



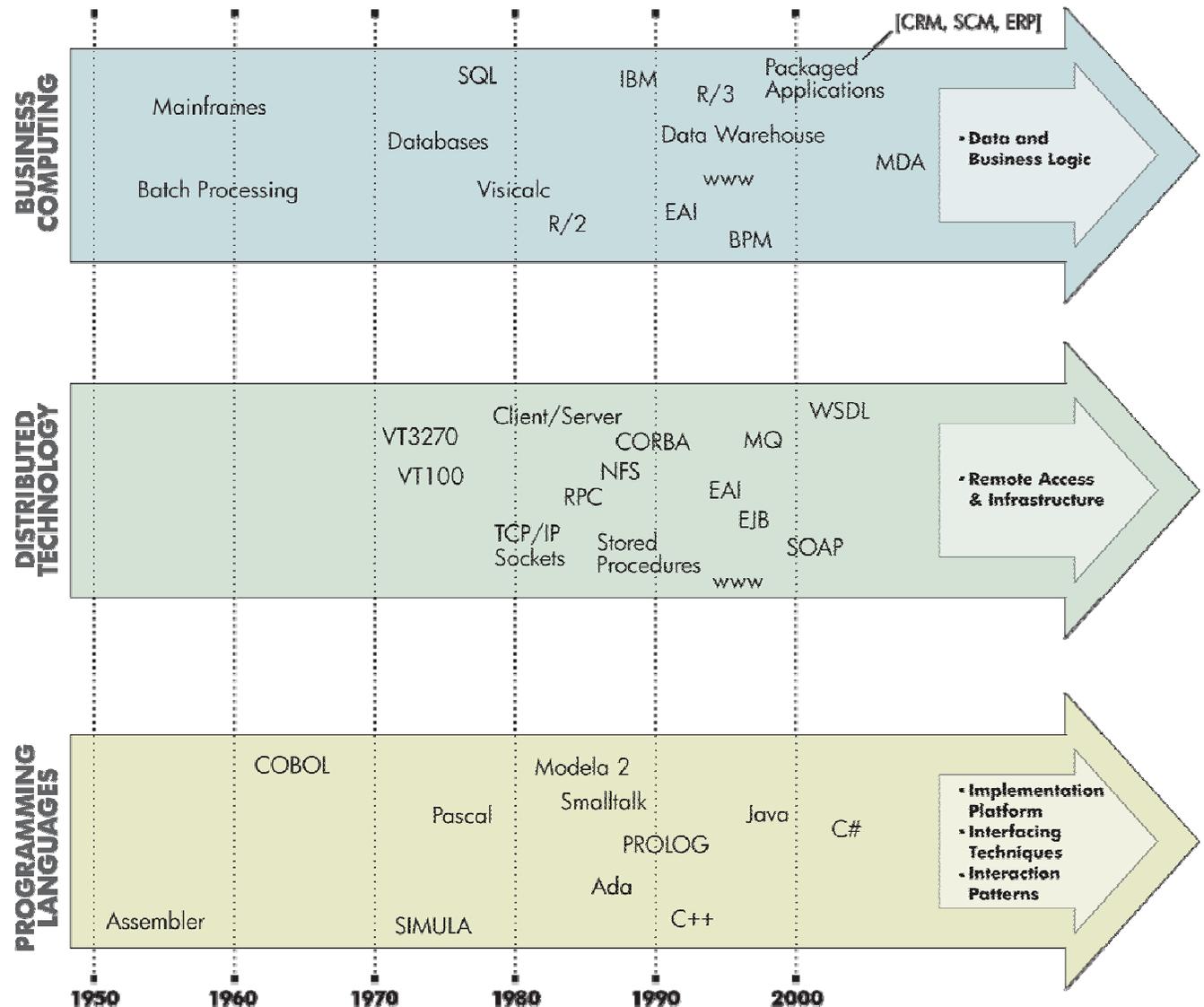
# **Design, Architecture, the NAS, SWIM, Net-Centric Operations, and SOA**

**Presented at the 6th ICNS Conference and Workshop  
May 1, 2006 • Michael McGrady • Version 1.0**

# A History of IT Abstractions

## IT Abstractions

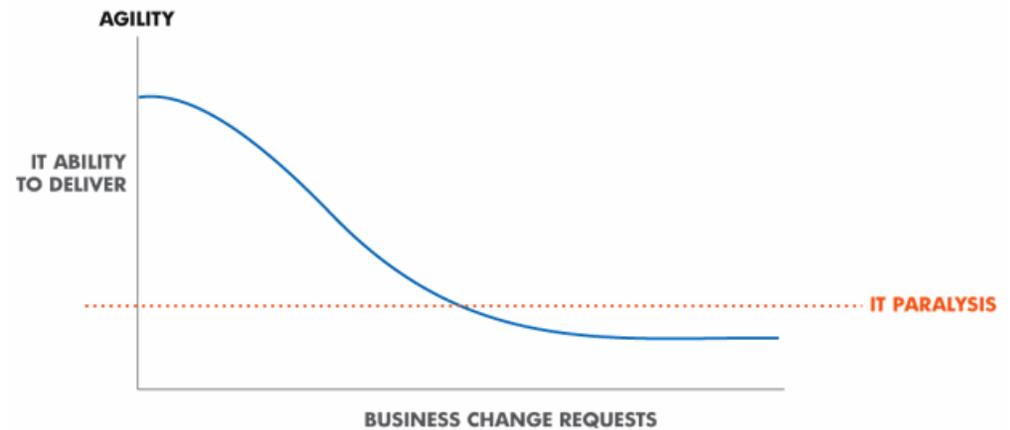
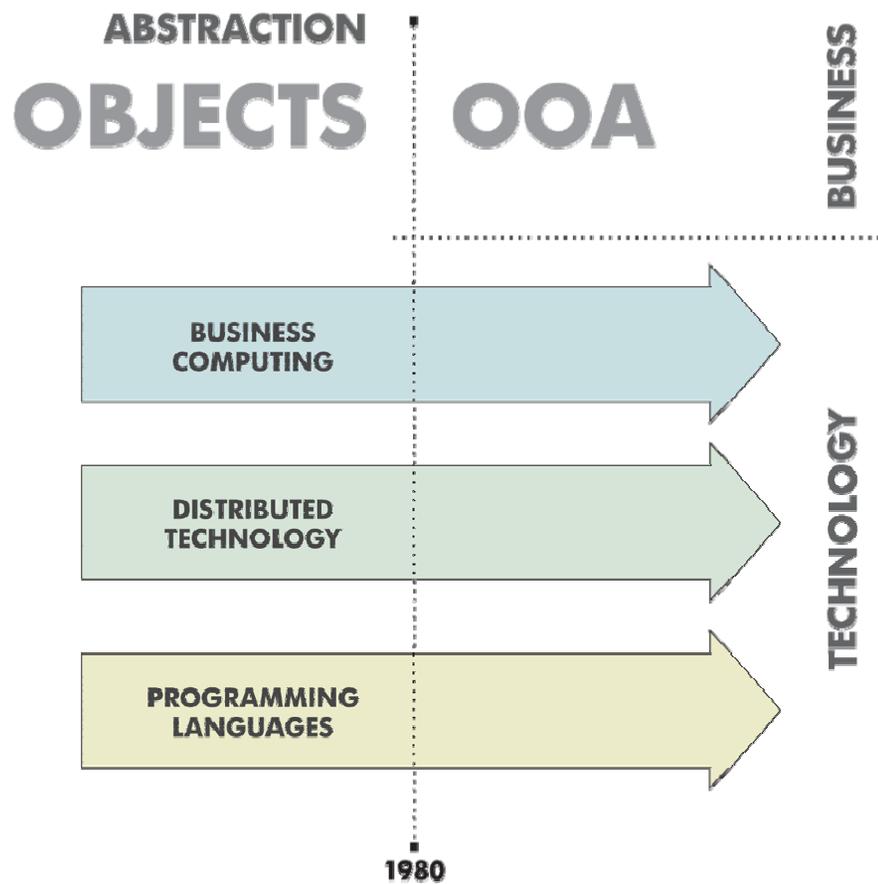
- Data
- Procedure
- Object
- Component
- System



