

Chapter 1.2 - Contents

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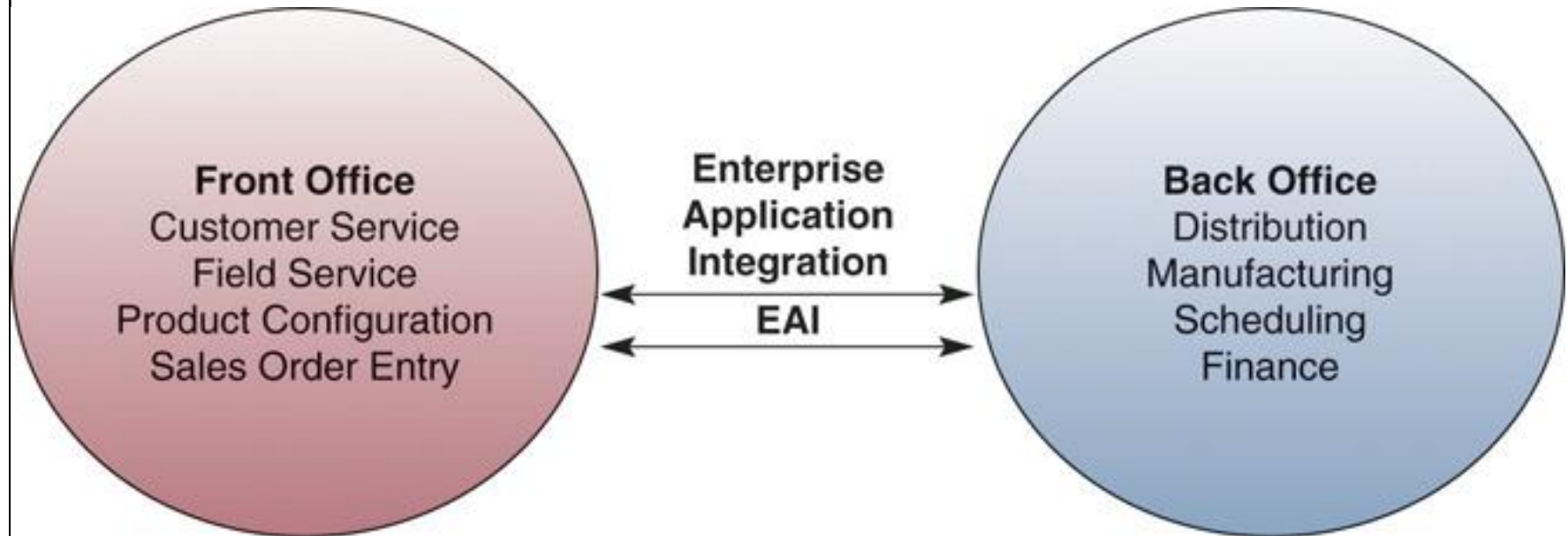


EAI: Enterprise Application Integration

How does a business interconnect its information systems....?

- EAI provides **middleware** (Middle Software) that performs Data conversion between different systems, coordinates Communication and Message passing between systems
- The idea is to use the existing systems, but to have a super-system for connecting related systems.

EAI: Enterprise Application Integration



Connects Front Office Systems with Back Office Systems

Example: When an order is complete, have the order application tell the accounting system to send a bill and alert shipping to send out the product.

How EAI works:

