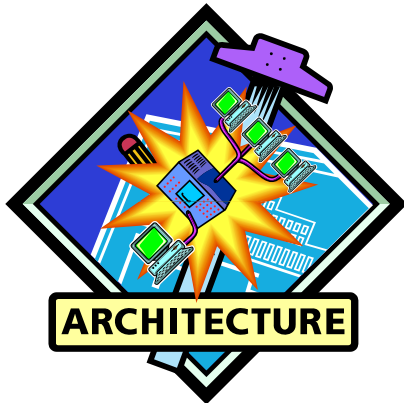
Service Oriented Architecture and Design Strategies



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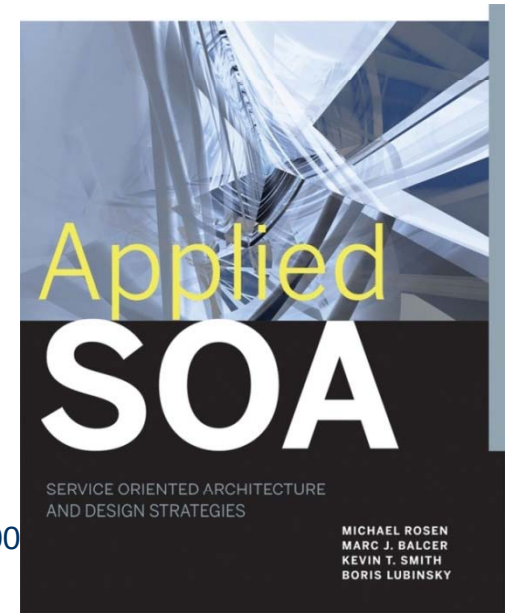
Mike Rosen

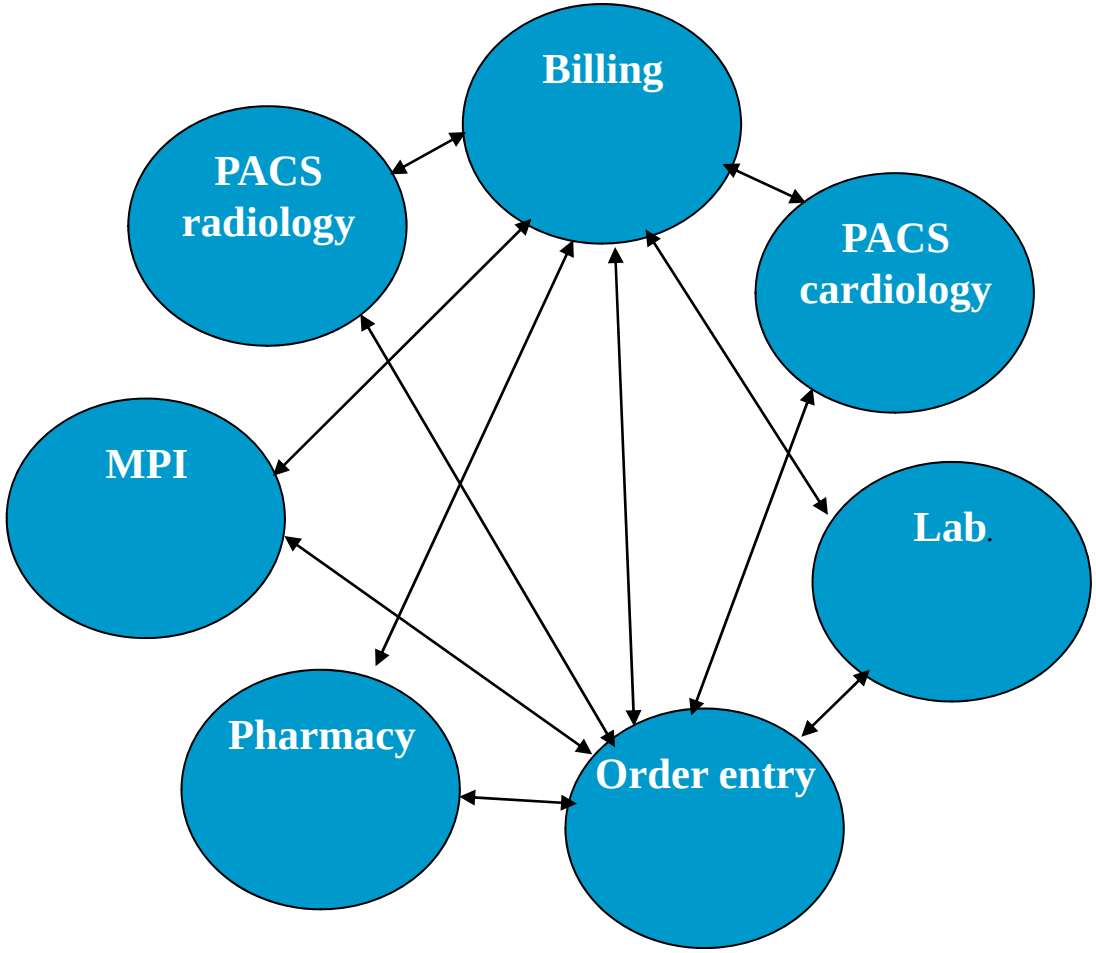
- Consultant
  - IT Architecture and Strategy
  - Chief Enterprise Architect for service- and component-based systems
    - Finance, Insurance, Telecom
  - SOA, EA and MDA implementation, strategy and training
  - 25+ years experience in distributed systems, software and architecture
- Cutter Consortium – Director of Enterprise Architecture
- SOA Institute – Editorial Director
- Author
  - Cutter Consortium
    - '10 Things and Architect Does to Add Value'
    - 'EA by Example'
    - "Designing Service Oriented Applications"
    - "EA – It's not Just for IT Anymore"
    - "Agile Methods and Enterprise Architecture"
    - "Enterprise Architecture Roll-out and Training"
    - "Service Oriented Integration: Aligning SOA with Enterprise Integration"
    - "Implementing SOA on Common Technologies"
  - Books
    - SOA Applied: Architecture and Design Strategies, 2008, Wiley
    - Developing e-Business Systems and Architecture: A Manager's Guide, 2000
    - Integrating CORBA and COM Applications, 1998, Wiley



