Architectural Framework for Electronic Commerce

Electronic commerce application architecture consists of six layers of functionality or services.

- Application services
- Brokerage services, data or transaction management
- Interface and support layers
- Secure messaging, security and electronic document interchange
- Middleware and structured document interchange
- Network infrastructure and basic communication services

–These layers cooperate to provide a seamless transition between today's computing resources and those of tomorrow by transparently integrating information access and exchange within the context of the chosen application.

Application Services	Customer –to-business Business-to-business Intra-organizational
Brokerage and data management	Order Processing-mail-order houses Payment schemes-electronic cash Clearing house or virtual mail
Interface layer	Interactive Catalogs Directory Support functions Software agents
Secure Messaging	Secure hypertext transfer protocol Encrypted e-mail, EDI Remote Programming (RPC)
Middleware Services	Structured documents (SGML,HTML) Compound documents(OLE,OpenDoc)
Network Infrastructure	Wireless – cellular, radio Wireline –coaxial, fiber optic

1. Electronic Commerce Application Services

–Three distinct classes of electronic commerce applications

- Customer to business
- Business to Business
- Intra organization

•Consumer-to-Business Transaction

This is called market place transaction. In a market place transaction, customers learn about products differently through electronic publishing, buy them differently using electronic cash and secure payment systems and have them delivered differently.

•Business-to-Business Transactions

–This is called market link transaction. Businesses, government and other organizations depend on computer-to-computer communication as a fast, an economical, and a dependable way to conduct business transactions. Business-to-Business transactions include the use of EDI and electronic mail for purchasing goods and services, buying information and consulting services, submitting requests for proposals and receiving proposals.

•Intraorganizational Transactions:

–This is called market driven transactions.

–A company becomes market driven by dispersing throughout the firm information about its customers and competitors; by spreading strategic and tactical decision making so that all units can participate; and by continuously monitoring their customer commitment by making improved customer satisfaction an ongoing objective.

–Three major components of market driven transactions are

- customer orientation through product and service customization;
- cross-functional coordination through enterprise integration
- advertising, marketing and customer service.

2. Information Brokerage and Management:

–Information brokerage and management layer provides service integration through the notion of information brokerages, the development of which is necessitated by the increasing information resource fragmentation.

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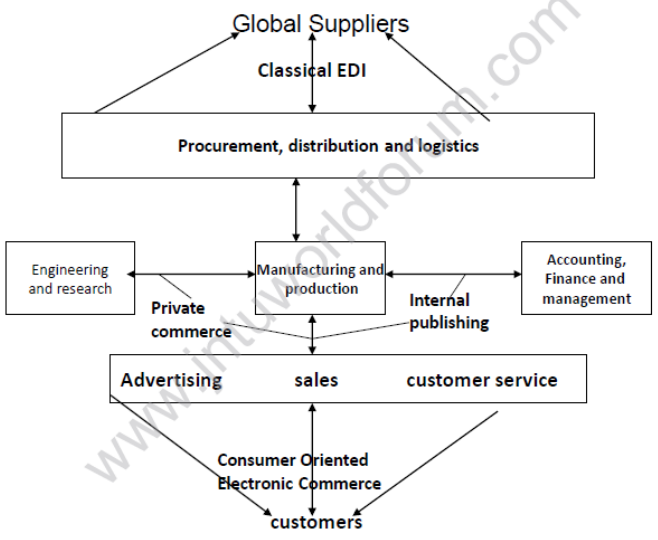

–Information brokers are becoming necessary in dealing with the voluminous amounts of information on the networks. With the complexity associated with large number of on-line databases and service bureaus, it is impossible to expect humans to do searching. Information broken or software agents that act on the searchers behalf.

–Ex: In foreign exchange trading, information is retrieved about the latest currency exchange rates in order to hedge currency holdings to minimize risk and maximizing profit.

–Brokerage function supports data management and traditional transaction services. This is accomplished by tools such as software agents, distributed query generator, the distributed transaction generator, and the declarative resource constraint base – which describes a business's rule and environment information.

3. Interface and Support Services

–This layer provides interfaces for electronic commerce applications such as interactive catalogs and will support directory services – functions necessary for information search and access.

–Interactive catalogs are the customized interface to consumer applications such as home shopping.

–Directories operate behind the scenes and attempt to organize the enormous amount of information and transactions generated facilitate electronic commerce.

–The primary difference between the two is that unlike interactive catalogs, which deal with people, directory support services interact directly with software

4. Secure Messaging and structured Document Interchange Services

–Messaging is the software that sits between the network infrastructure and the clients or electronic commerce applications, masking the peculiarities of the environment.

–Messaging services offer solutions for communicating non-formatted data –letters, memos, reports – as well as formatted data such as purchase orders, shipping notices, and invoices.

–Unstructured messaging consists of Fax, e-mail, and form based systems like Lotus Notes. Structured documents messaging consists of the automated interchanging standardized and approved messages between computer applications. Ex: EDI

–Messaging supports both synchronous and asynchronous message delivery and processing. It is not associated with any particular communication protocol. With messaging tools, people can communicate and work together more effectively.

–Due to lack of standards, there is often no interoperability between different messaging vendors leading to islands of messaging.

–Security, privacy and confidentiality through data encryption and authentication techniques are important issues that need to be resolved for ensuring the legality of the message based transactions.

5. Middleware Services

–With the growth of networks, Client–Server technology, and all other forms of communicating between/among unlike platforms, the problems of getting all the pieces to work together became a necessity.

–Middleware helps to mediate between diverse software programs that enables them talk to one another. To achieve data-centric computing, middleware services focus on three elements; transparency, transaction security and management and distributed object management and services.

•Transparency:

–Transparency implies that users should be unaware that facilitates a distributed computing environment.

–Transparency is accomplished using middleware that facilitates a distributed computing environment. This gives users and applications transparent access to data, computation, and other resources across collections of multi vendor, heterogeneous systems.

•Transaction Security and Management

–Security and management are essential to all layers in the electronic commerce model.

–At the transaction security level, two broad general categories of security services exist; authentication and authorization. For electronic commerce, middleware provides the qualities expected in a standard TP system: ACID properties.

6. Distributed Object Management and Services

–Object orientation is proving fundamental to the proliferation of network based application.

–Instance of an object in electronic commerce is a document. The term object is being used interchangeably with document resulting in a new form of computing called document oriented computing. The trend is moving from single data type documents to integrated documents known as compound architectures .