

# *Quality of Service Task Force*

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## *Service Level Agreements in Enterprise QoS: Boeing Business Case*

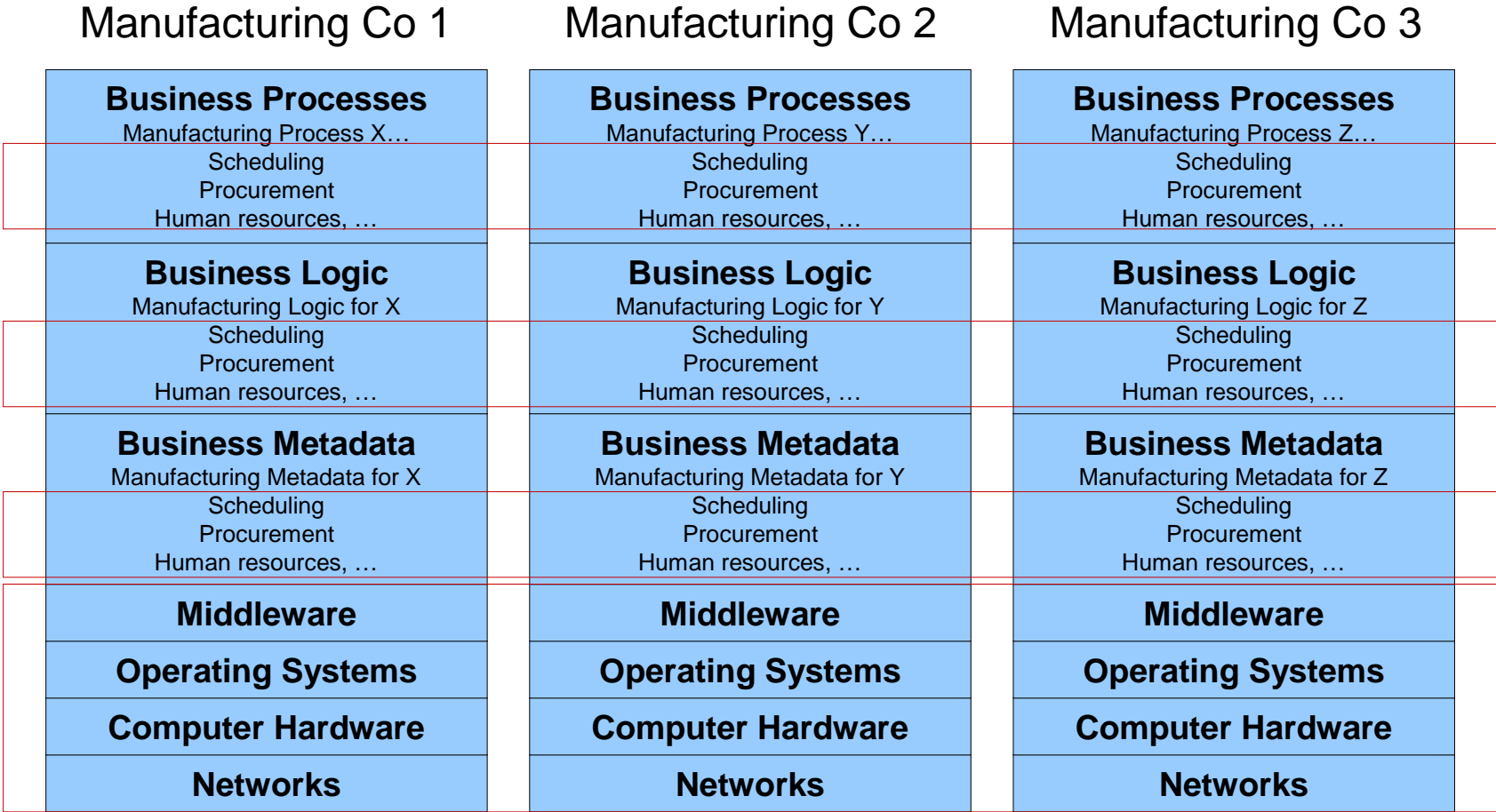
*Paris, 2002*

# Where Are We

## How did We Get Here

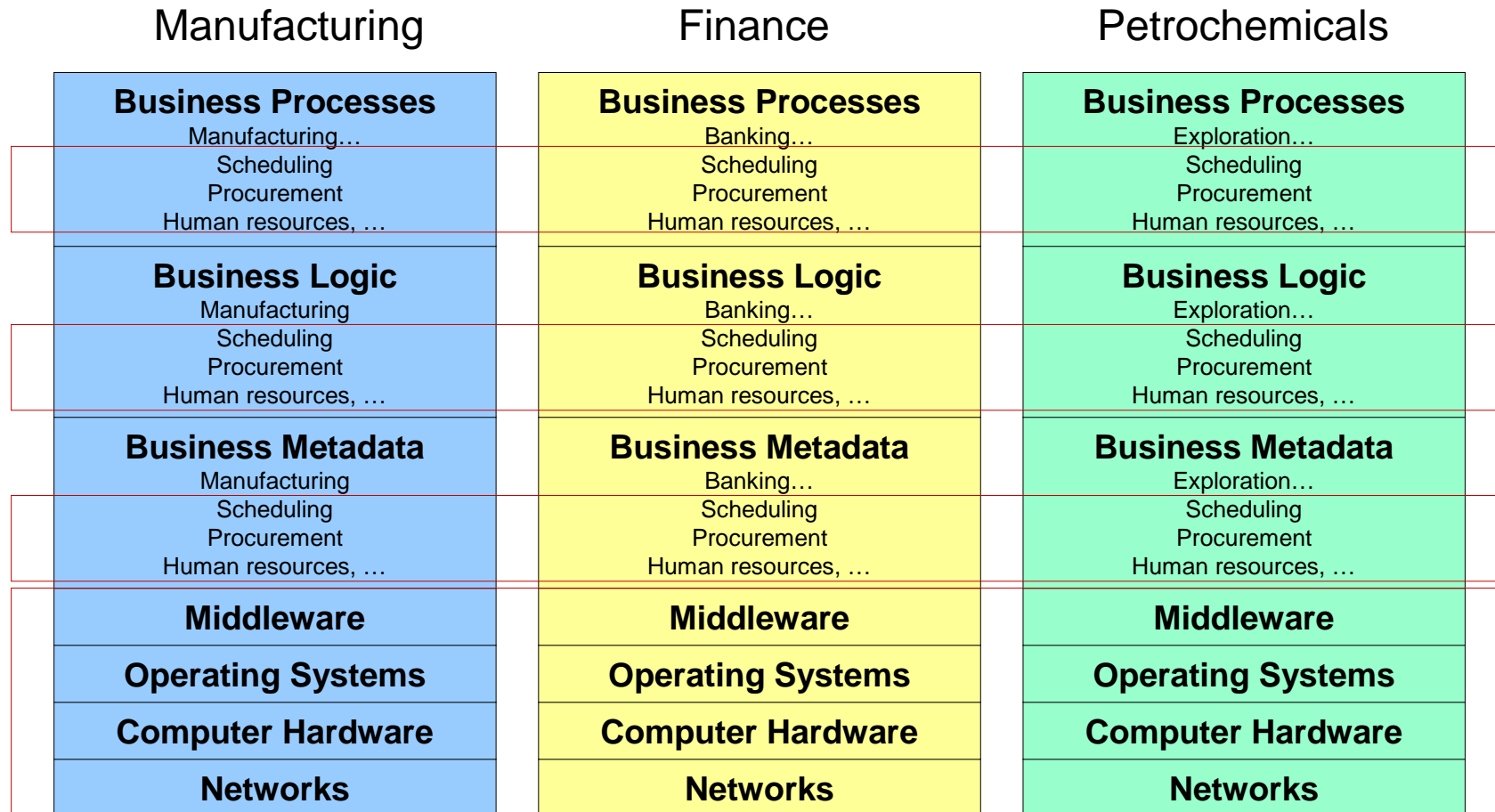
- ❑ July,01 Austin Conference
  - Idea for Scenario Formulated
- ❑ October,01 – Scenario Workshop at Boeing
- ❑ December,01 – First Draft Boeing Scenario
- ❑ January, 02 Anaheim Conference
  - Boeing Scenario => Transaction Processing
- ❑ Paris, April, 02 - Where do we go from here?
  - More depth - drill down further into Boeing Scenario?
  - More breadth - to other Manufacturing Companies?
  - More breadth - to other Verticals (e.g. Finance )

# Shared Problems



**Common problems**

# Shared Problems across Industries



**Common problems**

# Where do we go from Here

<b>Application focus</b>	<b>Focus on Transaction Processing (time to complete)</b> Boeing	<i>Add breadth include, fairness (equal start = 's equal finish) SIAC</i>	<i>Add breadth include Web applications for exam. Ebay or CNN</i>
<b>Business focus &amp; details</b>	<b>What is the business rationale for having internal QoS focused SLAs</b>	<i>What are the business and legal reasons for having QoS focused SLAs</i>	<i>What are the business and legal reasons for having QoS focused SLAs</i>
<b>Business Costs</b>	<b>What are the resources used to deliver the required service</b> A. How many servers & storage resources m B. How much network resource C. Operational costs		
<b>How do we measure success</b>	<b>What are the relative costs for achieving success vs. not.</b>		

# Boeing Scenario as it Exists Today

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# Boeing Scenario as it Exists

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- ❑ The following presentation is The Boeing Scenario as we have captured it thus far.
- ❑ As we go through this Presentation please consider where we go from here?
  - More depth - drill down further into Boeing Scenario?
  - More breadth - to other Manufacturing Companies?
  - More breadth - to other Verticals (e.g. Finance )

