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Creating Decision Guidance for Applying Agile System Engineering

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Background and Context

Observation Space Design

Assessment of Agility Needs

Findings and Future Work

Outline

Integrating Learning Journeys

CAB Members

- Large Variation
- Systems, Life Cycles
- Regulatory Constraints
- Risk Tolerance
- What Agile Means

AGILE SE WG

- Fundamentals
- ASELCM
- Pattern Work

Fundamental Values

- Purpose is to assist teams in making directionally correct decisions
- Solution suitable to address wide range of development applications
- Products created - simple to use, quick to use
- Ensure integration with other learning within the agile SE WG community

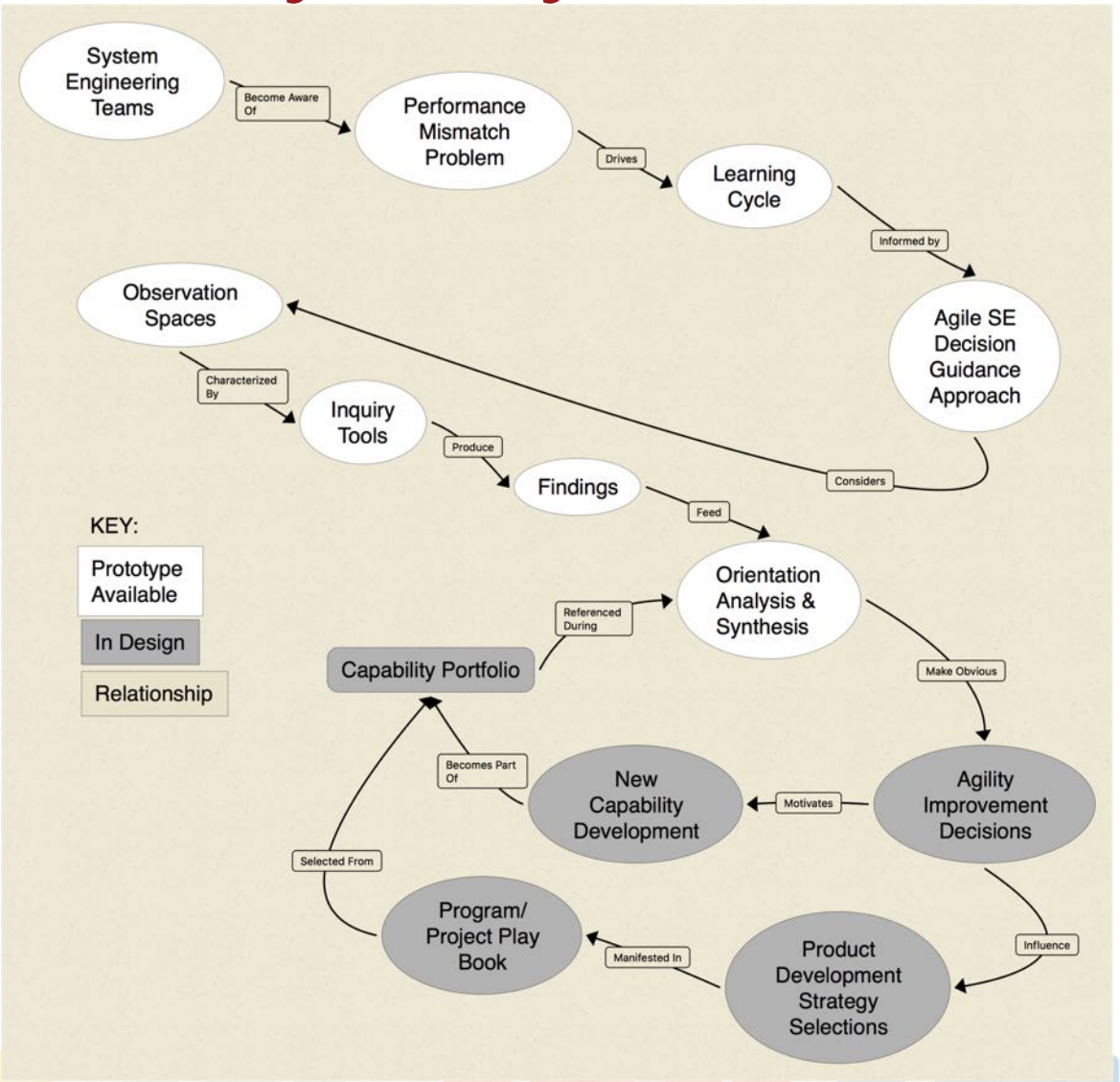
Decision Guidance Is Really A System

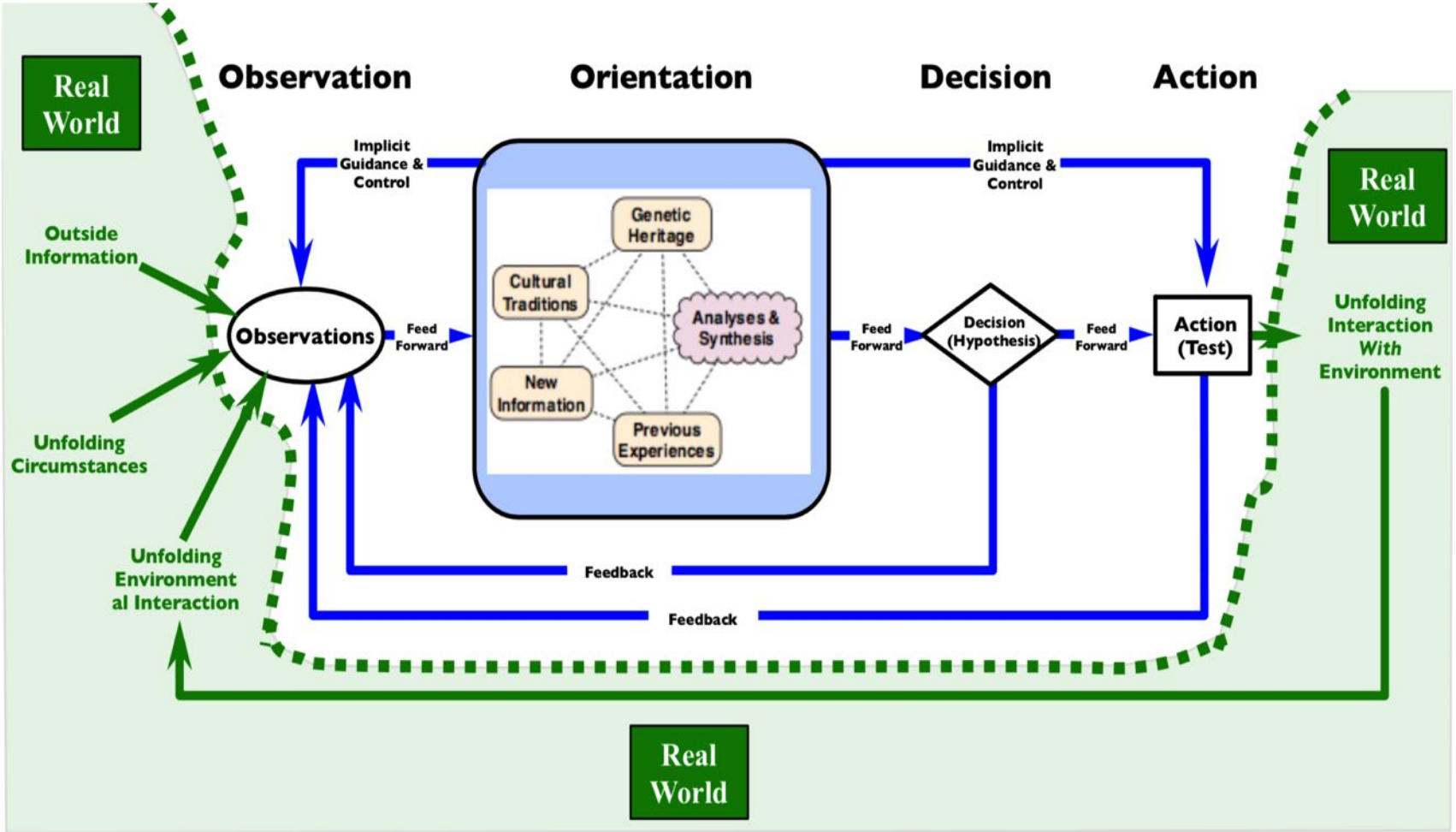
- Scope
- System Elements
- Relationships
- Organizing Framework