Agenda

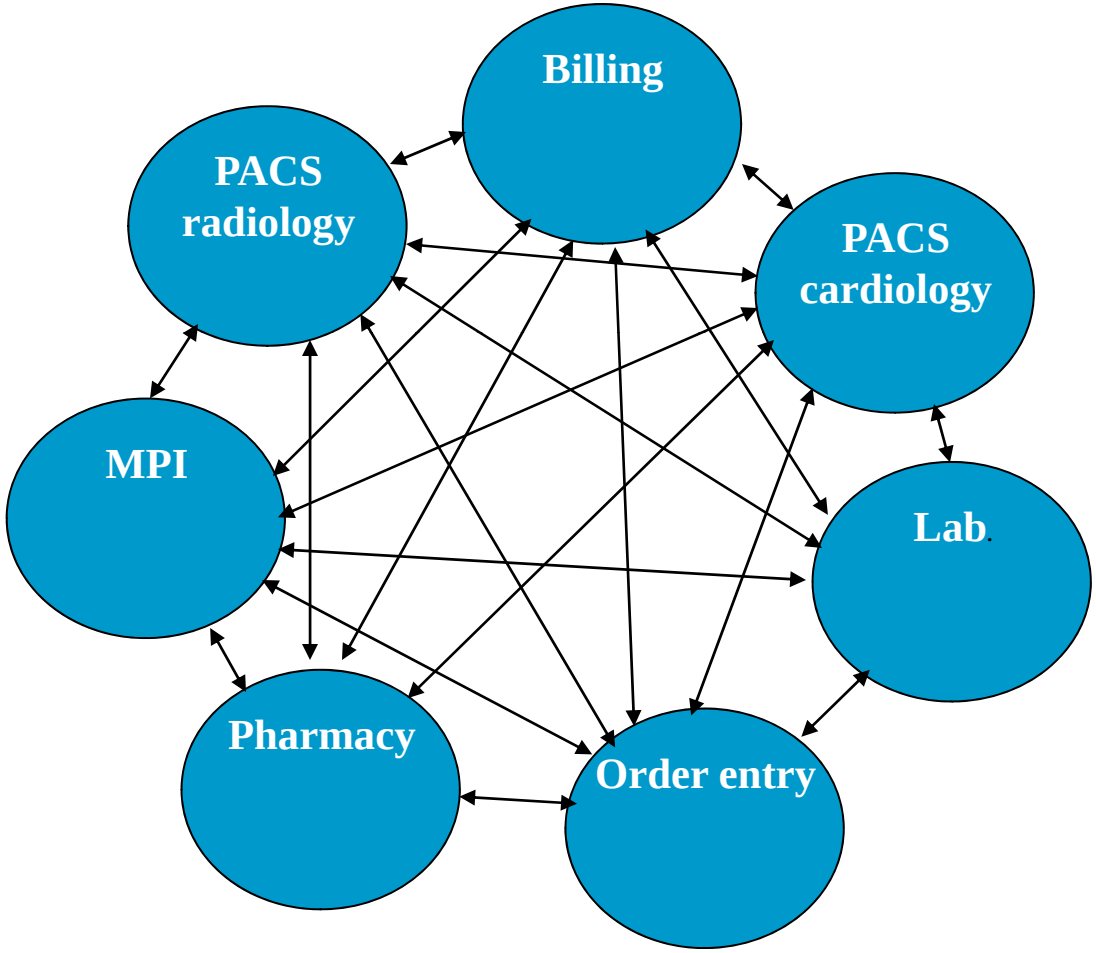
- Problem
- SOA Solution
- Hype and Reality
- Challenges
  - Semantics
  - ownership
- Standards to the Rescue
- Conclusion

A common view of Healthcare Integration

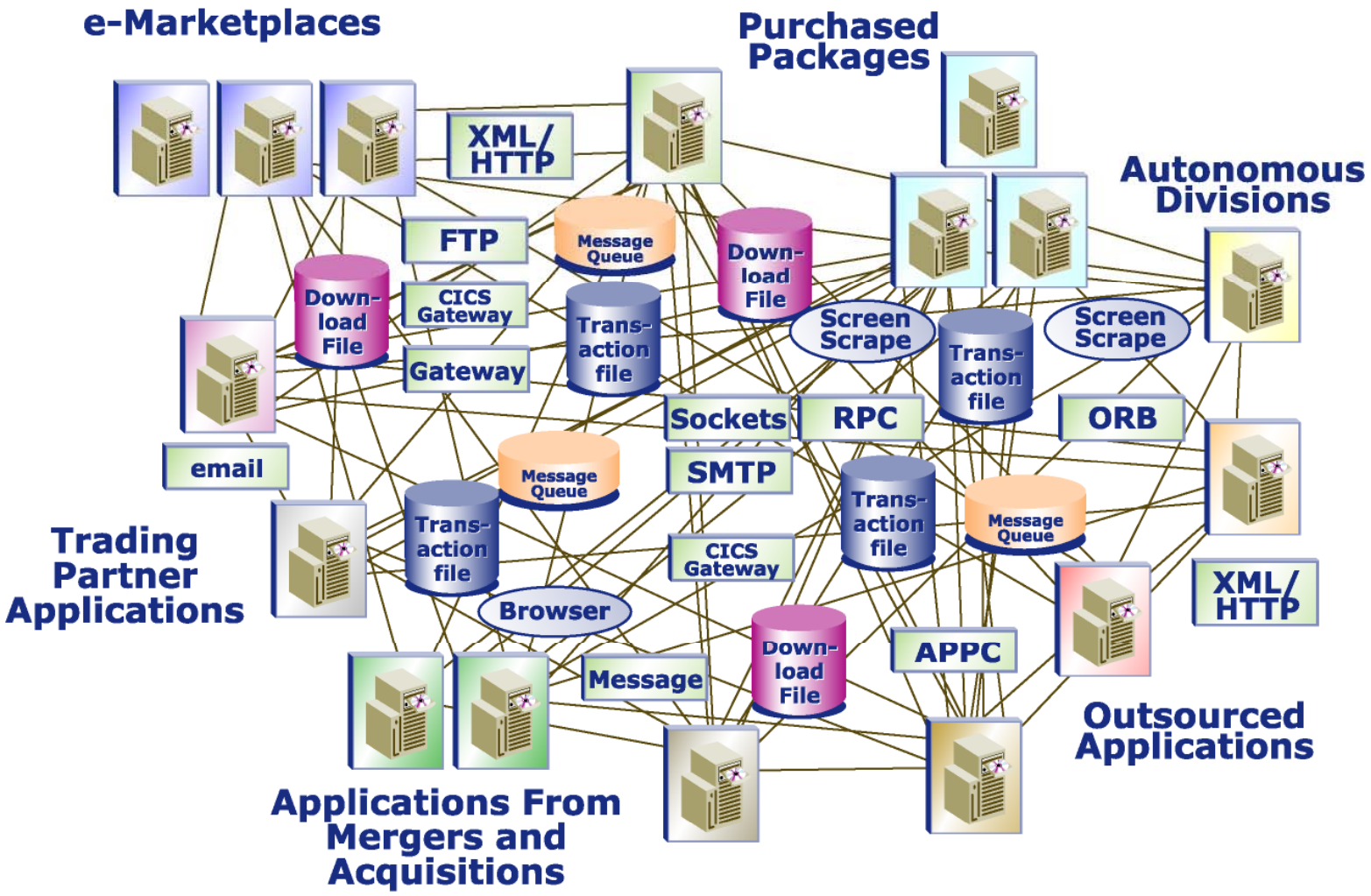


From http://hssp-infrastructure.wikispaces.com/space/showimage/CORBAmed_2000_05_01_ROADMAP_2_0.doc

