

# **Systems Integration & Engineering for Mission Success**

**A Customer Focused Approach**

**PEO SYSCOM**

**November, 2004**

**Ronald E. Johnson  
Vice President, Engineering & Operations  
Air Force Systems**

# Systems Integration & Engineering For Mission Success

## Mission Effectiveness/ Modeling & Simulation

- Operations Analysis
- SoS to Component Level

## Life Cycle Affordability

- Operational Environments;  
End-to-End Thinking
- Engineering, Operations,  
Supplier Mgmt, Support

## Systems Engineering

- SoSE Processes
- Early Implementation/Discipline

## Collaborative Product Development

- Team Product Definition &  
Production
- Comprehensive Communication  
for Decision Making

# Strategic Initiatives Framework

## Requirements, Tradeoffs, Planning (Customer Focus)

### Mission Effectiveness/ Modeling & Simulation

- Operations Analysis
- SoS to Component Level

### Life Cycle Affordability

- Operational Environments;  
End-to-End Thinking
- Engineering, Operations,  
Supplier Mgmt, Support

### Systems Engineering

- SoSE Processes
- Early Implementation/Discipline

### Collaborative Product Development

- Team Product Definition &  
Production
- Comprehensive Communication  
for Decision Making

# Strategic Initiatives Framework

Requirements, Tradeoffs, Planning  
(Customer Focus)

**Mission Effectiveness/  
Modeling & Simulation**

- Operations Analysis
- SoS to Component Level

**Life Cycle  
Affordability**

- Operational Environments;  
End-to-End Thinking
- Engineering, Operations,  
Supplier Mgmt, Support

**Systems Engineering**

- SoSE Processes
- Early Implementation/Discipline

**Collaborative  
Product Development**

- Team Product Definition &  
Production
- Comprehensive Communication  
for Decision Making

**Product, Execution, Delivery, Support**

# Strategic Initiatives Framework

Requirements, Tradeoffs, Planning  
(Customer Focus)

## Mission Effectiveness/ Modeling & Simulation

- Operations Analysis
- SoS to Component Level

The System

## Systems Engineering

- SoSE Processes
- Early Implementation/Discipline

## Life Cycle Affordability

- Operational Environments;  
End-to-End Thinking
- Engineering, Operations,  
Supplier Mgmt, Support

## Collaborative Product Development

- Team Product Definition &  
Production
- Comprehensive Communication  
for Decision Making

Product, Execution, Delivery, Support

# Strategic Initiatives Framework

Requirements, Tradeoffs, Planning  
(Customer Focus)

**Mission Effectiveness/  
Modeling & Simulation**

- Operations Analysis
- SoS to Component Level

The System

**Systems Engineering**

- SoSE Processes
- Early Implementation/Discipline

Product, Execution, Delivery, Support

**Life Cycle  
Affordability**

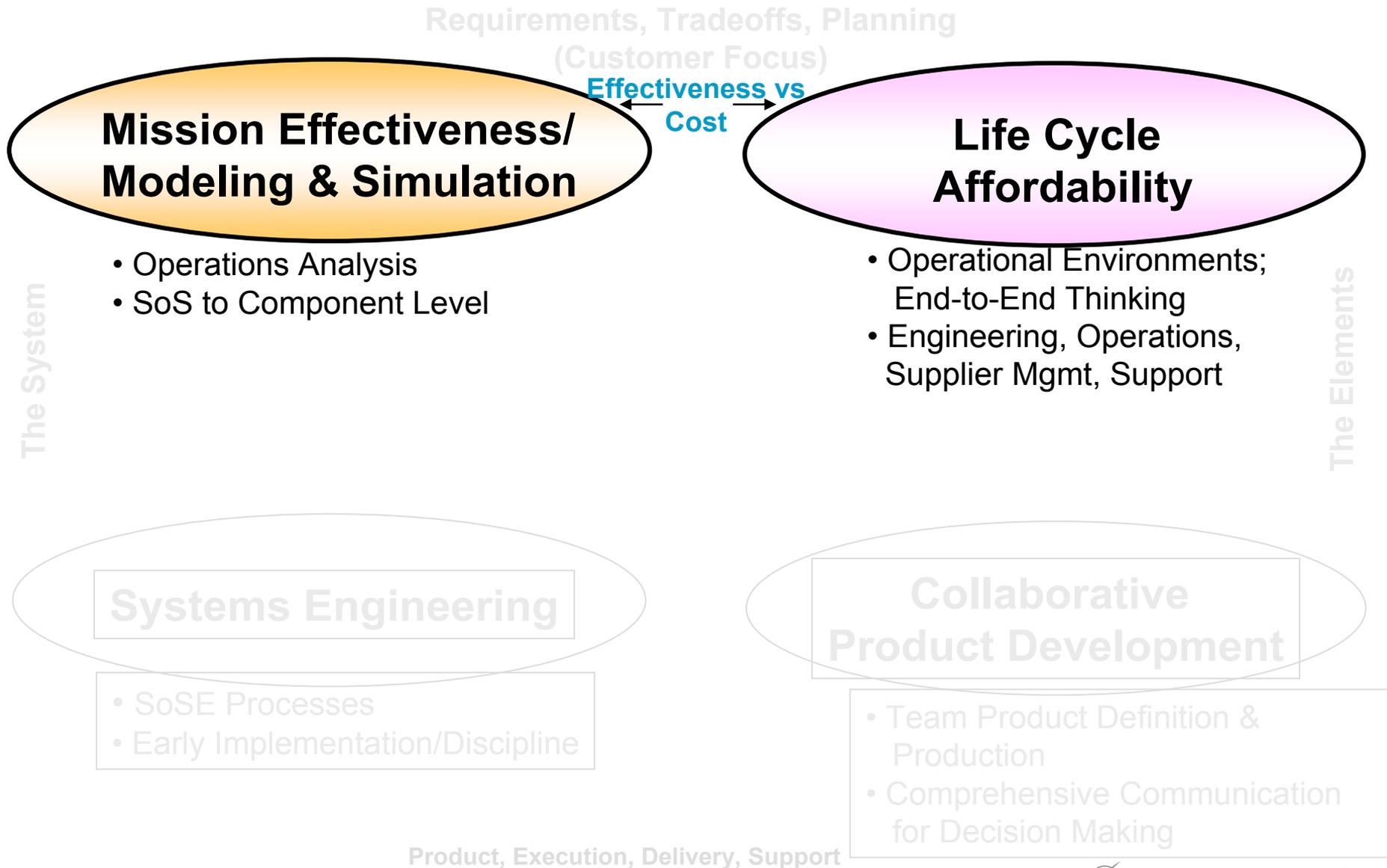
- Operational Environments;  
End-to-End Thinking
- Engineering, Operations,  
Supplier Mgmt, Support

