1. Enterprise Applications Integration (EAI) – An Overview

**EAI Goals**
EAI should provide seamless integration of Enterprise/Business Systems for sharing and exchanging data between systems, and conducting business electronically. The successful implementation of EAI requires a Broad Experience with
- Networking
- Administration
- Project Management
- Tools
- Multiple Software Products, Operating Systems and Hardware Platforms
- Software Development for Multiple Platforms
- Across multiple industries

**Requirements for Data Sharing**
- Concurrency – allowing multiple applications or users accessing and updating the same set of data
- Security – need-to-know based, control list
- Extensibility – self-describing data

**Requirements for Exchanging Data**
- Preset Agreement
- Definite data exchange format with assumption elimination

**Features of Enterprise Architecture**
- Service-Oriented Architectures
- Legacy System Migration
- Web-based
- Application Integration
- Datacentric Architecture

**EAI Enabled Virtual Applications**
- Data-Centric
  - Loosely coupled integration
  - Many-to-many systems
  - Allow only pure data objects to enter and leave systems
  - Implementations can change without affecting systems
- Interface-Centric
  - Tightly coupled integration
  - Point-to-point

**Emphasize**
- Service Access and Mode of Delivery
- Service Platforms and Infrastructure
- Service Interface and Integration
- Process Automation Services
- Real-time
- Adaptive
**EAI Infrastructures (from Enterprise Application Integration with XML and JAVA, JP Morgenthal and Bill La Force, Prentice Hall, 2001)**

- Communication Layers (Horizontal layers)
  - HTTP, FTP, SMTP, DBMS, DCOM, Queues, CORBA, Java, RMI, EJB, TCP/IP 3270, 5250, X/A, LDAP
  - Open Database Connectivity (ODBC) for interacting with SQL-based databases
  - Message-Oriented Middleware services (MOM) via TCP/IP
  - Legacy Application Mining
  - Object Request Broking (ORBs)
- Routing & Broking Layer & Functions
  - Aggregation
  - Transformation
  - Metadata brokering
  - Object request brokering
  - Message routing
  - Event handling
- Business/Enterprise Intelligence Layer
  - Data analysis
- Security
  - Data security and integrity
- Management
  - Remote management of each layer
  - Most needed data
  - Auditing, logging, and alert management
- Message Routing
  - Windows Messaging System
  - Java Method Calls
  - Asynchronous Messaging
  - Interprocess communications (pipes, queues, Microsoft COM)
  - Distributed object computing (Microsoft DCOM and CORBA)
- Metadata and Rule Repository

**Example 1: A Typical Java-based Web Server and Applications**

[Diagram of a typical Java-based web server and applications]

**Java Web Server using JSP and Servlets**

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1. Enterprise Applications Integration – An Overview
Example 2: An EAI Infrastructure Build on Java Technology

Example 3: EAI Infrastructure Using IIS Web Server

1. Enterprise Applications Integration – An Overview
Some Examples of Enterprise/Business Solutions

- Customer Relationship Management (CRM)
- Enterprise Resource Planning (ERP)
- Supply Chain Management (SCM)
- Portal
- E-Business and E-Commerce
- Business Intelligent Management
Example 4: Components of a CRM

<table>
<thead>
<tr>
<th>Communication CRM (Front-end)</th>
<th>Operation CRM (Core-center)</th>
<th>Analytics CRM (Back-end)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Call Center</td>
<td>- Marketing</td>
<td>- Information Search</td>
</tr>
<tr>
<td>- e-commerce</td>
<td>- Sales</td>
<td>- Analysis Algorithms</td>
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<td>- Web</td>
<td>- Customer Services</td>
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<tr>
<td>- Wireless</td>
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</tbody>
</table>

Database: business, and engineering data

Example 5: A CRM Designed for A Medical Device Manufacturing Company

1. Enterprise Applications Integration – An Overview
Examples of Enterprise Applications Integration

- Company portal
- Integration Broker and Enterprise Data Warehousing
- Business Intelligence (decision making)
- Customer Relationship Management (CRM)
- Enterprise Resource Planning (ERP)
- Supply Chain Management (SCM)
- Global Consolidations - enables the consolidation of general-ledger information that is spread across disparate systems
- Sales Incentive Management (SIM)
  - Gather information from variety of applications - for example, human resources, financials, CRM, and ERP
  - Perform sets of calculations that determine a rate of sales incentive compensation, based on a variety factors

Example 6: An Example of Enterprise Applications Integration

1. Enterprise Applications Integration – An Overview
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