

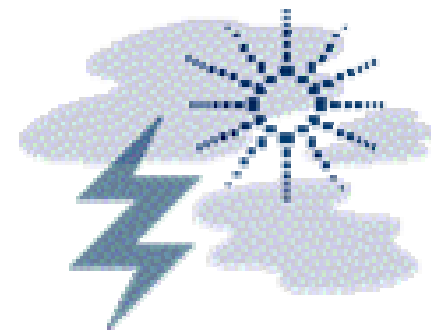


# From Systems Thinking to Capability Thinking

*Bill Parkins*

*SYPAQ Systems Pty Ltd*

# Cloud Sketchers?



Paraphrasing from Richard Rayner's recent novel  
"The Cloud Sketcher" about a Finnish architect who  
in the 1920's came to New York and built a  
skyscraper. His wife explained to their son as they  
looked at the building:

Your father did this:

'He planned it in his head, he drew it and then he built  
it.'

'Plan It, Draw It, Build it' will be used to structure this  
presentation

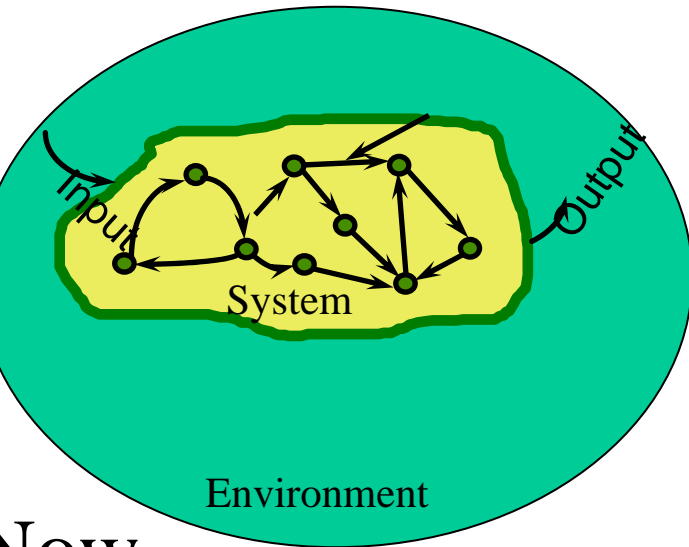
Cloud Sketcher is Finnish for Skyscraper



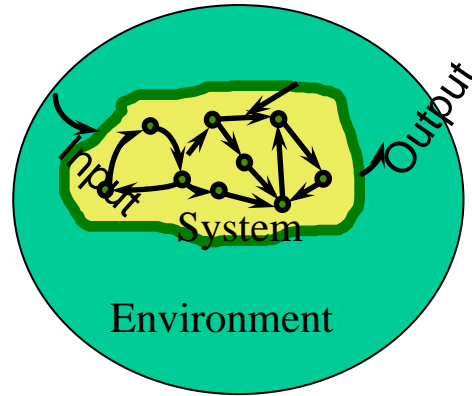
# Outline

- **Plan It**
  - The dynamics of systems and environments
  - Inputs to Capability
  - Planning the Capability Definition effort
  - Life Cycle Processes
  - Capability Inputs
- **Draw It**
  - The system of interest
  - Architecture Views and defining the system
- **Build the Capability Baseline**
  - OCD as the key document
  - Establishing Roles
- **Conclusion**

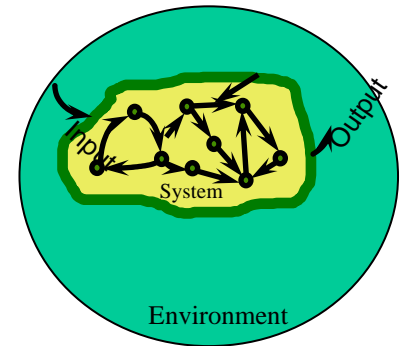
# System Dynamics Requires Capability Thinking