The Elements

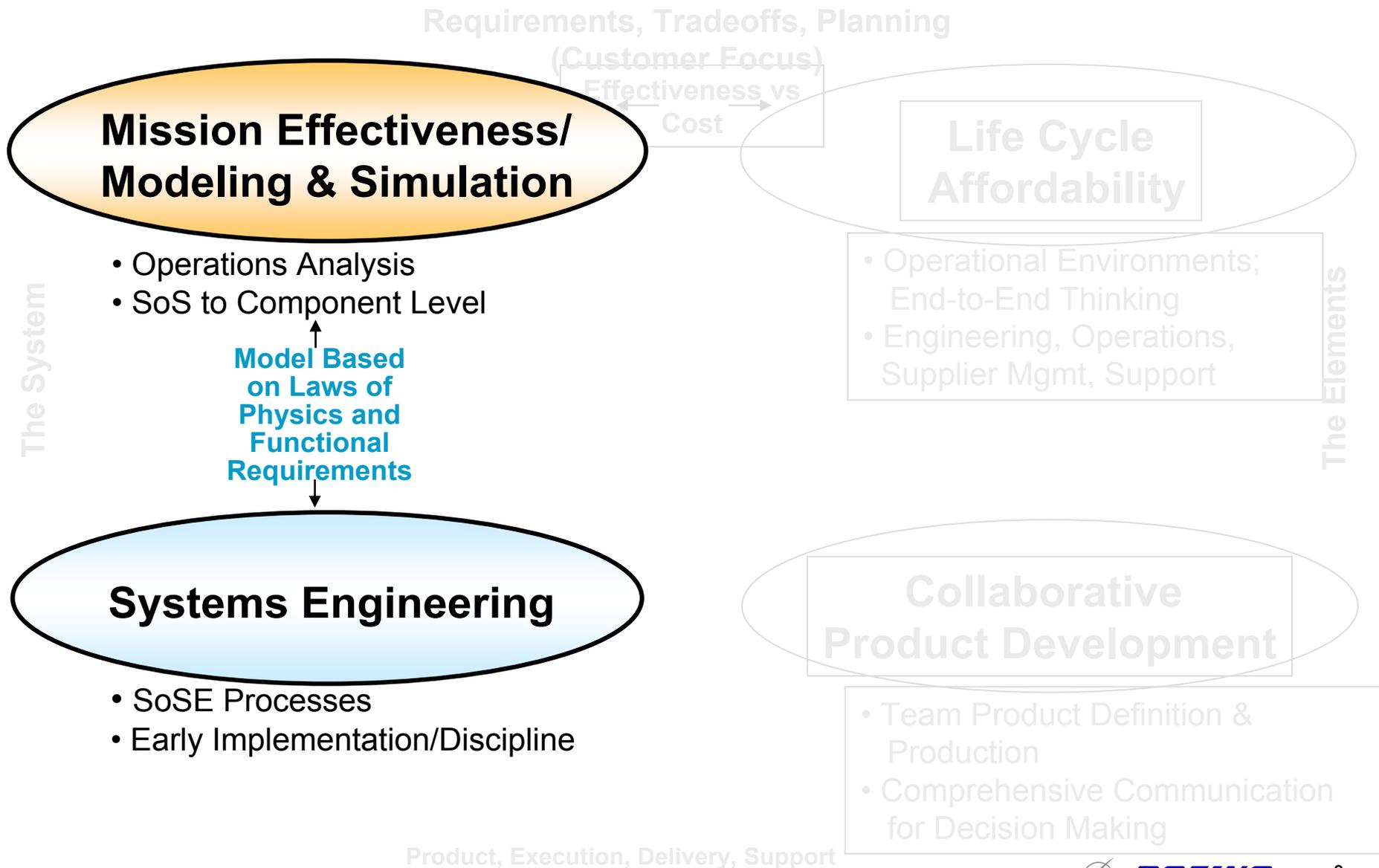
**Collaborative  
Product Development**

- Team Product Definition &  
Production
- Comprehensive Communication  
for Decision Making

