

INCOSE Chicagoland Chapter Meeting

Systems Engineering & Decision Management go Hand-in-Hand

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There is a pattern of decisions

Behind every

- Strategy
- Design
- Architecture (Business, Enterprise, System, Software, ...)

**Decisions create your future
Take control!**

Exposing this Decision Network gives you a unique set of controls:

- Thinking Breakdown Structure to tame complexity
- Innovation Framework to visualize new possibilities
- Evaluation Framework to guide and capture your analysis
- Roadmap to fast-forward and align your plans proactively

Hidden costs burdening today's businesses

- ❖ **Misalignment between business strategy and engineering**
- ❖ **Indecision and decision churn at all levels of the organization**
- ❖ **Lack of a clearly articulated vision**
- ❖ **Unexecuted strategies**
- ❖ **Lack of a platform strategy**
 - ❖ **Multiple unique investments costs more**
- ❖ **Poor handling of risk and uncertainty**

Assess your new product and business initiatives:

Massively parallel thinking

We go in circles, churn decisions forever, never produce anything of real value

We serialize our decisions and slowly push them through a long string of gates

We deliver new products and capabilities 10X faster than our competitors

Efficient thinking

Our decisions often fail, and require rework or involve too many contributors/approvers

We make most of our decisions from scratch and suffer from analysis paralysis

We leverage proven patterns to accelerate our decisions and shrink our analysis costs

Innovative thinking

Our competitors are the innovators; we follow in their wake and pick up the leftovers

We innovate in a few specialized areas, but most of our products and processes are ho-hum

We innovate in every product and process with a longer horizon than our competitors

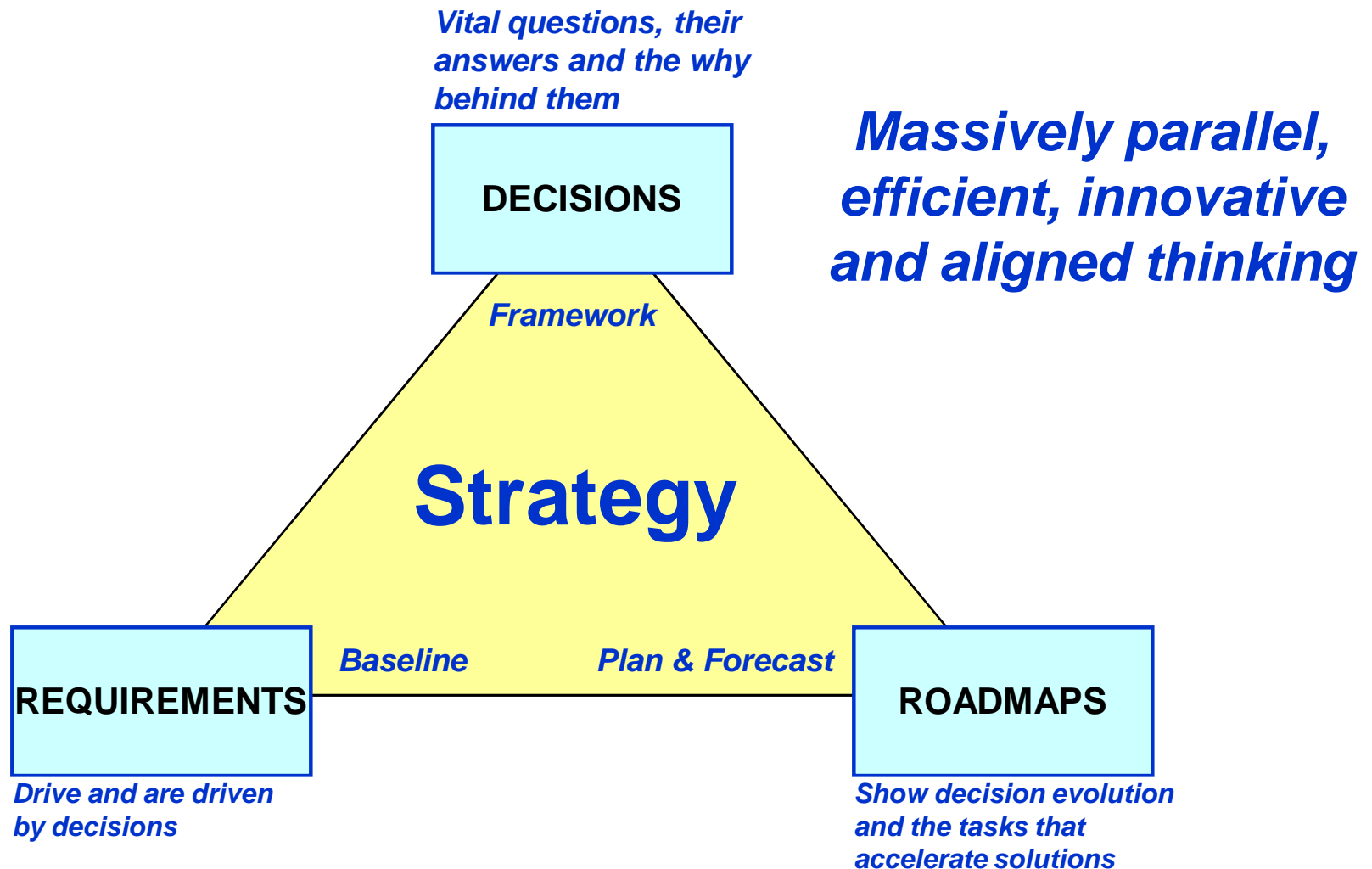
Aligned thinking

Our labs, product teams and management pull in different directions and fight each other's efforts

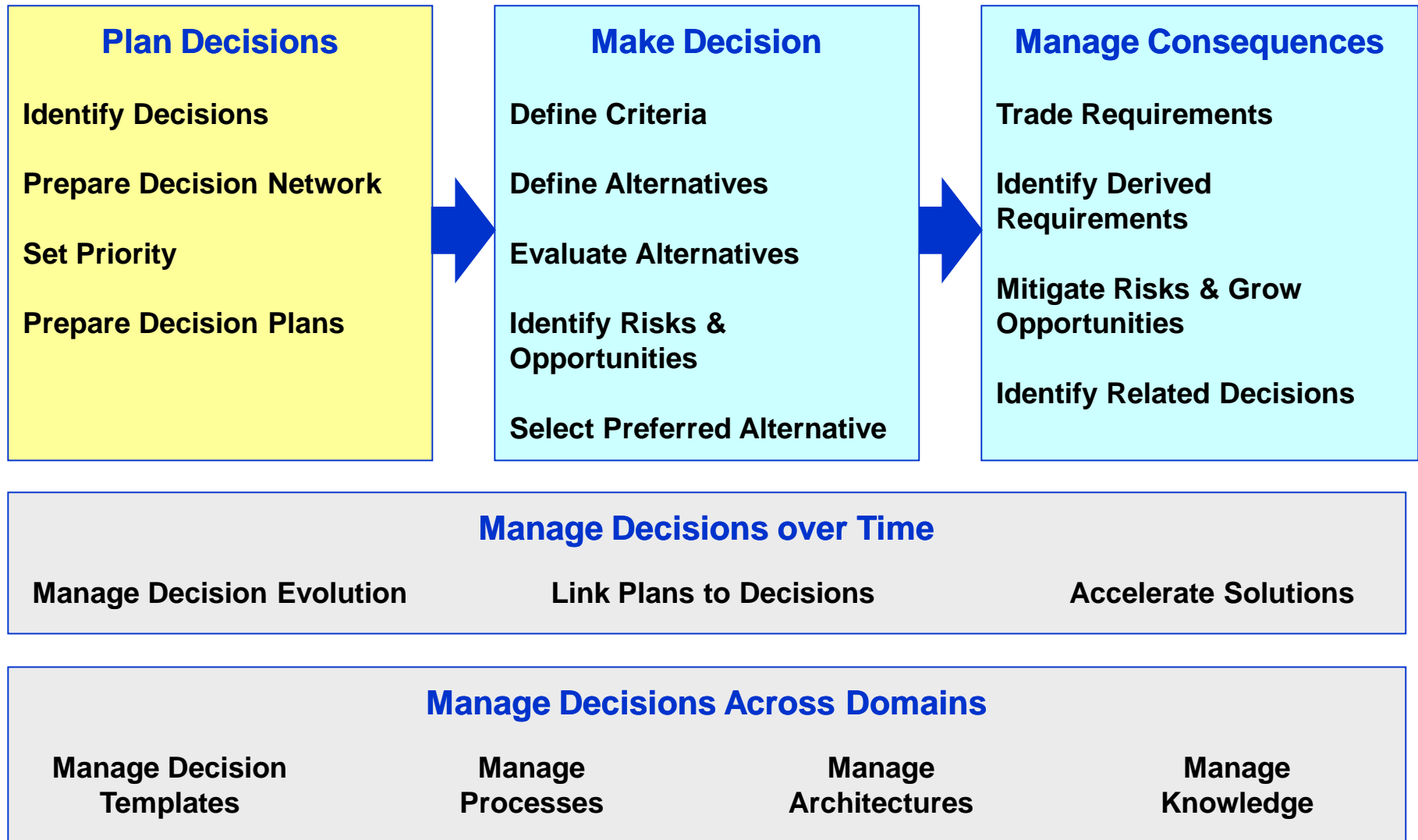
We align our efforts through brute force on a few high priority initiatives

All our projects align by design and support our common vision without delays or bottlenecks