Now



Next  
Upgrade



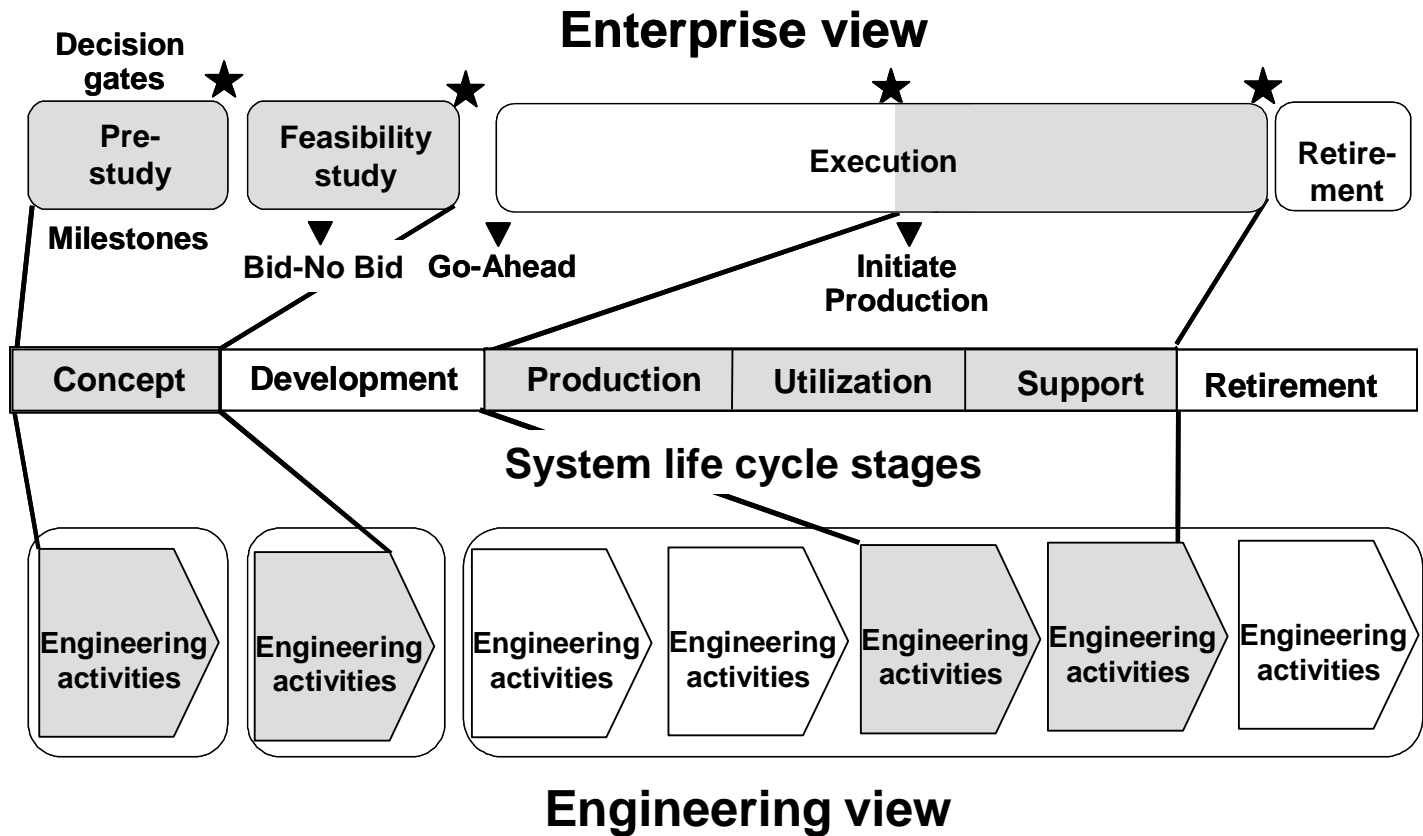
Future

- System Requirements change over time
- Technology changes influence solution & expectations
- Environment including interfacing systems also changes
- Adaptive acquisition strategies are needed to deliver capability