# Goals

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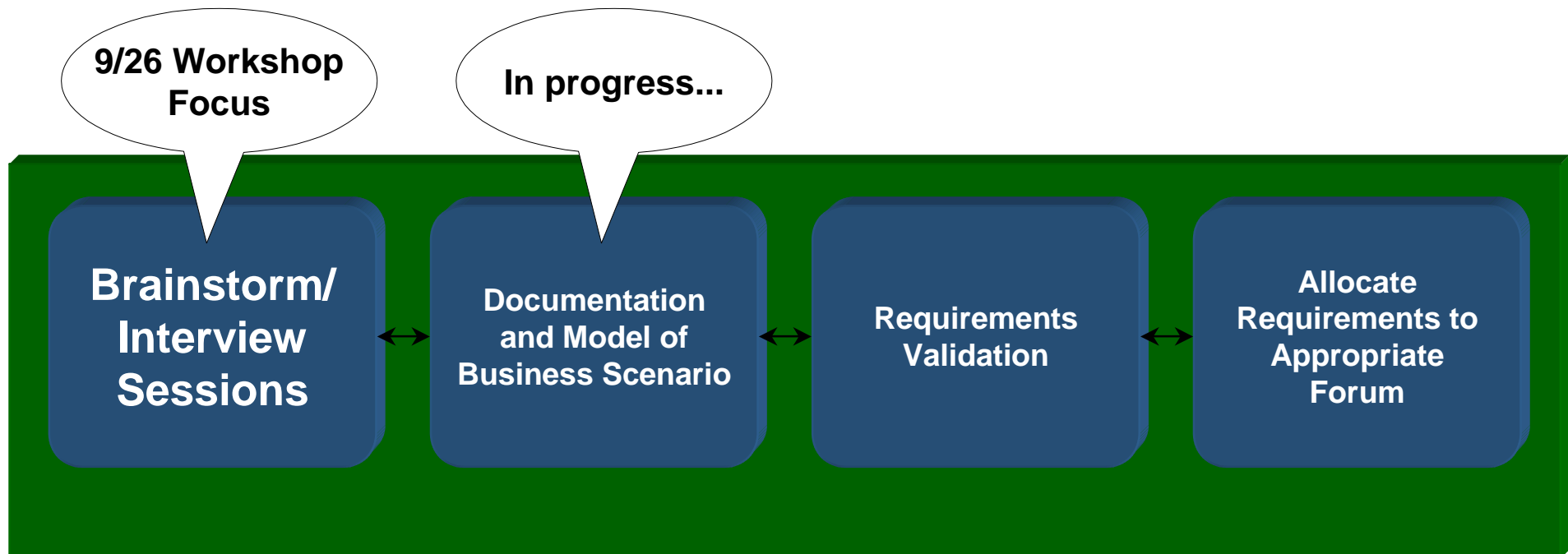
- ❑ **Identify the standards needed to promote the use and interchange of SLAs as a business tool to negotiate and enforce service guarantees among IT entities**
- ❑ **Lay the groundwork for automated monitoring and enforcement of SLAs throughout the end-to-end delivery chain**



# Methodology

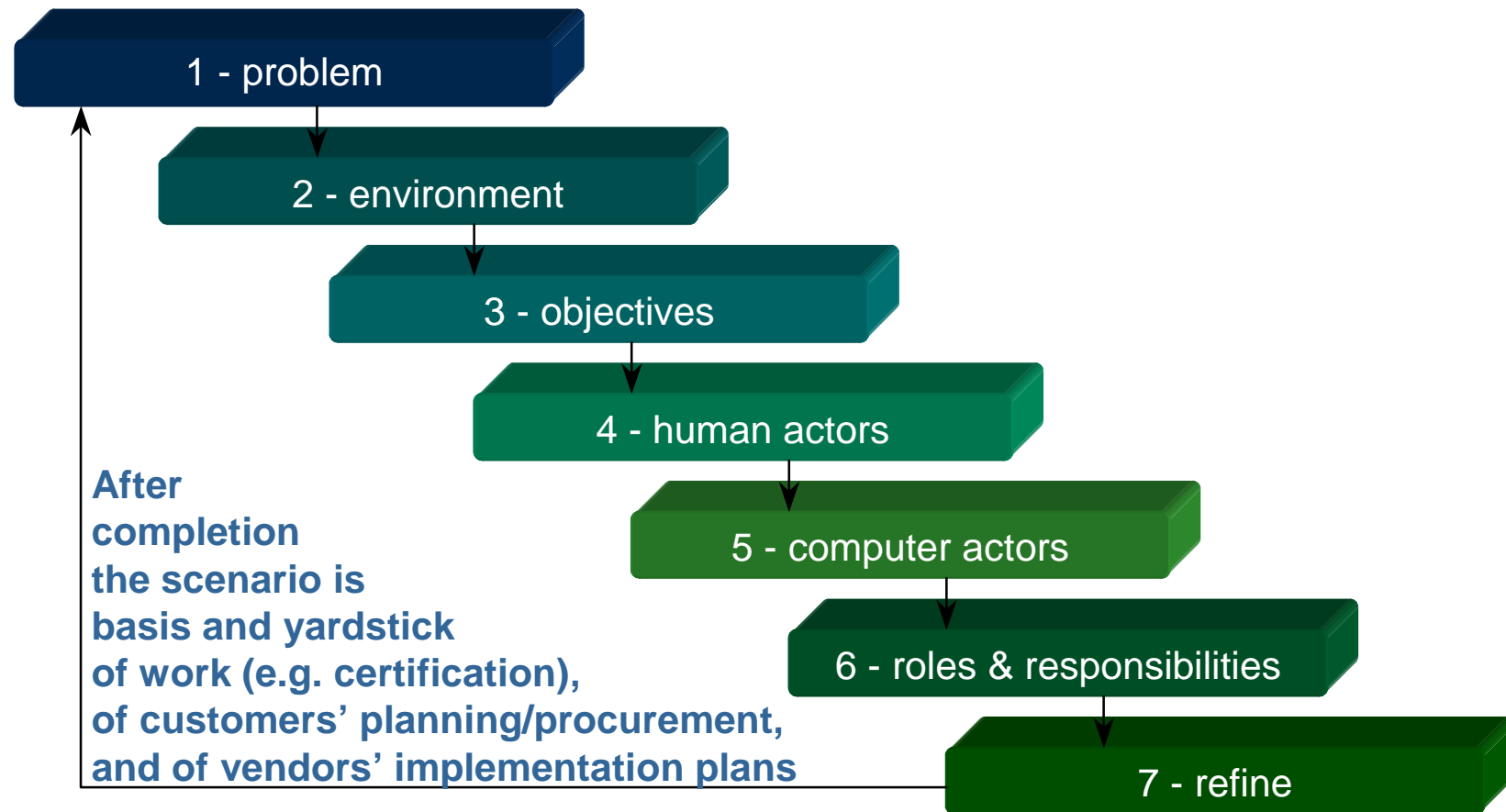
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- ❑ **Used Business Case Model to provide Structured approach**
- ❑ **Chose Boeing Defined Configuration Aircraft Control (DCAC) application as representative enterprise case**



