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Legacy Modernization using Service Oriented Architecture

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Decades of Legacy Assets

- New Code cost 5X more than Reusing Existing Code (*Software Productivity Research*)
- 200 Billion Lines of COBOL Code in existence (*eWeek*)
- 5 Billion Lines of COBOL Code added yearly (*Bill Ullrich, TSG Inc.*)
- Between 850K and 1.3 Million COBOL Developers with 12,000 per year attrition (*IDC*)
- Majority of customer data still on Mainframes, even though a lot of it is front-ended by Web and eCommerce applications (*Don Greb, Mellon Financial Group in ComputerWorld*)

A Gartner Study of Legacy Systems

- The mainframe environment can be divided into three general segments:
  - < 500 MIPS
  - 500-1000 MIPS
  - > 1000 MIPS
- Enterprises less than 500 MIPS are most likely to successfully migrate which is again heavily dependent on application and environmental complexities
- Lack of innovation in this market (IBM is the only vendor providing J2EE-centric solutions on mainframe)
- Mainframe Enterprises Options:
  - Determine a long term application strategy
  - Decide on the role of mainframe in this strategy – maintain, transition or migrate
  - Consider SOA for preserving and extending mainframe applications
  - Evaluate investment in skills for external staff

Agenda

- What is Legacy
- What is Modernization
- Challenges of Legacy Modernization
- Evolution of Solutions
- Service Oriented Architecture – a solution for Legacy Modernization

What is a Legacy System?

- In an IT context, Legacy Systems are defined as production enabled systems with varying ‘ages’, those support mission critical business operations to generate revenue, to save operational cost and/or to perform accounting tasks, with varying implementation and deployment platforms.
- **Characteristics:**
  - Monolithic application built over years
  - Old/outdated computing platforms, languages, databases and UI
  - Decreasing vendor support
  - Complex program flow with no modularity and hard coded logic
  - Little to no trace ability to business flows
  - Inflexible and not scalable to support mergers and acquisitions

Challenges of Legacy Systems

- Lack of application knowledge among IT staff
- Business Knowledge is ‘tribal’ (in the head of the legacy developers and not documented anywhere)
- Apply changes to redundant code
- High cost of change
- Inability to integrate with new technologies
- Difficult to extend to support new business requirements
- Limited UI leading to low end user productivity

What is Modernization?

- Web enabling
- Enabling integration of disparate systems
- Software migration
- Hardware Migration
- Business Process Re-engineering
- Process change
- People skills change

Challenges of Legacy Modernization

- **Crystallization of Business Value** – Developing a convincing business case for the Modernization. Modernization as a technology change initiative is often won't go much far ahead.
- **Cost Management** - based in assumptions and extrapolations, high initial cost, frequent surprises, very hard to show reduced TCO in short term
- **Multiple Stakeholders** : Due to the vast system footprint inside an organization, there can be large number of stakeholders, need extremely efficient program management practices
- **Managing Expectations** – "Old is gold and new should be gold or platinum " – e.g. (the monolithic) CICS applications gives sub second response, the new distributed system should do the same.
- **Testing Effort** – difficult to justify with the stakeholders if there is a lack of sufficient enhancements in the functionality or business process.
- **Managing change in the Ecosystem** - Decades old practices and usage patterns are going to change. Need extremely good change management practices
- **Need to coexist and integrate with the surroundings** : One system or a few systems are changing at a time, need to coexist and run the business as usual