But this was not sustainable…

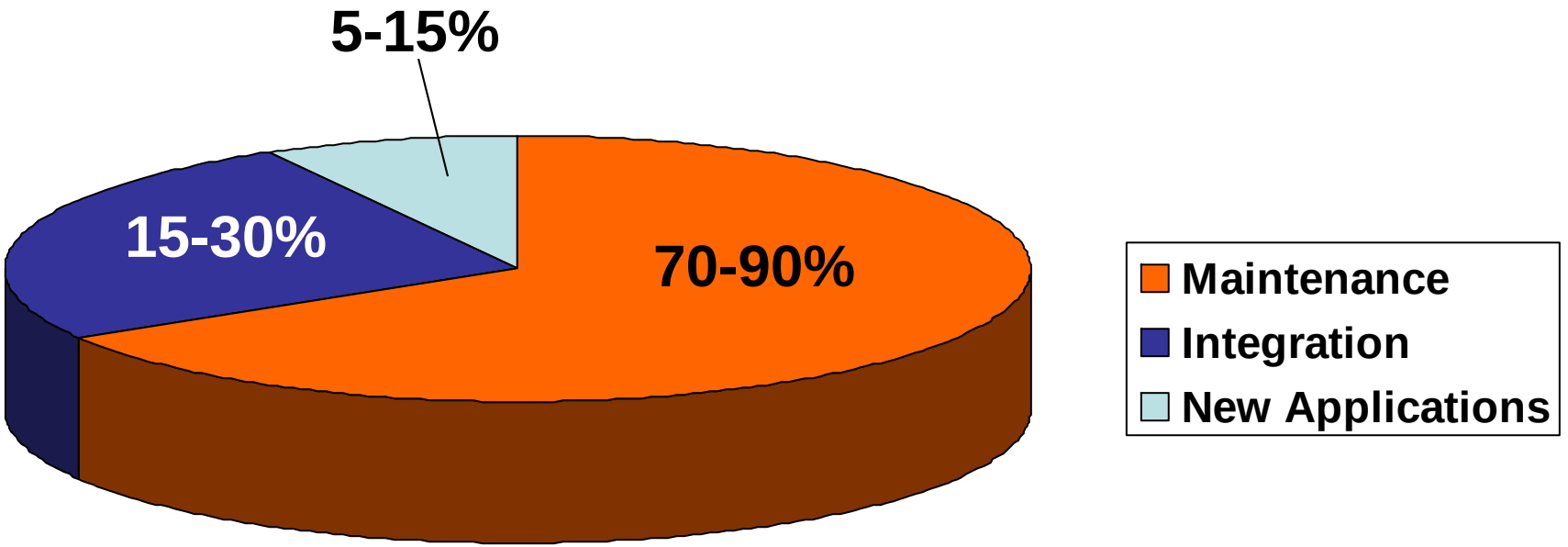


The Result: Enterprise Application “Spaghetti”