# Business Scenario Overview

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# DCAC Overview

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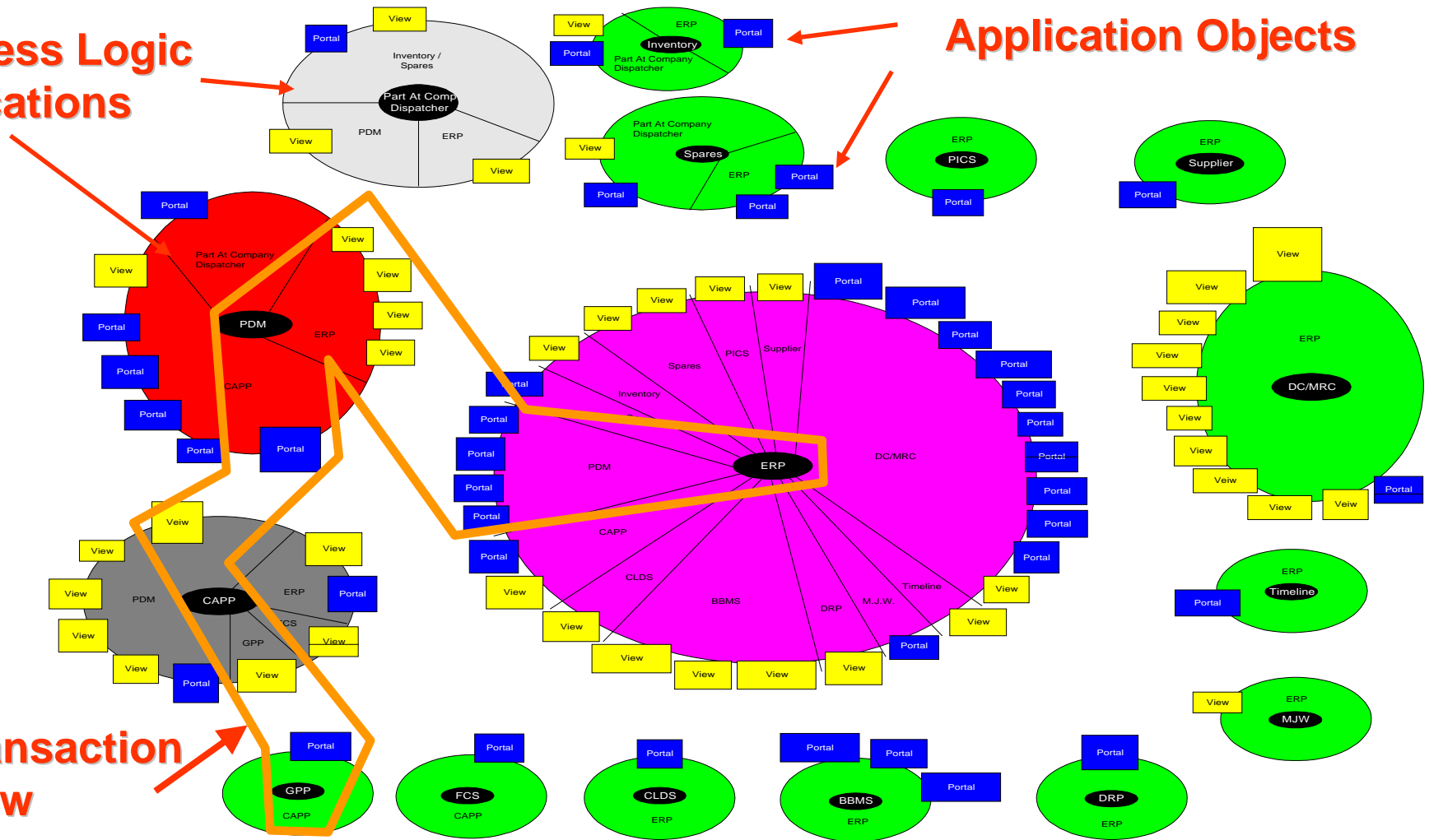
- ❑ Collection of (large) applications containing business logic and data
  - e.g., Manufacturing Resource Management, engineering documentation, etc.
- ❑ Applications integrated through object wrappers on application functions
- ❑ Multi-
  - System
  - Site
  - Vendor