KEY:

Prototype Available

In Design

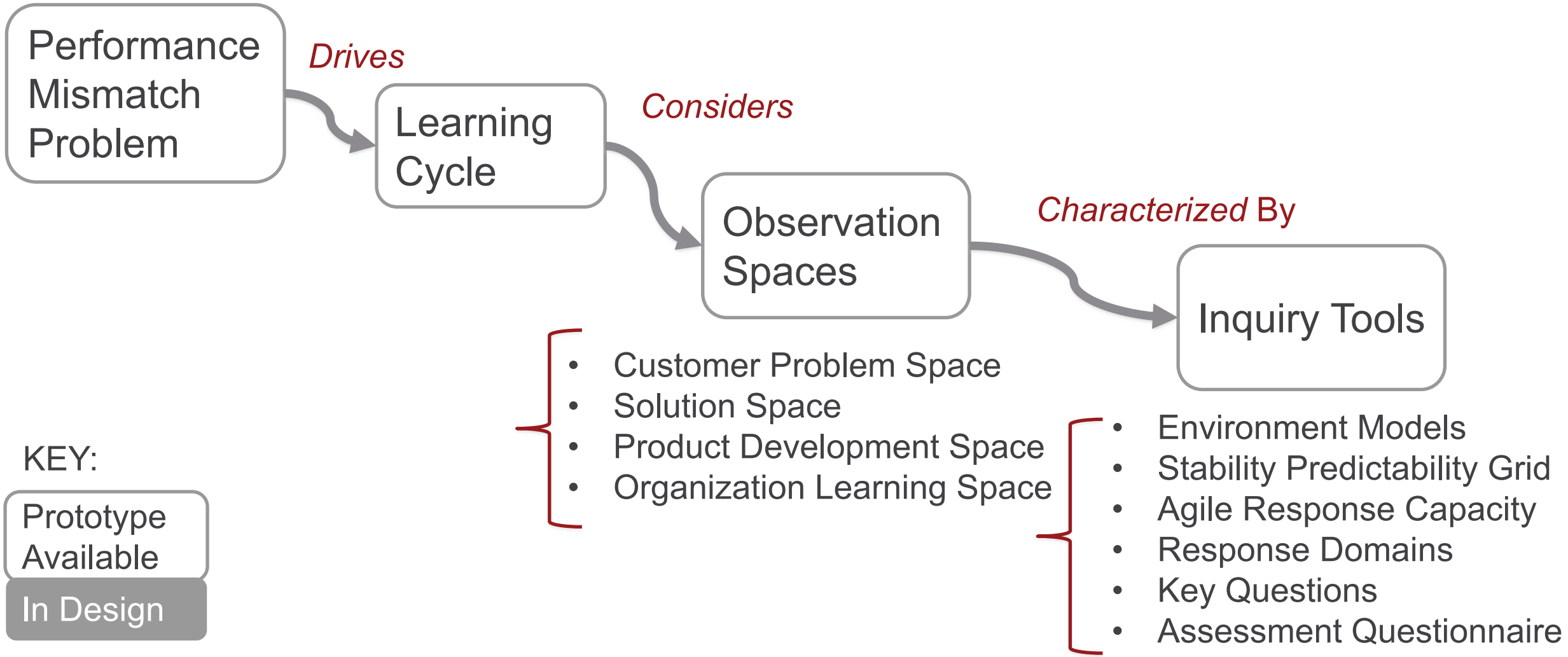




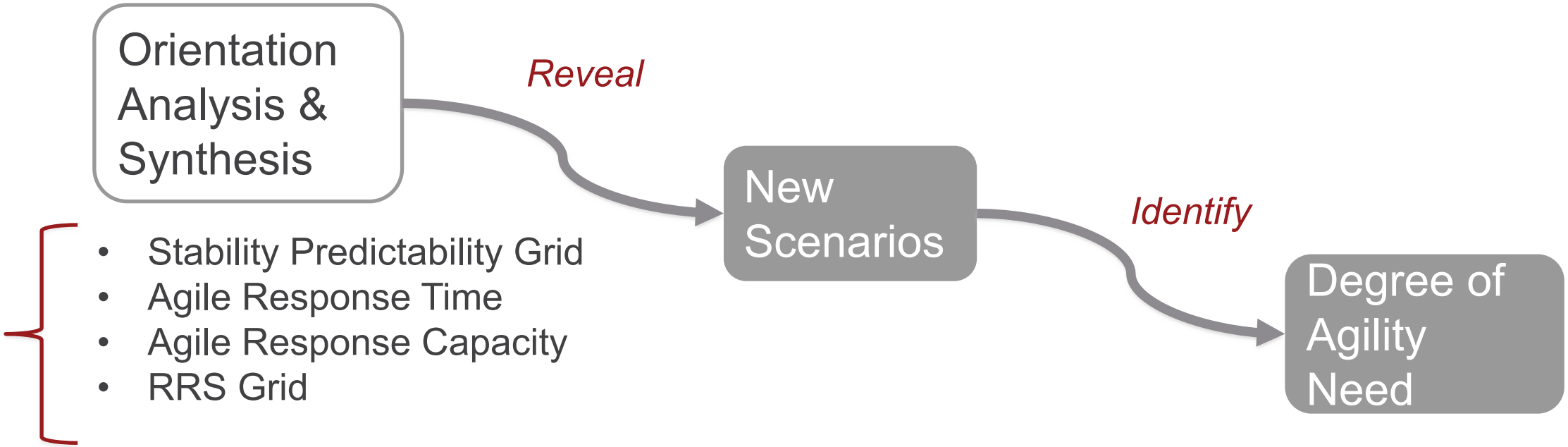
Choosing The OODA Loop For An Organizing Framework

Framework For An Information Processing System Whose Purpose Is To Provide A Guide For Action