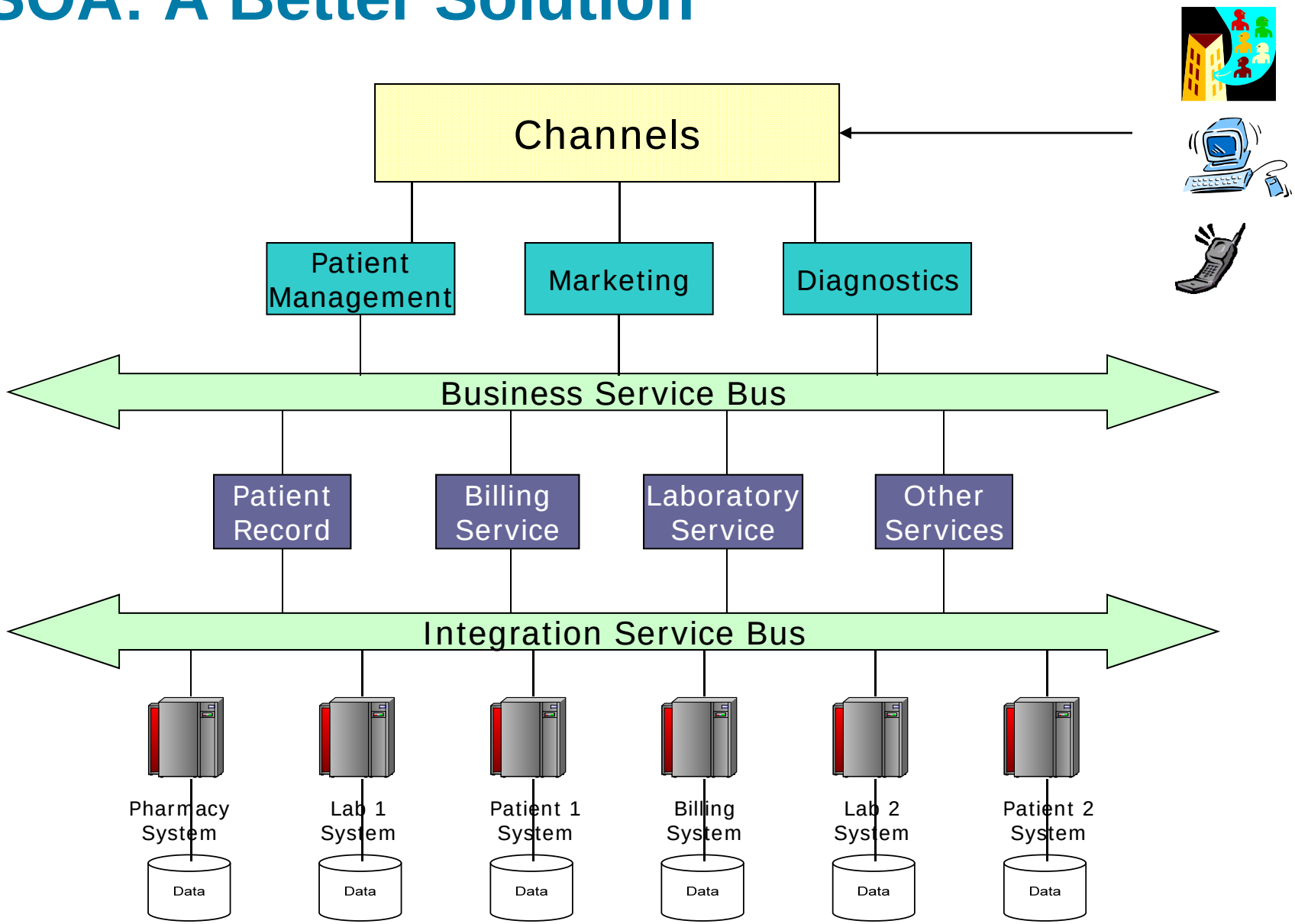


Source: Gartner, 2000

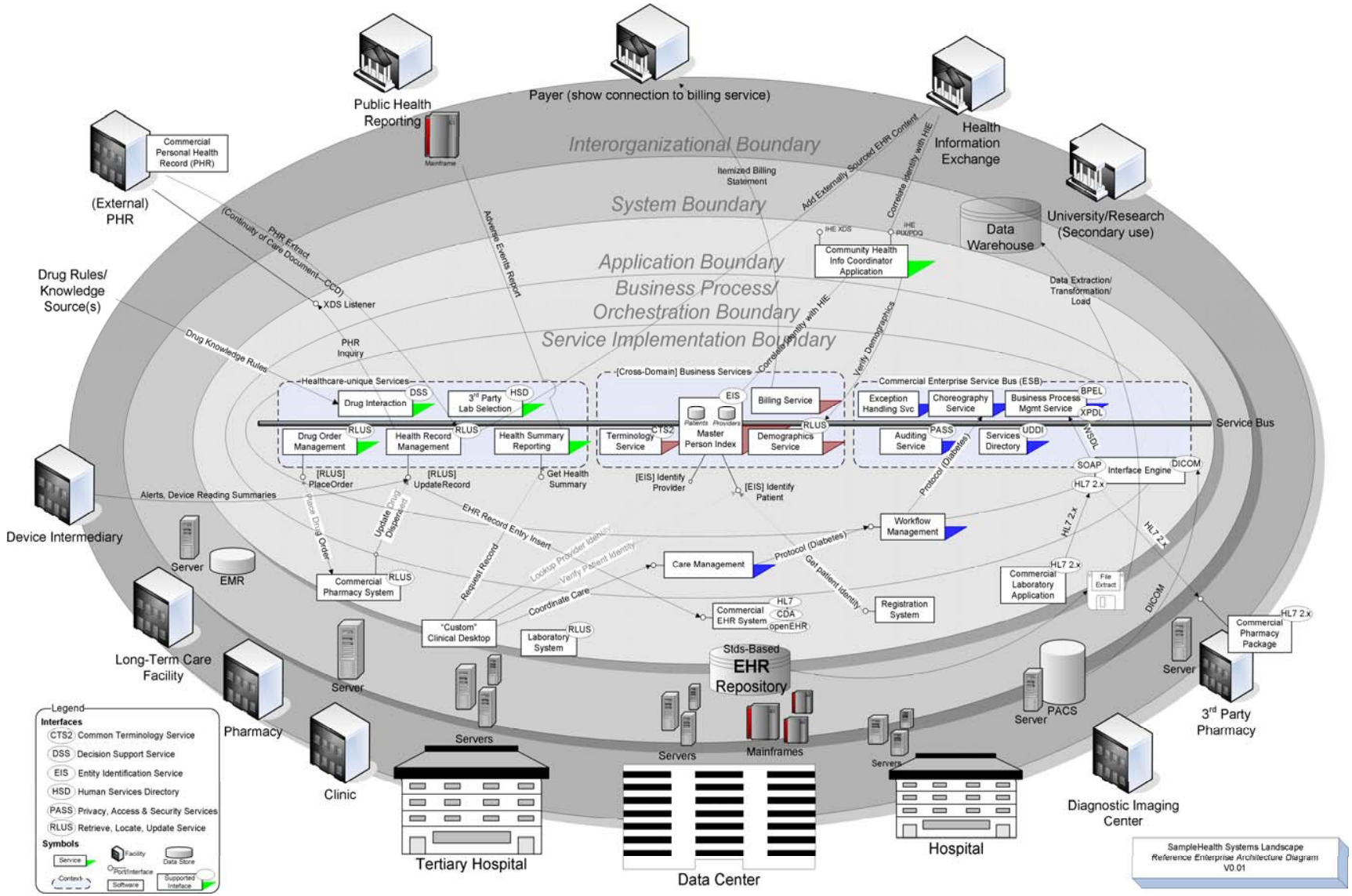
The Result: Typical IT Budget Allocation



SOA: A Better Solution



SOA Context in Healtcare



Source: Practical Guide to SOA in Healthcare

Healthcare Context Boundaries

- The ***Inter-organizational Boundary*** (outermost) represents inter-organizational considerations, such as policies, sharing agreements, and business partners.
- The ***System Boundary*** represents the physical platforms on which software and systems run, including servers, networks, and so on.
- The ***Application Boundary*** represents the software running on those platforms, inclusive of applications and data.
- The ***Business Process / Orchestration Boundary*** manages the intersection between software and workflow, and would manage coordination among multiple software components that all must interact to satisfy business needs.
- The ***Service Implementation Boundary*** depicts the implementations themselves, interacting across a service bus, and realizing the architecture.

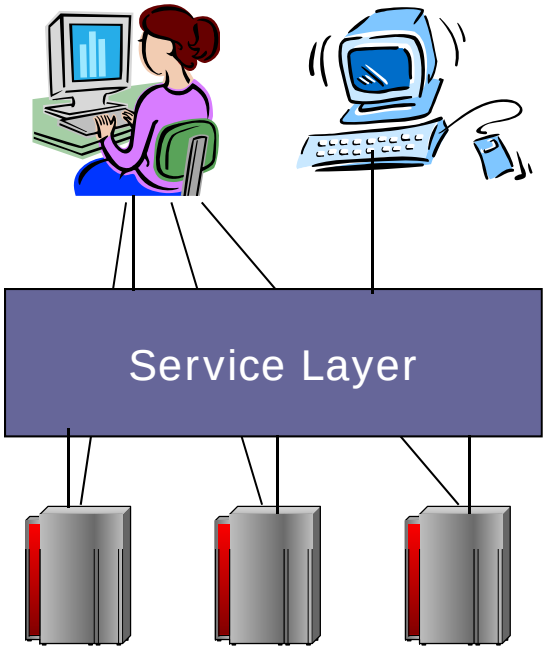
Source: Practical Guide to SOA in Healthcare