Modernization Options

- Legacy Wrapping
- Legacy Refactoring
- Legacy Integration
- Legacy Migration

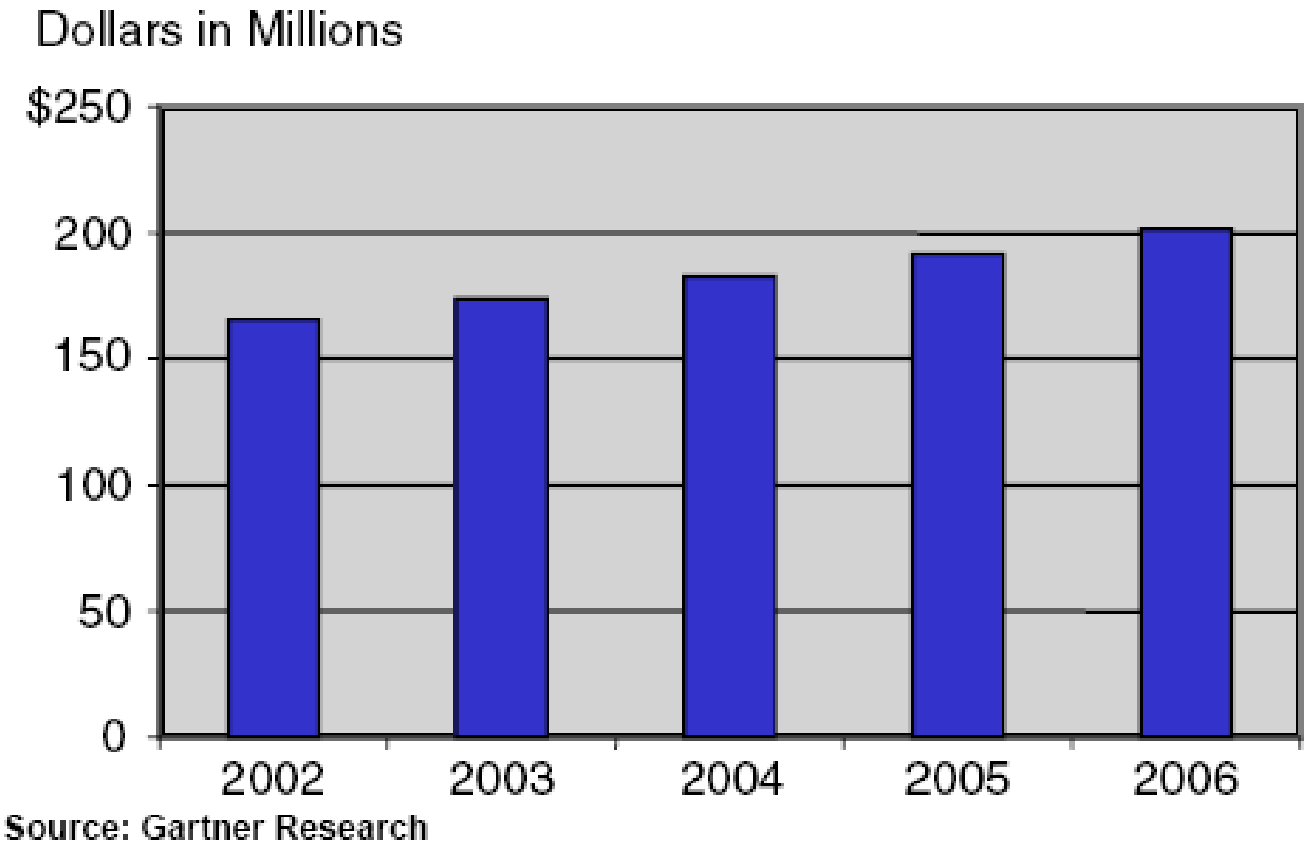
Evolution of Architecture, Tools & Technologies

- Enterprise Architecture
- Service Oriented Architecture
- Legacy Asset Extraction Tools
- Internet
- Web Services
- Enterprise Service Bus
- Grid Technology

Evolution of Solutions

- Screen Scrapping
- Connecting to mainframe components using proprietary protocols
- Wrappers/Facades over Legacy Components
- Service Oriented Architecture

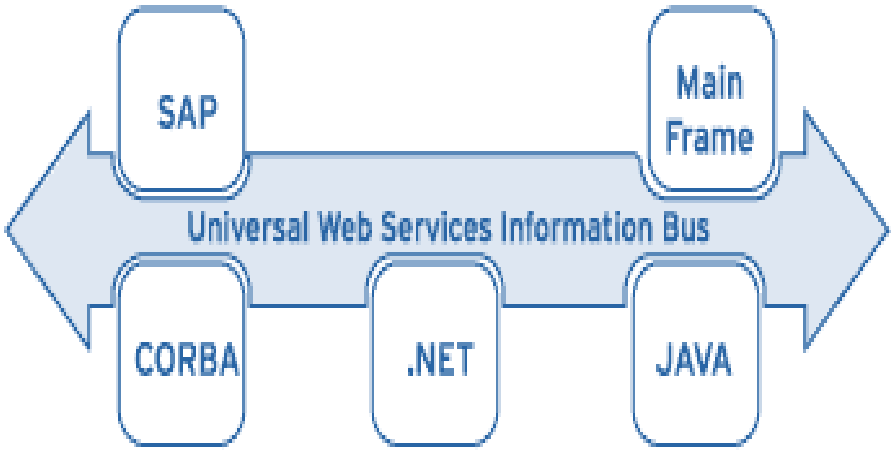
Growth of the Legacy Modernization Market as Tools and Technologies evolve