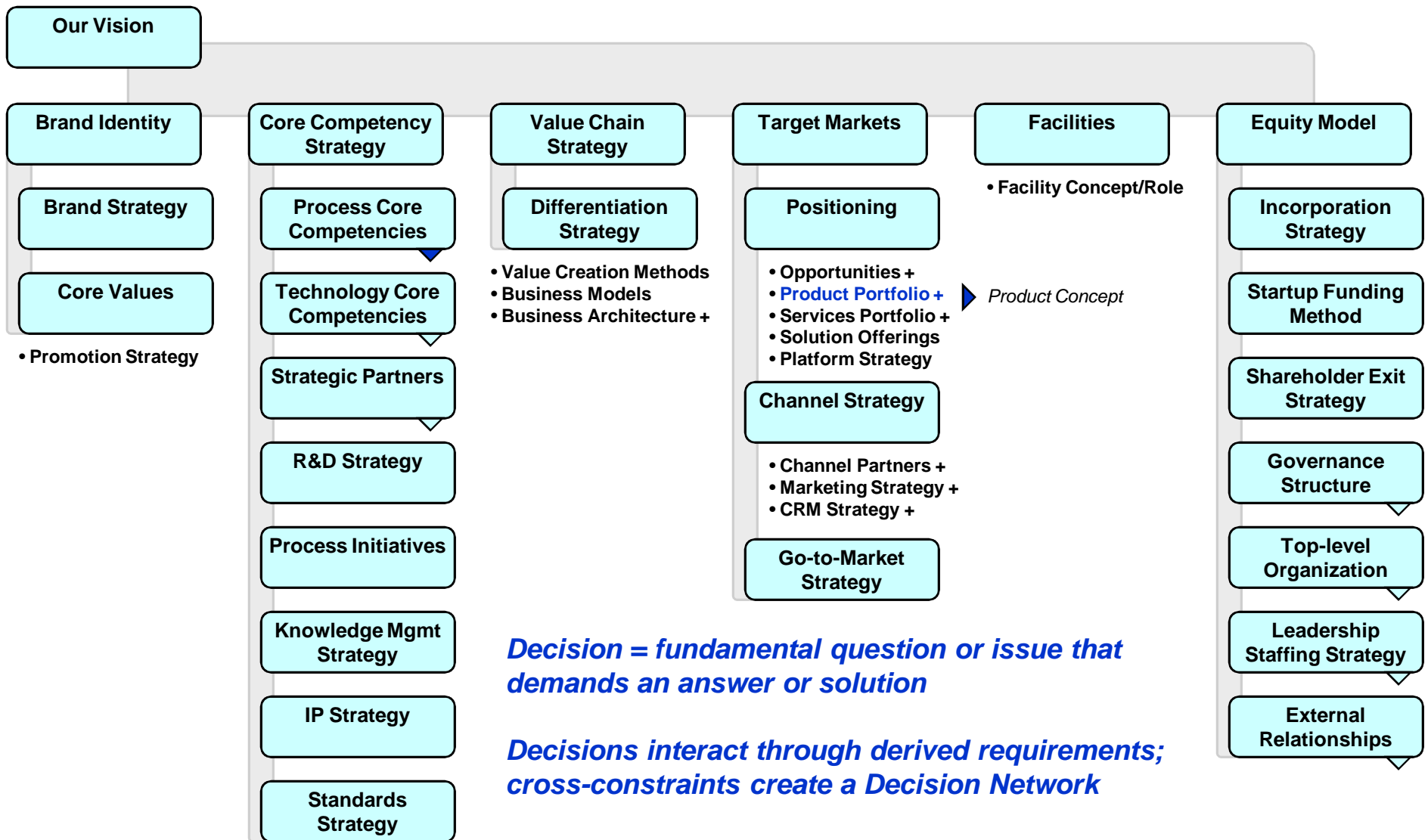
Elements of Strategy



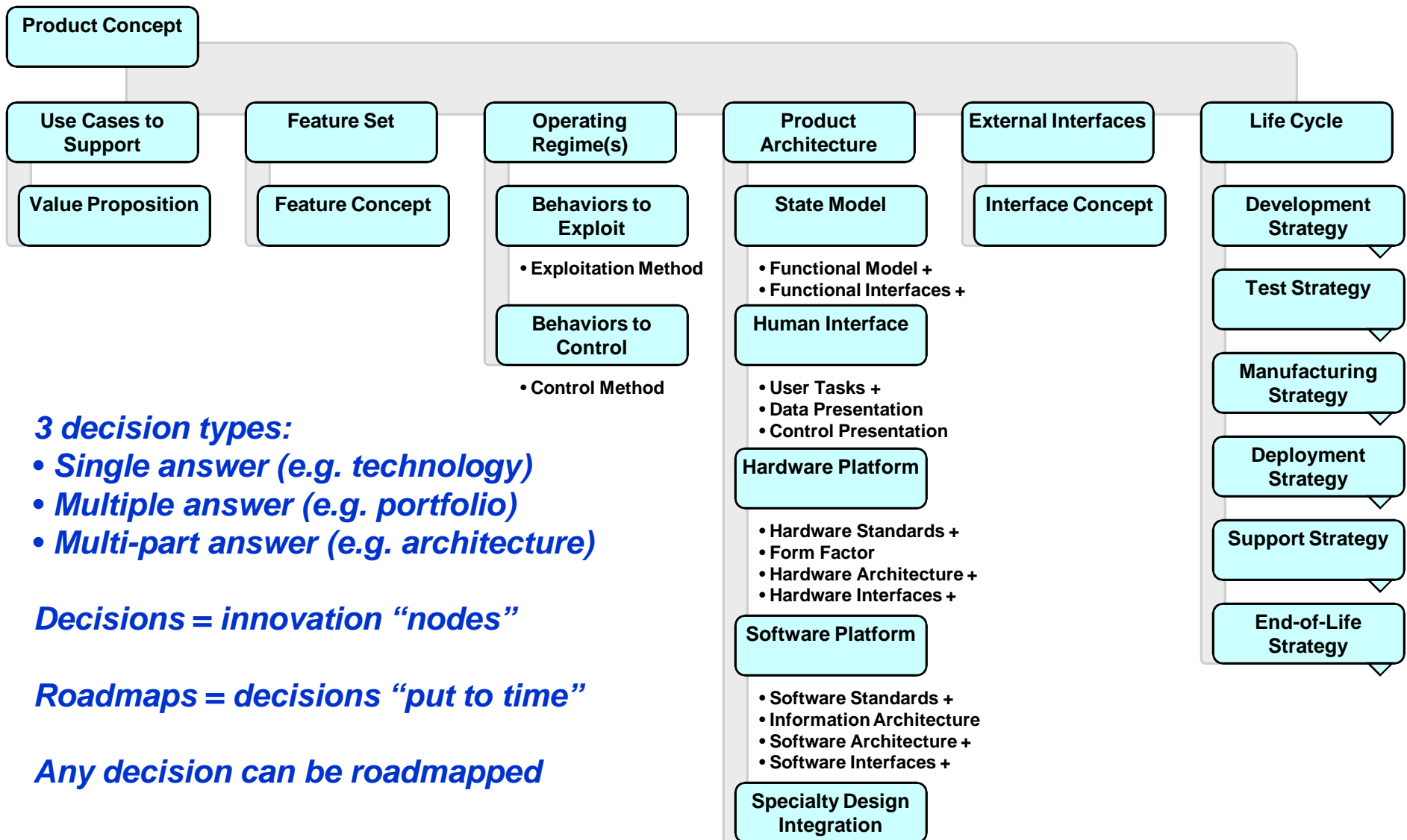
Methods Overview



Strategy Decision Network



Product Design Decision Network



3 decision types:

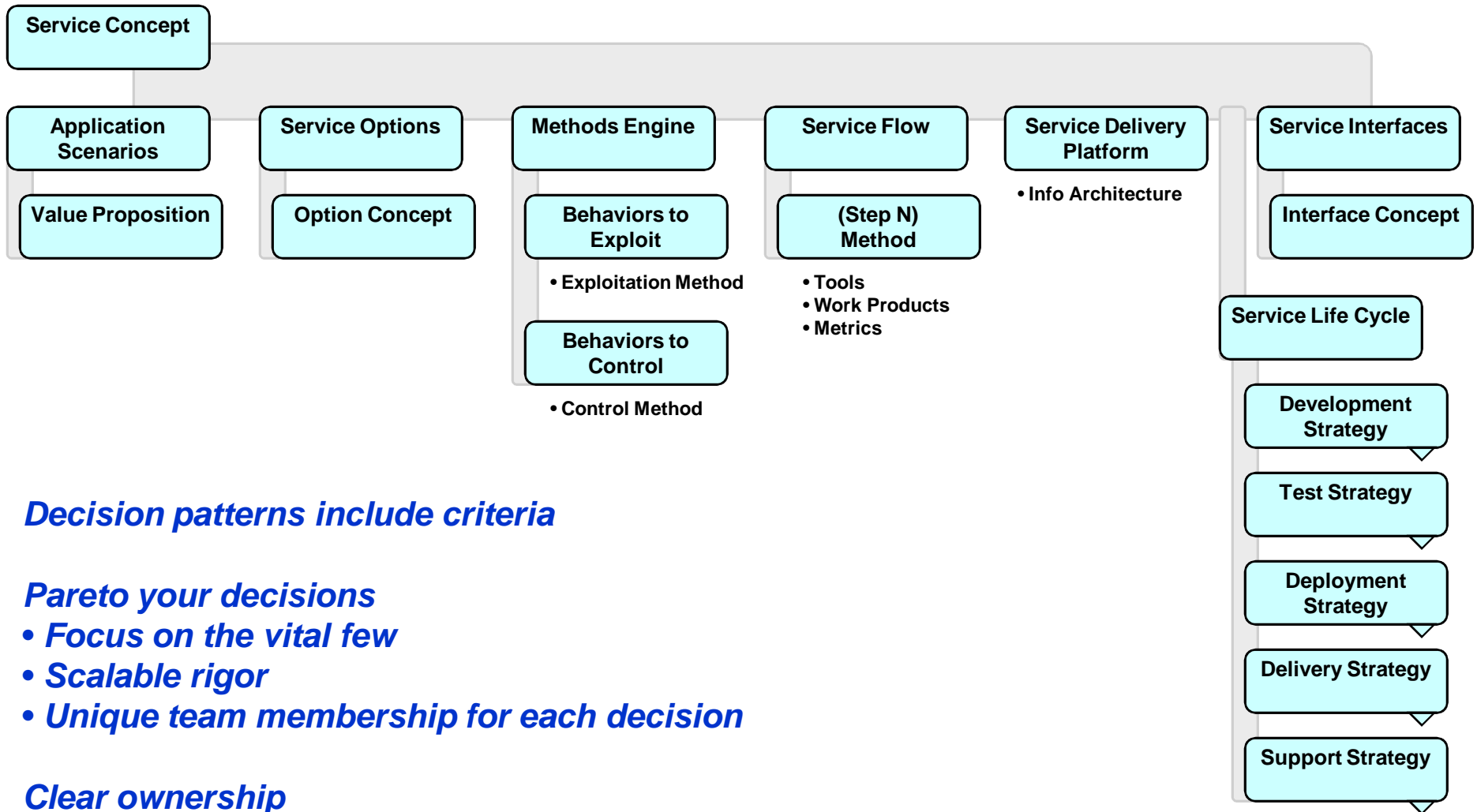
- *Single answer (e.g. technology)*
- *Multiple answer (e.g. portfolio)*
- *Multi-part answer (e.g. architecture)*