SOA History

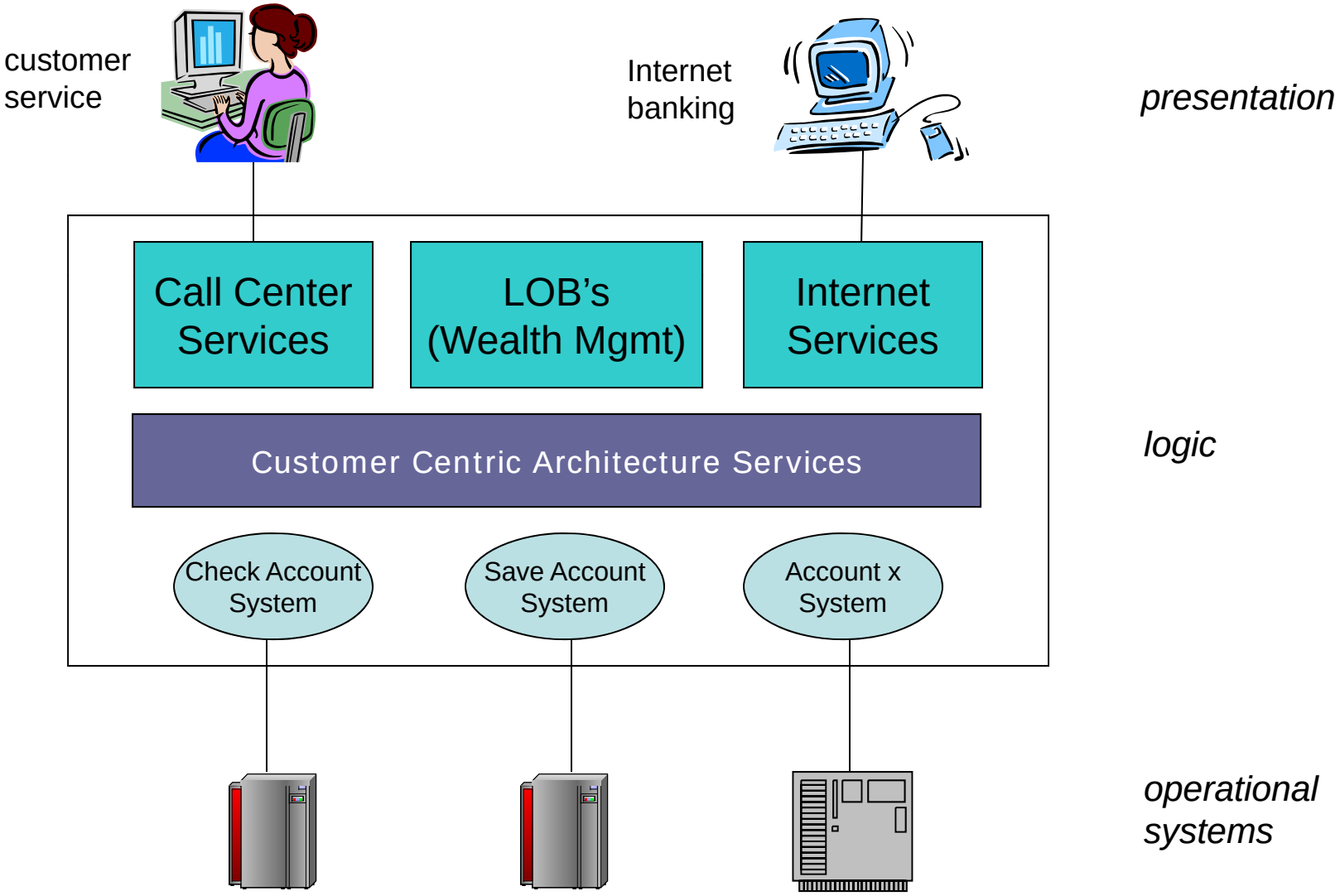
- Service Oriented Architecture (SOA) is NOT new!
- Many Successful SOA Applications have been built in the past:
  - CORBA (Wells Fargo, Credit Suisse)
  - Tuxedo
- Many, many more attempts at SOA failed
- But, we can learn from what failed, and what succeeded

SOA, Who Cares?

- Built on SOA, originally for Customer Service Representatives
- …Expanded to 80 Lines of Business
- Agile / Flexible Industry leading functionality