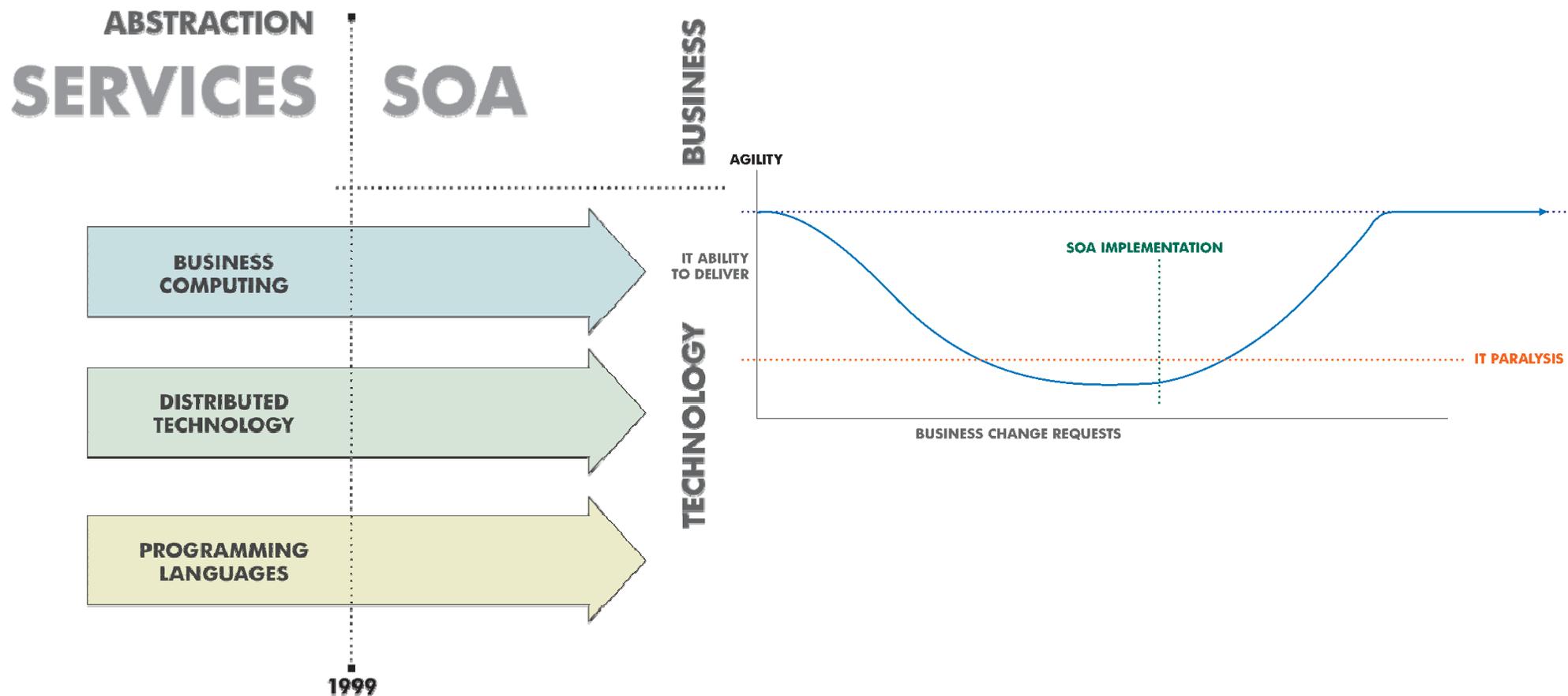
## Quality Control Criteria

The “Ilities”				
Accessibility	Extensibility	Recoverability	Accountability	Adaptability
Administrability	Affordability	Agility	Availability	Composability
Configurability	Customizability	Degradability	Demonstrability	Dependability
Distributability	Durability	Embedability	Evolvability	Failover
Flexibility	Installability	Integrability	Interoperability	Maintainability
Manageability	Mobility	Modifiability	Modularity	Nomadcity
Openness	Performance	Portability	Predictability	Reliability
Retractability	Reusability	Robustness	Scalability	Seamlessness
Security	Serviceability	Simplicity	Stability	Survivability
Tailorability	Testability	Understandability	Usability	
These ilities are best handled by a good architecture, rather than a post-architecture workaround.				

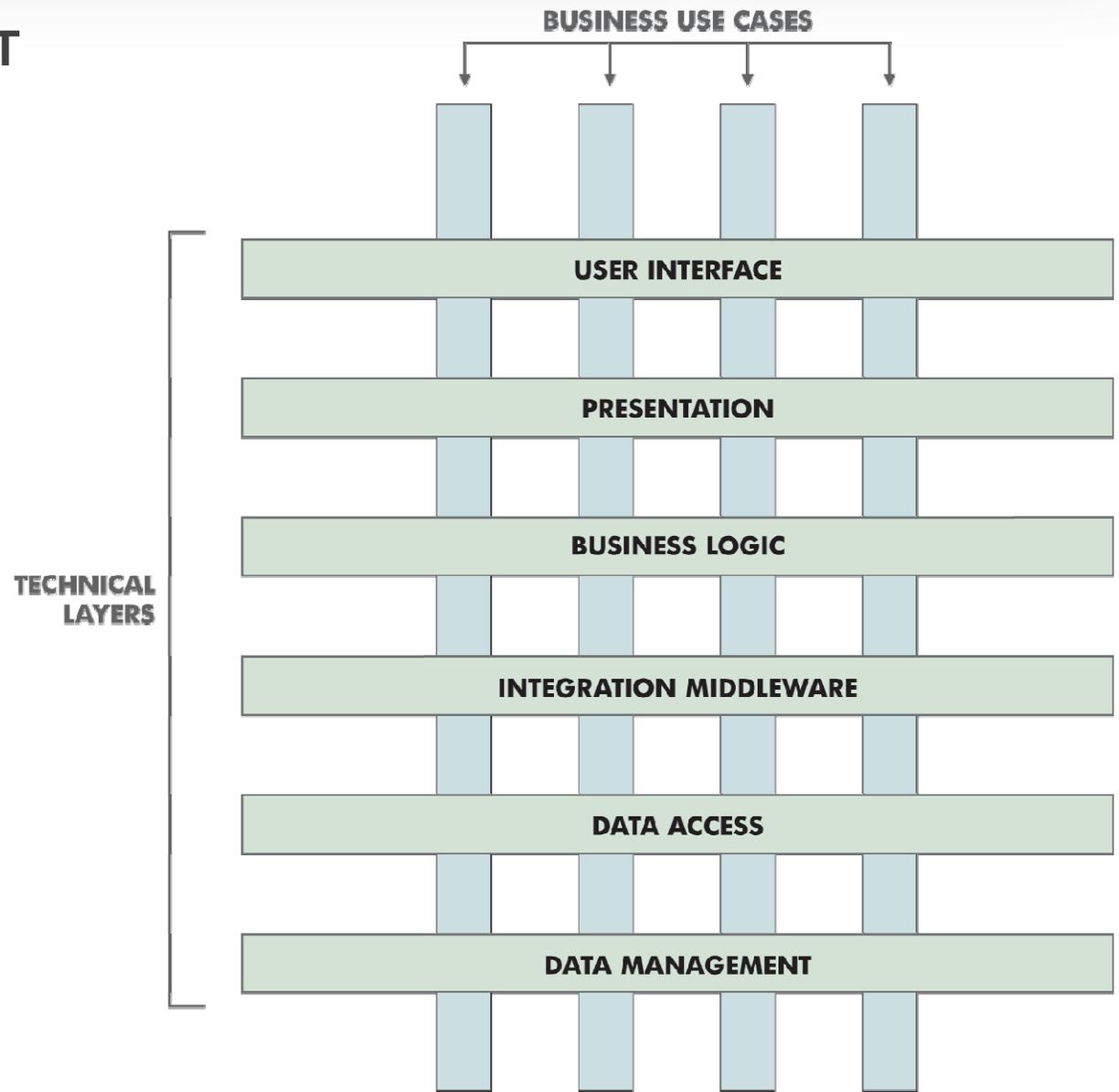
# Enterprise IT and Enterprise Change Management