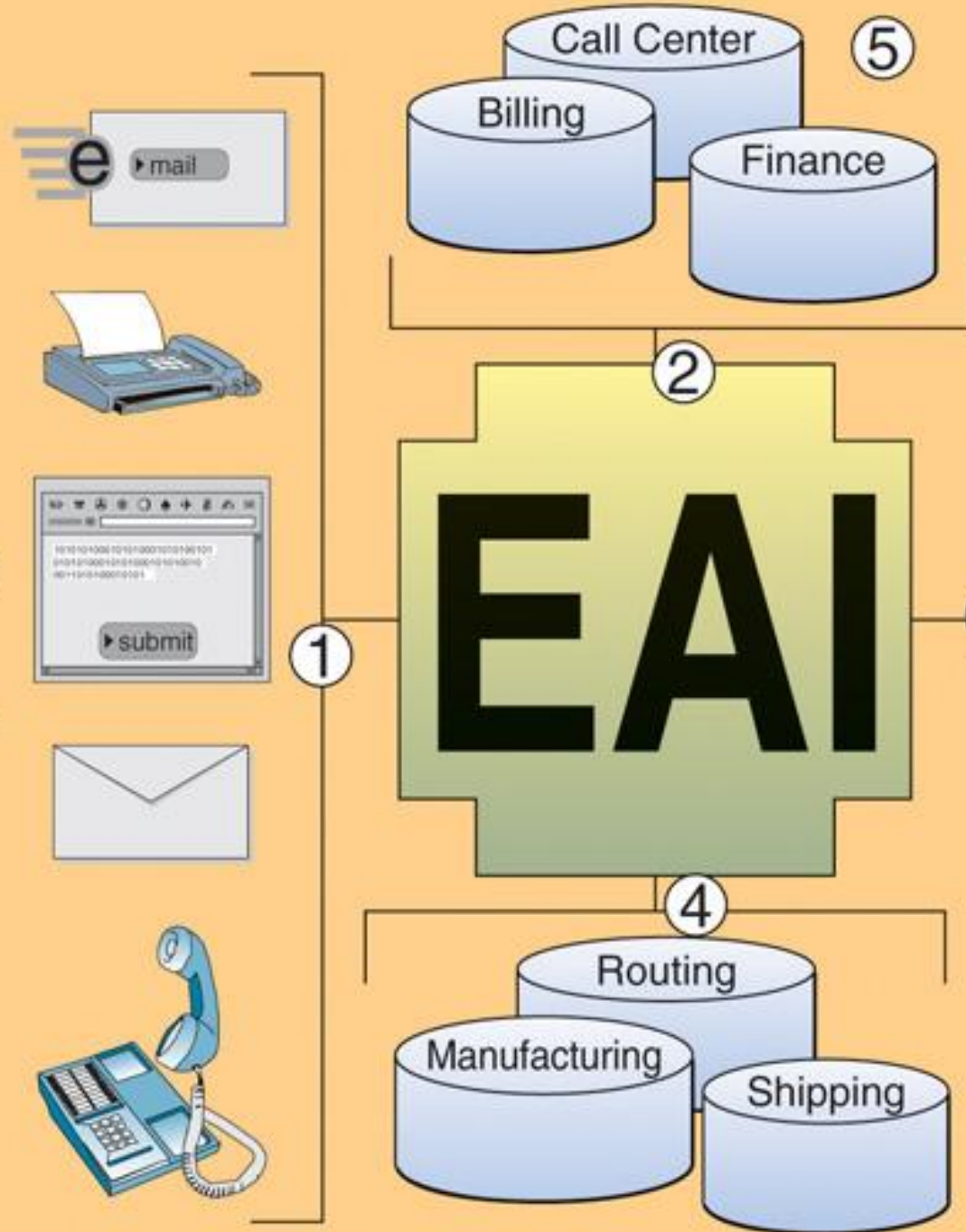
1 An order comes in via the call center, mail, e-mail, the Web, or fax.

2 Customer information captured in the order process is sent to a “new customer” process, which distributes the new customer information to multiple applications and databases.