Decisions = innovation “nodes”

Roadmaps = decisions “put to time”

Any decision can be roadmapped

Service Design Decision Network



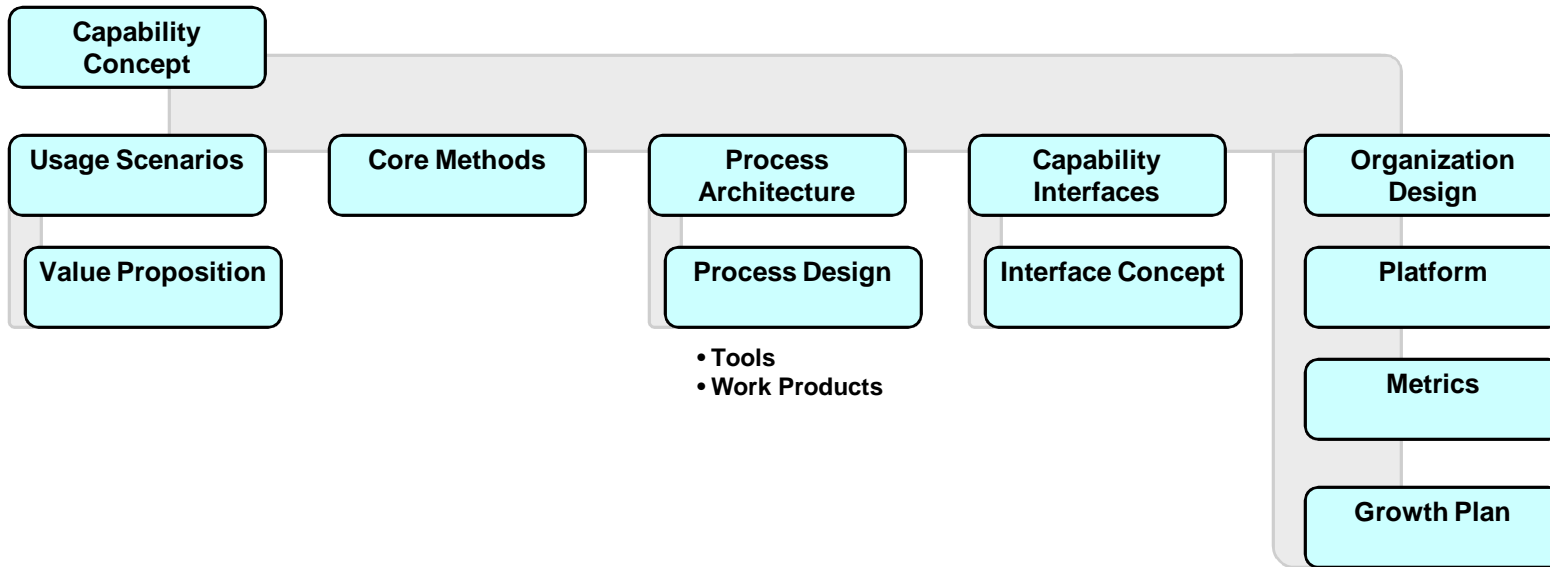
Decision patterns include criteria

Pareto your decisions

- Focus on the vital few
- Scalable rigor
- Unique team membership for each decision

Clear ownership

Capability Design Decision Network



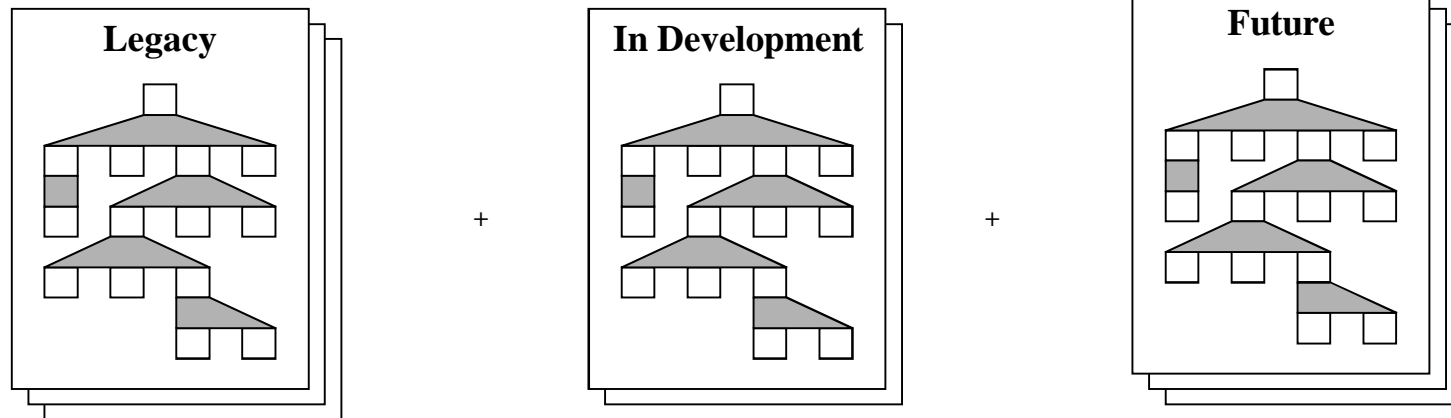
Decision = a stable question that evolves through a series of states