OODA State - Observing



OODA State - Orienting

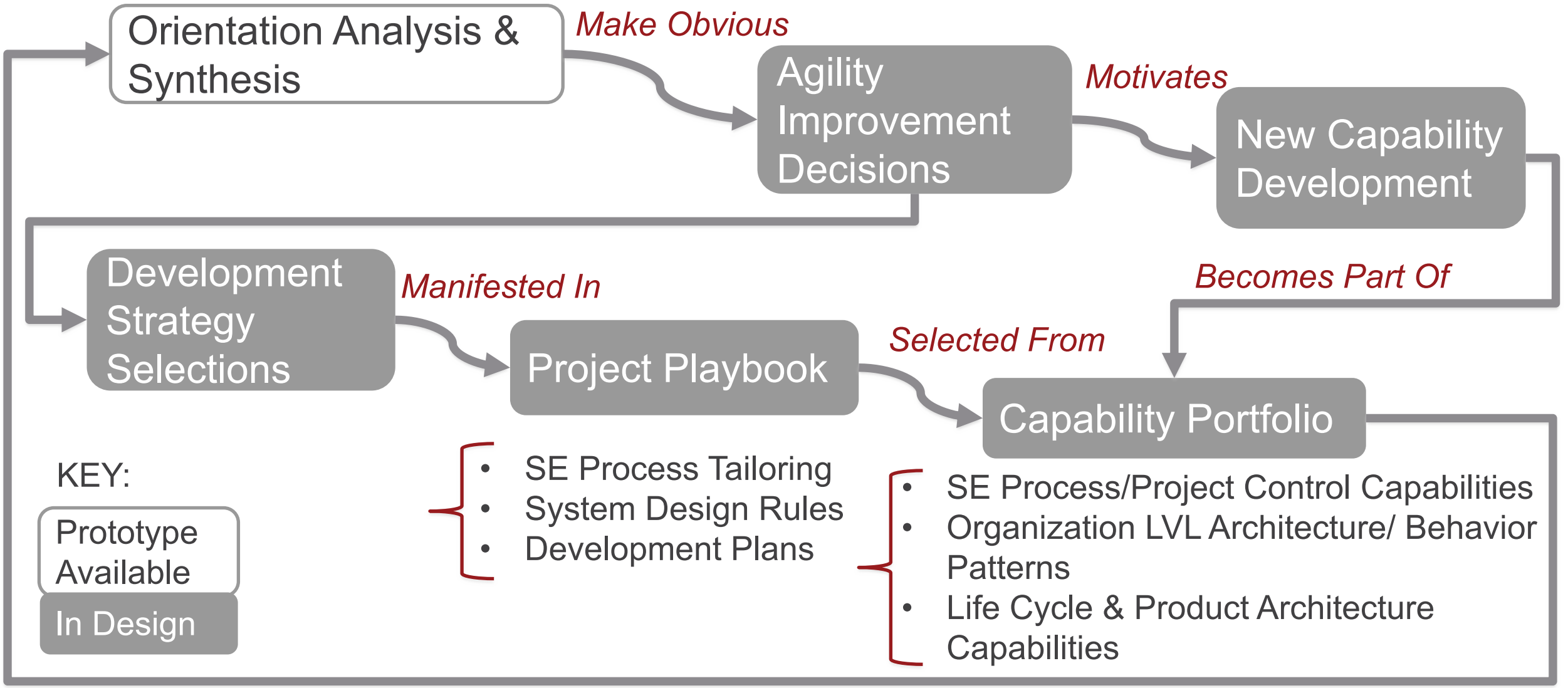


KEY:

Prototype Available

In Design

OODA State - Deciding



Joe's Story

Think Short Story
- There are settings
- There is a hero
- There is a conflict
- There is a strategy in play
- There are other actors

- ✓ Captures the problem space
- ✓ One author but many can weigh in to ensure accuracy
- ✓ Used as reference for assessment