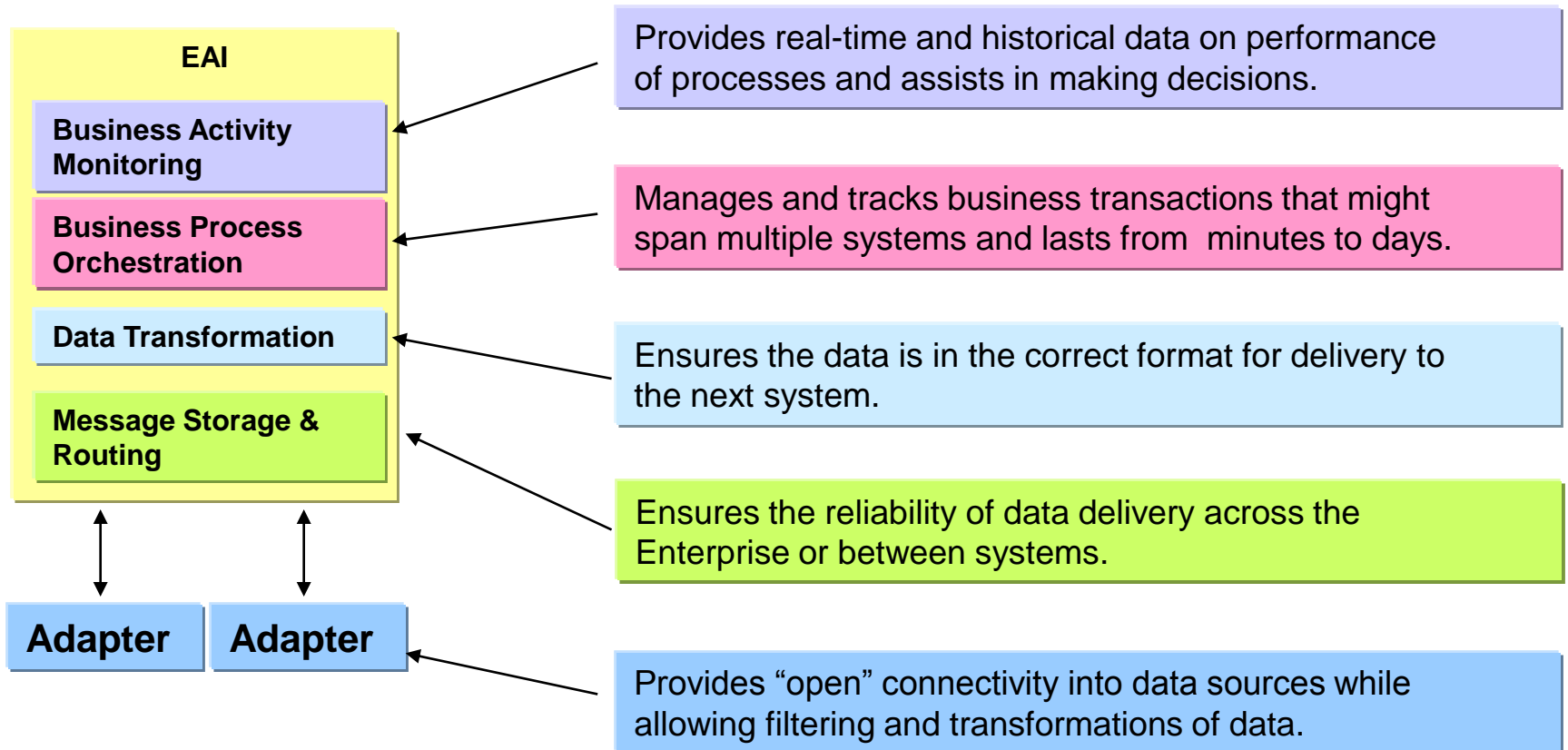
3 Once the order is validated (customer, credit, items), relevant details are sent to order fulfillment—which may pick the requested items from inventory, schedule them for manufacture, or simply forward them.

4 Fulfillment returns status and shipment info to the order-entry system...

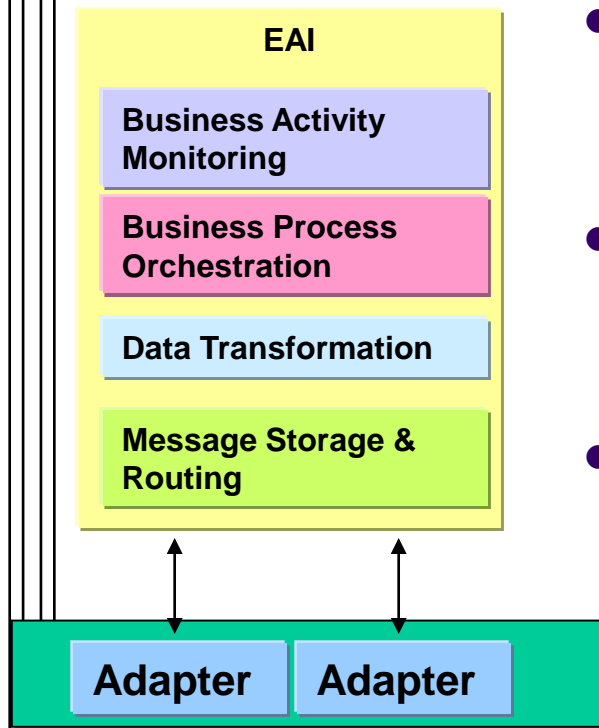
5 ...and to the call center, which needs to know about outstanding orders.