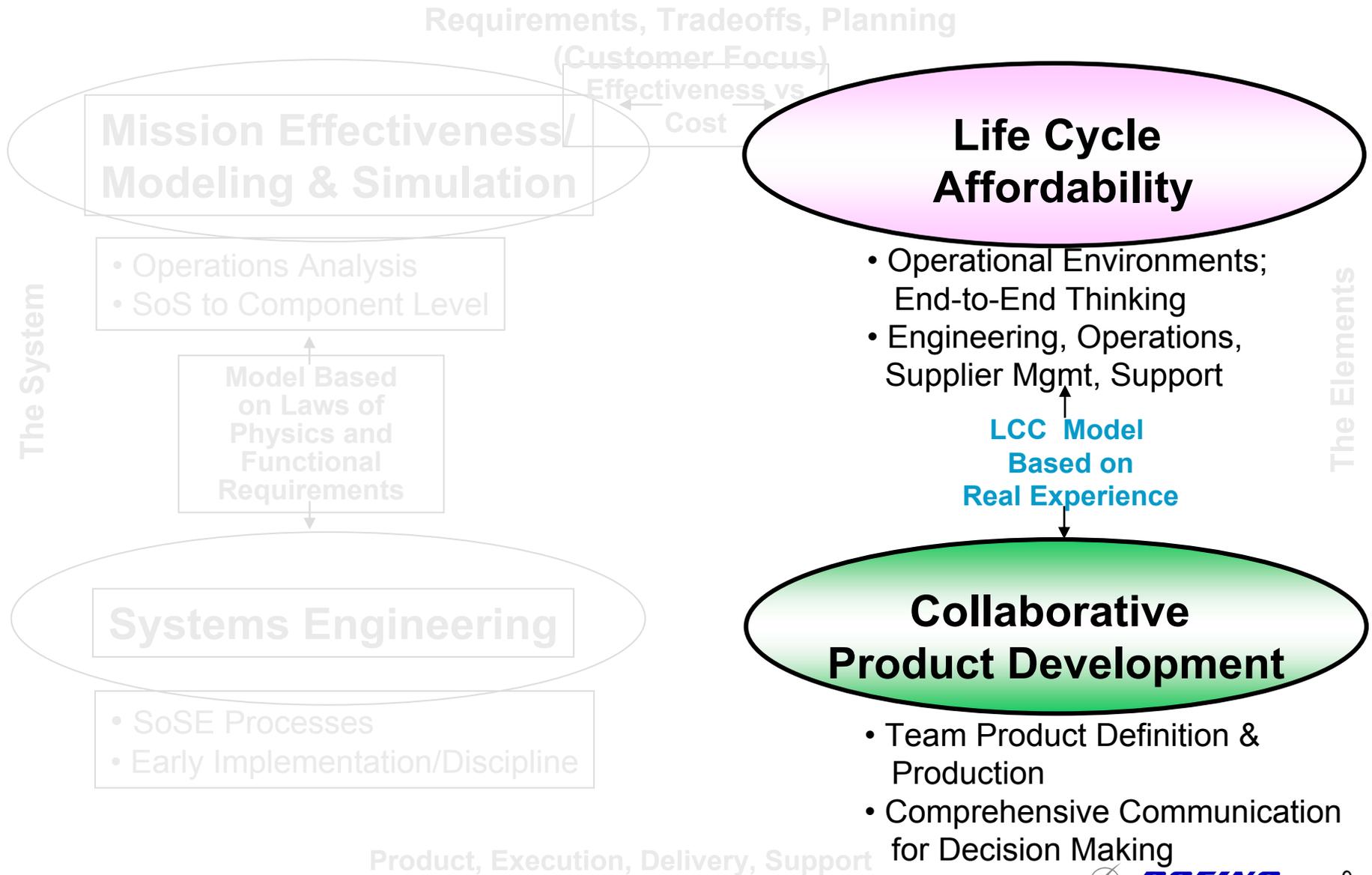
# Strategic Initiatives Framework



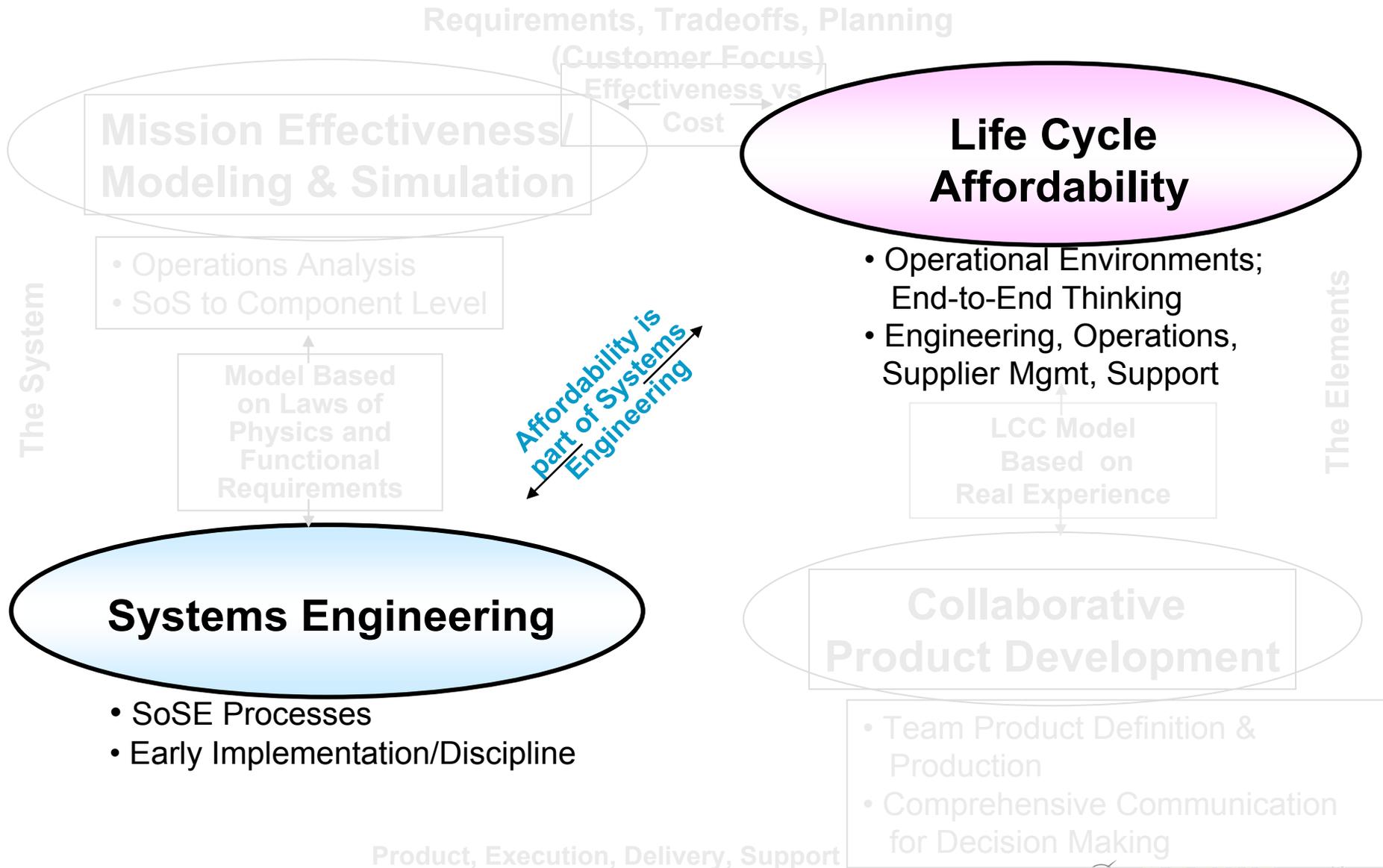
# Strategic Initiatives Framework



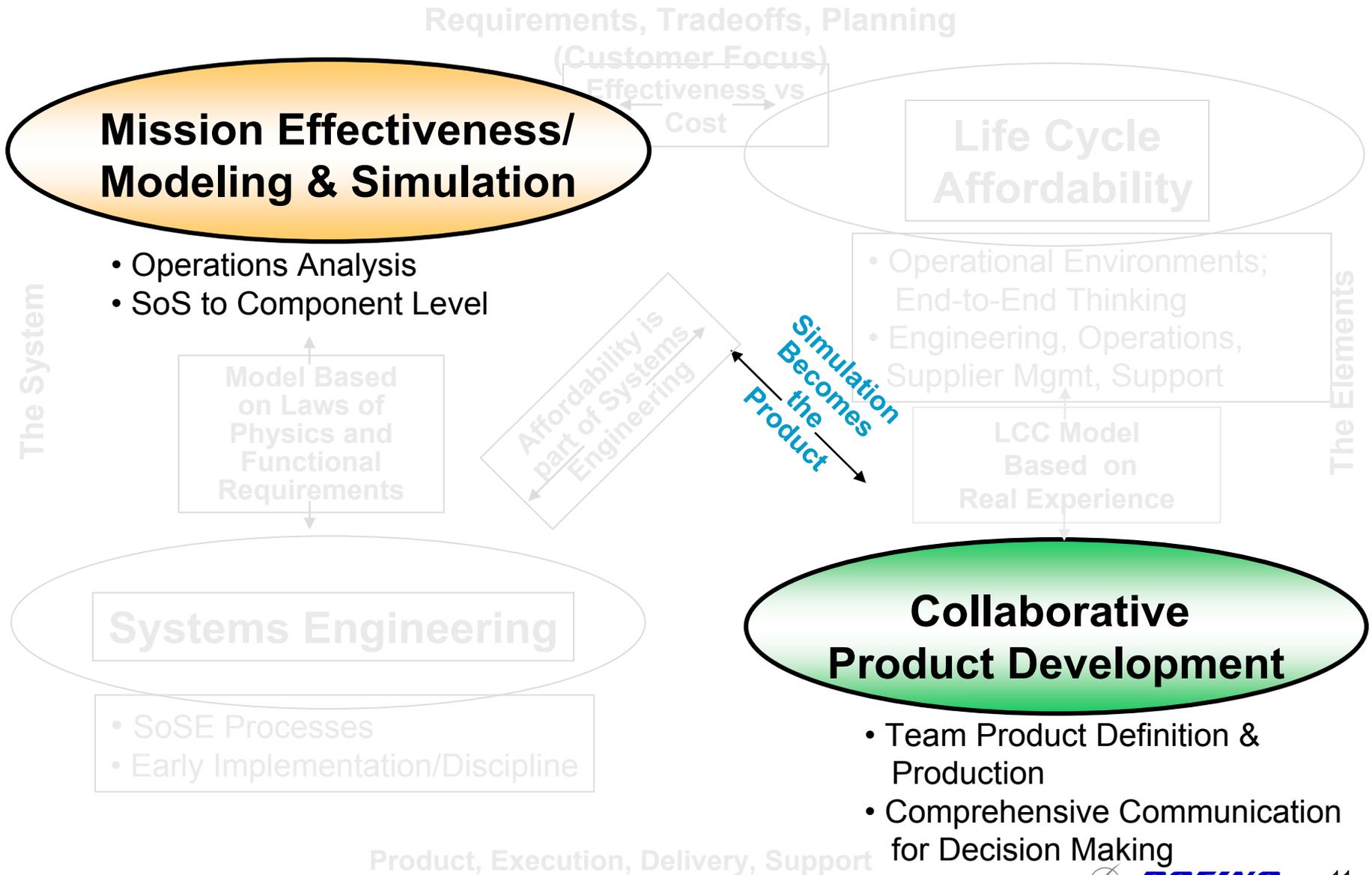
# Strategic Initiatives Framework



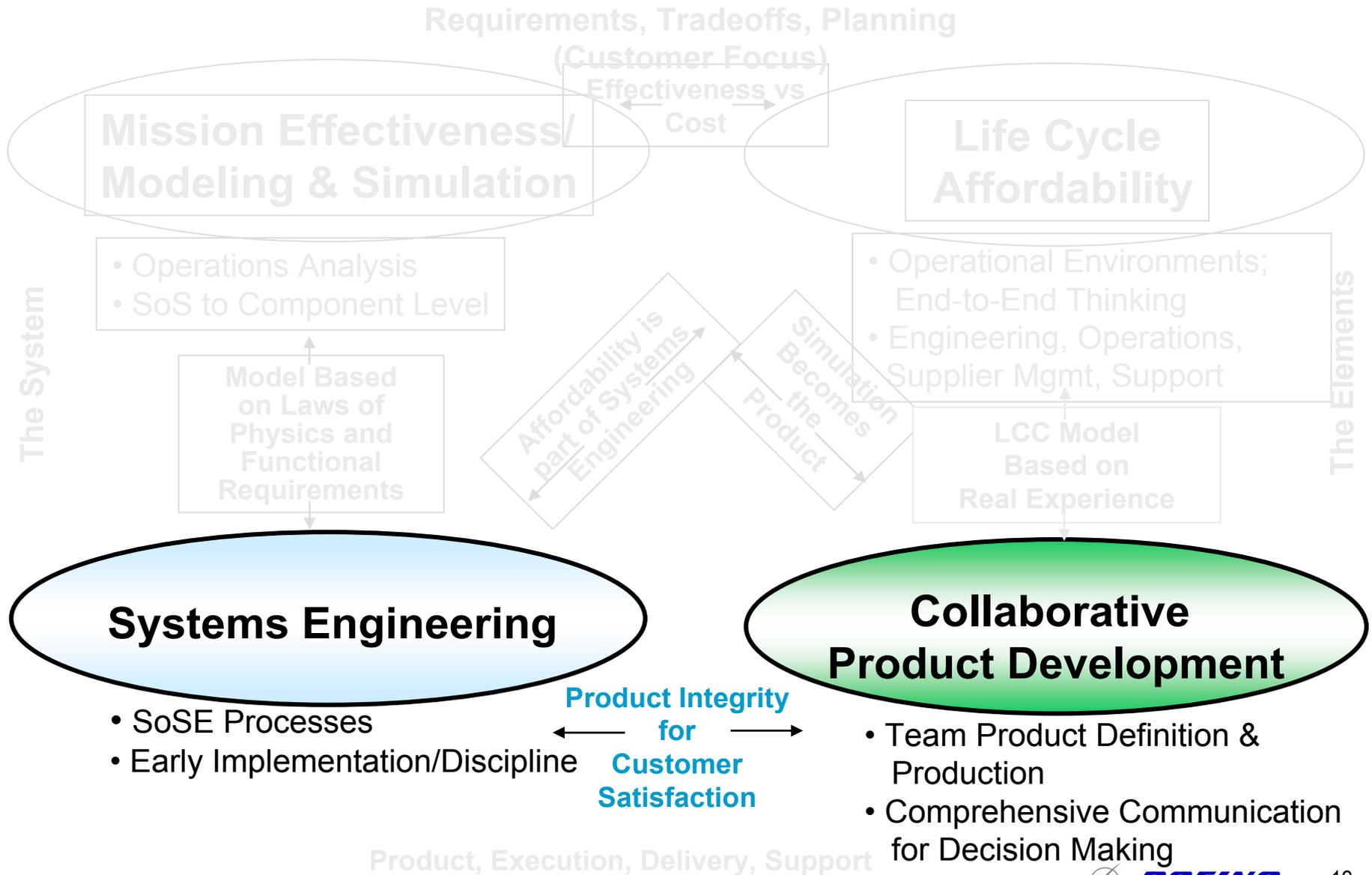
# Strategic Initiatives Framework



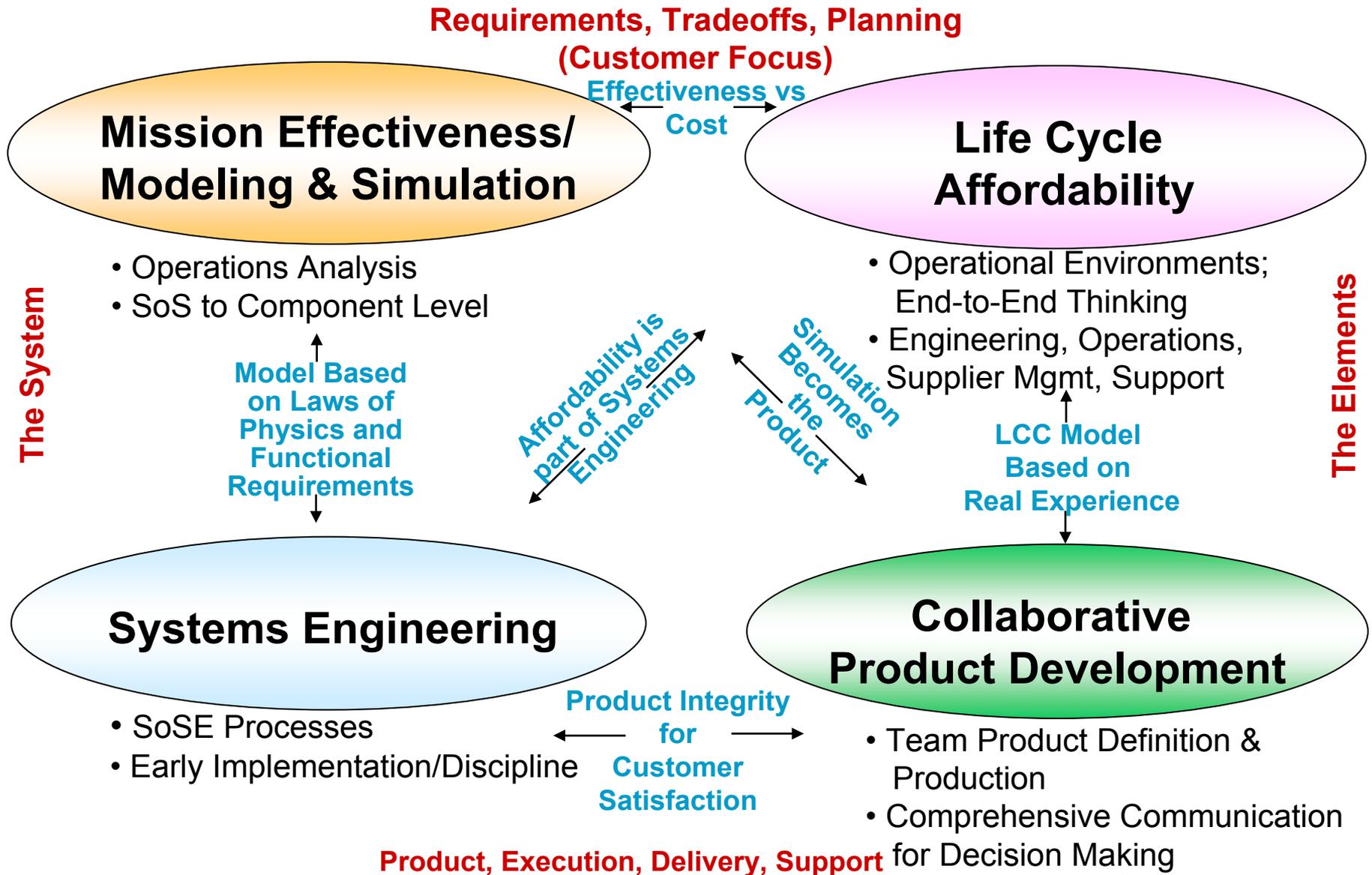
# Strategic Initiatives Framework



# Strategic Initiatives Framework



# Strategic Initiatives Framework



# Program Success Through Process Improvement



### Overarching Framework

- Management Leadership
- High level visibility

# PMBP

Program Management