"Easy reading is damn hard writing" Nathaniel Hawthorne

Observation Space Design

Customer Problem Space

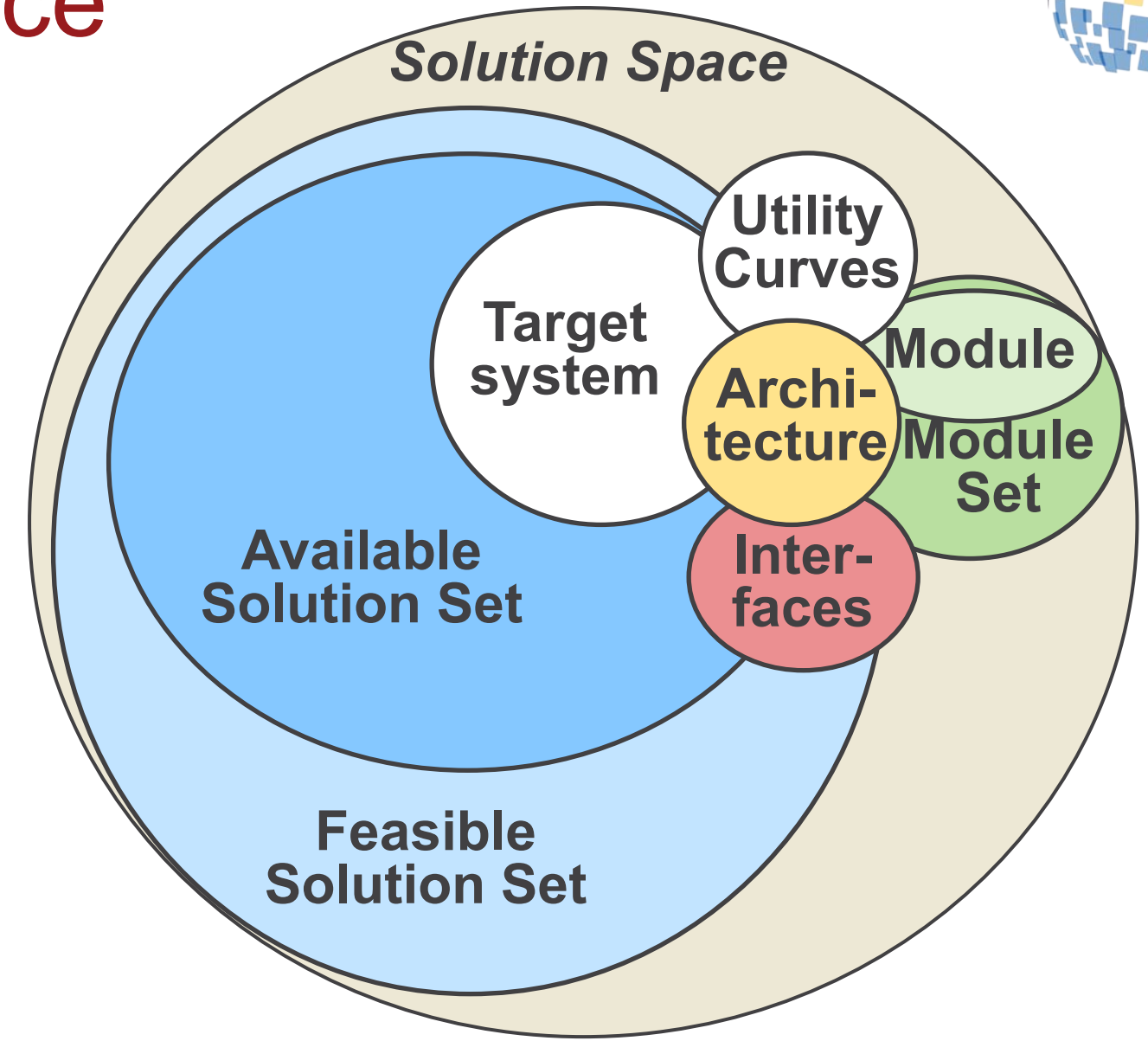
Target System Aspects For Assessment

- What drives purpose, timing, and capabilities?
- How Dynamic Is This Space?
- What Kind of Variation Might Be Expected?