Layers of an EAI Stack

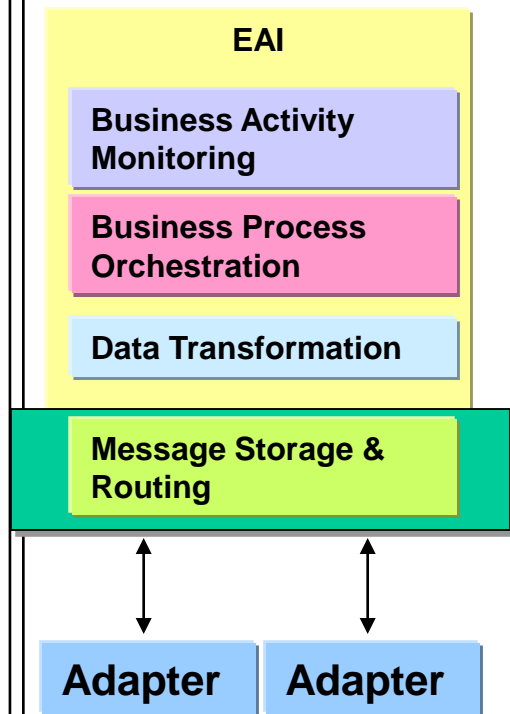


Adapters



- Also known as “Connectors”, “Translators”, “Wrappers” or “Bridges”
- Provide seamless connectivity to the underlying application or data
- Convert information and events into data that can be utilized by the infrastructure
 - Two way translation between the proprietary format and the common format
- Many adapters available off the shelf
- From EAI Software vendors such as Tibco, or application software vendors such as SAP.

Message storage and routing



- **Reliable messaging**

- Products that connect applications running on different systems by sending and receiving application data as messages
- JEE architecture provides JMS interface

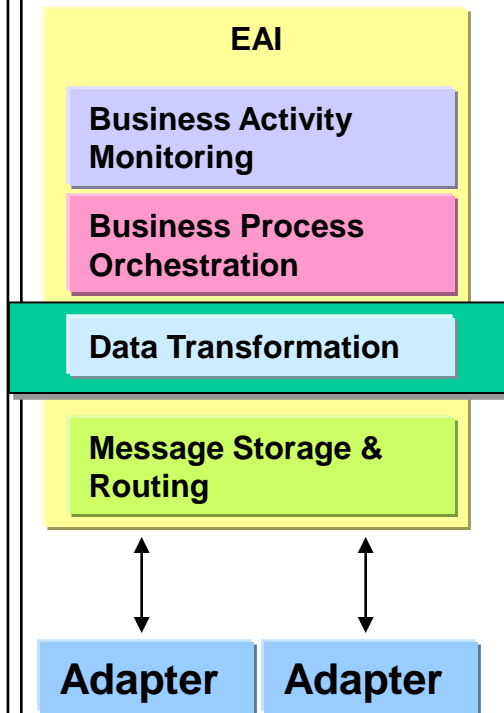
- **Message storage**

- Central repository for temporary storage of transactions until they can be delivered
- Also called “**Message Warehousing**”

- **Message queuing and routing**

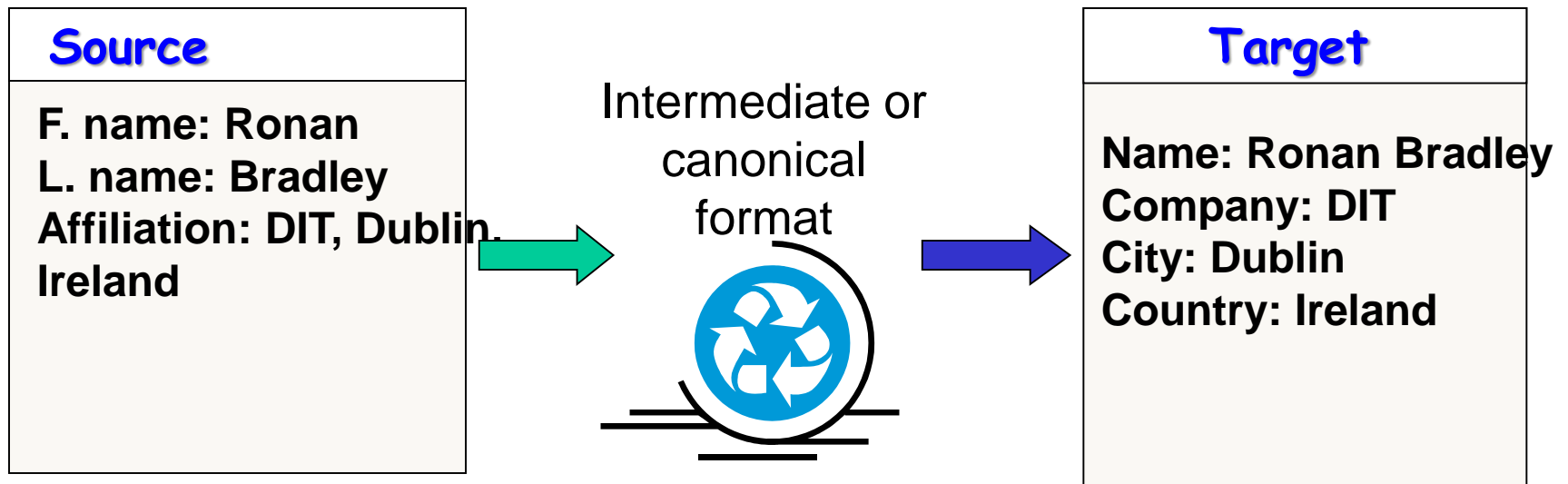
- Asynchronous communications style
- Set of tools that route messages between sources and consumers based on pre-defined business rules