# DCAC SLA Environment

**Business Logic Applications**

**Application Objects**

**Transaction Flow**



# Business Drivers for SLAs

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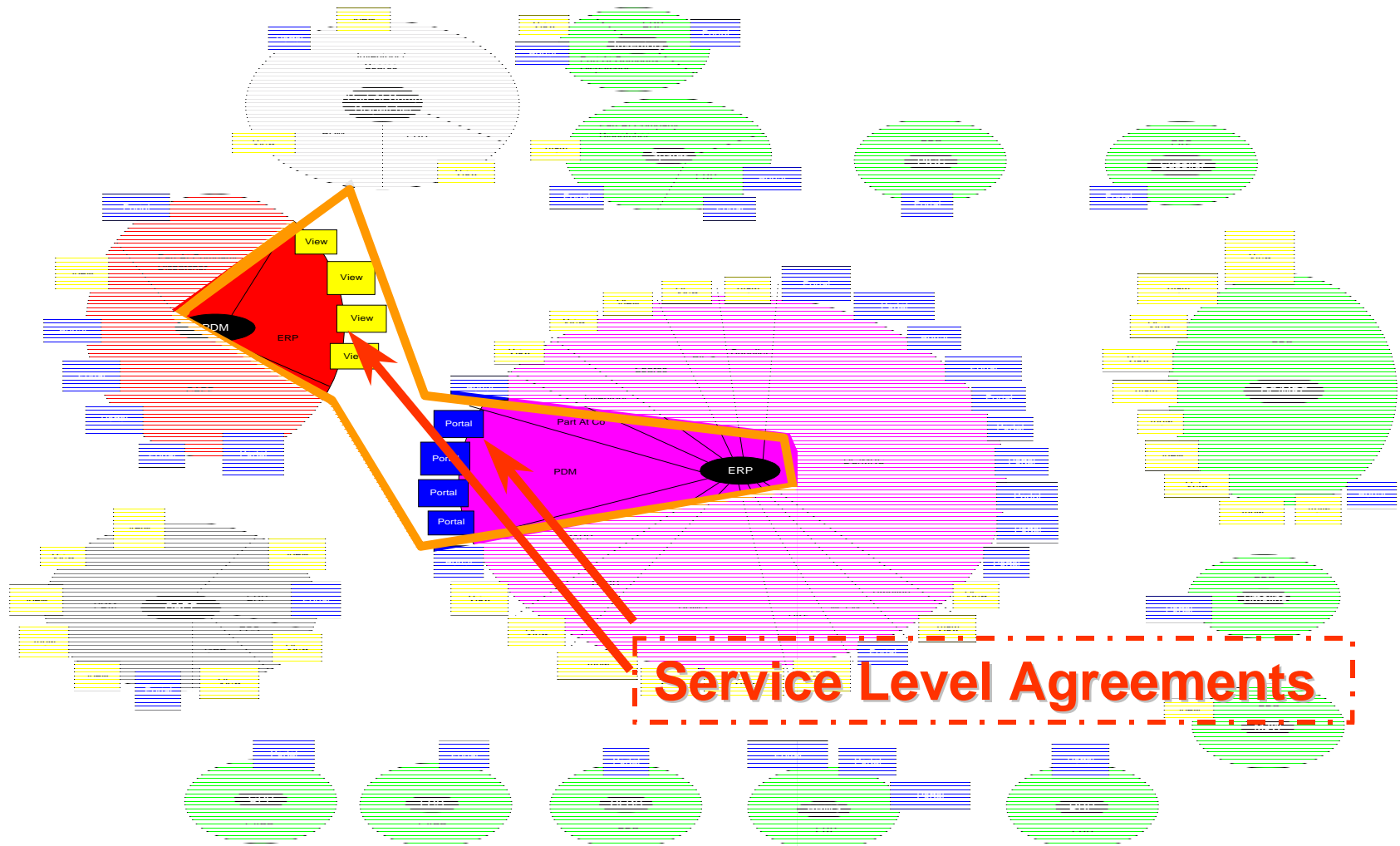
- ❑ DCAC system supports manufacturing operations at multiple sites
- ❑ Slow response idles manpower and inventory
- ❑ Overall Customer satisfaction
  - Service is measurable and actionable
  - Support for IT spend decisions
- ❑ Mechanism to quantify IT priorities

