



# JMS E Business Messaging and EAI

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The Internet offers a convenient way for businesses to tie their enterprise systems. Increasingly companies are looking to the Internet to integrate their supply and demand chains. Information is the most vital asset enterprises possess and its movement across the Companies eco system is as vital as the movement of inventory. Winners will be those who build their eco systems and move Information in real time. Eco- Systems, however will not be static they will be subject to change, constant re-configuration as Companies re-engineer to encompass outsourcing partners, build new demand channels through virtual exchanges and business trading hubs. The next frontier of operational efficiency will be driven by how efficiently, quickly and reliably companies can move Information in real time. Cycles will be very short.

While the Internet promises a low cost integration infrastructure it is not without its problems. There are issues other than those that relate to security even though security will demand the highest attention. There are other challenges- those of scale and reliability.

Messaging has long been used to solve integration of disparate applications in a dedicated backend IT infrastructure or even distributed over proprietary networks. Banks, Financial services and Telcos have been early adopters and users of this technology. Many of these have to deal with low volume messaging. Emerging eBusiness architectures on the other hand demand scale and high volume messaging.

Consider some integration scenarios:

- A Financial Services Company needs to distribute stock quotes as a feed or stock reports/ advisory services over the Internet to its customers. These customers will continue to grow. The architecture needs to provide an efficient means to distribute content, selectively to a participating audience. At best the solution needs to be scalable and fast. AT the same time it needs to be asynchronous decoupling the receiving application from the sending application.
- An Engineering company needs to propagate a series of documents to its supply chain whenever an engineering change occurs. This may include an Engineering change notice, revised Bill of Material, revised Engineering Drawings, substitute parts/ changed parts specifications, affected subassembly documents and so on. These have to be sent as a transacted set, which means that either all documents are sent to the supply chain or none are sent.
- The internal IT systems solve domain problems – The ERP systems implement solutions for the Operations, Manufacturing and Distribution and manage the Supply/Chain. The Demand Chain solution manages Customers, Resellers, Partners, Virtual storefronts and exchanges. Stakeholder solutions take care of financial reporting, Accounting, Investor Management and audit, finally Employee management solutions include Human Resource Management Systems, ORMS (travel, event planning etc.) and MRO purchasing systems. Often these solutions are a combination of best of breed and homegrown. In some situations they are un-integrated or very tightly integrated. Lack of integration creates information silos with each function having its own view of the “business” or the “Customer”. Tight integration creates tremendous headaches when newer versions or newer business models and applications have to be accommodated. When two Companies merge this problem becomes acute as

systems and databases have to be harmonized and synchronized. Messaging offers the best solution to loosely integrate these silos.

- An Institution such as a Bank manages Investment accounts, savings accounts, checking accounts, mortgage accounts, credit card accounts, Insurance accounts and ATM transactions. Messaging can create a framework to integrate these multiple channels that will present Information from all sources at one time to either the customer or the bank itself.
- E-Business requires enterprises to make available information in Real time to Stakeholders, Employees, Trading partners and Customers. This information that was currently available internally now needs to be visible to the Customer, Supply/Chain, Trading Partners, Functional units. Further, this information has to be transacted in Real time, over the Internet. The messaging backbone plays an important role in orchestrating the E-Business model. The level of information needed affects all aspects of the IT System:
  - Catalog creation
  - Purchase approvals and routing information
  - Merchandizing, Upsells, Campaigns, Click stream personalization in real time
  - E-Financing, credit approvals
  - Inventory / Warehouse Management
  - Order status
  - Short shipment status, Goods Routing status
  - Supply/Chain Partner notification
  - Supply/Chain work in progress status
  - Back order status
  - Scheduling
  - Delivery status
  - Warranty and Maintenance status
  - Spare parts inventory and location status
  - Managing distributed assets
  - Tax and regulatory compliances
  - RMA management
  - Substitute parts approvals
  - Negotiations and Contracts B2B / Exchanges / Customers

Messaging systems such as JMS blend themselves well for business messaging. They support a multi domain messaging system:

- Publish/Subscribe messaging offers an attractive solution to distribute selective content to Internet users. Users register their interest on topics and Publishers publish to that Topic. The JMS broker takes the

responsibility of distributing content to subscribers. The Publisher of the Information is decoupled from the subscribers in fact it has no knowledge of the subscribers. This decoupling allows adds, changes to be smooth.