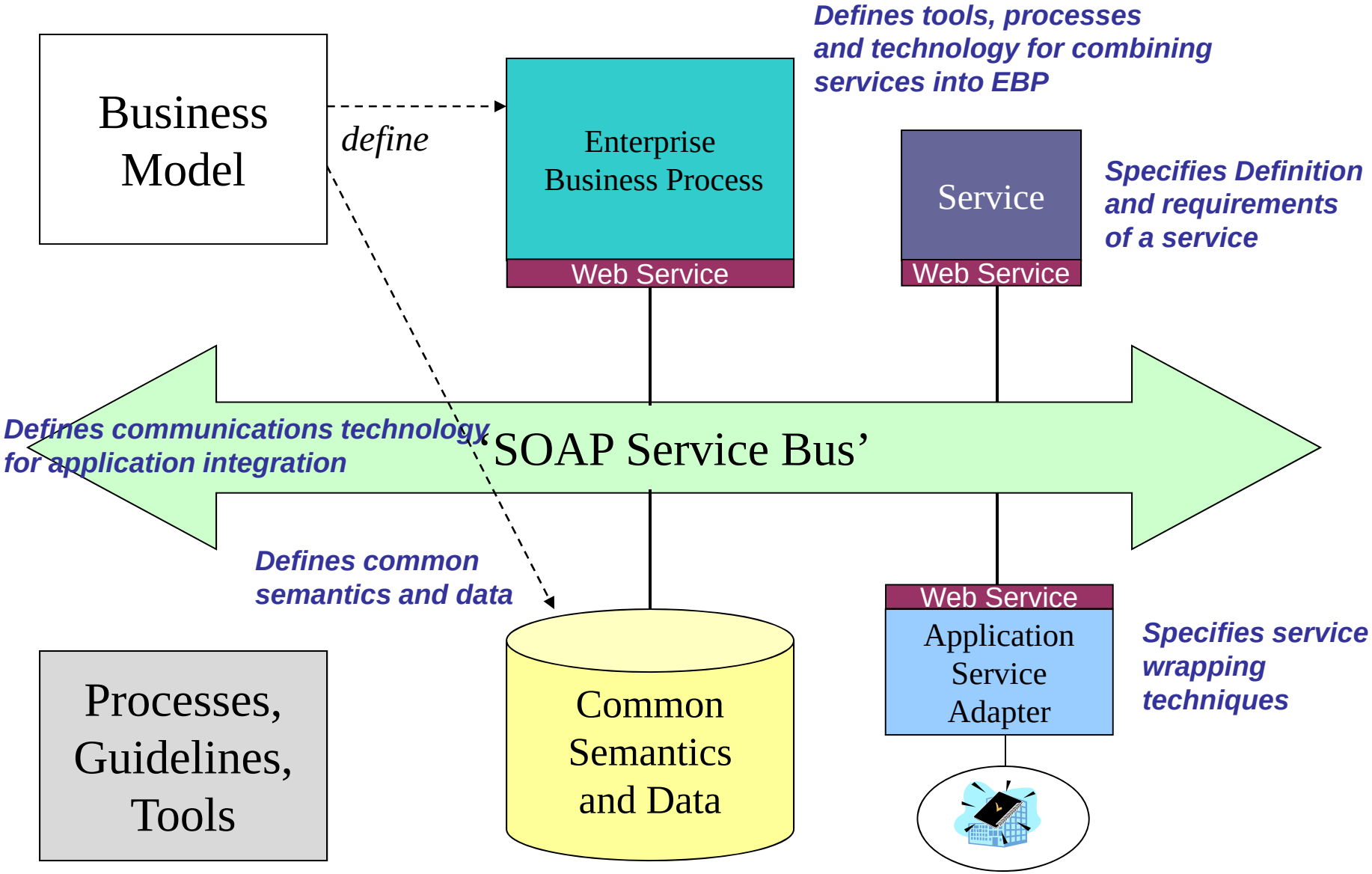
SOA Solution for Unified Customer



SOA is Hard!

- Previous technical infrastructures were very difficult to master
- We did not adequately understand the characteristics of services and service design
- Requires an understanding of the business and information and a strategic vision
- Requires an architectural based approach
- Requires an appropriate methodology
- Requires a supporting organizational structure

Enterprise SOA



SOA Definition

- “In a nutshell, SOA provides an approach for business transformation based on dividing complex environments into well defined, formally specified functions based on the activities they perform (services).
- Each service has well defined responsibilities and authority.
- These services then work together in collaboration to support the workflow of the business, all within the context of governance and oversight that manages their coordination and performance.”
  - Practical Guide to SOA in Healthcare – OMG & HL7

A Definition of SOA

- SOA is concerned with the *independent* construction of services which can be *combined* to realize meaningful, higher level business processes within the *context of the enterprise*.

- A Service Oriented Architecture describes several aspects of services within an enterprise:
  - The granularity and types of services
  - How services are constructed
  - How the services communicate at a technical level
  - How the services are combined together (i.e. orchestrated)
  - How the services interoperate at a semantic level (i.e. how they share common meanings)
  - How services contribute to IT and Business Strategy

So what else is needed?

Common taxonomy or layering of types of services (e.g. process, core business, data access)

Common framework of supporting infrastructure services to manage the " …ilities"

Enumeration of meaningful, appropriate Services

Standards for Service interfaces, including agreed information and behavior semantics

Clarification of dependencies between services and relationship to key business processes

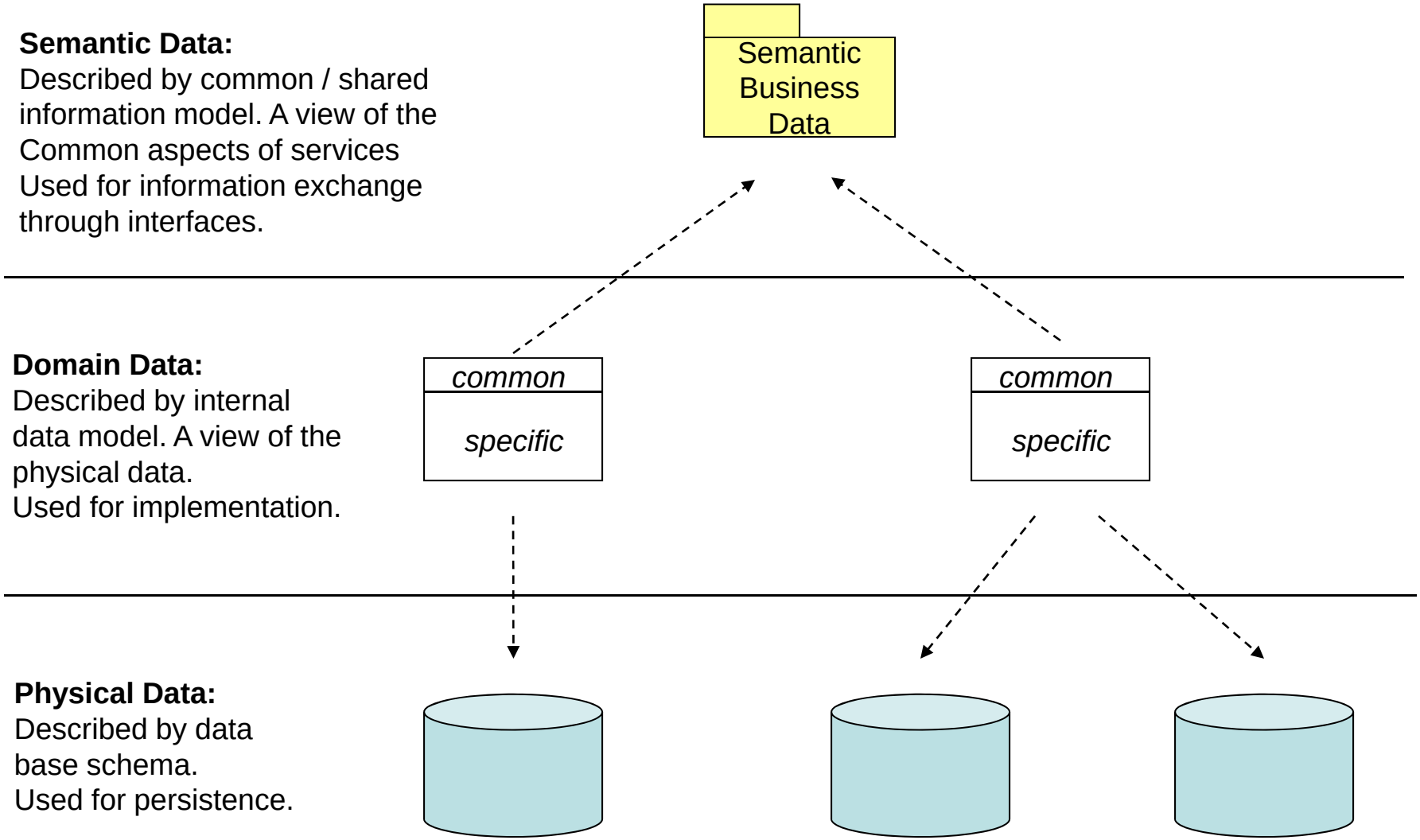
Source: HL7 Education Summit, Kaiser Permanente

Types of Data

Semantic Data:
Described by common / shared information model. A view of the Common aspects of services
Used for information exchange through interfaces.