# Plan It

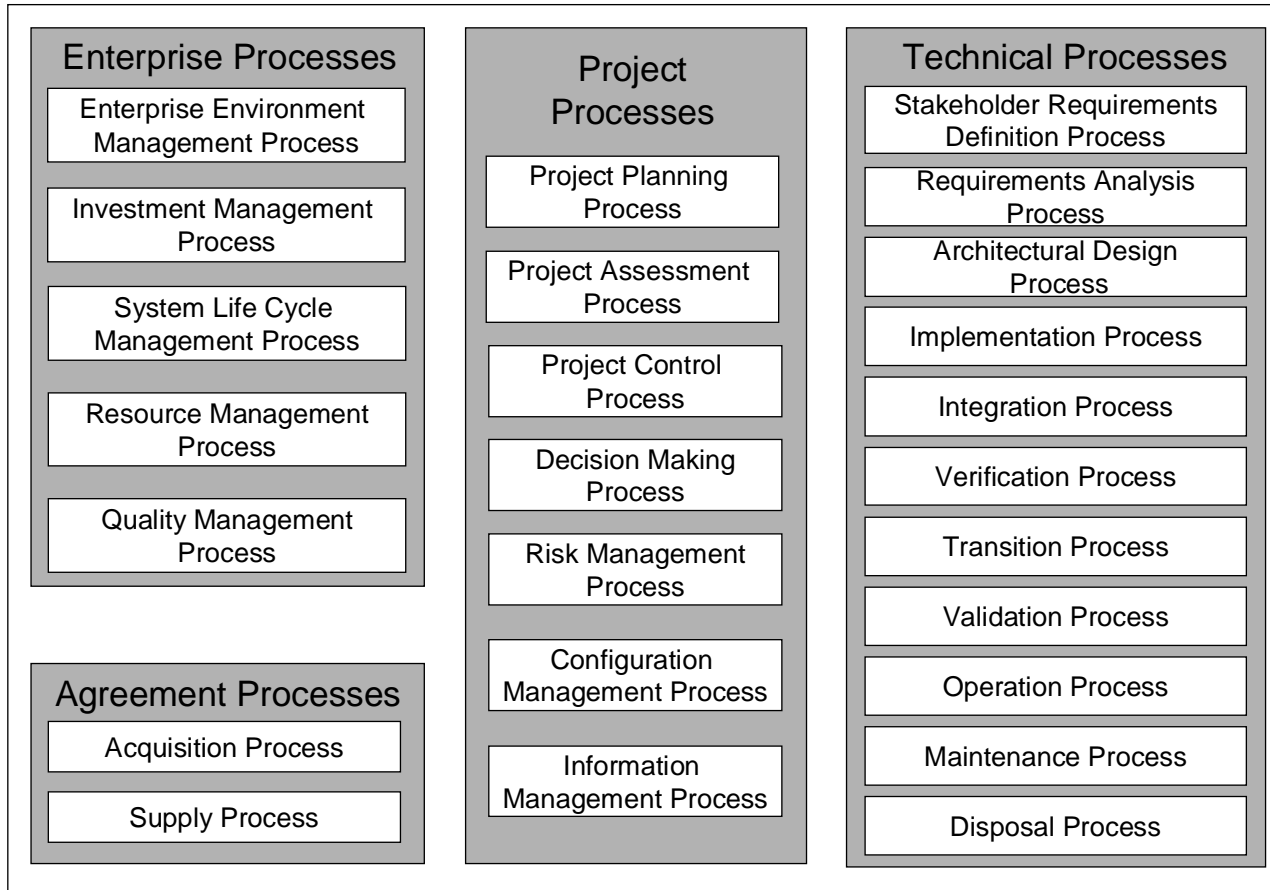
- Work Breakdown Structure
  - Scope Description, Reviews & Completion Criteria
  - Dependencies, Assumptions, Exclusions
- Deliverables
  - Product Specifications/Templates
- Schedules
  - Work Flow, Team Activities, Milestones
- Process
  - Plans, Standards, Risk & Adaptivity
- Resources Required
  - People, Tools, Time, Customer Links