Evolving decision(s) = a roadmap

Building an “Architecture / Platform” Decision Network

Reverse Engineer Decision Networks

Forward Engineer Decision Networks

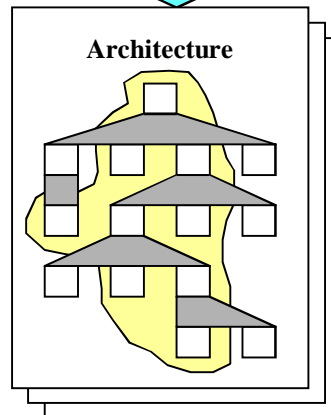


AS-IS Chaos -
Incoherent
Systems

Time Pressure –
Single Customer Focus

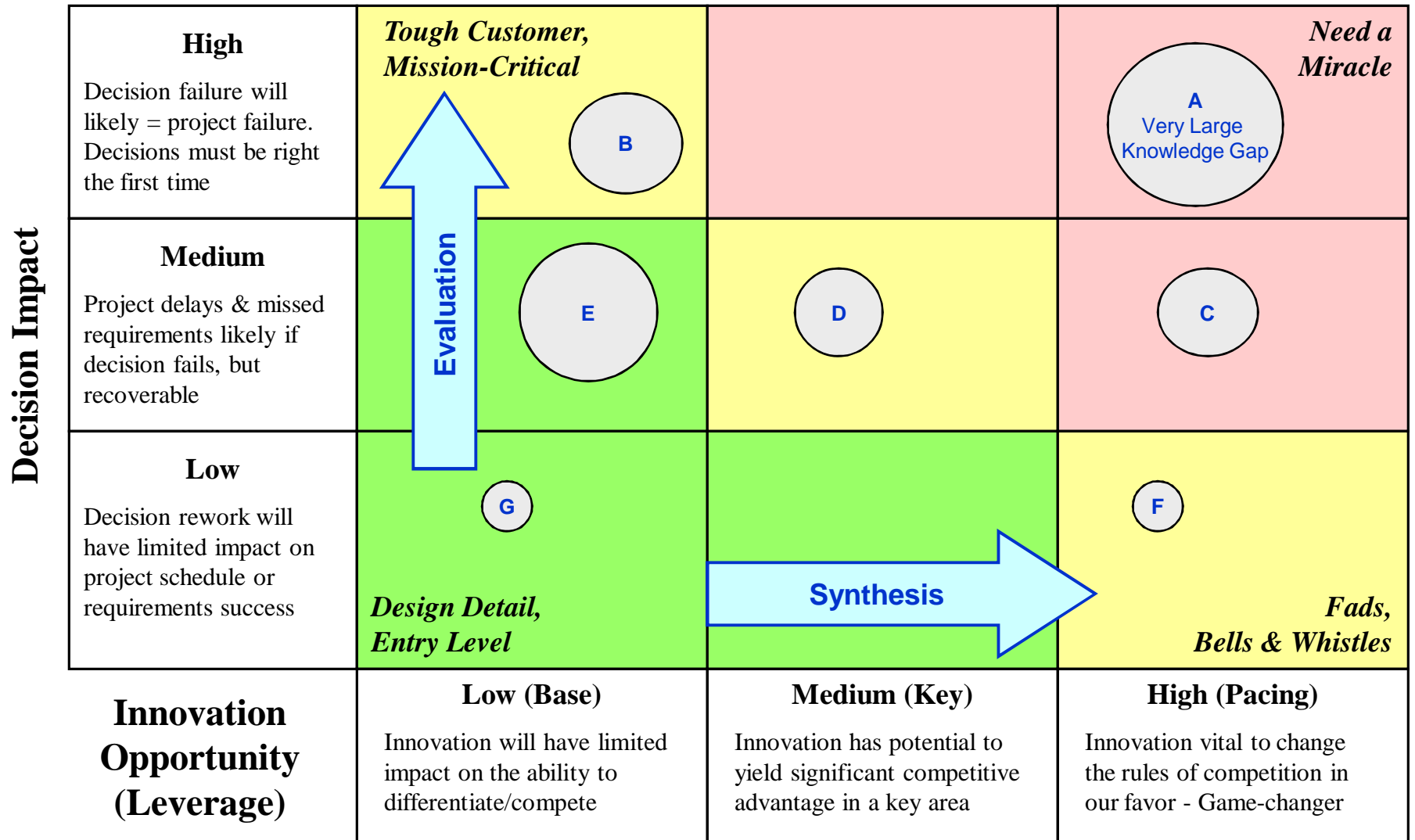
Uncertainty in
Needs &
Technology

“Platform” Boundary =
Common Decisions with
Common, Scalable
Solutions

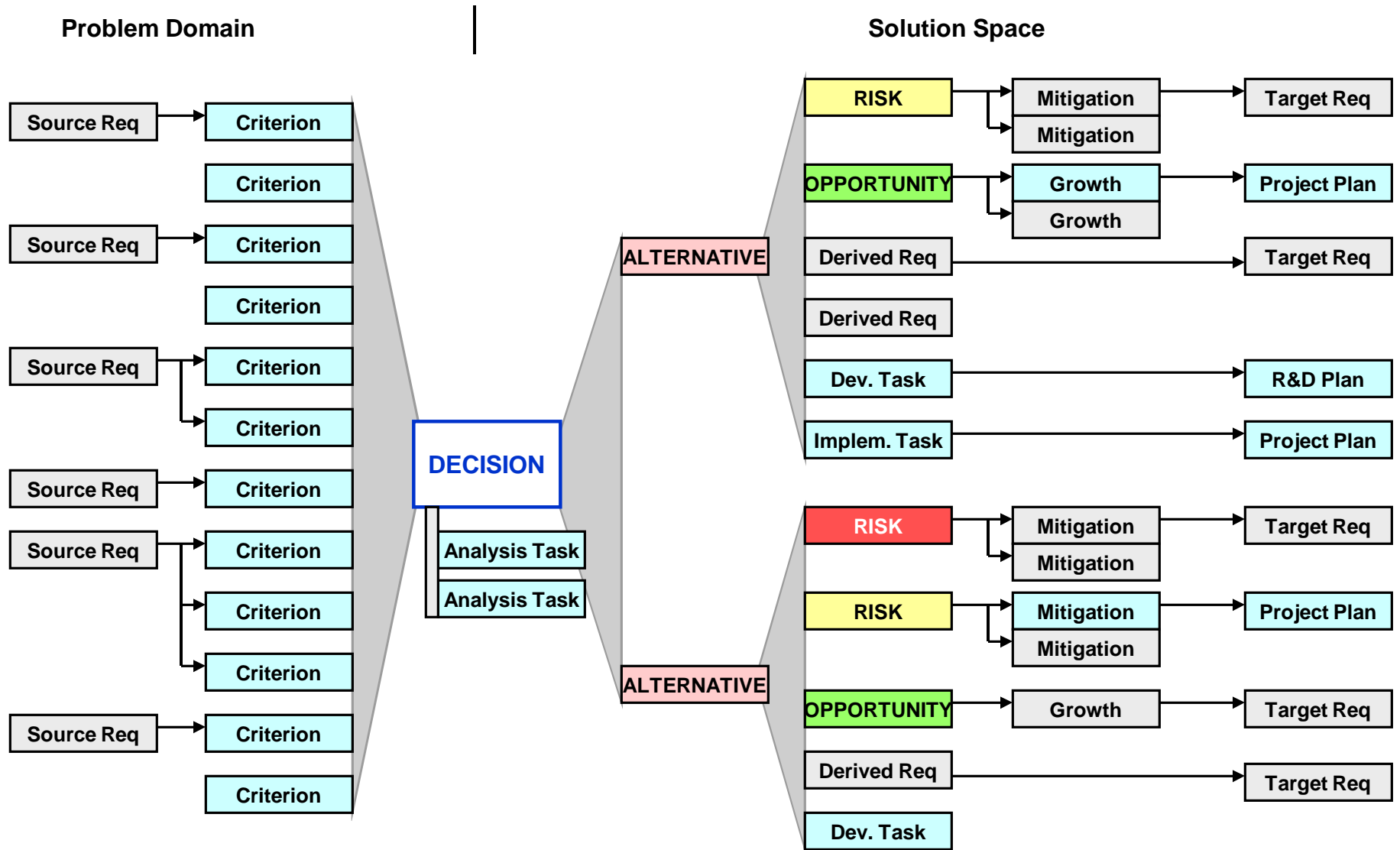


This is the hand-off point
to Implementation
Team(s)