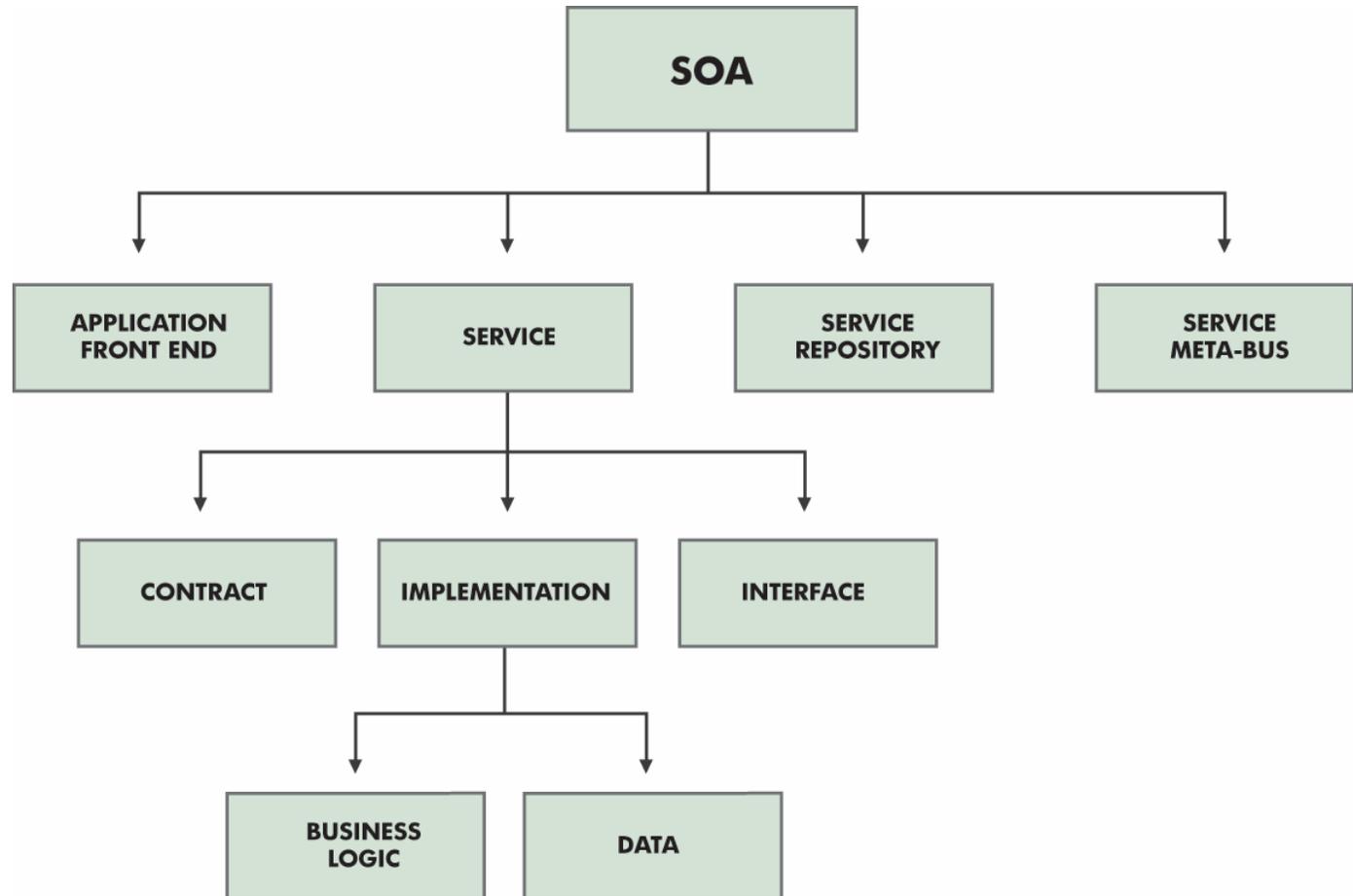
# Enterprise IT and Enterprise Change Management