Best Practices

Managing

- Maturity matrix
- Review feedback

## Business Excellence



Capability Maturity  
Model Integration

Doing

- Implementation
- Metrics driven

# Lean

Lean Enterprise

Thinking

- End to End
- Value Stream Analysis



Being

- Quality in everything/culture
- Fundamental supporting concept



# Baldridge National Quality Program

## Overarching Framework

- Management Leadership
- High level visibility

# PMBP

Program Management  
Best Practices

## Managing

- Maturity matrix
- Review feedback

# Business Excellence



Capability Maturity  
Model Integration

## Doing

- Implementation
- Metrics driven

# Lean

Lean Enterprise

## Thinking

- End to End
- Value Stream Analysis



## Being

- Quality in everything/culture
- Fundamental supporting concept

Mission Assurance

## Mission Assurance – the Third Dimension

# Mission Assurance

## Culture

- Customer Focus
- Attitude of Excellence
- Culture of Commitment
- Supportive Organization
- Best Practices/Continuous Improvement

- Overarching Closed Loop for Continuous Improvement
  - Management Emphasis
  - Leadership Development
  - Training

## Independent Reviews & Technical Integrity

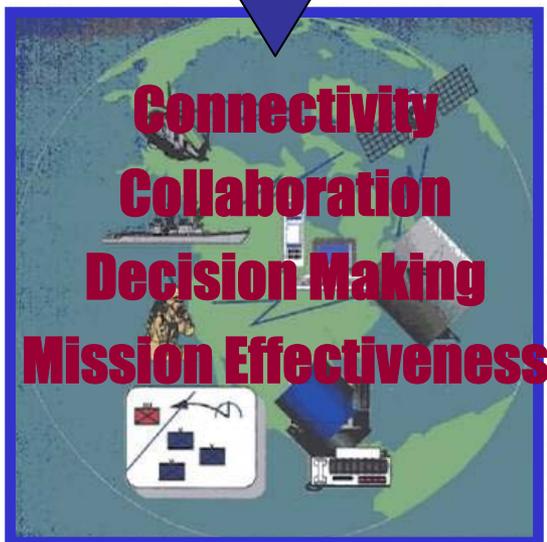
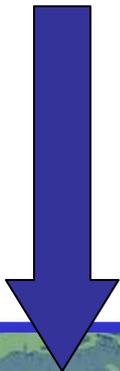
- Independent Reviews as Operating Standard – Encouraged/Desired/Mandated
  - Rigorous Risk Management
  - Comprehensive requirements management, systems engineering thinking, margin analysis, configuration control, verification/validation and safety
- Non-conformance follow through
  - Root Cause Analysis, CLCA
- Technical Integrity
  - Embedded Mission Assurance
  - Institutionalized Best Practices
    - All Functions, All Program Phases
    - Maintained Through Periods of Stress
    - Tenacious Attention to Details
    - Metrics Driven