Data Transformation



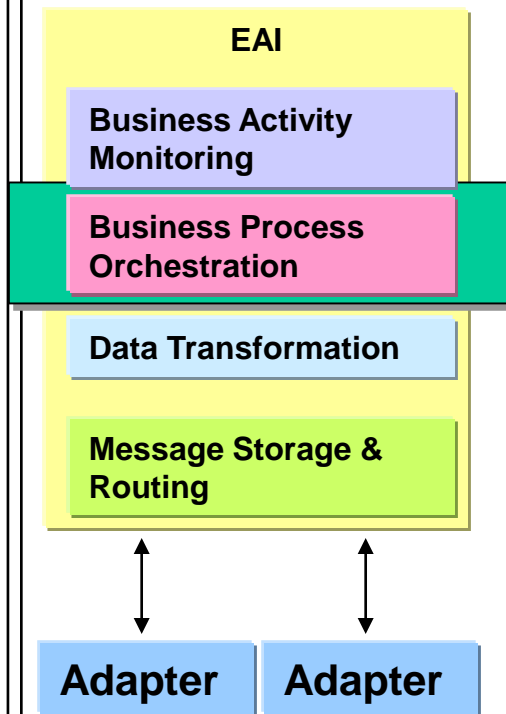
- Transformation to and from formats used by Different Systems
- Handling simple or complex data structures
- Typically representing data using XML standards
- GUI Configuration tools to help define the transformations

Data Transformation



- EAI typically converts the source data into an intermediate format and then convert it into the target format
 - Intermediate format is called the canonical format.

Business Process Orchestration



- **Process Modeling**

- Often GUI based
- Describing the flow of information in the context of business processes
- Using the input/output of processes as the Integration points between diverse business processes

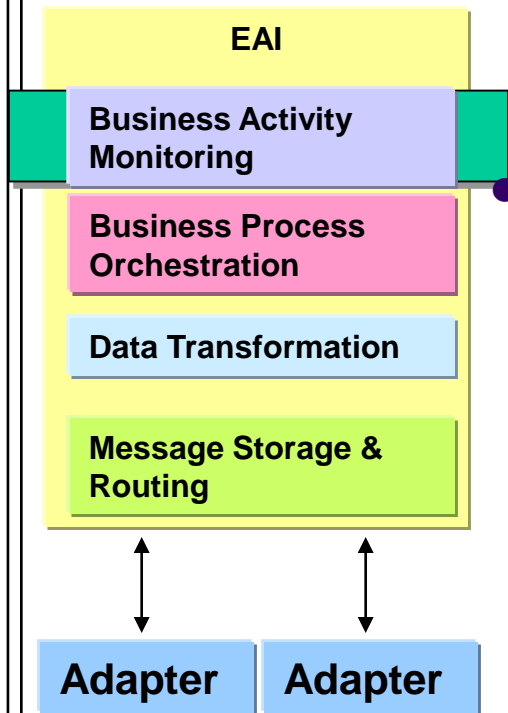
- **Process Brokering**

- Execution of discrete steps within a business process
- Ability to recover from failed steps
- Workflow engine