- Queues can take care of point to point messaging. Queues can also be used to distribute user requests for http pages to Application servers in a server farm, providing a very efficient load balancing mechanism.
- Persistent messaging brings reliability and ensures that messages are guaranteed to be delivered once and at most once to the subscriber. The combination of persistent messaging and durable subscriptions allows implementing integration architectures over unreliable transports such as the Internet.
- Pub/Sub non persistent messaging can be used for ticker feeds or transporting information that one can afford to lose.

EBusiness Messaging for a Financial Services Company:

Financial Trading companies require:

- Distribution of information (One to Many) such as ticker information, analyst reports, news and alerts in real time. The solution requires infrastructure to deal with messaging throughputs that can vary from extremely high to normal. Next generation messaging systems will deploy message based routing systems to efficiently and selectively distribute messages to the subscribers.
- Order Management. Trading houses sell and buy equities and instruments for their clients. At the end of the trading activity books are reconciled to have an idea of existing inventory. The order management process can be automated by a messaging infrastructure.

The **Financial Interface eXchange (FIX)** effort is an emerging standard for streamlining the trading process between Brokers and Institutions. FIX and STP (Straight Through Processing) promises to eliminate the tedious and error prone manual processes in trading securities.

Messaging and workflow form a backbone to enable smooth FIX transactions.  
Messaging and JMS

An integration scenario for a Financial Services customer is shown below:



**JMS**



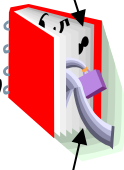
**QUEUES**

**REPORTS** | **ORDER MANAGEMENT**

**BID/ASK**

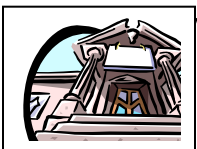


**TICKER**



**INVENTORY**

**JMS**



**REPLENISH INVENTORY /  
FIX**



**QUEUES**

**PUB / SUB NON DURABLE**  
 Ticker  
 Analyst Reports  
 Stock Market Reports  
 Index Reports, News,  
 Portfolio Reports

**PUB/SUB DURABLE**  
 Order Management  
 Trading  
 Order Status  
 Inventory  
 Management  
 Application  
 Integration

**QUEUES**

- Application Integration
- Support Call Distribution
- Load Balancing
- Error Logging
- Trading Books Reconciliation
- FIX TRANSLATION

**STOCK TRADING /  
FINANCIAL SERVICES**

The plumbing or Middleware such as JMS plays an increasingly important role in orchestrating this integration. Some requirements other than scalability and reliability of the solution include:

- **Performance** – The ability to move information in near real time
- **Security** – Since applications are distributed across the network and information propagates over segments of trusted and un-trusted networks it has to be highly secure
- **Availability and System Manageability** – The middleware becomes the heartbeat of the system; if it fails the system collapses even though individual applications are up and running. The Middleware has to support fail over and fail safe characteristics. Managing and administering the solution becomes a very important consideration
- **Simple APIs and Development / Systems Tools** – The solution should have simple unambiguous methods to move Information reliably point to point or between one to many or many to many clients. It should come with good tools to manage the data, develop and debug applications and tune the system for better performance

Vendors of JMS solutions are building their differentiators around some of these issues. Despite standardization there is ample room to either be proprietary or create competitive advantages. JMS does not standardize the wire protocols so JMS solution sets from different vendors will not interoperate.

Standardizing the API on the other hand brings its own benefits. The API is unambiguous. Multiple providers build solutions based on the standard, this will keep technology procurement and change costs low as investment in the application will be conserved.

As organizations struggle with challenges posed by newer business models, evolving E business architectures, integrating the old to the new or simply harmonizing disparate IT solutions they can look to messaging systems such as JMS to bring order to the chaos in a simple, efficient and reliable manner.



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