- What Capacity Requirements Need To Be Served?

Solution Space

Solution System Aspects For Assessment

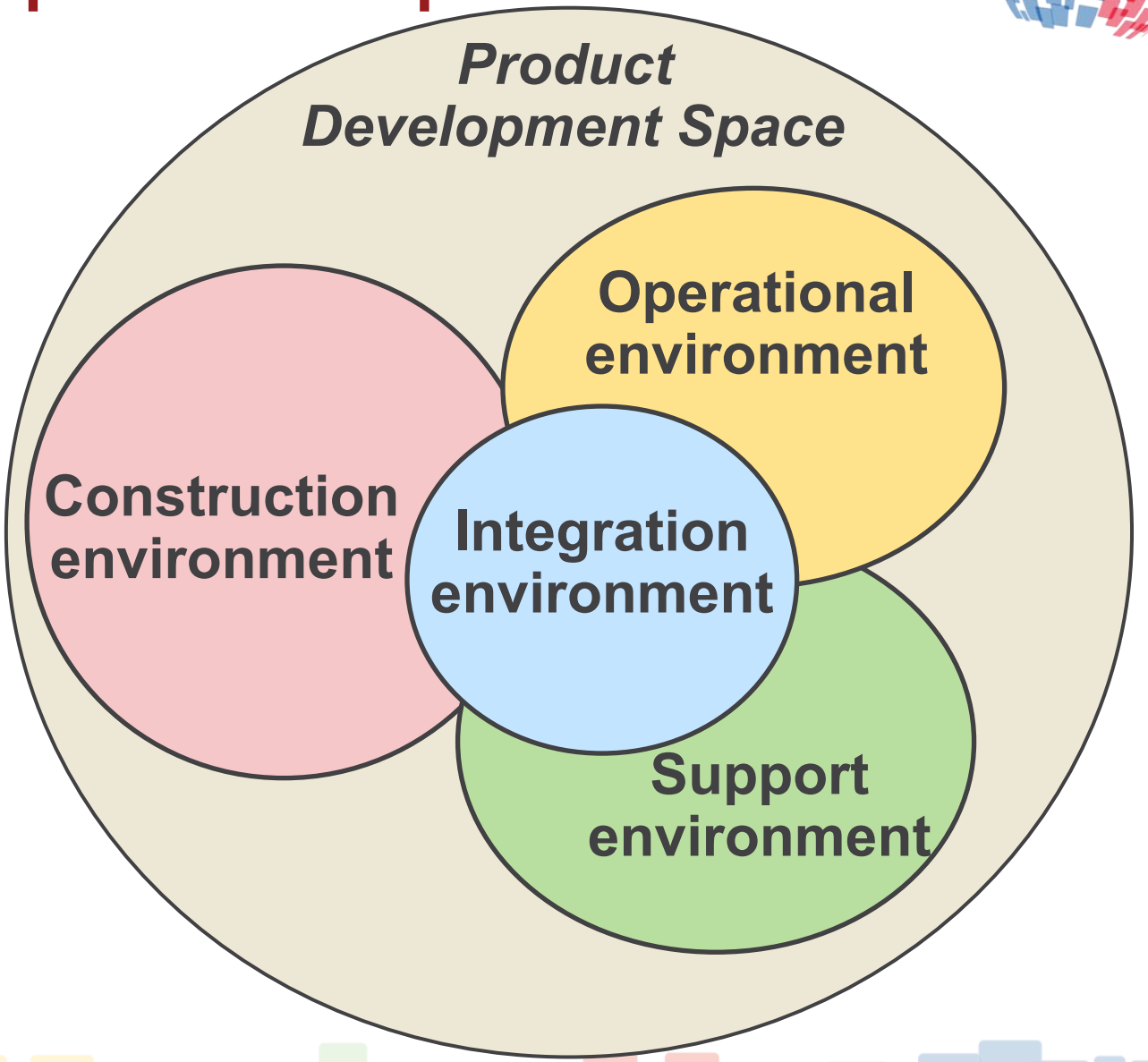
- What drives purpose, timing, and capabilities?
- How Dynamic Is This Space?
- What Kind of Variation Is Needed?
- What Capacity Requirements Need To Be Available?



