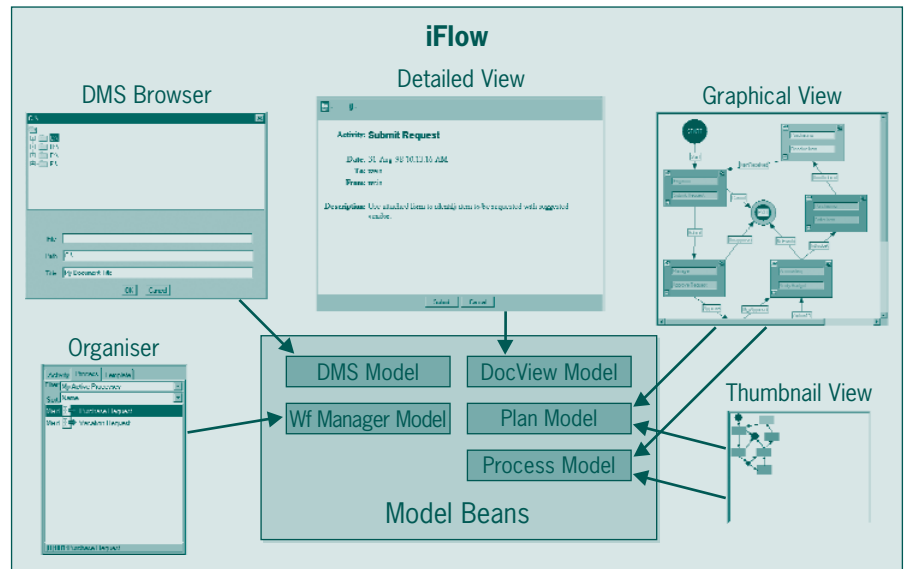


- **Development Manager** is a fully featured graphical design environment, its role is to design process templates that are used to start and modify processes at runtime, access tasks, and check progress status and history. The functional application of this product is targeted at process designers, business analysts, advanced i-Flow users, and supervisory staff who have the relevant access permissions. Development Manager provides the graphical design environment for building process flows.

At its simplest level, the developer client enables new processes to be established very rapidly. Once deployed, these processes can be amended and modified as necessary. This includes implementing changes on a runtime basis, and whilst processes are being executed. The developer uses Web authoring tools for forms design, and from this process i-Flow generates a simple form with embedded Java applets. These forms can then be enhanced with commonly used Web authoring tools. The component kit, based on JavaBeans and JavaScript, provides two types of components for models and user interfaces. The user interface components are for Web client presentation and can be customised by importing them into any popular Java IDE, for example Visual JavaScript from Netscape, or JavaStudio from Sun Microsystems.

- **Task Manager** is used to access and respond to work items. It is capable of identifying and displaying the users assigned to specific tasks, and also has the role of giving access to forms and attachments, thereby allowing it to provide the standard interface for most workers to i-Flow.
- **E-Mail Work Item** is used by the system to respond to tasks and relevant documents. If a new task is identified, i-Flow can send an e-mail notification to the owner of the task and provide them with an automated link to the process. This level of communication can be useful to advise infrequent i-Flow users, who do not automatically log into the system, when a new task is ready to be actioned.
- **New Process** is what it claims to be, and can be used to create new processes from existing process components. Typically, this type of client would be embedded in a corporate Web site ready to start new processes.

- **Administration Client** is used to manage processes, for example, ensuring the integrity of template versions, and allowing administrator-level staff to control when new templates are released. It is also used for the importing, exporting, archiving, or deleting of process designs, instances, and tasks, and for the modification, set-up, or removal of user profiles.



Within the i-Flow tool box there is a wide range of functionality, including automated forms generation, using simple default forms that can be modified or enhanced using virtually any commercial HTML editing tool. There is also document attachment support for the document check-in and check-out processes for use with the Microsoft and UNIX platforms. Task filtering and sorting facilities are also available using the i-Flow organiser, and users can be given the ability to accept, decline, or reassign tasks dependent upon their existing workloads.