Source: Gartner Research

Service Oriented Architecture

- A service-oriented approach will standardize interaction
- Allows more flexibility in the process
- The complete value chain within a company is divided into small modular functional units or services.
- Companies and sub-units can provide services
- **Other business units can use these services to implement business processes**



Service Oriented Architecture Components

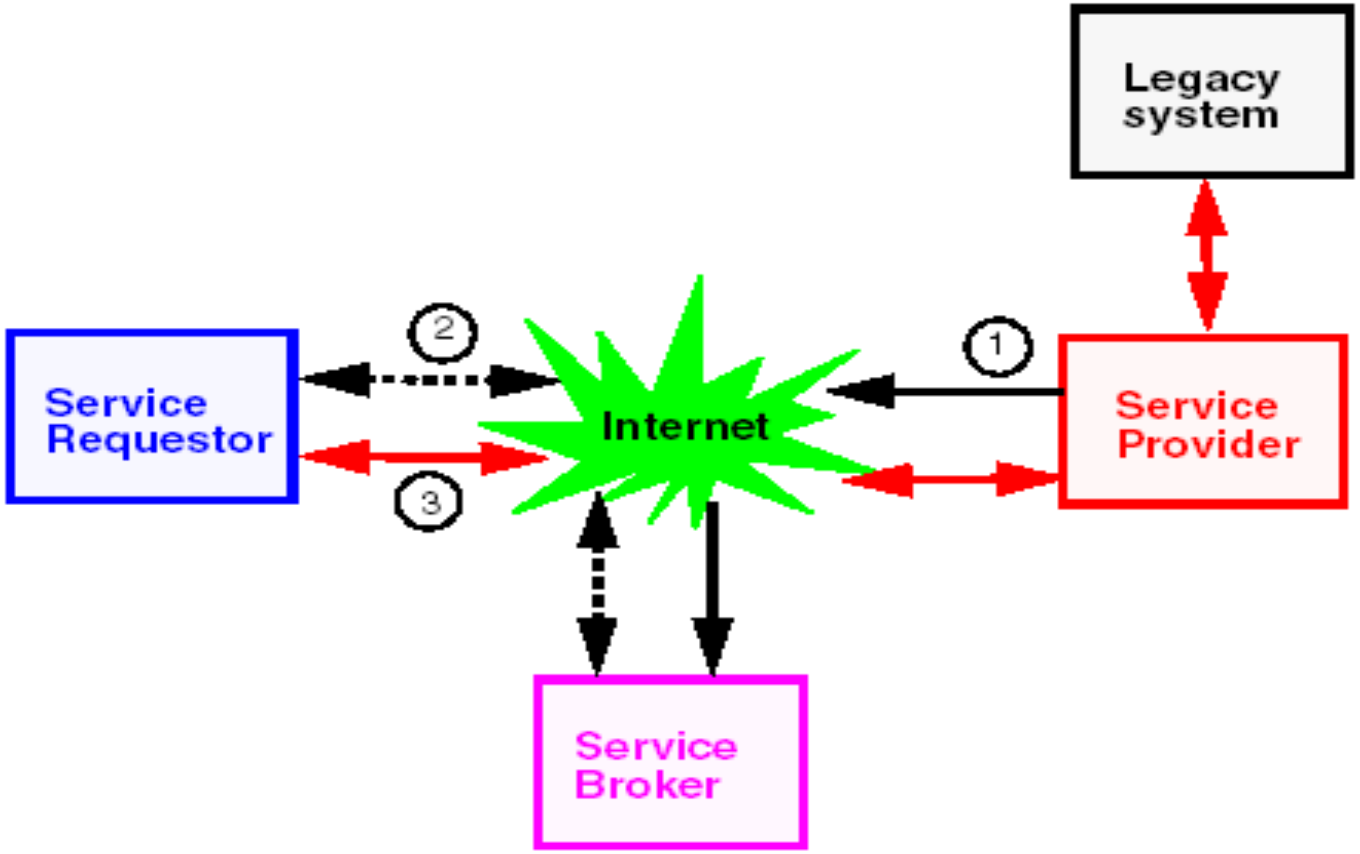
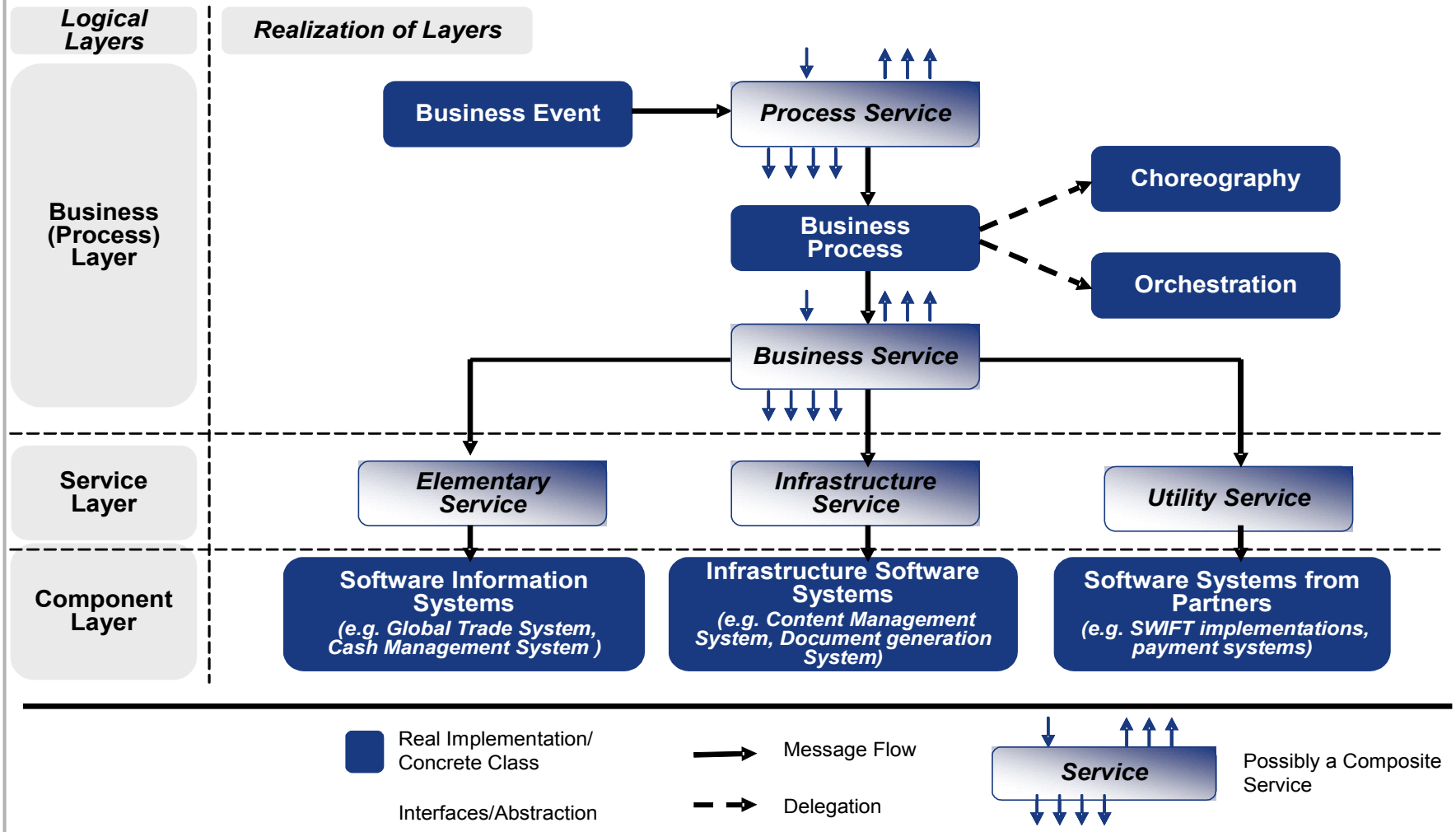