## Product Output Across the Program Life Cycle

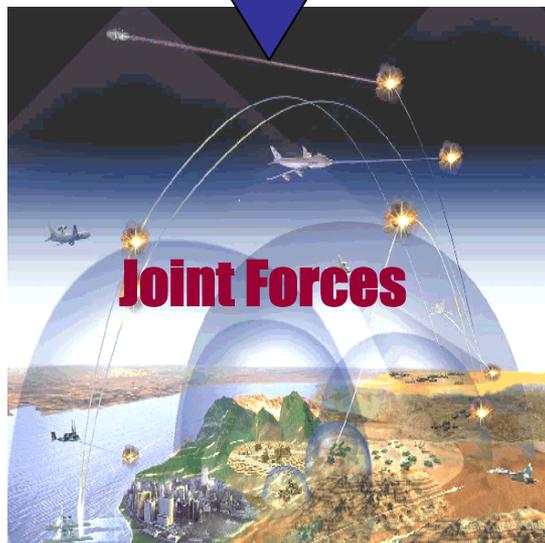
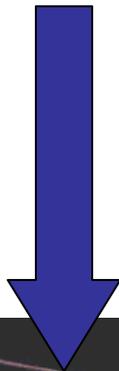
- Customer Satisfaction
- Product Integrity/Highest Quality
- 100% Mission Success

# Definitions

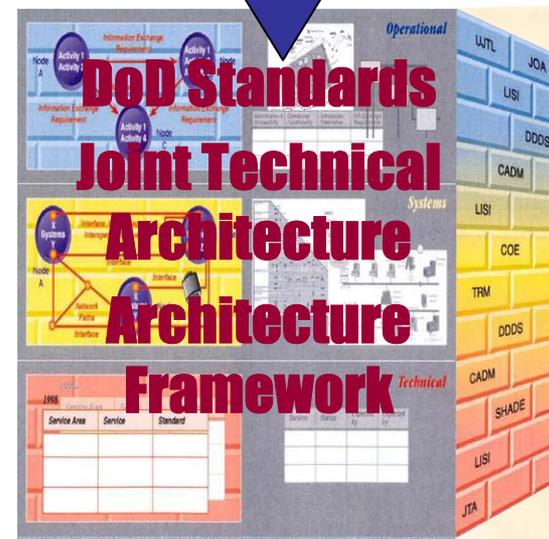
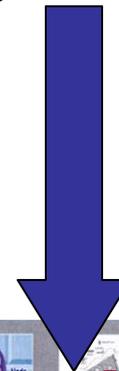
## Network Centric Operations



## Interoperability



## System of Systems



# Network Centric Operations

## THE BATTLEFIELD

**Connectivity**

**Collaborative Environment**

**Situational Awareness for Decision Making**

**Mission Effectiveness**

## THE BUSINESS

**Connectivity**

**Collaborative Environment**

**Situational Awareness for Decision Making**

**Mission Assurance/ Program Success**

# DoD Framework--One Architecture ...Three Views



### *Operational View*

Describes and interrelates the operational elements, tasks and activities, and information flows