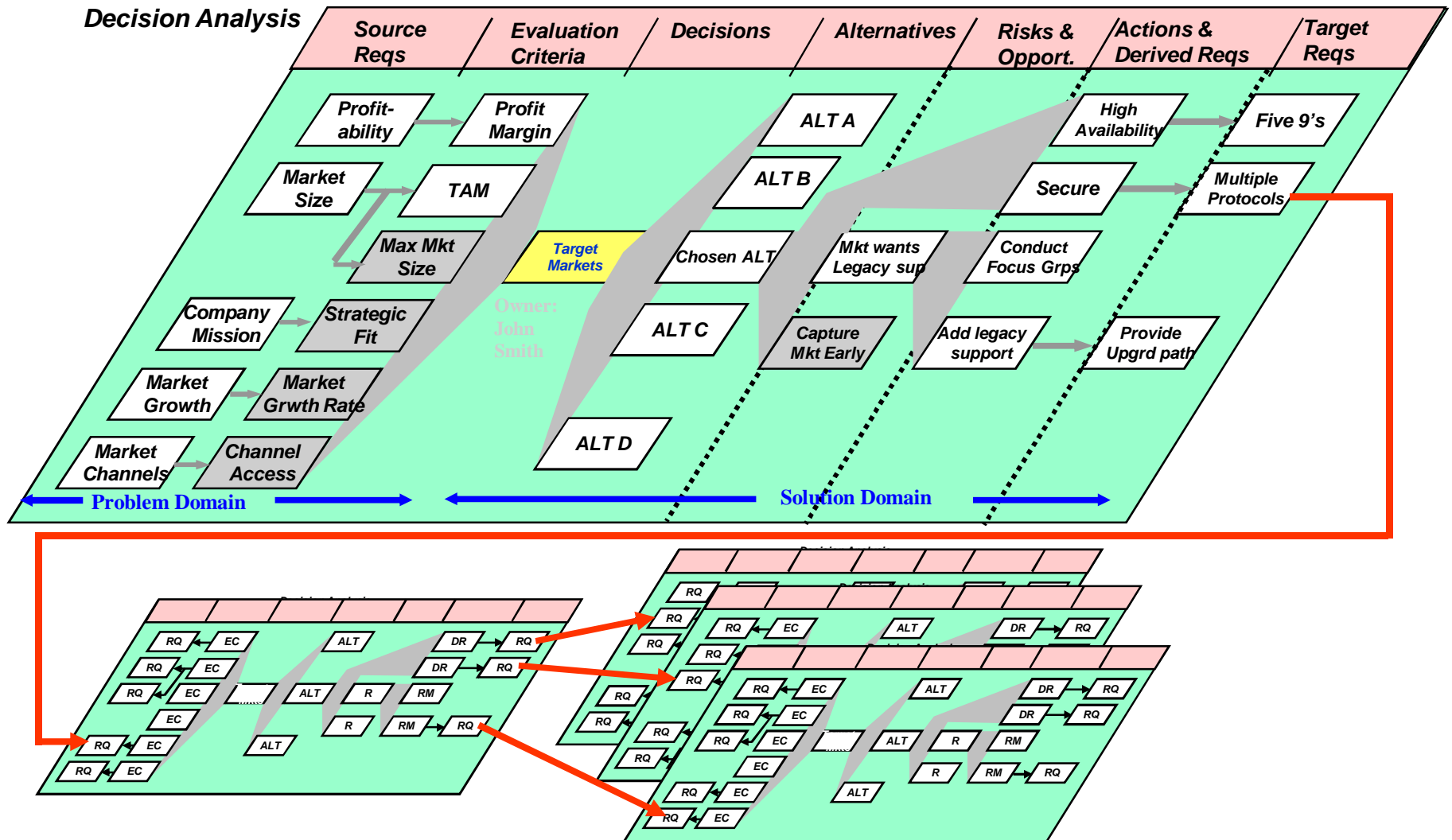
Set Decision Priority



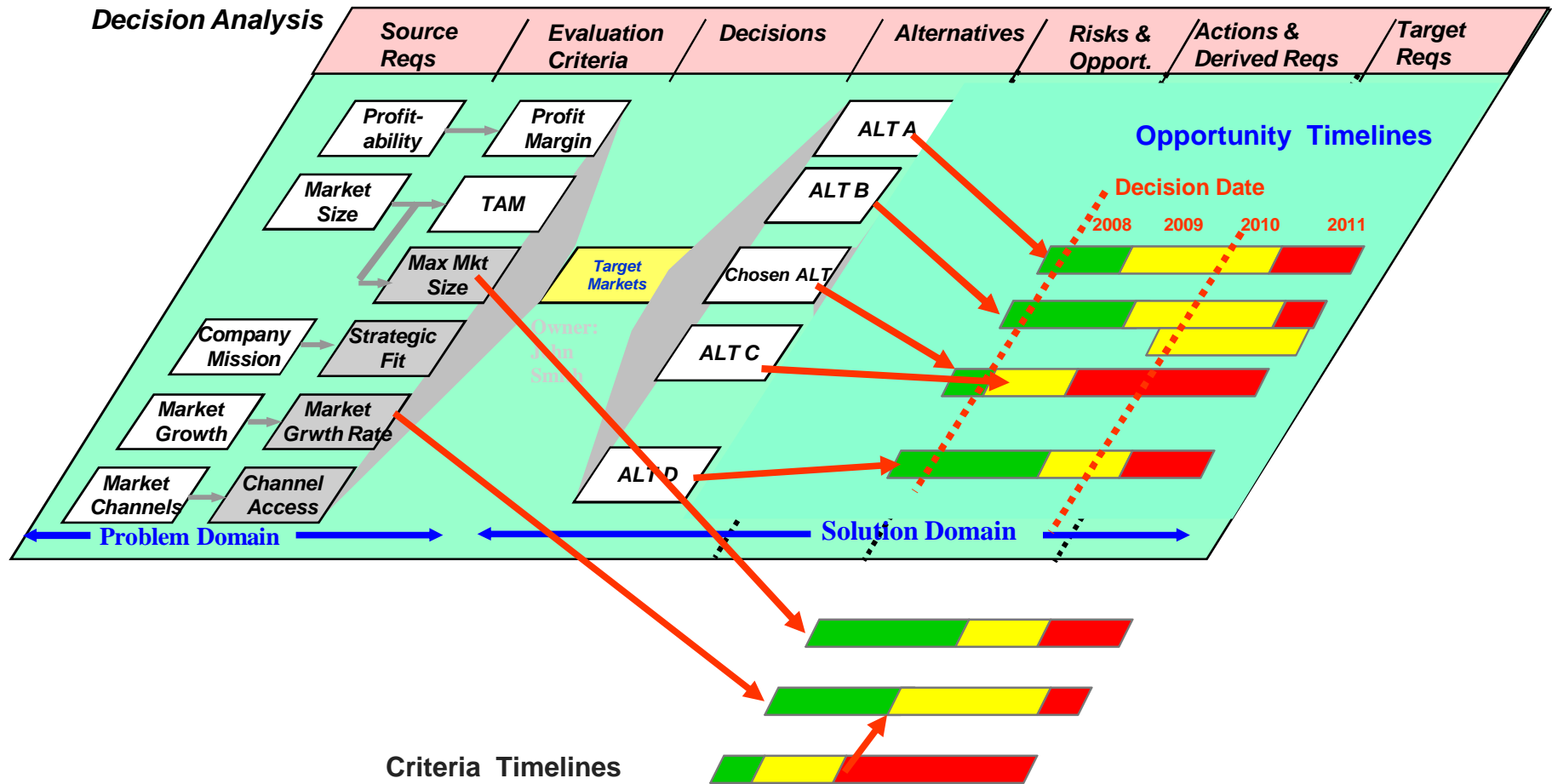
Information Architecture



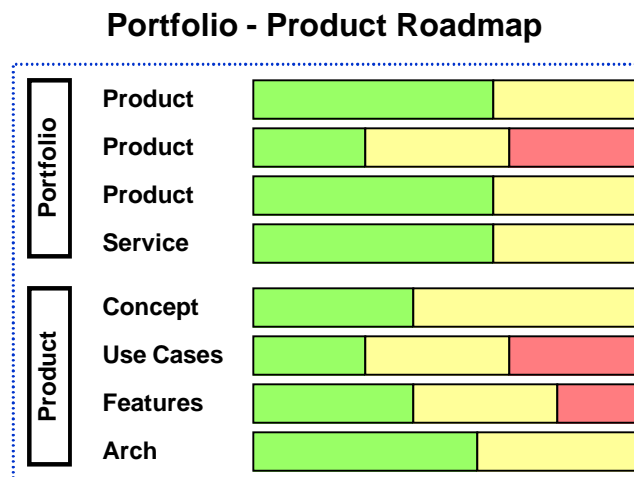
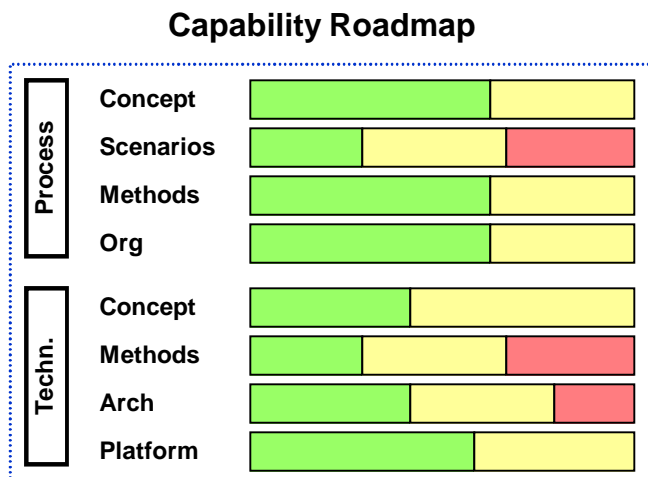
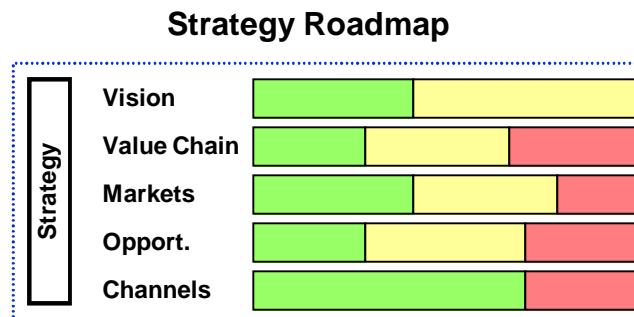
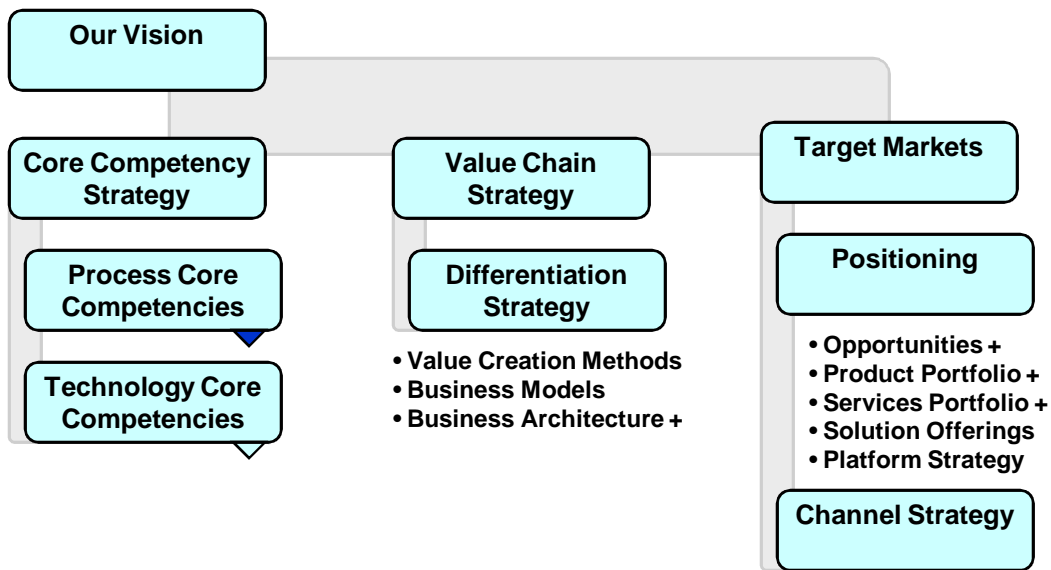
Decision Analysis View – Requirements Traceability



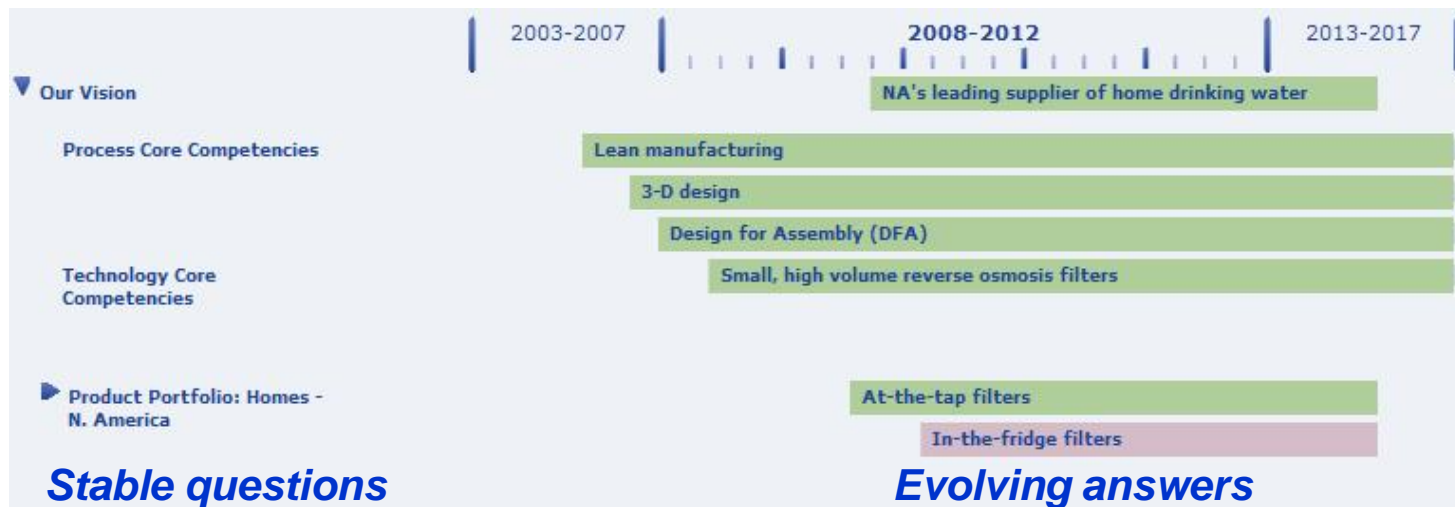
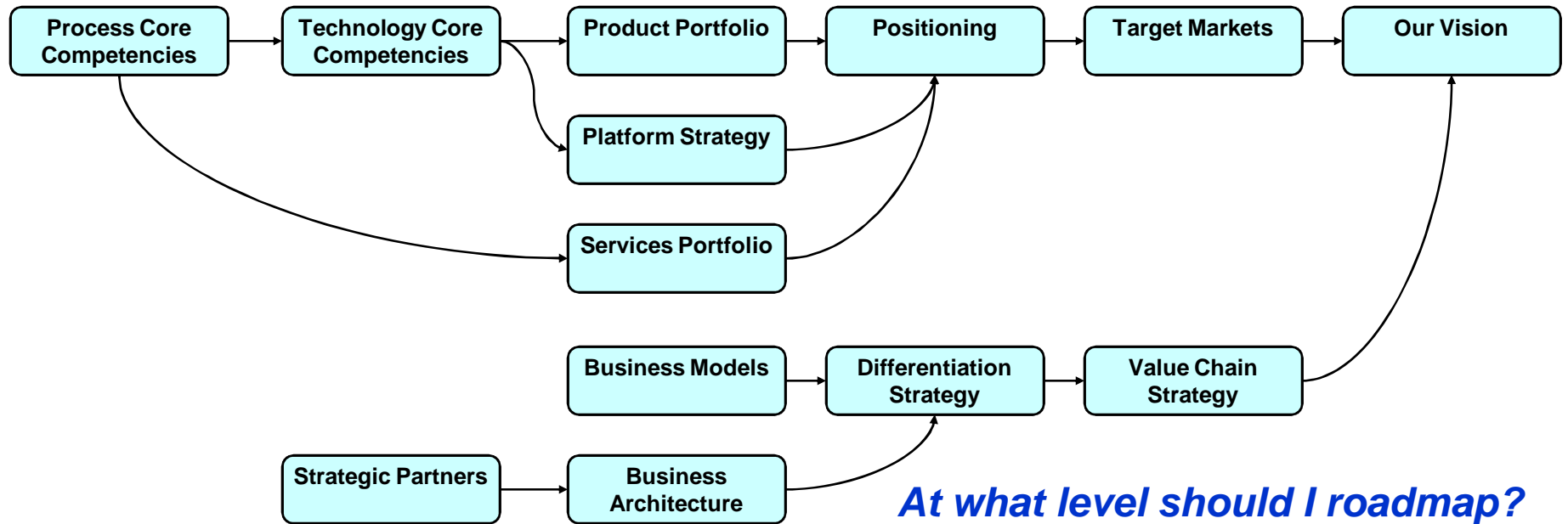
Decision Analysis View – Timeline Traceability