- **Process Management**

- Monitor business processes
- Correlate metrics to specific business process steps

Business Activity Monitoring



- **B**usiness **A**ctivity **M**onitoring is using your data assets to make better decisions
- BAM is used to gather information about what is occurring in the EAI deployment
 - Status of current processes
 - Identification of problem areas
 - E.g. Spotting applications that are not responding
 - Monitoring of unusual activity
 - E.g. Unusually large orders
- The collected information is displayed for operators or managers to diagnose and determine the solution



Potential EAI benefits

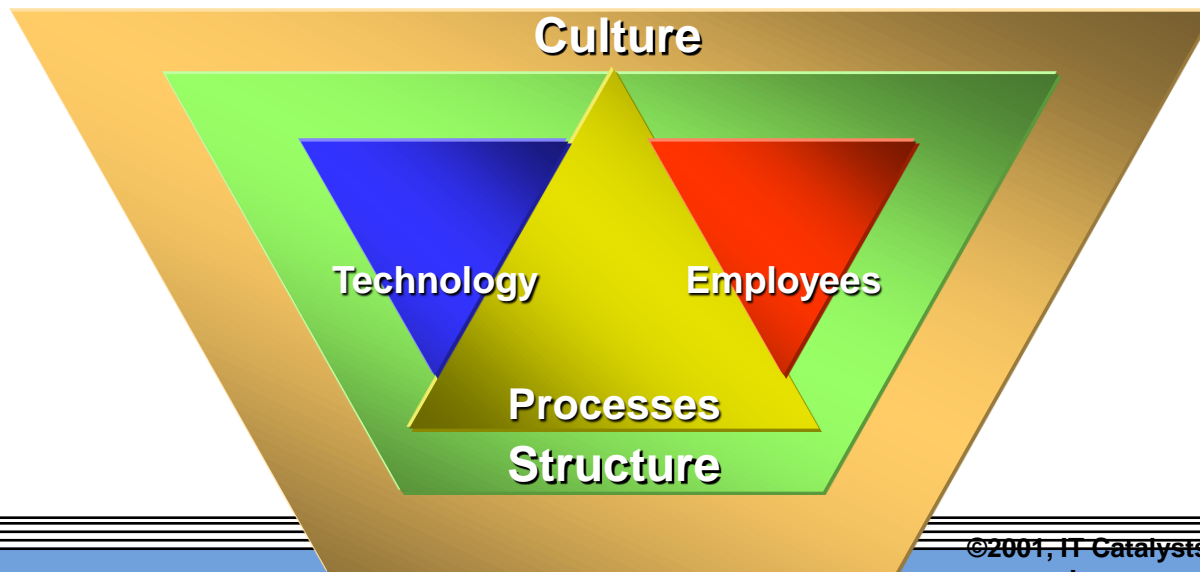
- **Lower development costs**
 - Overtime, each additional integration requirement can more easily be addressed
- **Lower opportunity costs**
 - Integration is done more quickly
 - corresponding cost savings reached sooner
- **Lower maintenance effort**
 - adapters extract the interaction with external systems
 - significant advantage from the software engineering point of view

Potential EAI Challenges

- **Hub and spoke architecture concentrates all of the processing into a single server/cluster.**
 - Often became hard to maintain and evolve efficiently
 - Hard to extend to integrate 3rd parties on other technology platforms
- **The canonical data model introduces an intermediary step**
 - Added complexity and additional processing effort
- **EAI products typified by**
 - Heavy customisation required to implement the solution
 - Lock-In: Often built using proprietary technology and required specialist skills
 - Lack of flexibility: Hard to extend or to integrate with other EAI products!
- **Requires organization to be EAI ready**

What is EAI readiness?

- Much of the challenge associated with adopting EAI is not related to the technology.
- EAI readiness is a state of business maturity in which its **systems**, **processes**, **employees**, **structure**, and **culture** are prepared for the successful introduction of both EAI technology and the business disciplines that drive its introduction.
- All five of these factors must be properly situated and aligned before an EAI implementation can succeed.





EAI: Enterprise Application Integration

EAI products are built on combination of technologies

- ☐ JEE
- ☐ XML (eXtensible Markup Language) for enterprise-wide content and data distribution using common DBs and Data Standards
- ☐ Message queuing
- ☐ Business Process Orchestration engine
- ☐ Sometimes Web Services