Product Development Space

PDS Aspects For Assessment

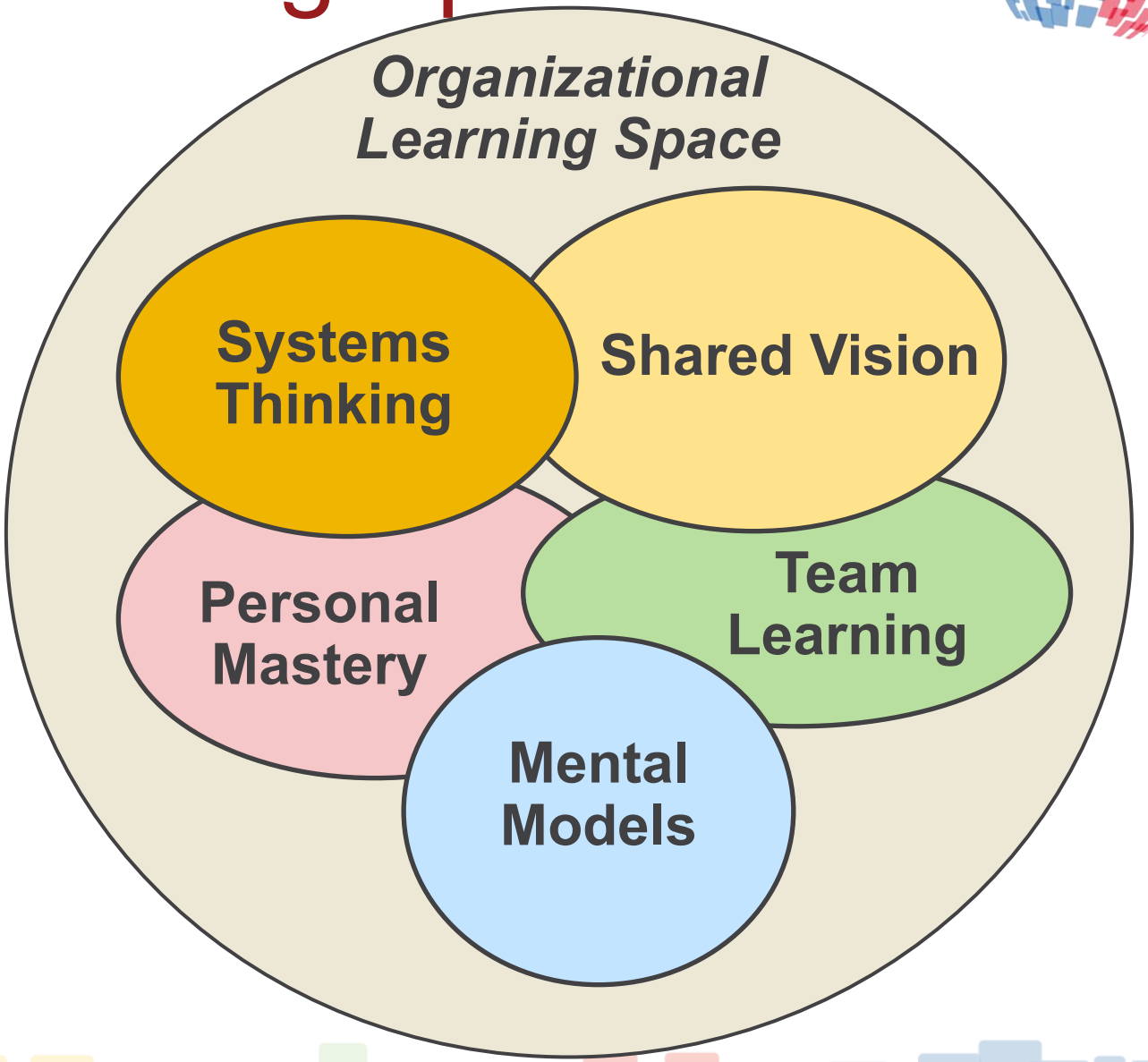
- What drives purpose, timing, and capabilities?
- How Dynamic Is This Space?
- What Kind of Variation Is Needed?
- What Capacity Requirements Need To Be Available?
- What Is Nature Of Coupling Between Environments?