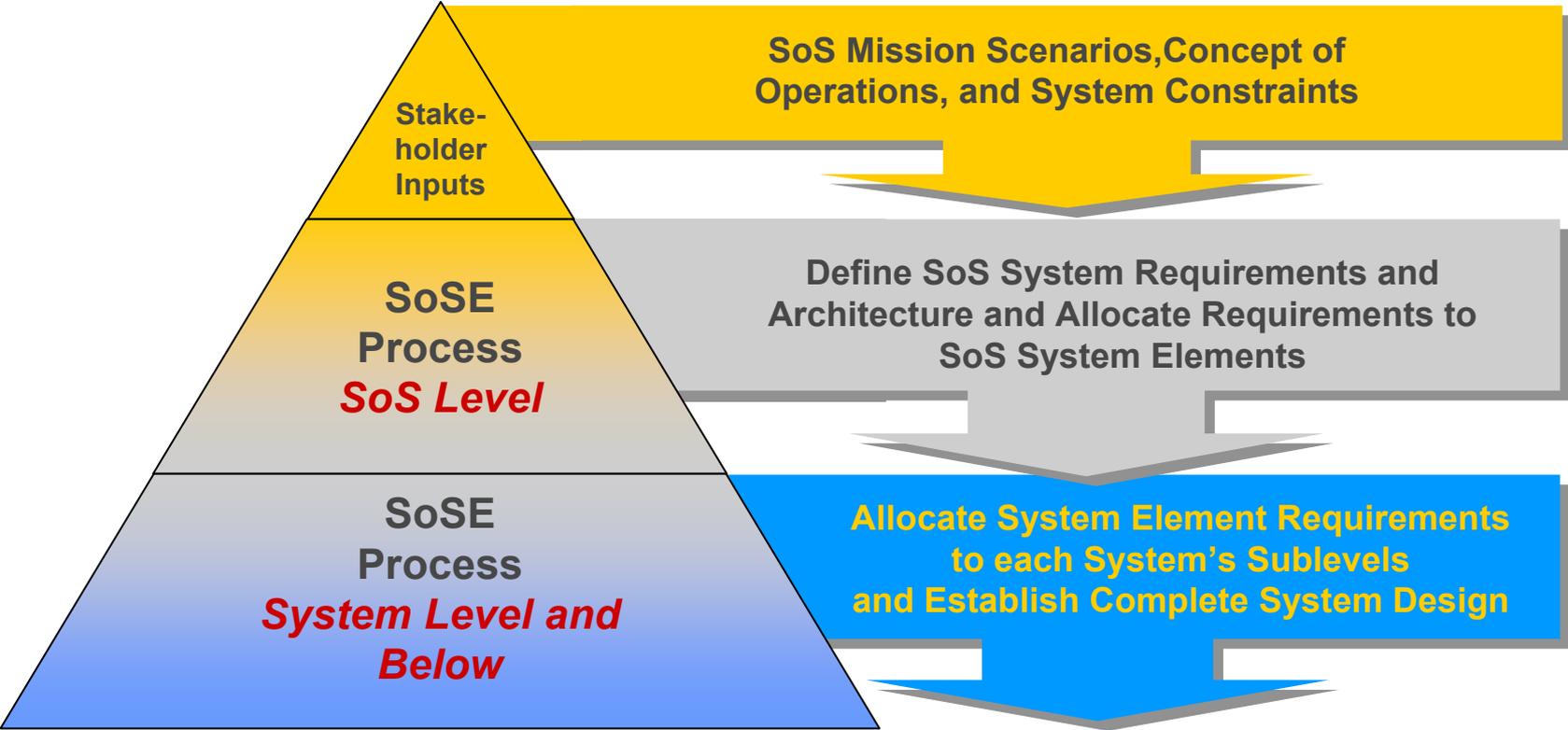
### *Systems View*

Describes and associates systems and their interconnections and performance to the operational view and its requirements.

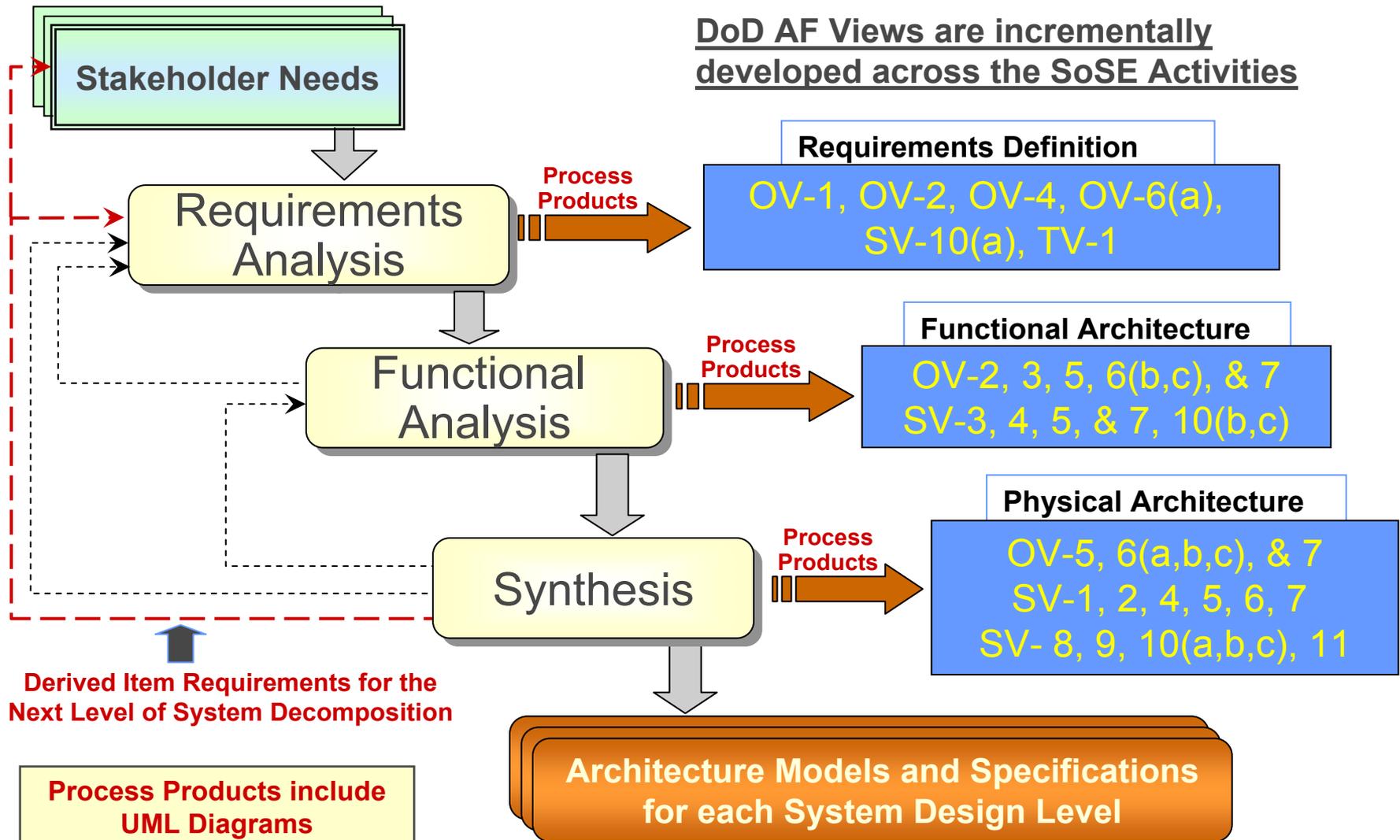
### *Technical View*

Describes the minimal set of rules governing the arrangement, interaction, and interdependence of system parts or elements.

# Principal SoSE Process Steps in SoS Architecture Definition



# DoDAF Views for Each System Design Level are Populated with SoSE Process Products



# SoSE Process Integrates Program Goals, Team Capabilities, and Industry Standards to Create an SoS Architecture Model