# Identify Roles per Life Cycle

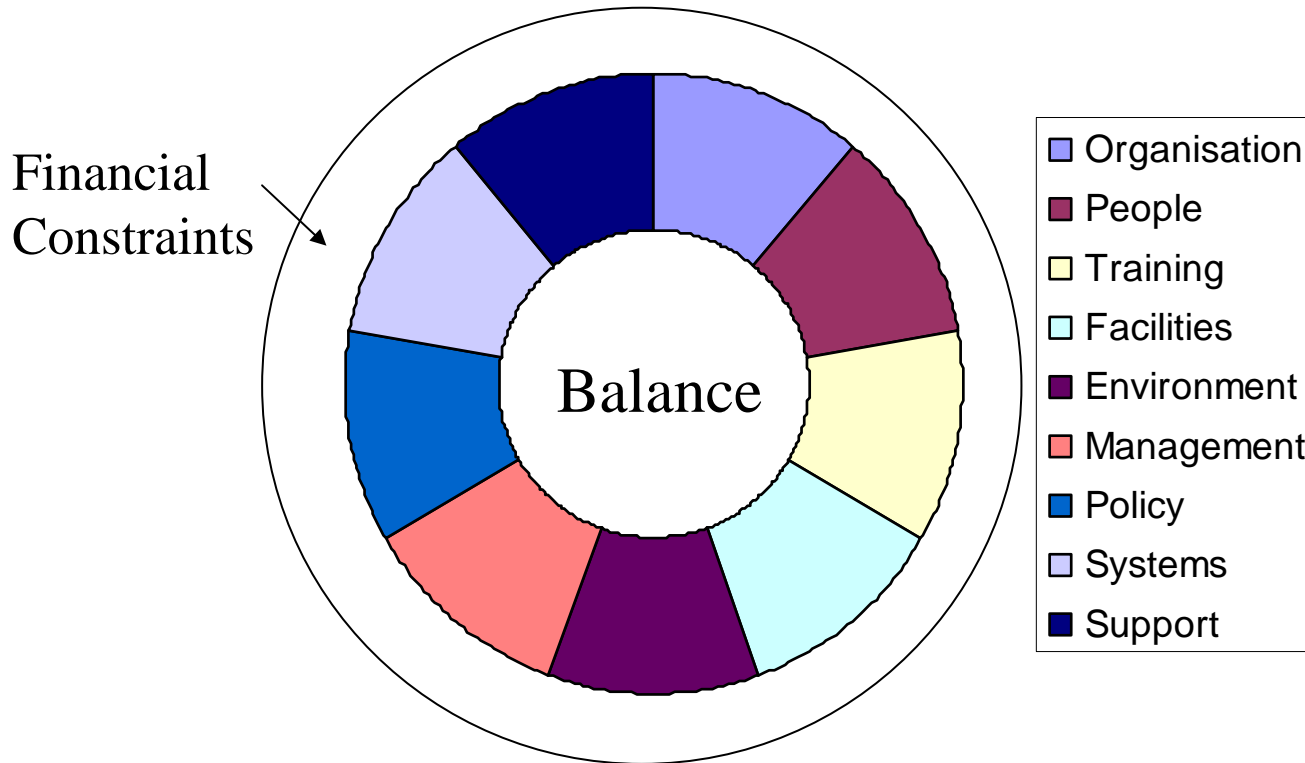


# ISO/IEC 15288

## System Life Cycle Processes



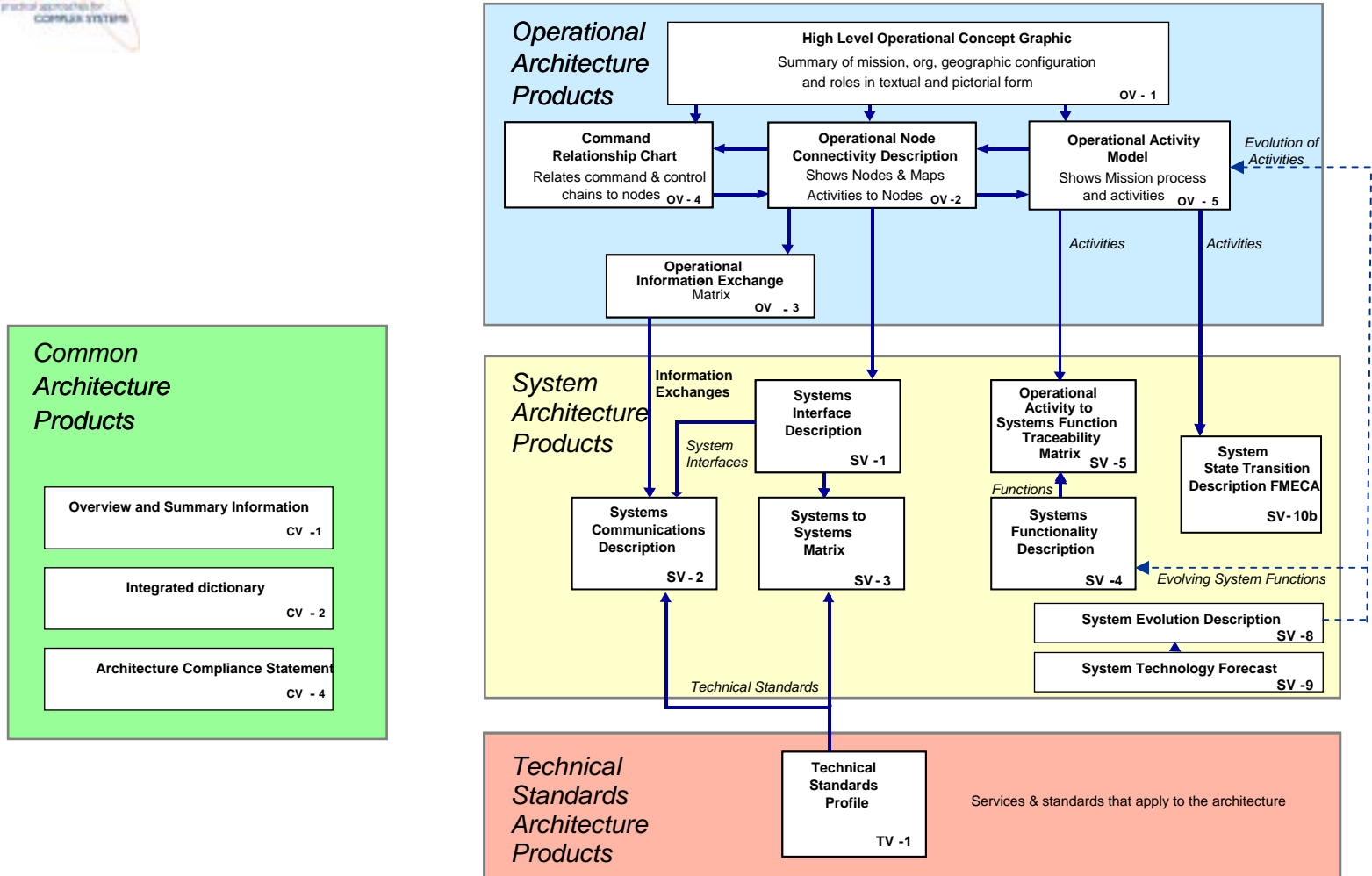
# Balancing Capability Inputs within Cost Constraints



# Draw It

- Views from the Architecture Framework
  - Decide relevant views for capability
  - Select views to help identify system (as-is, to-be).
- Use guidelines and standards
  - Capability Definition Documentation
  - Life Cycle Management Manual
  - SE System Life Cycle Processes

# Architecture View Road-Map



# Build the Capability Baseline

- Model and/or documentation required
  - Operational Concept Document & depth
  - Specifications and Interface Control Docs
  - Test & Acceptance Documents
- Plans
  - Baseline capture and change control
  - Tools and processes
  - Acquisition and Transition Strategy Documents
- Contracts, Agreements, and Understandings
  - Applicable contracts
  - Service Level Agreements
  - Memorandums of Understanding

# OCD as the key document for Capability Development

- OCD

- User Needs compared with existing systems to capture capability gaps for given scenarios
  - Engage and maintain stakeholder involvement to assure accuracy, ownership & traceability
- Required system concept(s) identified along with enabling systems and future trends
- Requirements Analysis checklist can be used to assess completeness (e.g. IEEE1220)

# Establishing Sustainable Capability Delivery Roles

## Customer

- Requirements
- Baseline Management
- Verification & Validation
- Independent Assessment
- Cost of Capability

## System Integration and Support Agencies

- People, Process and Products to develop, deliver and support
- Research & Development
- Change Management

- Software intensive systems are evolutionary and require SE processes to be adaptive
  - Use enterprise architecture approach
  - Use guidelines and standards (tailored)
  - Plan with roles identified and allow for change
- Capability thinking is needed for systems, especially in an information environment