Domain Data:
Described by internal data model. A view of the physical data.
Used for implementation.

Physical Data:
Described by data base schema.
Used for persistence.



So why standard Healthcare Service Specifications?

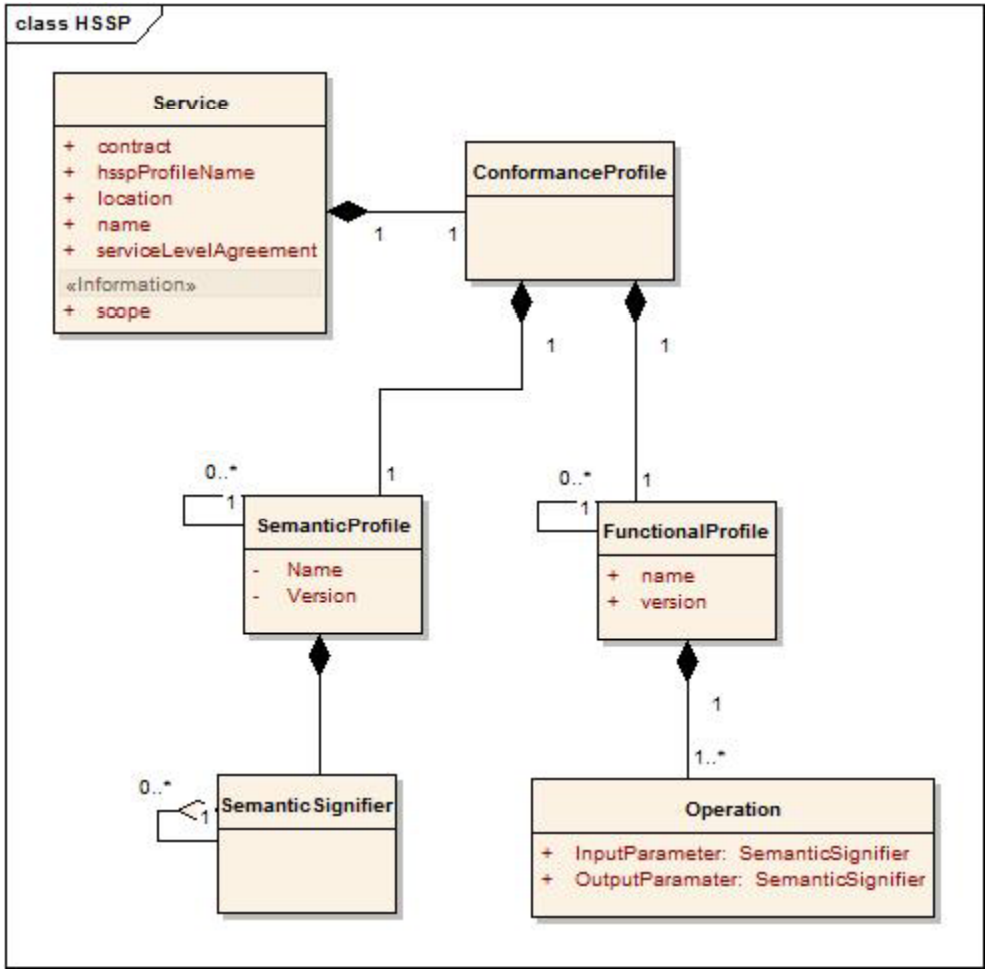
- Provide common architectural building blocks
  - Solve problems and create opportunities for developers / architects to improve healthcare with technology
  - For consumers (like KP) provides cheaper and faster integration
  - Enable inter-organization interaction over the internet using a common approach
- Tie good SOA practices and patterns to the rich models of HL7, CEN, OpenEHR
- Create true *Interoperability* specifications, not just *Integration* specifications
- Two important services
  - EIS – Entity Information Service
  - RLUS – Retrieve, Locate, and Update Service

Source: HL7 Education Summit, Kaiser Permanente

EIS (Content Models)

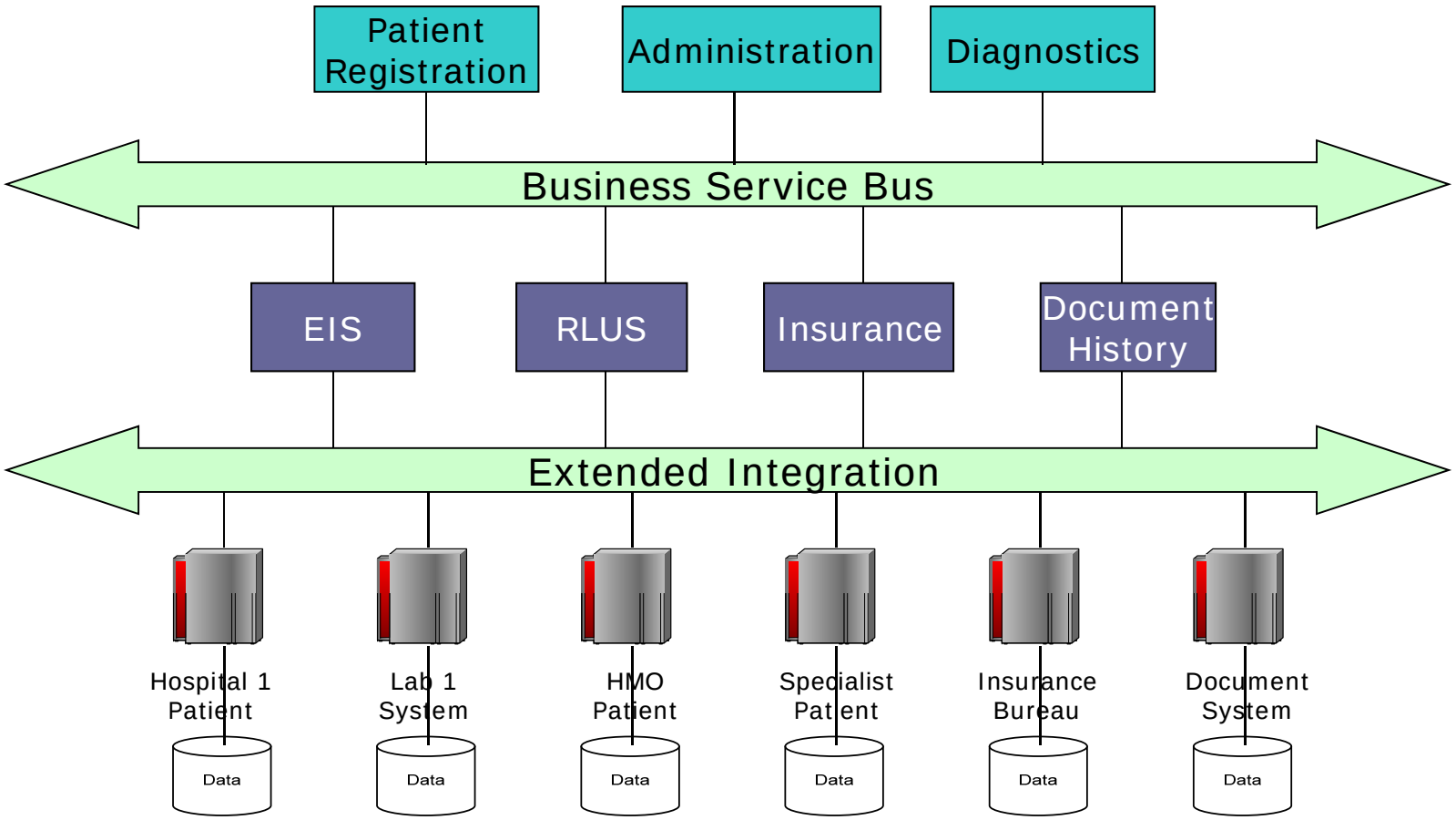
An EIS instance contains:

- A Functional Profile – An Instance's Supported Operations
- A Semantic Profile – the composition of semantic signifiers, e.g. HL7 RIM v2.14 Patient, OpenEHR Patient Archetype, HL7 V2.5 Patient, Provider, Device etc.

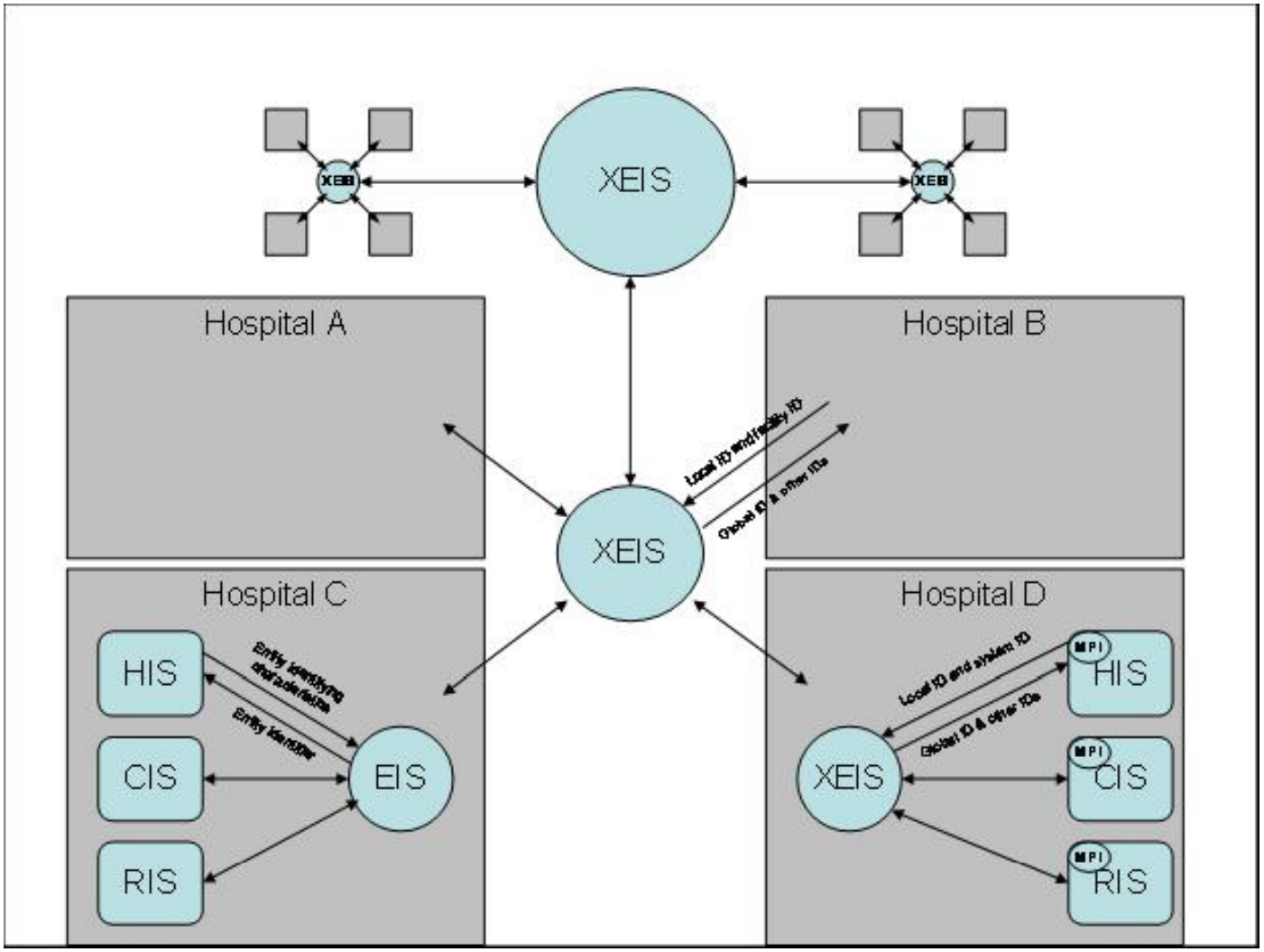


Source: OMG EIS Specification

SOA Patient Information Solution



Cross Domain EIS (XEIS - Hierarchic)



Source: OMG EIS Specification

As Simple As Possible…

- …but not more so! (A. Einstein)
- Single system view
  - Enables consolidated view (read), but not data utility (CRUD)
- Single repository
  - Impractical. Data needs to be stored at the service, and then exposed and integrated into workflows
- Master Patient Index
  - Integrates data, but not workflows
- Big bang, analysis paralysis, uncoordinated efforts, not enough governance, too much governance, …

Summary

- SOA is a good solution for the challenges facing healthcare patient information
- Anyone can build a service…SOA is about making things work together to build higher level value
- This requires common understanding and semantics
- Use industry standards where they exist
- Accommodate organizational realities
- Adopt an incremental approach
- Have perseverance and patience

Thank You!

"Every complex problem has a solution that is clear, simple…and wrong"

— H.L. Mencken, 1949