# SLAs in DCAC

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- ❑ SLAs represent agreement between manufacturing users and IT management on acceptable level of transaction response time
  - Enforcement based on % of transactions that exceed limit within a stated time period
  - Metrics agreed up front and shared with users
- ❑ Focused on top 20% of critical business transactions
  - This still results in 100+ SLAs

# SLAs and Transactions



# SLA Policy and Mechanism

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- ❑ SLA represents policy on highest level of transaction performance
- ❑ Performance measurement occurs at component level
- ❑ Note components may participate in multiple SLAs
  - Maintaining sufficient context for analysis is significant issue

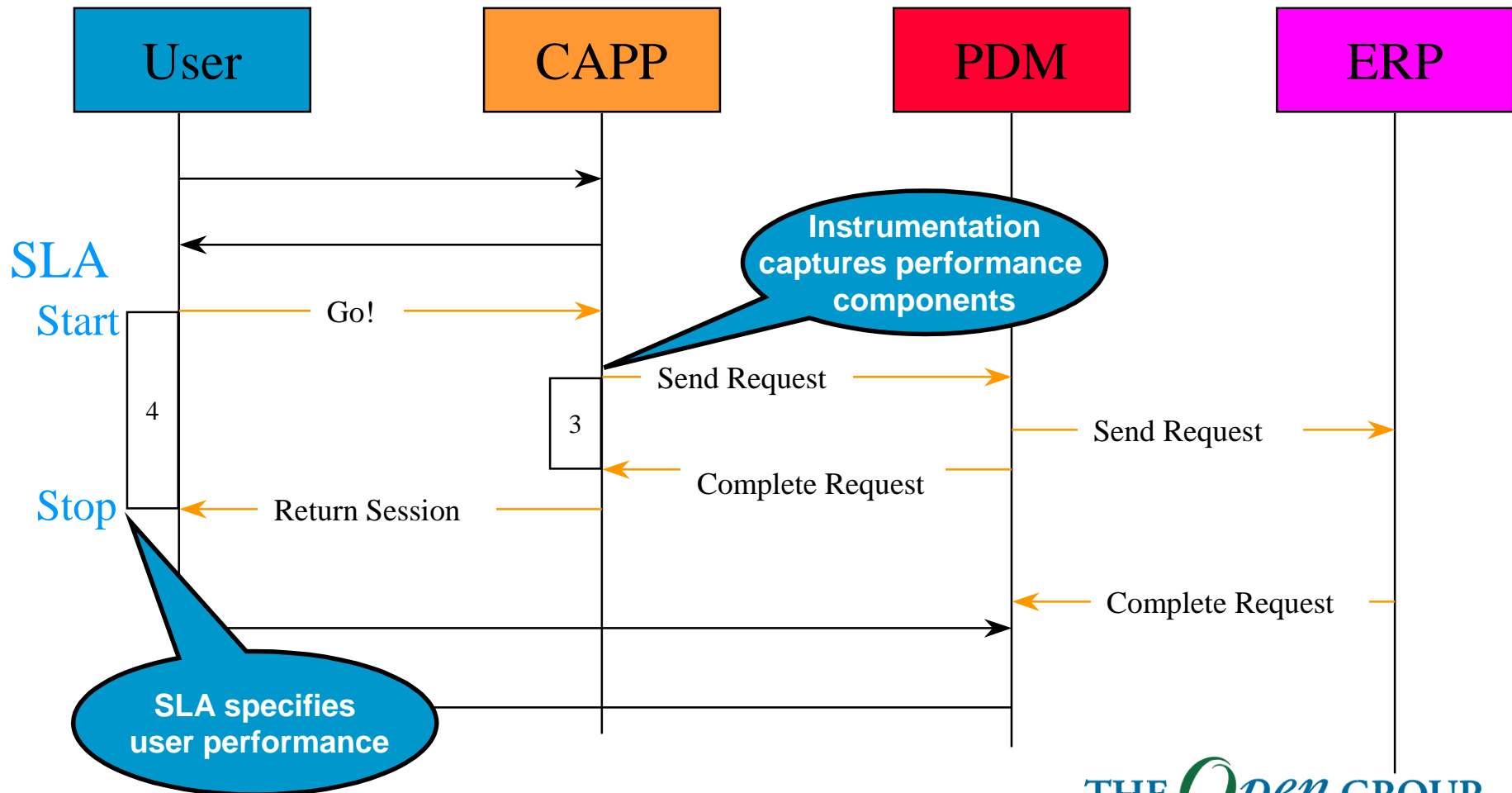


# Instrumentation

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- Extensive component instrumentation provides mechanism to observe SLA compliance
  - Application components instrumented using ARM to measure transaction start-stop times
  - Contextual data such as network and CPU use also collected
  - Data kept in repository for later analysis
- Commercial tools used for analysis and display
  - OpenView, Measureware

# SLAs and Instrumentation



# SLA Lifecycle

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# SLAs in Operation

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- ❑ Users and IT staff monitor compliance using agreed measures
- ❑ Users report service problems to IT Help Desk
- ❑ If analysis shows SLA not being met for 90% of transactions over specified time period, analysis and repair initiated by IT
  - Repairs prioritized by business impact
- ❑ SLAs also monitored for 100% compliance
  - May indicate overprovisioning or permissive specification