Authorised users are provided with the facilities to edit active tasks, allowing them to change any aspect of an active process using the graphical Web-based interface. This facility can be used to add or remove tasks, change the routing of business rules, and add or remove data items and forms. All runtime changes are stored in a private template, which can then be used to make permanent changes to the process by developing a new version for future use. Designers can reuse existing process designs to develop sub-processes within a parent process, and these sub-processes can also be chained together and may eventually form new and independent business processes.

From an auditing perspective, i-Flow maintains a history of all events that occur during a process, and the audit data is available for viewing at any stage during or after the running of the process. i-Flow provides chart-based reporting on the status of processes, templates and tasks, and from these reports administrators and managers are able to monitor progress, and determine how many processes are open, and who the process owners are.

Product Emphasis

Having the ability to provide organisations with the agility and flexibility to react to changing operational circumstances, effectively allowing the corporate users to work smarter is one of the most important issues facing business today. Increasing productivity, lowering systems development costs, whilst maintaining a competitive advantage, are also areas of concern. However, they all pale into insignificance if the organisation does not have systems in place that can react immediately to the real ongoing business needs of the operation.

Fujitsu, with its i-Flow business automation engine, is focused on providing solutions that can provide this type of benefit. Its products provide open standard functionality, because i-Flow is 100 per cent browser-based, and was developed using Java and XML technology. It allows users to deploy processes without having the need to learn proprietary technologies, whilst also enabling organisations to utilise their existing IT infrastructure using its adapter technology.

The overall business benefits that deploying i-Flow seeks to provide includes: the provision of change management facilities, reduced time-to-market through the use of its integration features, increased productivity by automating the routing of tasks and providing increased project visibility, and, perhaps of primary importance to many organisations, reducing development costs.

► DEPLOYMENT

The skills required to deploy and develop Fujitsu's i-Flow solutions are pretty much what would be expected for a BPM platform. They include Java/JavaScript, HTML design, and database skills such as Microsoft SQL Server, Oracle or DB2, along with business analysis and business process skills.

In many ways i-Flow does provide the capability of an out-of-the-box solution with large portions of its applications functionality predefined. As a result, Fujitsu has a number of reference clients using its i-Flow solution as a plug-and-go application. However, this is just part of its flexibility, as the solution can also be tailored to meet the specific needs of individual organisations.

Operationally, the solution can be deployed in time-scales varying from two to three months for small implementations, where plug-and-go functionality can often account for between 60 and 70 per cent of the final solution; whereas, realistically, the time-scales for deployment of an enterprise-level solution, using a modular approach, will take between three to twelve months. This takes into account the fact that business processes can be deployed in an ongoing basis, with those processes that provide the best Return On Investment (ROI), or those that are most important to the business, being deployed first. ROI for i-Flow can be measured in a number of ways, including successfully achieving overall business strategies, productivity increases, and profitability increases as a result of its deployment, as well as everyday improvements in cycle times and information flows.

- **Operating platforms supported include:** Microsoft Windows NT, and Windows 2000, plus AIX, HP-UX, and Solaris.
- **Database servers:** Microsoft SQL, Oracle, and IBM DB2.
- **Web and FTP servers:** Any compatible Hyper Text Transfer Protocol (HTTP) or File Transfer Protocol (FTP) server such as Microsoft Internet Information Server (IIS), Netscape Enterprise Server, or Sun Microsystems WebServer.
- **Communication Channels supported:** RMI, CORBA, and TCP/IP.
- **i-Flow's horizontal capability supports integration with:** Operational Databases, Content Document Management, CRM, ERP, HR and Web sites.

When deploying business process automation solutions such as Fujitsu's i-Flow, it should not be necessary to change operational processes, but, having said that, processes will often change as a by-product of the organisation's wishes to become more efficient. This has certainly been Fujitsu's experience, and one that it has seen repeated on many occasions.

Product Strategy

The market for products like Fujitsu's i-Flow, with its focus on productivity, process flexibility, and low cost maintainability is growing rapidly. There is a continual need for products that are capable of providing increased customer service, and flexible resourcing, whilst retaining the ability to include human collaboration within the delivery process.

As companies push for increased revenues and operational efficiencies, staffing levels, especially in high-earning areas of organisations, such as IT, often get squeezed. As a result, the use of traditional development methodologies becomes more impractical, hence the movement towards, easier to use, fast deployment technologies, such as BPM solutions like Fujitsu's i-Flow.