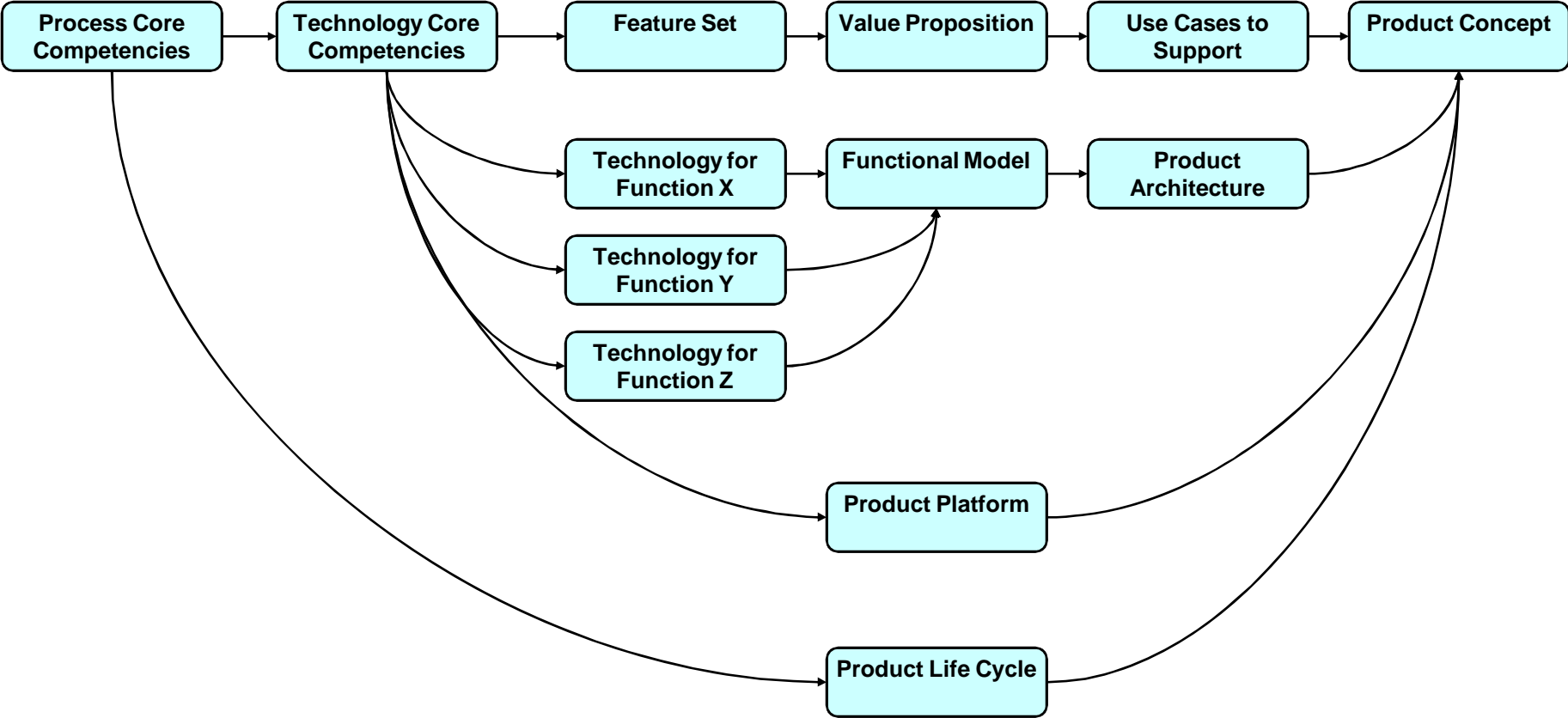
Decisions Integrated with Roadmaps



Roadmap Threads - Top-Level Strategy

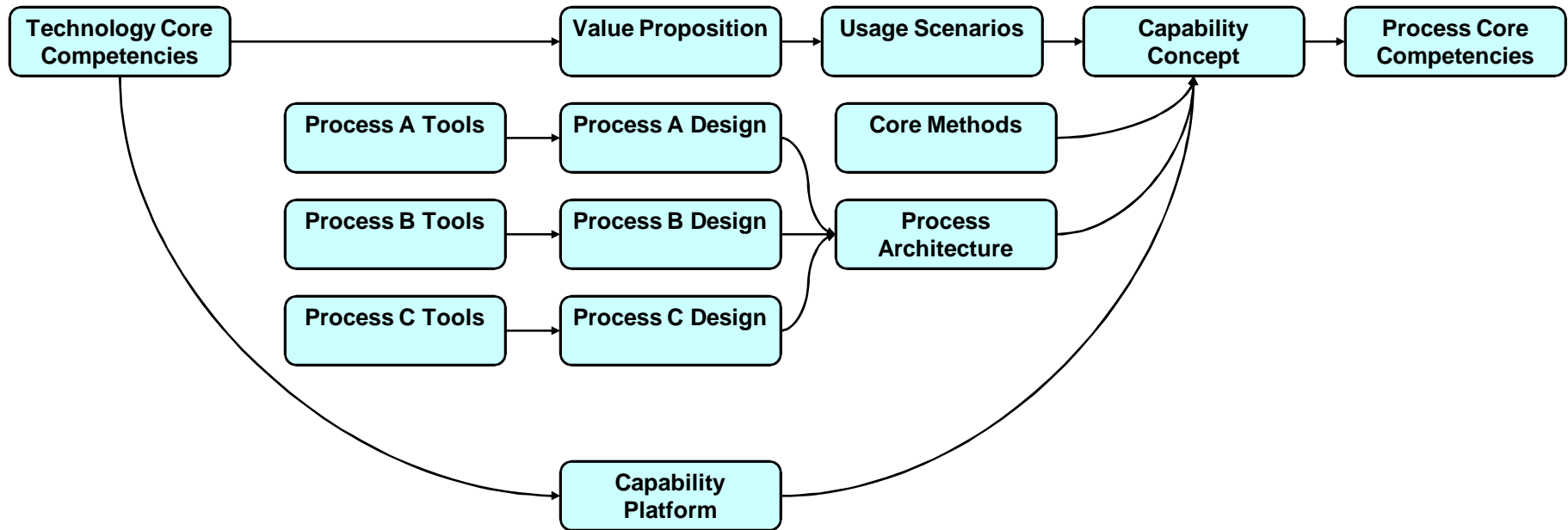


Roadmap Threads – New Products

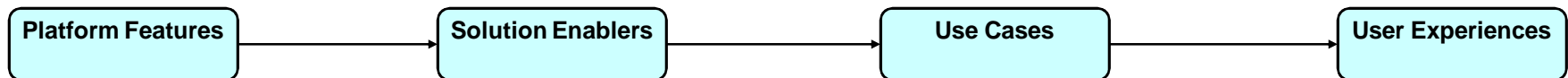


Roadmap Threads – Other Possibilities

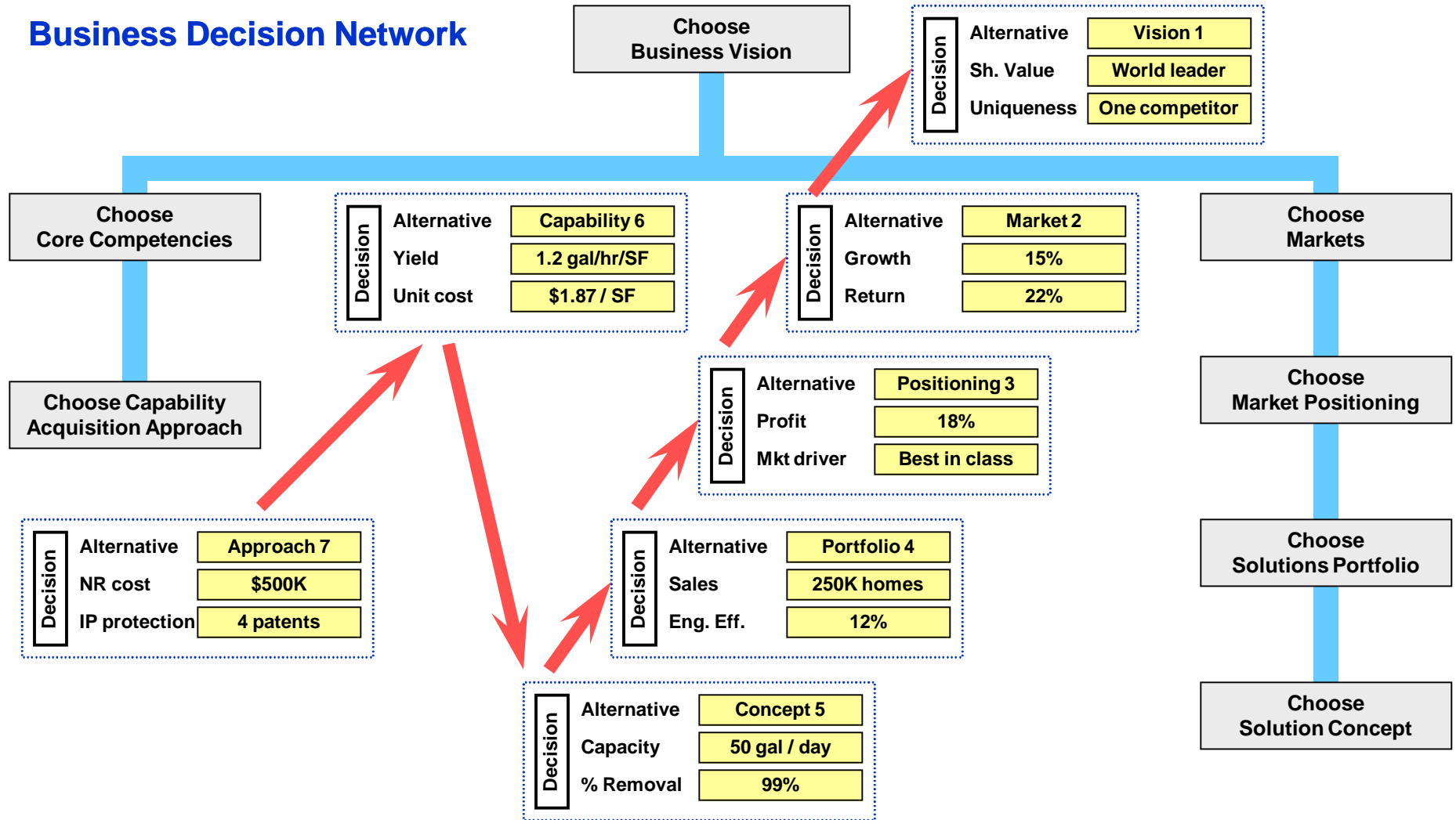
Capability Design and Maturity



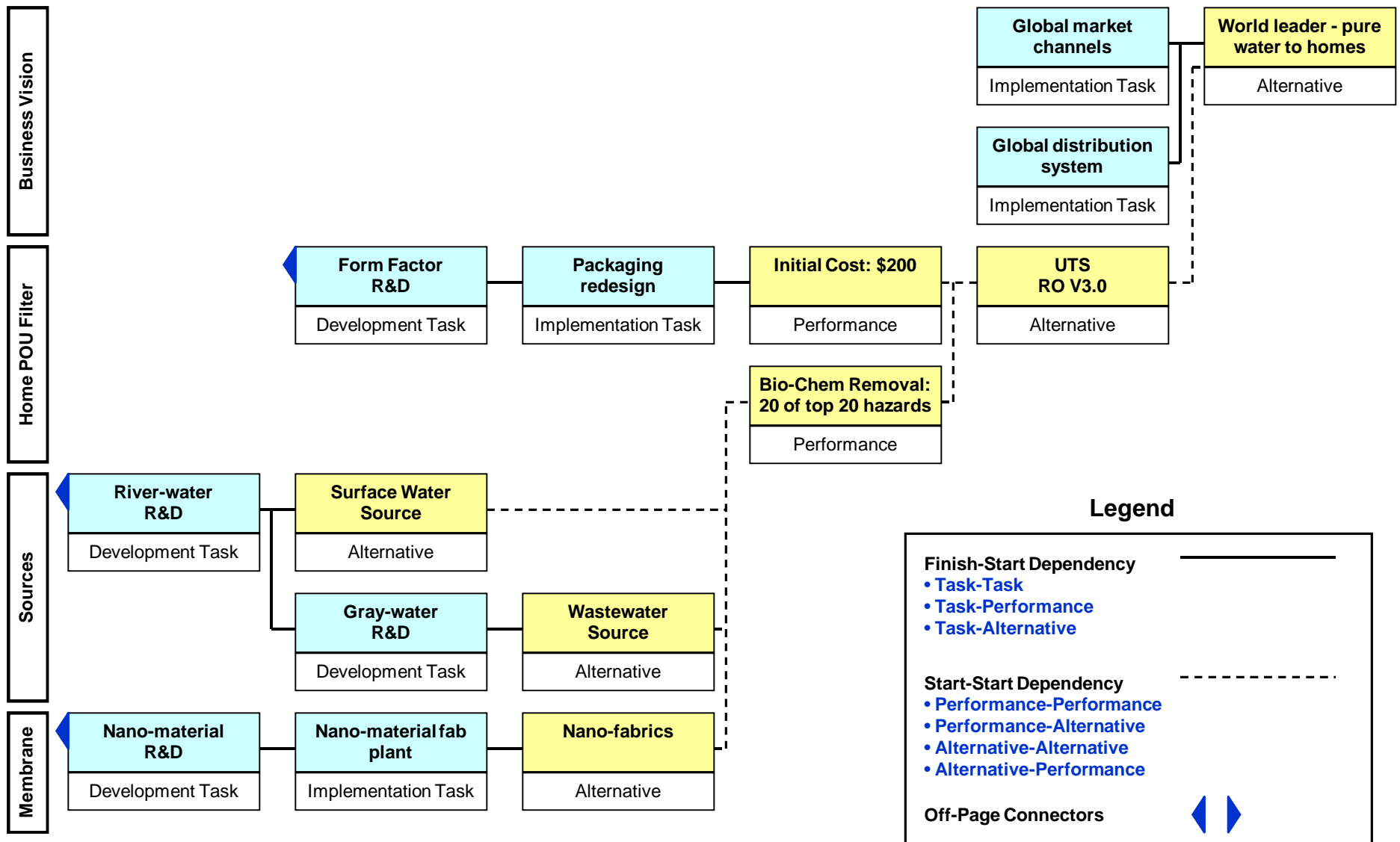
End-to-End Experience Design



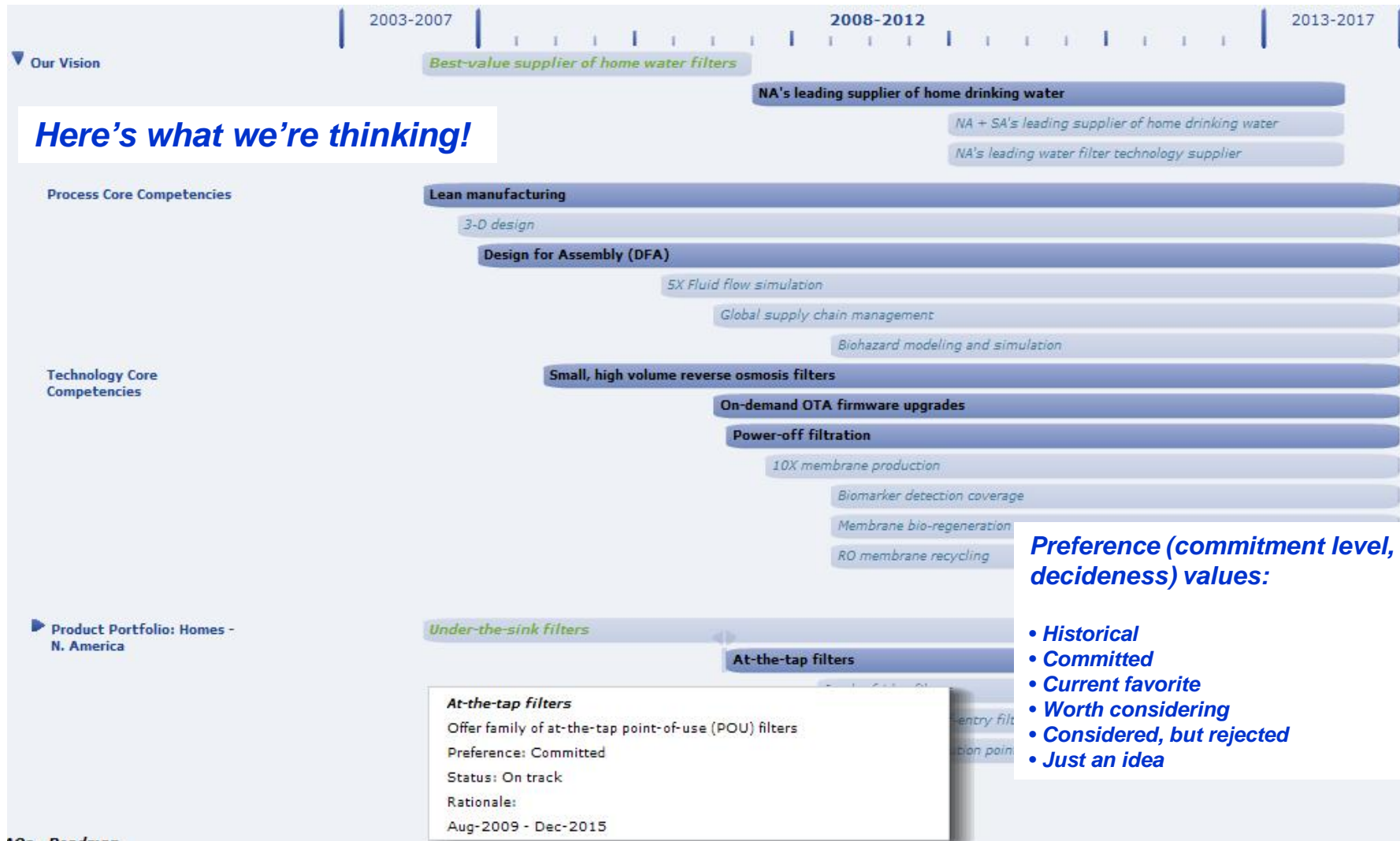
Strategy Decisions – Composite Roadmap



Dependency Network

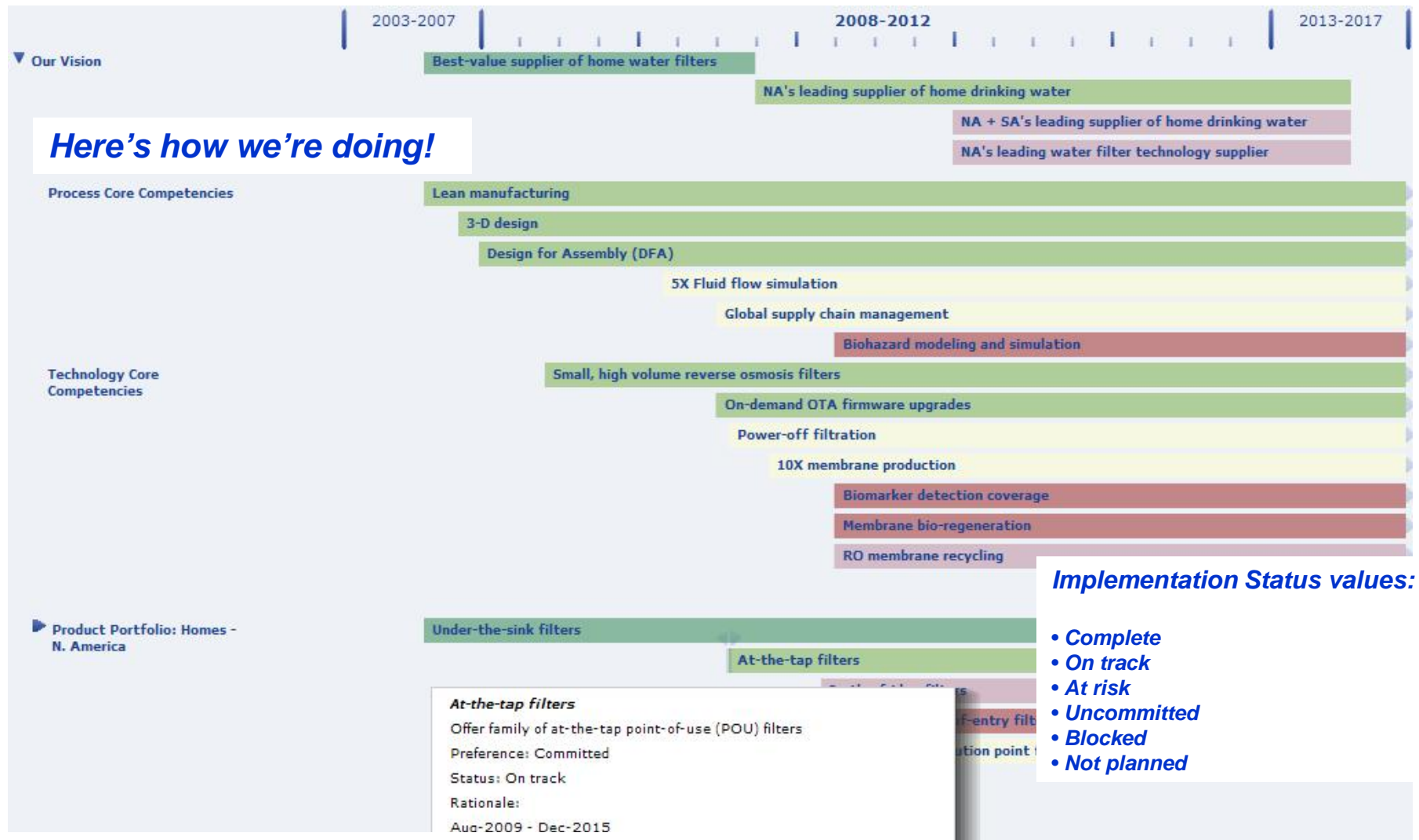


Ideation Roadmap



<http://decisiondriven.wordpress.com/2008/07/29/interpreting-roadmaps/>

Implementation Roadmap



<http://decisiondriven.wordpress.com/2008/07/29/interpreting-roadmaps/>

Organizational Challenges

Strategic Decision-Making vs. Roadmap “silos”

- Roadmaps visualize and inform decisions
- Overlapping processes and kingdoms
- No one owns or manages the business opportunity (value-creation) critical path

Roadmap vs. Project Management confusion

- Roadmaps are a “state” model first, enabled by a project of projects
 - Misinterpret roadmaps
- Very different time horizons and task granularity

Decision Management not valued as a strategic capability

- Every situation seen as unique; no reuse of decision patterns
- Strategic excellence not reachable with Operational excellence toolkits
 - Six Sigma, Lean, Stage Gate techniques are often misapplied

Organizational Challenges

Strategy by PowerPoint

- **No explicit dependencies**
- **Focus = to gain or preserve funding**
 - Hide the bad news
- **Fuzzy definitions**
 - Redundant or inconsistent information; limited depth of data