# SLA Issues From Scenario

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- ❑ While SLAs represent end-to-end path through multiple components, measurements done at component level
  - Limited contextual information, unnecessary differences in data reporting = slow/costly correlation of instrumentation data to reported failure
- ❑ Gratuitous complexity still a problem

# SLA Issues From Scenario

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- ❑ Different SLAs have different criticality to manufacturing business, however metrics don't contain sufficient context tags to allow differentiation of transaction flow data
  - Must distinguish critical from non-critical traffic in service restoration
  - Prevents automated resource prioritization or service restoration for critical flows

# Areas for Standardization

<b><i>Technical Needs</i></b>	<b><i>Standardization Areas</i></b>
<b>SLA Specification</b>	<ul style="list-style-type: none"><li>• Language and tools for creating and interpreting SLAs</li></ul>
<b>Prioritization of resources</b>	<ul style="list-style-type: none"><li>• CPU resource monitoring and control</li><li>• Network traffic differentiation and prioritization</li><li>• Mechanisms to pass application prioritization and classification through OS and middleware layers</li></ul>

# Areas for Standardization (2)

<b><i>Technical Needs</i></b>	<b><i>Standardization Areas</i></b>
<b>Instrumentation and data collection</b>	<ul style="list-style-type: none"><li>• Consistent application performance instrumentation</li><li>• Metrics at and below middleware layer</li><li>• Mechanisms for collecting and labeling contextual/situational information for performance and failure data</li><li>• Mechanisms for tying gathered data to application transaction flow</li></ul>



# Areas for Standardization (3)

<b><i>Technical Needs</i></b>	<b><i>Standardization Areas</i></b>
<b>Identification of performance bottlenecks and failures</b>	<ul style="list-style-type: none"><li>• Tools for correlation of performance and diagnostic information across multiple platforms</li><li>• Tools which display end-to-end views of performance, rather than component-focused approach</li><li>• Cross-platform and cross-resource resource monitoring tools</li></ul>

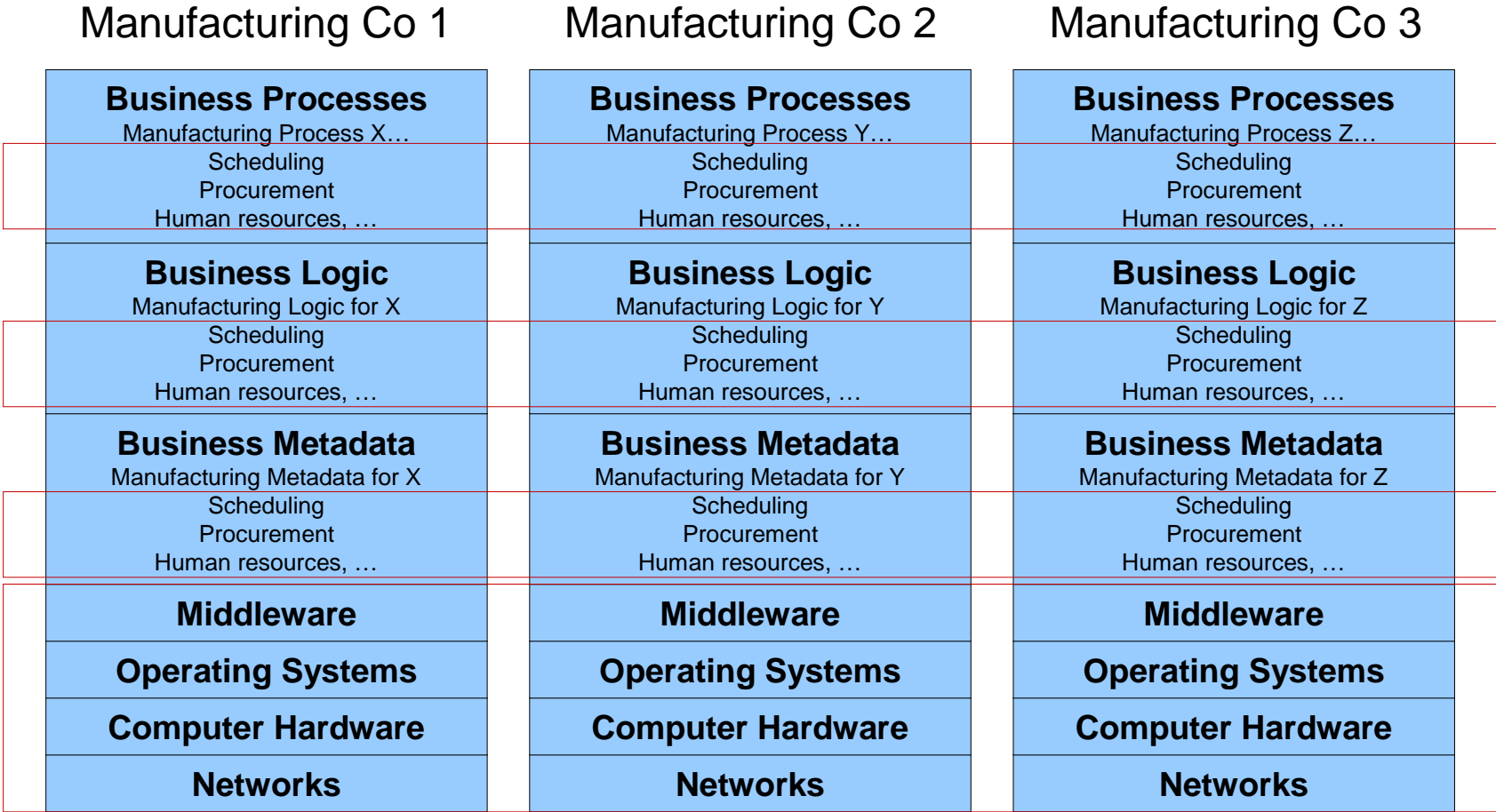
# Areas for Standardization (4)