Figure 1-1 Web services roles and operations

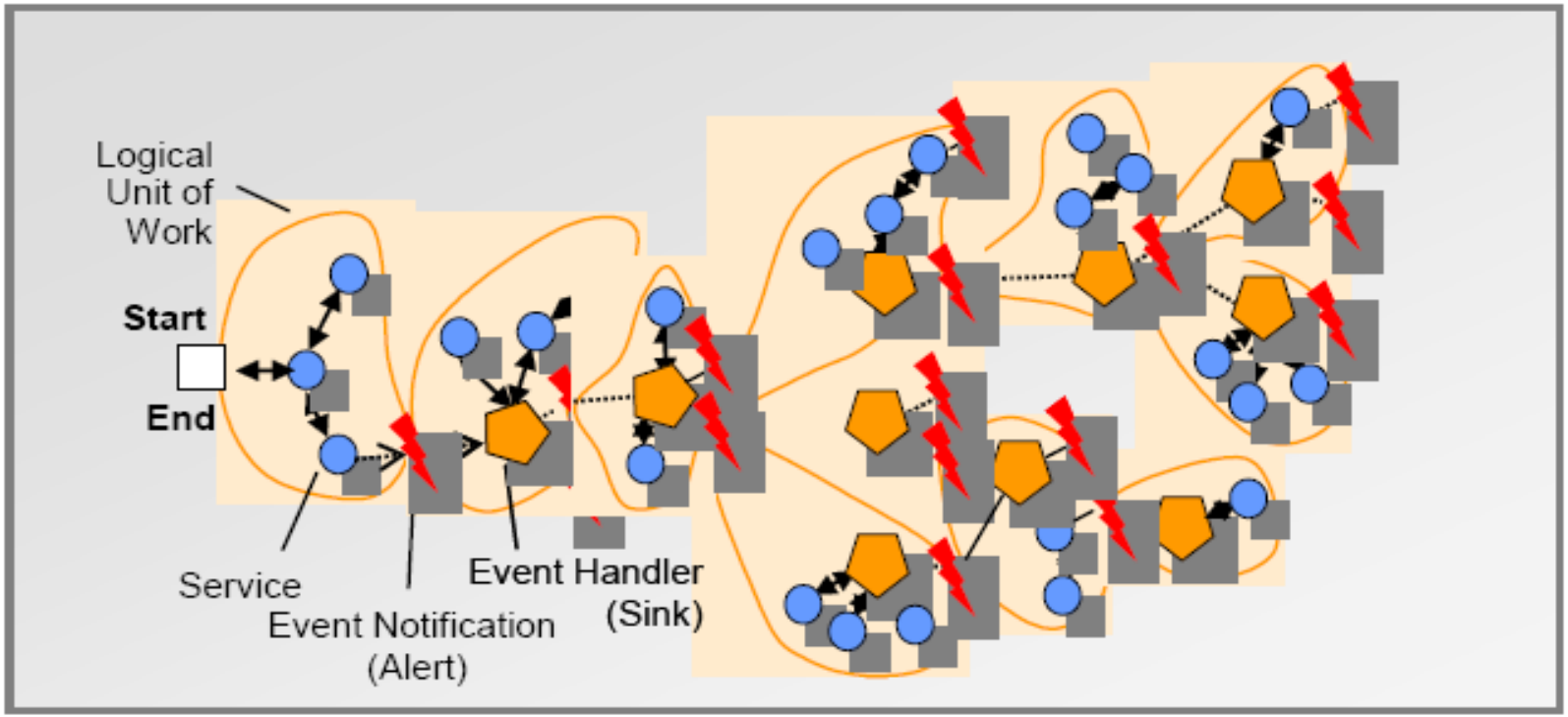
Advantages of Service Oriented Architecture

- Better Return On Investment
  - *The creation of a robust service layer has the benefit of a better return on the investment made in the creation of the software. Services map to distinct business domains.*
- Location Independence - *the client does not care where the service is located*
- Focused Developer Roles
- Support for Multiple Client Types
- Service Assembly
- Better Maintainability
- More Reuse
- Better Parallelism in Development
- Better Scalability

Service Design Framework



EDA and SOA – an advanced software topology



Source: Gartner (July 2006)

Thank You

Questions ?