- **Not dynamic**
 - No discipline of continuous alignment by design, progress tracking progress or adjusting for competitive events

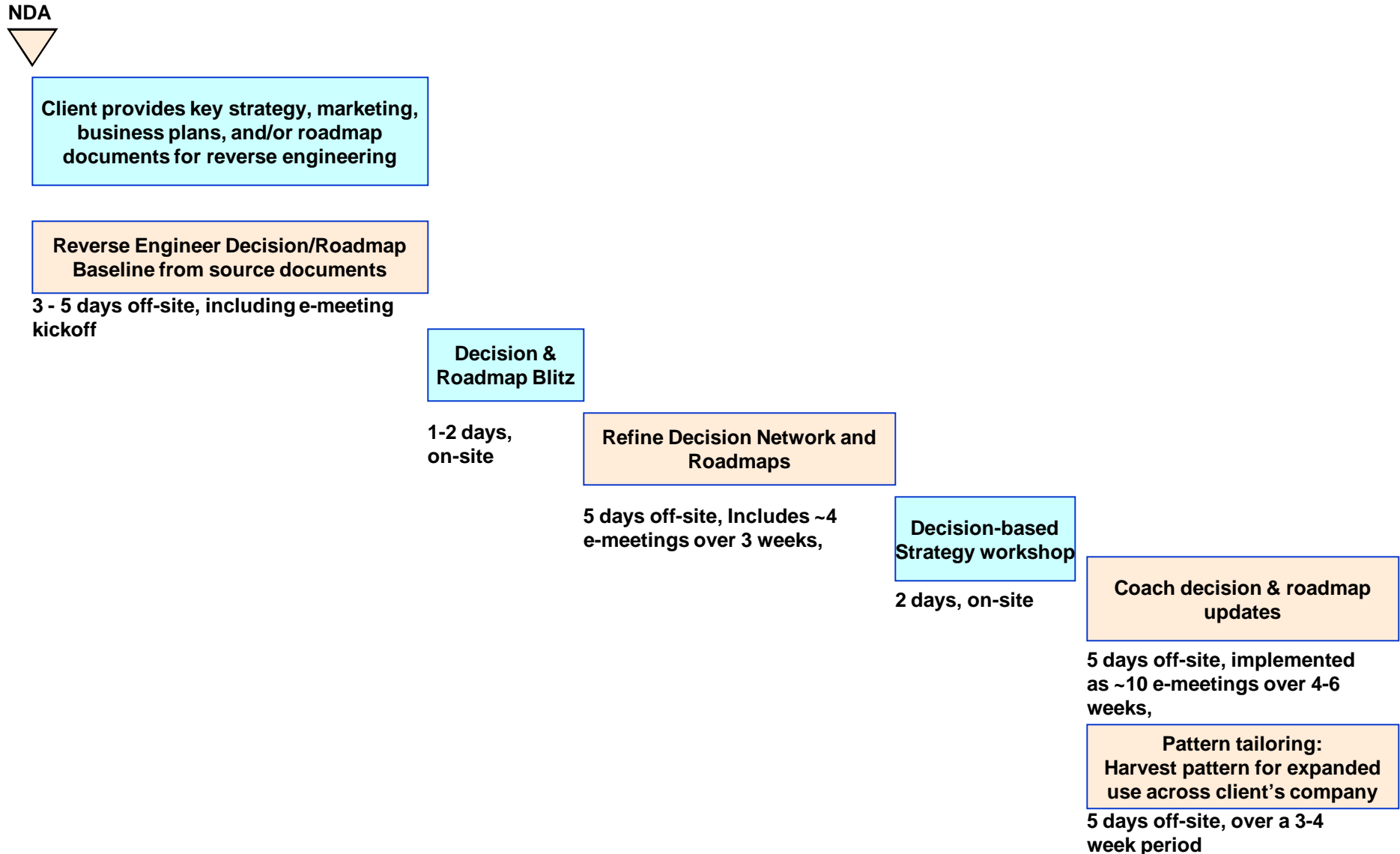
Current enterprise roadmap tools lack a robust decision methods engine

- **Focus on graphics and linking, not thinking**

Decision-based Strategy Value Equation

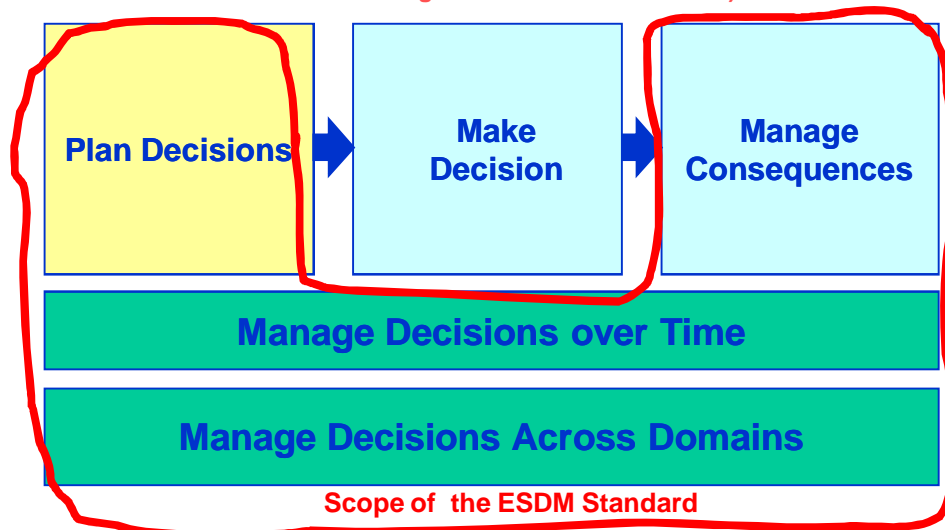
- **System view of decision making allows early identification of critical decisions**
- **Decision patterns means that decisions do not need to be made from scratch**
- **Support of massive parallel thinking leading to higher speed to market**
- **Decision to decision alignment**
- **Ability to see decisions evolving over time creating a roadmap to the future (identify gaps & overlaps)**
 - **Length of planning horizon, ability to align more elements of your plan to overwhelm the competition**
- **Decision networks codify organizational knowledge**

Typical Jump Start Engagement



IEEE P1694 Standard for Enterprise Strategic Decision Mgmt (ESDM)

(The ESDM Standard enables multiple “Make Decision methods” to be managed in the same framework)



Scope of the Standard

This Standard defines a common framework for the enterprise-level management of strategic decisions. It defines and enables ESDM governance models and requirements. It defines common methods and work products for:

- 1) decision planning, analysis, traceability and execution,
- 2) collaboration within and among enterprises and
- 3) linkages with other business processes.

IEEE P1694 Co-chairs: Gary DeGregorio, Michael Menke

Purpose of the Standard

