Enterprise Application Integration (EAI) Techniques

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Outline

- What is it?
- Why is it needed?
- How can it be implemented?
- An example
- Summary

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What is EAI?

It is the combination of processes, software, standards, and hardware, resulting in the seamless integration of two or more enterprise systems allowing them to operate as one.

EAI.ITtoolbox.com

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A little 'history'..

- In the early days, data existed in a homogenous environment
- As technology developed.. This was no longer the case
- Decisions were made to implement the "coolest" technologies
- The rush to incorporate new systems resulted in lack of architectural foresight.

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The Problem

- Stovepipes

- Forester Research estimates that up to 35% of development time is devoted to creating interfaces

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EAI Architecture

There are two types :

1. Point to Point - Traditional
2. Middleware - More modern

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Point-to-Point

- Systems communicate directly with one another

- Simple, quick and easy…

  ….BUT only when there are a few applications!

Point-to-Point: The Problem

- Tight coupling and dependence

- Large number of integration points

- Difficult to maintain and integrate

- Changes to one system may change another system

Middleware

- Generic interface for communication

- Can add/replace applications without complication

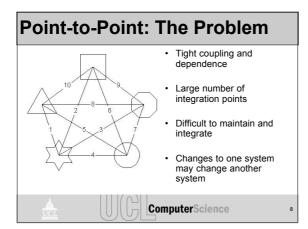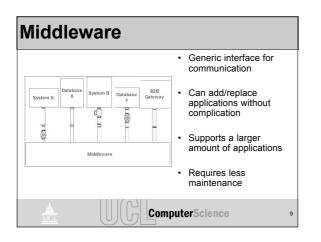- Supports a larger amount of applications

- Requires less maintenance

Integration Methods (1)

- Data-level integration
- Application-level integration
- Method-level integration
- User interface-level integration

Integration Methods (2)
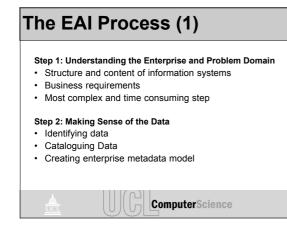
Data-Level Integration
- WHERE data exists, WHICH data flows WHERE and WHY
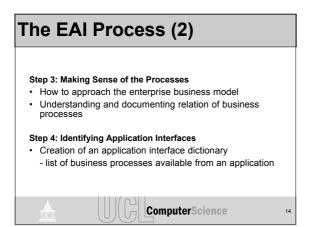- Process of moving data between data stores
- Cheaper

Application-Level Integration
- Using interfaces in custom packages to bundle many applications together
- Most widely used

Integration Methods (3)

Method-Level Integration
- A more complicated form of application-level integration
- Sharing of business logic within an enterprise
- Integrates Applications must support RPC
- Tight coupling

User interface-Level Integration
- Bundling applications by using UIs as point of integration
- Usually the last resort

The EAI Process (1)

Step 1: Understanding the Enterprise and Problem Domain
- Structure and content of information systems
- Business requirements
- Most complex and time consuming step

Step 2: Making Sense of the Data
- Identifying data
- Cataloguing Data
- Creating enterprise metadata model

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The EAI Process (2)

Step 3: Making Sense of the Processes
- How to approach the enterprise business model
- Understanding and documenting relation of business processes

Step 4: Identifying Application Interfaces
- Creation of an application interface dictionary
  - list of business processes available from an application

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The EAI Process (3)

Step 5: Identifying the Business Events
- Events that occur in an enterprise
- When something happens there is a resultant reaction
- Fully capture business events that will take place in the domain

Step 6: Identifying Schema & Content Transformation
- Data in one system won't make sense to another system
- Assures maintenance of consistent application semantics

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The EAI Process (4)

Step 7: Mapping Information Movement
- What data element or interface information is moving from

Step 8: Applying Technology
- Understand available solutions match those to criteria
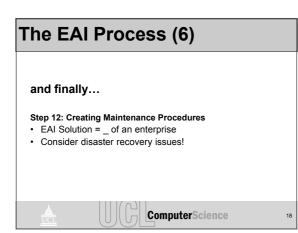- Requires pilot project to see if it works

Step 9: Testing!
- Ensure that solution is scalable
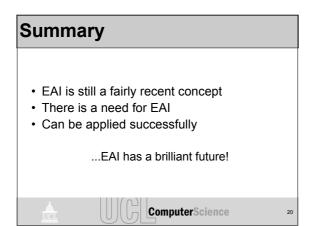- Plan! – Most systems are business-critical.

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The EAI Process (5)

Step 10: Considering Performance
- Response times
- Test under different conditions

Step 11: Defining the Value
Hard Dollar:
    e.g. Reduction of error rates
        Processing orders more quickly
Soft Dollar:
    e.g. Increased productivity over time
        Customer satisfaction

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The EAI Process (6)

and finally…

Step 12: Creating Maintenance Procedures
- EAI Solution = _ of an enterprise
- Consider disaster recovery issues!

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TIGRA – an example

- Before TIGRA… IT department for trading had to implement, maintain and integrate about 120 different applications.

- **Middleware** – control reliable transport of trade data between front, middle and backend office systems,

- **Data Integration** using XML and XSLT– resolve semantic differences between different trade data representations.

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Summary

- EAI is still a fairly recent concept
- There is a need for EAI
- Can be applied successfully

...EAI has a brilliant future!

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Further Reading

www.EAI.ITToolbox.com

"Enterprise Application Integration" W. A. Ruh, F.X. Maginnis, W. J. Brown.
Wiley 2000

"TIGRA: An Architectural Style for Enterprise Application Integration"
W. Emmerich, E. Ellmer and H. Fieglein. Proc. of 23rd Int.
Conference on Software Engineering

"Enterprise Application Integration" David S.Linthicum.
Addison Wesley 20000

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