# Enterprise Use Cases vs. IT Requirements

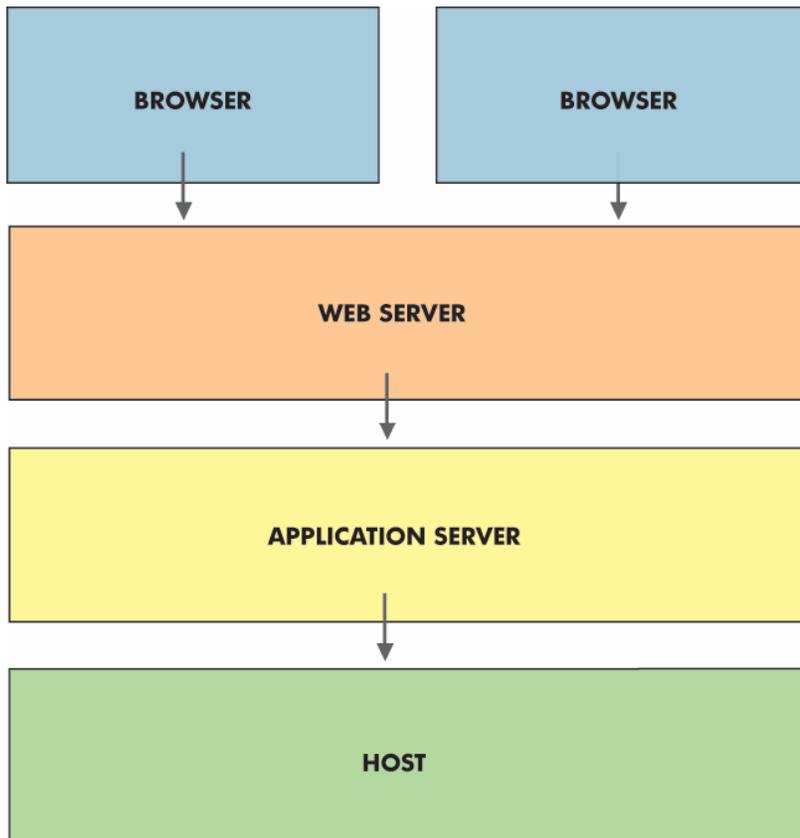


## SOA Concepts

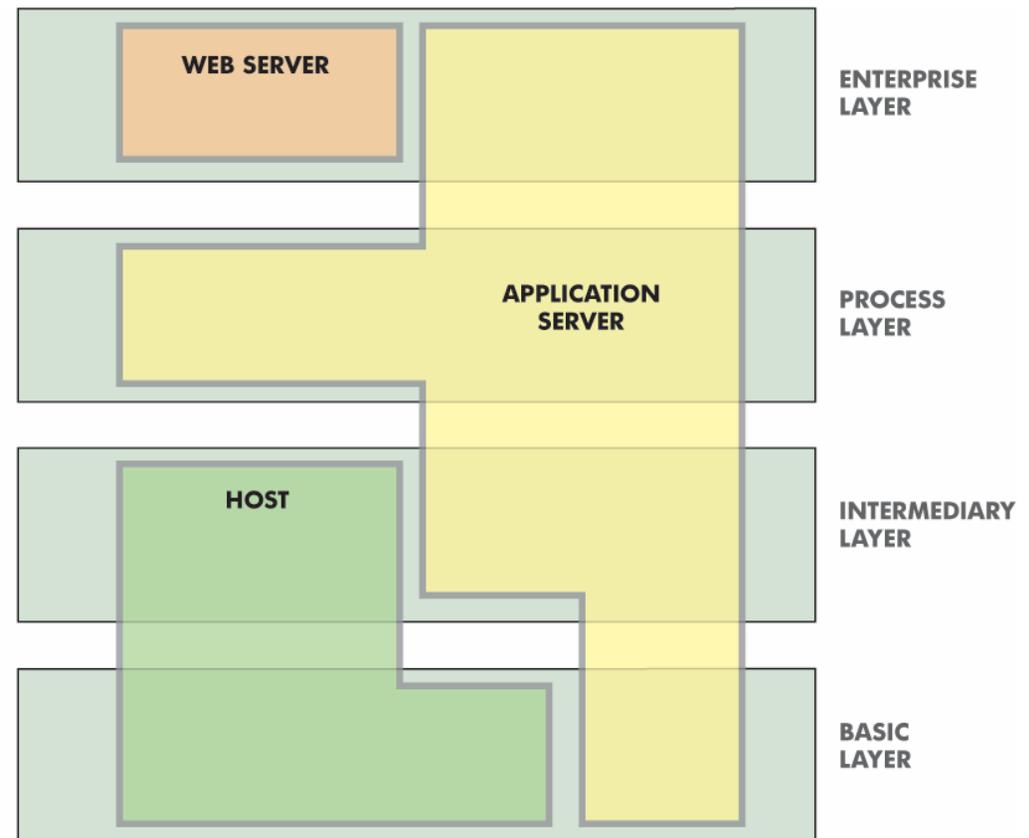


## Enterprise Layers and SOA Layers

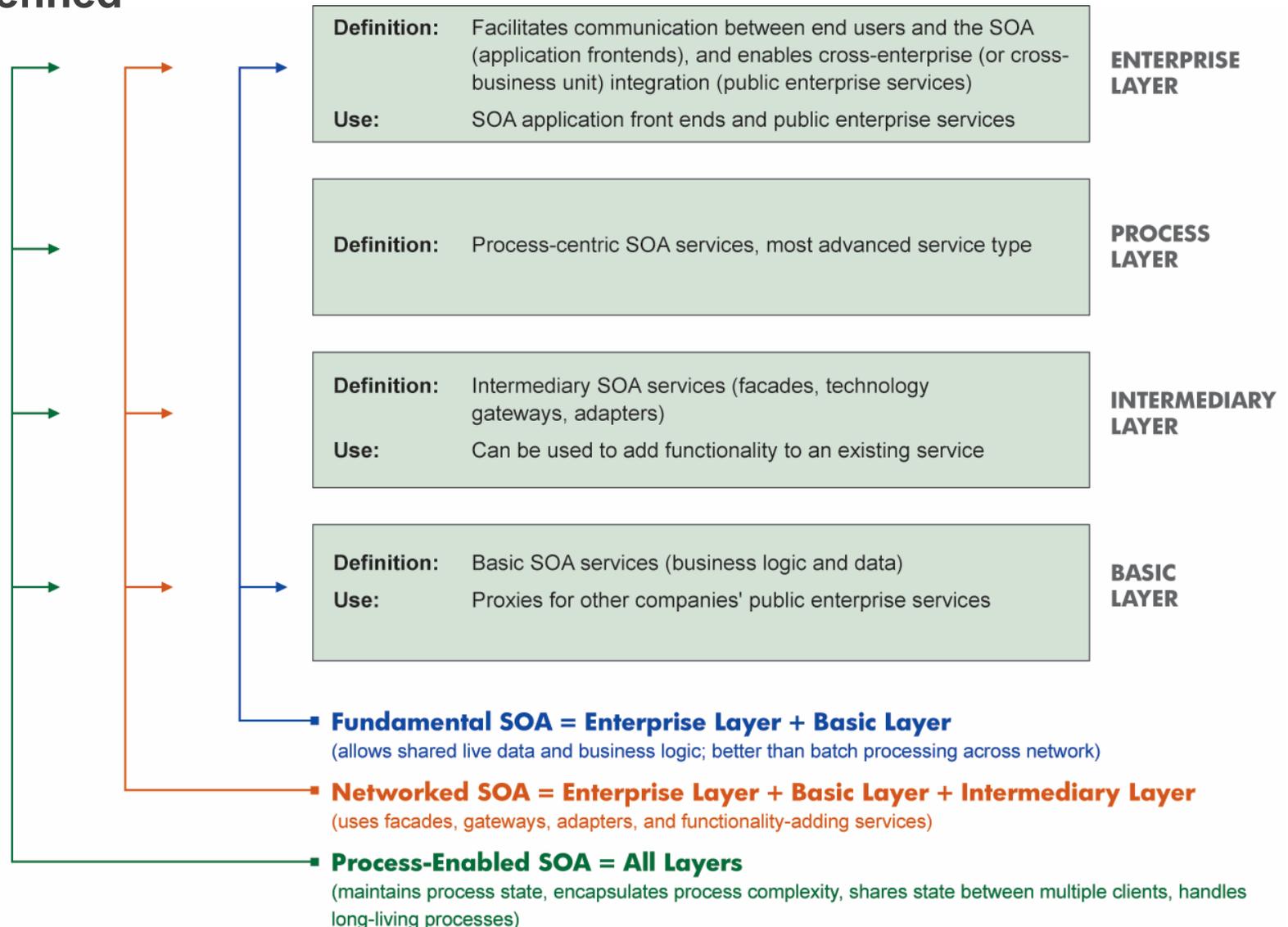
### Enterprise Layers



### SOA Layers



## SOA Layers Defined



## Web Services

**DELIVERY IT  $\neq$  BUSINESS IT**



## Vogels on Web services

### Vogels: "Web Services are not Distributed Objects"

Some developers/architects see Web services in this series: CORBA, DCOM, RMI . . . Web services

- The only relation: Web services are sometimes deployed where distributed object applications failed
- In distributed technology: associate Web services with messaging technologies—shared architectural view, but addressing different application types

Cutting through the hype.