This, of course, is not the only reason for moving an organisation's processing and development strategy towards the use of BPM tools. The fact that these applications can provide business users with the ability to react to changing conditions within their day-to-day working environments, without the need for development-level assistance is important. But the really important issues revolve around the whole solution, the fact that Fujitsu's i-Flow application is capable of providing an end-to-end solution, one that is both responsive and one that remains available to its users before, during, and after process changes have been made.

The target market for Fujitsu's i-Flow solutions are Fortune 2000 organisations, although realistically any medium to large organisation could derive benefit from utilising its process management technology. Currently its main focus for business is the US, with Germany and the UK providing its most successful European markets. Other markets where Fujitsu is currently making overtures include Australia, Brazil, Malaysia, and Singapore.

To date there has been particular interest from the banking and insurance sectors, telecommunications organisations, and content management providers. Most sales are made to end-user organisations through Fujitsu's business partners, although direct sales are a possibility within the European sphere of operations until a strategic partner network is fully in place. Where sales are made through business partners, these organisations normally provide level-one support facilities, with Fujitsu being responsible for giving product support. Key business partners for Fujitsu's i-Flow products include Amdahl, DMR, TRC, Adsystem, Accenture, North Plains, Tower Technology, and Second Foundation.

The i-Flow product suite continues to evolve to meet the changing needs of its core markets. i-Flow currently supports Fujitsu's INTERSTAGE and BEA's WebLogic application servers. The next release will see the product become EJB-based (Enterprise JavaBeans), thereby enabling i-Flow to utilise application servers for features such as clustering and failover. Support for other J2EE technologies, such as Java Message Service (JMS), JSP/servlets, and the calling of other Java objects over RMI, will be enhanced.

Typically, product deployment costs start at around US\$100,000, and are split between licensing costs, server costs, and the service costs of implementing the solution. Maintenance and support is charged at 20 per cent of the original licence price, but year-one maintenance is included within the initial purchase.

► COMPANY PROFILE

The Fujitsu Software Corporation is a global supplier of hardware, IT services, and systems solutions, it is a wholly owned subsidiary of Fujitsu, a US\$45 billion technology conglomerate (Nasdaq = FJTSY). Headquarters are in San José, California, and it has many other offices worldwide. Fujitsu Software Corporation was established in 1991 and its products include INTERSTAGETM, e-business infrastructure software that includes the INTERSTAGE Application Server and i-Flow™; and Fujitsu COBOL. The INTERSTAGE Application Server enables enterprises to build and run mission-critical applications. The i-Flow Business Process Management Platform empowers enterprises to manage business processes and business process change. Fujitsu COBOL is a COBOL development environment and suite of tools to build fast, mission-critical business systems on open platforms, including Microsoft's .NET Framework.

The company is a leading supplier of platform-independent groupware, messaging, and business automation processing software, and the expertise for its i-Flow suite is currently shared between its offices in Ireland, Germany, Brazil, Australia, and Singapore. Fujitsu sells its products via its Independent Software Vendor (ISV) partners who are typically systems integrators, custom development organisations, and the larger consultancies. Among its list of high-profile customers, of which there are currently around over 100, are well-known names such as Arizona State University, Farmers Insurance, Massachusetts Department of Education, GlobalSight, Spawar, and iJet Travel Intelligence.

► SUMMARY

Fujitsu's i-Flow application suite provides corporate users with a BPM solution that is focused towards supporting, maintaining, and energising business processes across the enterprise. Entirely written in Java, it offers a scalable support engine that has the ability to leverage CORBA-IIOP/RMI protocols, and is able to integrate its product services and core functionality through the use of its adapter technology.

The core strength of i-Flow comes from its innate flexibility within the areas of process control, and process regeneration. Its ability to manage application to user interactions, and application to application integration. This is added to by i-Flow's ability not only to re-work business processes on a real-time basis, but also to provide the users with the facilities to store existing and changed processes, with the option of choosing which process goes forward for future use.

Butler Group firmly believes that i-Flow provides business users with a number of key operational advantages in the process support environment, and its evolutionary development as the first 100 per cent Java- and browser-based workflow technology solution adds further to the overall value proposition.

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