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<b><i>Technical Needs</i></b>	<b><i>Standardization Areas</i></b>
<b>Automation</b>	<ul style="list-style-type: none"><li>• Automated collection and reduction of performance, failure and contextual data</li><li>• Automated mechanisms for prioritized resource reassignment for service restoration</li></ul>

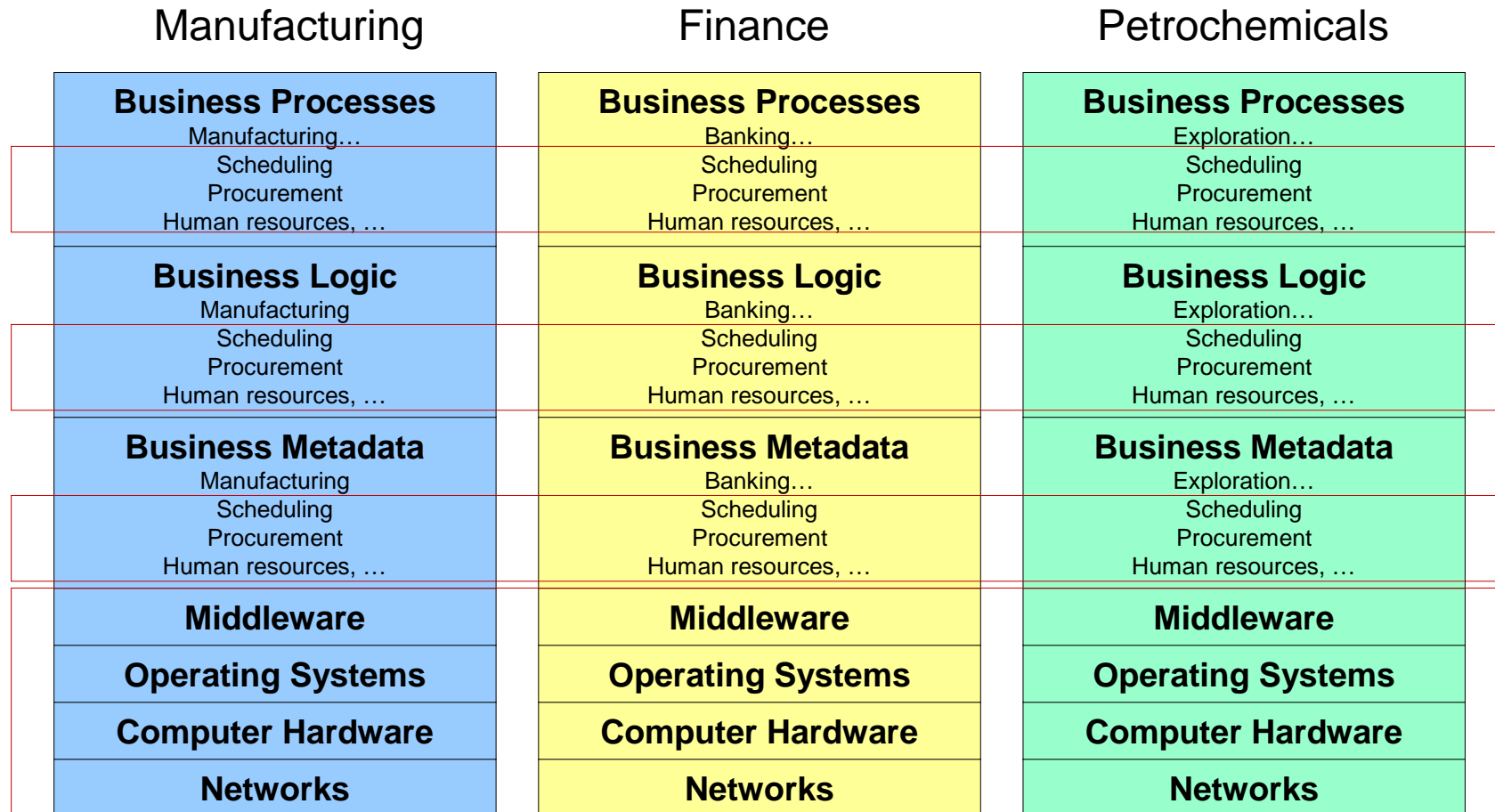


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