*Web services comprise three components:*

- *Service:* software processes an XML document received through a combination of transport and application protocols
- *Documents:* process described using an XML schema (WSDL)
- *Address/port reference:* a protocol binding combined with a network address to find the service using a particular protocol (TCP, HTTP)

*From: Vogels, Werner. "Web Services Are Not Distributed Objects," IEEE Internet Computing Nov-Dec 2003.*

## Birman on Web services

### Birman: "Like it or Not, Web Services are Distributed Objects"

**Excitement:** Interoperability really is easier with Web Services and a widely adopted advance in program-to-program interconnection/integration merits applause

#### The reliability challenge

- Web browsers: outages don't cause much harm.
- Web services: outages could disrupt an enterprise-dependent computer-to-computer pathway within an application

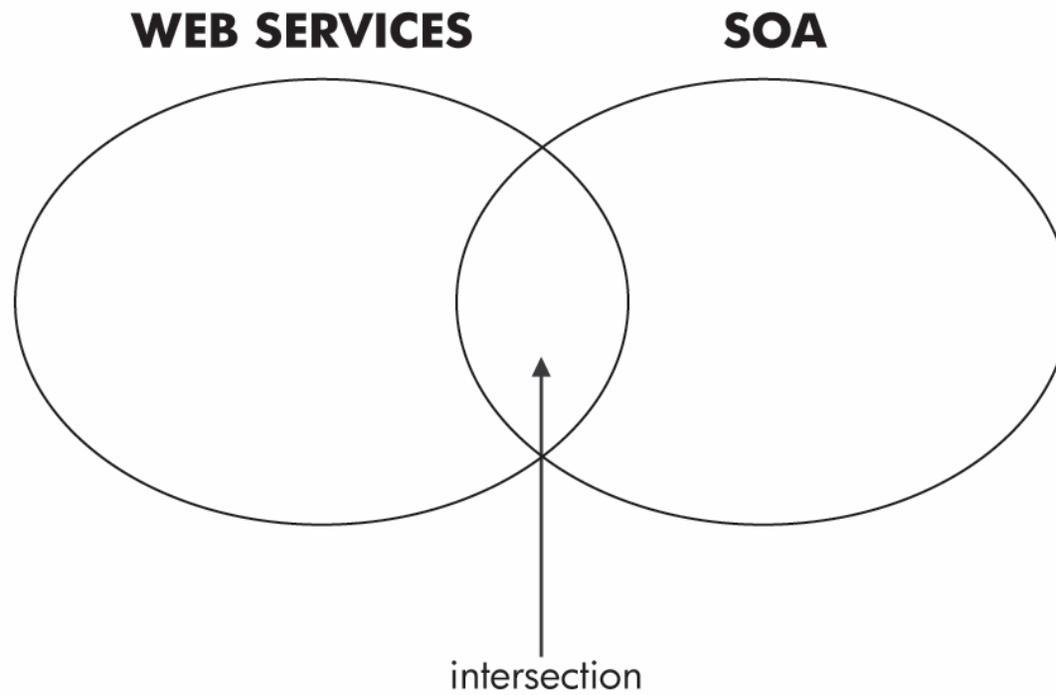
**"The Web is scalable and robust," ignores the way the Web is used**

- A different challenge: error conditions handled seamlessly and automatically
- Appropriate use patterns cannot be enforced when a batch service or Web site becomes a Web Service.

**"Like it or not, Web Services are becoming a de-facto standard – for everything."**

*(From: Birman, Ken. "Like it or not, Web Services are Distributed Objects!" Comm ACM 47(12): Dec 2004, 60-62.)*