- This project enables common decision management methods to be used across all parts of an enterprise (or among enterprises), including, but not limited to, strategy, portfolio management, technology/capability management, systems/platform engineering and “product” development.
 - The term “Product” includes product, platform, software, process, system, solutions, services etc.
- What we will be standardizing as part of this document primarily includes:
 - Common ontology
 - A common decision management process framework that can be customized for different domains and industries
 - A high-level information model that defines the minimum information that is needed to be passed between decisions as well as between different roles

Working Group Charter Member Companies:

- Boeing, Decision Strategies, Inc., HP, IBM, Intel, Motorola, Seagate Technology, SmartOrg, & Systems Process, Inc.

Reference Papers

- **“Motorola’s Technology Roadmap Process;” Research Management, September/October 1987; Charles H. Willyard, et al**
- **“Less is More: Capturing the Essential Data Needed for Rapid Systems Development;” INCOSE Systems Conference; July 1996; Boston, MA; Gary DeGregorio & Robert Novarita**
- **“Technology Management via a Set of Dynamically Linked Roadmaps;” IEEE International Engineering Management Conference; August 2000; Gary DeGregorio**
- **“Managing Strategy/Platform Decisions across the Enterprise and over Time;” IEEE International Engineering Management Conference; September 2005; Newfoundland, BC, Canada; Gary DeGregorio & John Fitch**

Thank You

If you would like to contact me regarding any of the presentation material or to arrange for an overview within your organization:

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