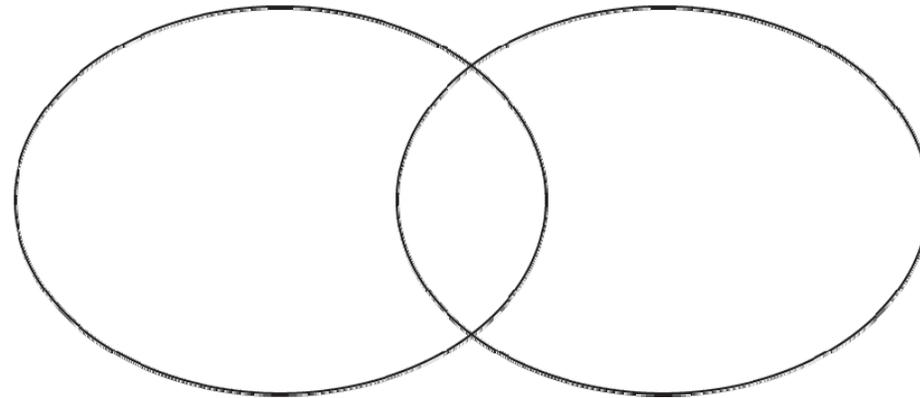
# SOA



SOA

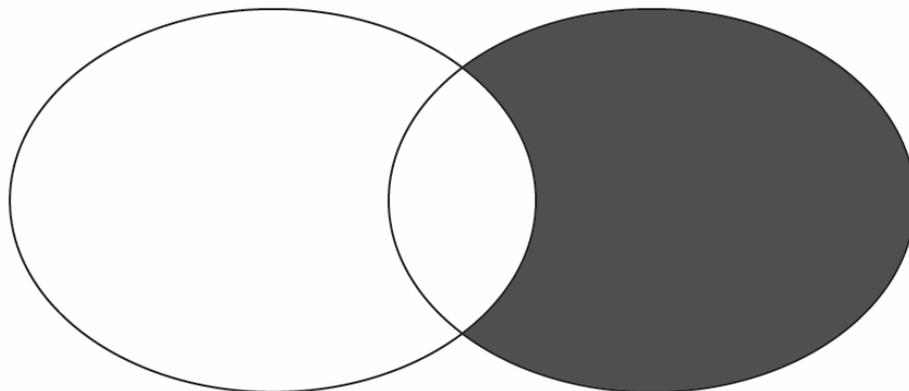
**WEB SERVICES**

**SOA**



**WEB SERVICES**

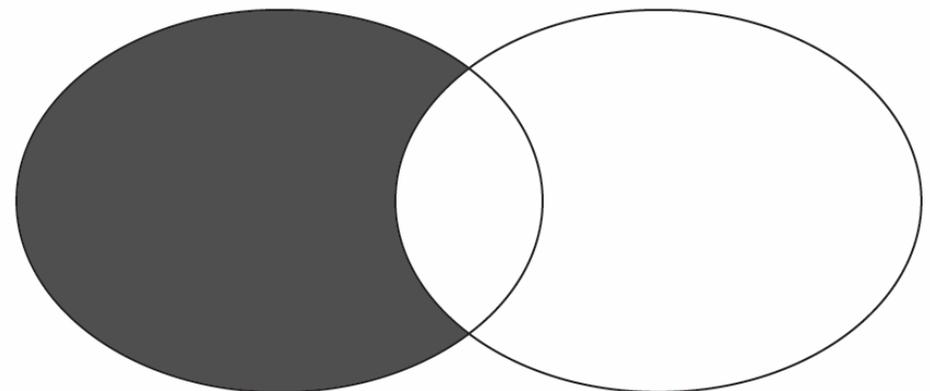
**SOA**



**FACT**

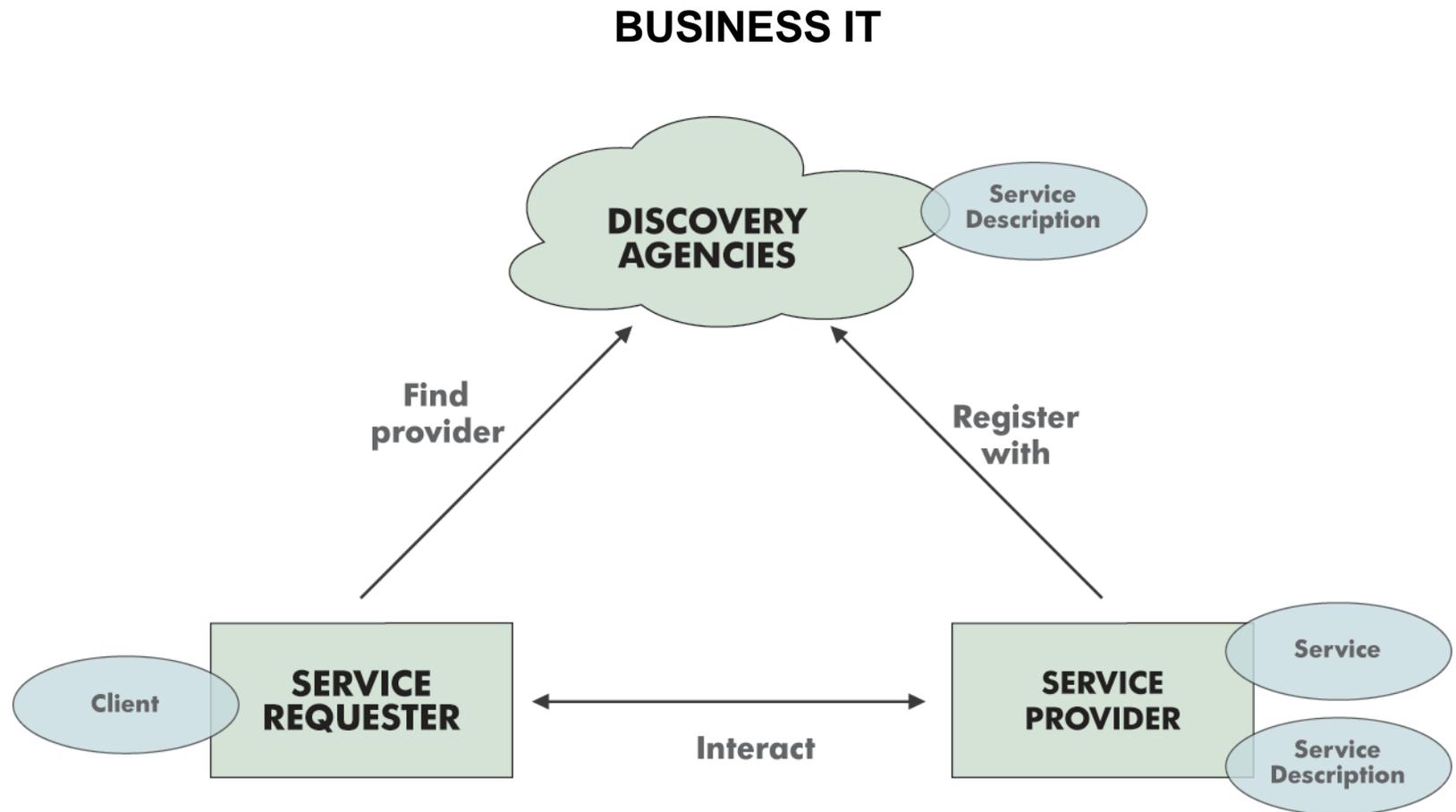
**WEB SERVICES**

**SOA**

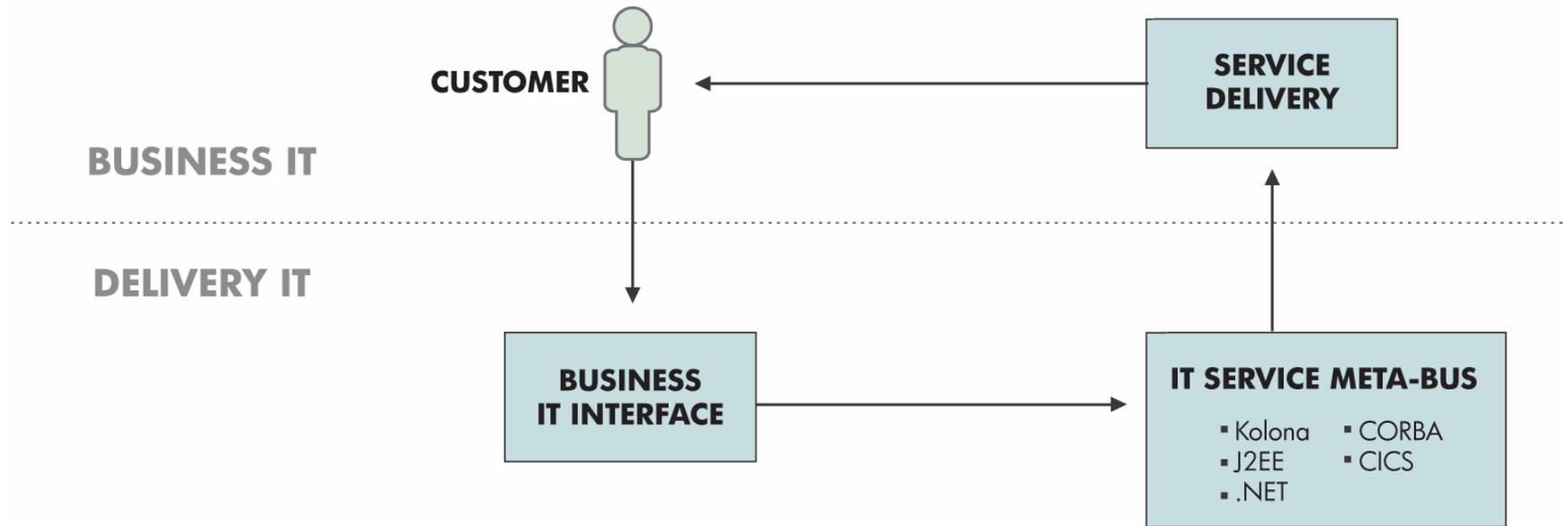


**(MIS)PERCEPTION**

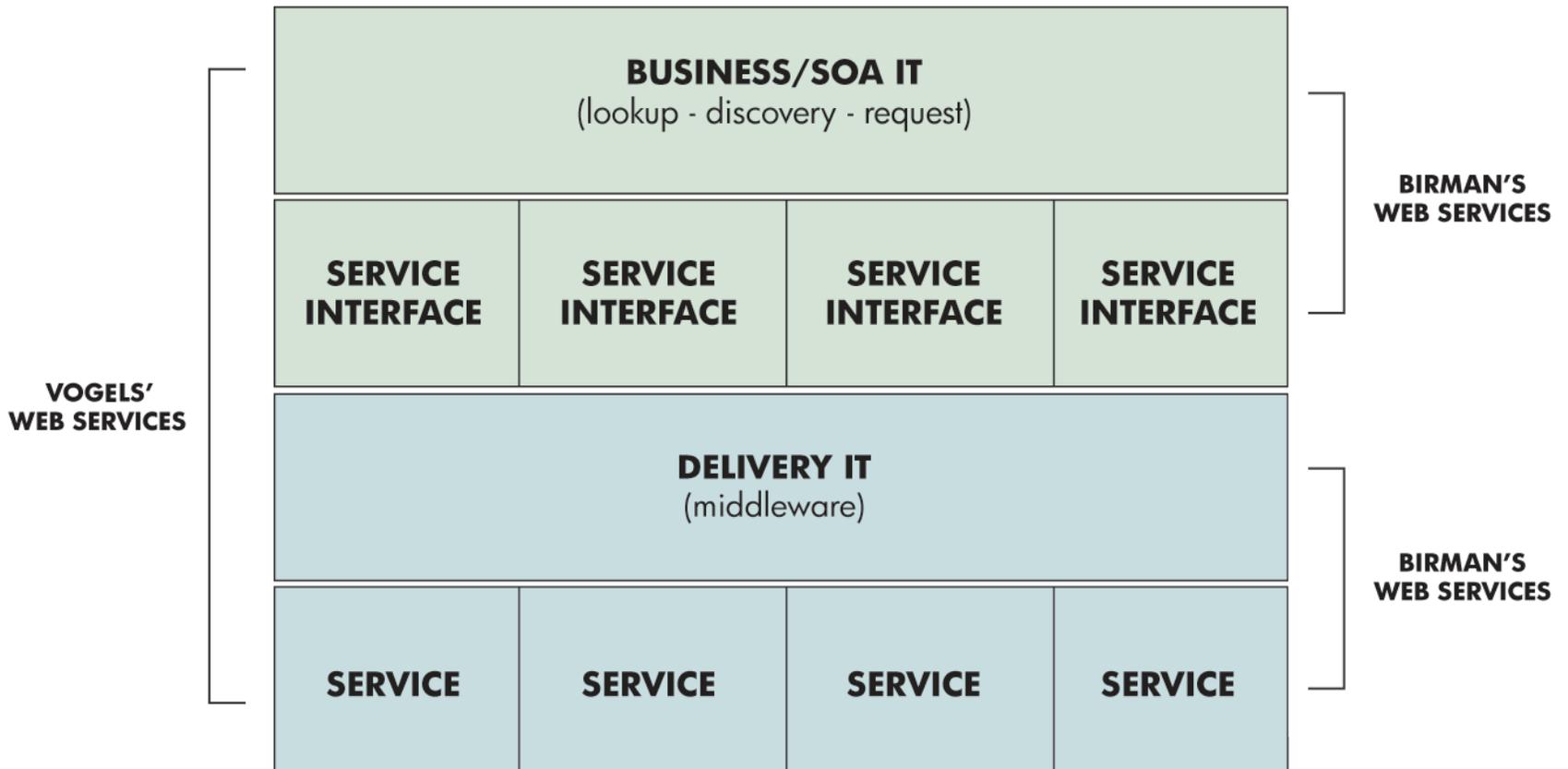
## SOA Discovery



## SOA Delivery and IT

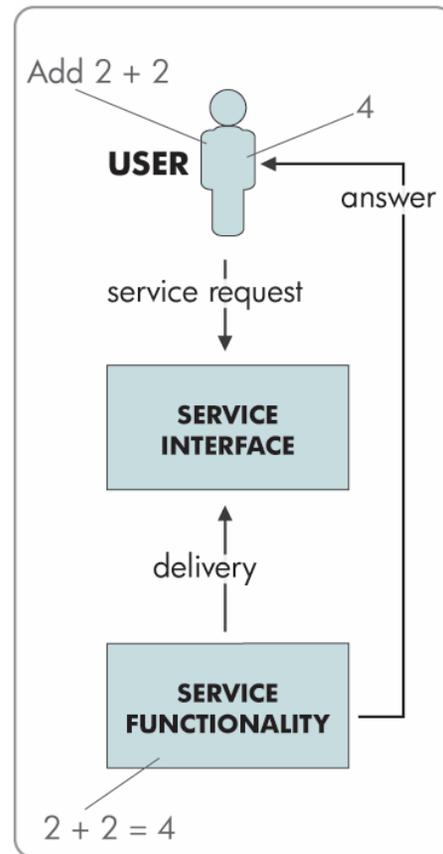


## SOA and Web Services

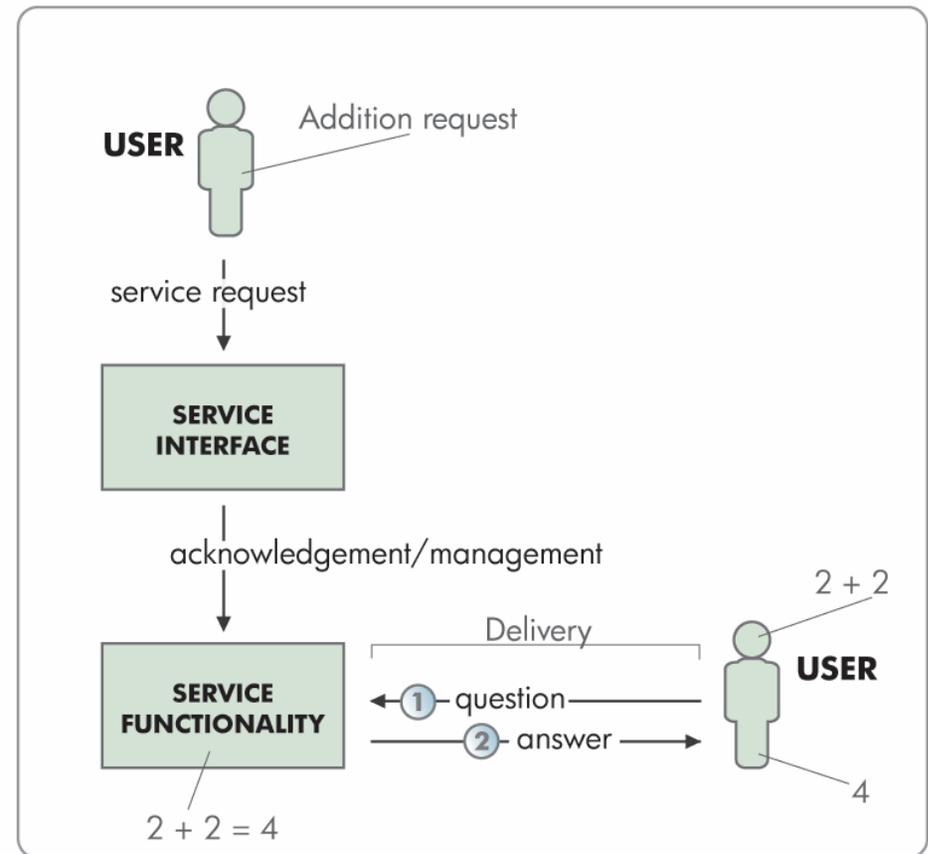


# Hello- or Real-World SOA

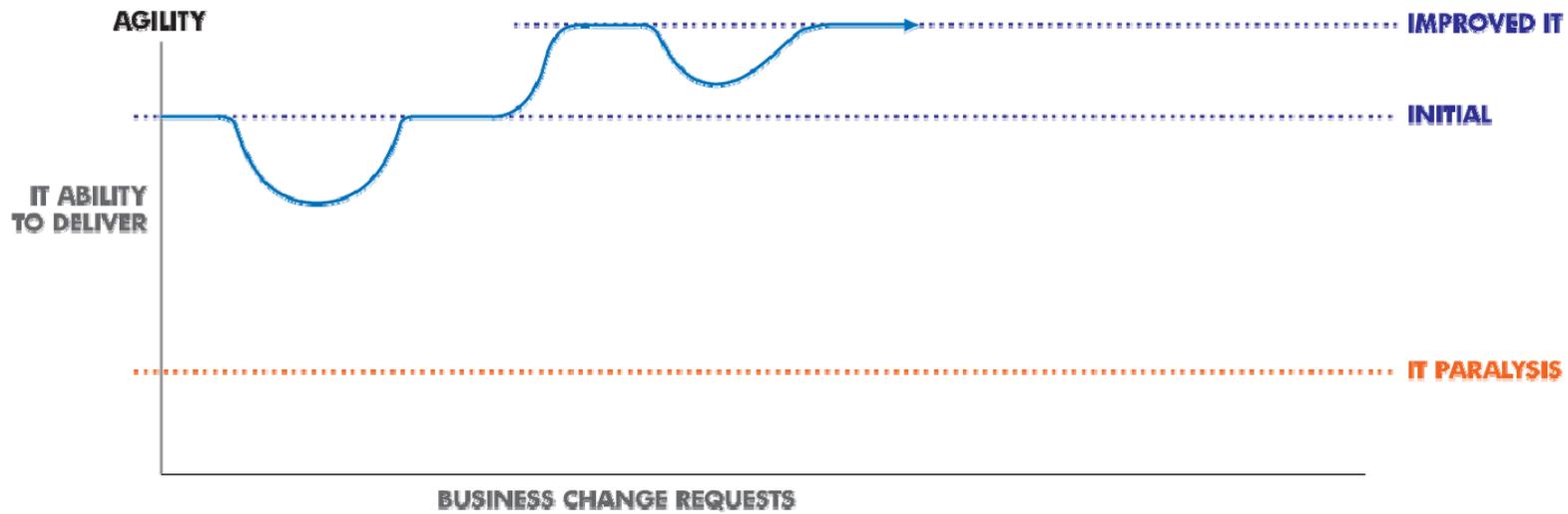
## “Hello, World!” SOA FAKE SOA



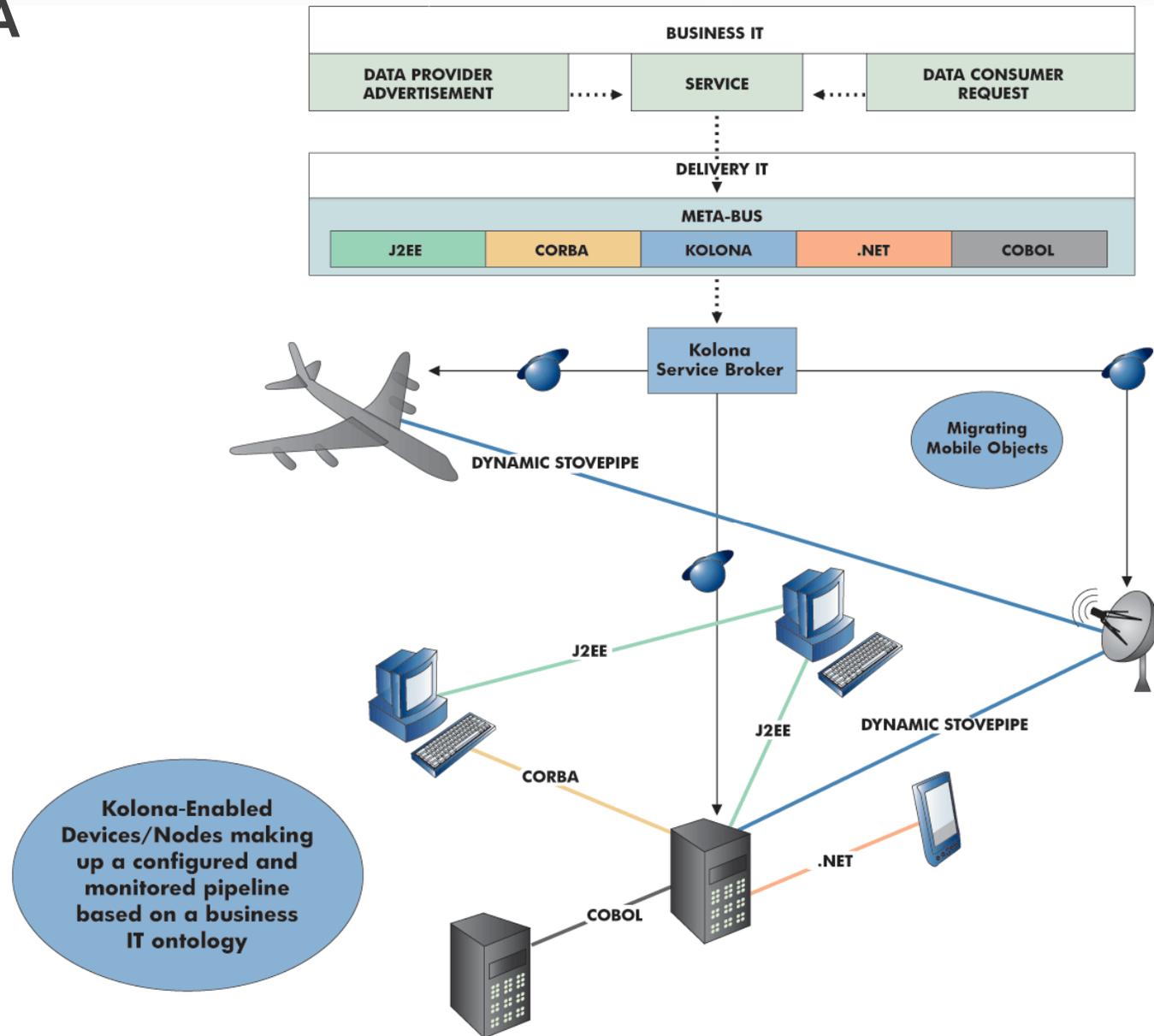
## Enterprise SOA REAL SOA



## SOA & IT: A Partnership with the Enterprise



# IT Flexibility in SOA



Questions?

# Back-up Slides

## Service-Oriented Architecture (SOA) & Web Services

### The “Eight Inescapables”

1. The net is inherently unreliable
2. Latency in the net is real
3. Bandwidth on the net is limited
4. The net has a constantly fluctuating topology
5. The net is insecure
6. The net has multiple administrators
7. The net is heterogeneous
8. The net has transport costs