Organization Learning Space

Learning Space Aspects For Assessment

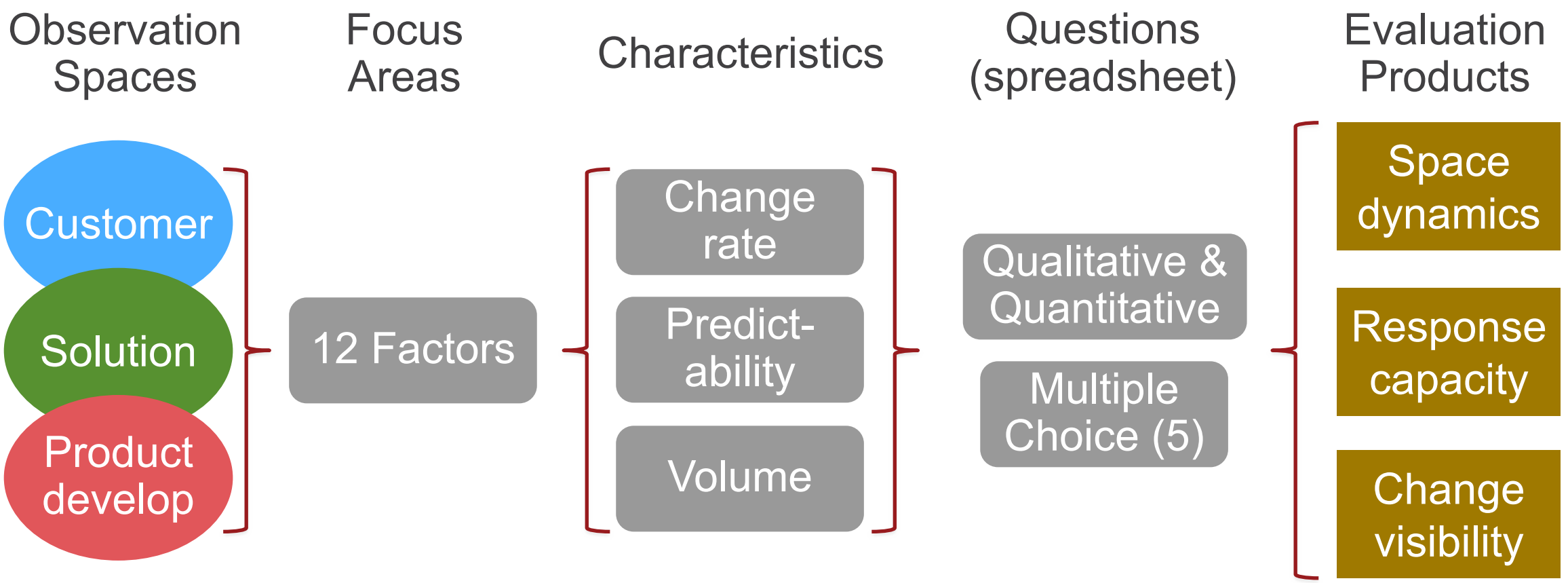
- How is new knowledge about processes, practices, products and vision shared?
- How are Organizational and individual mental models of past practices evolved to revised practices?
- What mechanism is used to facilitate team learning?



Assessment of Agility Need

Form of Assessment

The Prototype Assessment Tool provides important insights into Agile needs

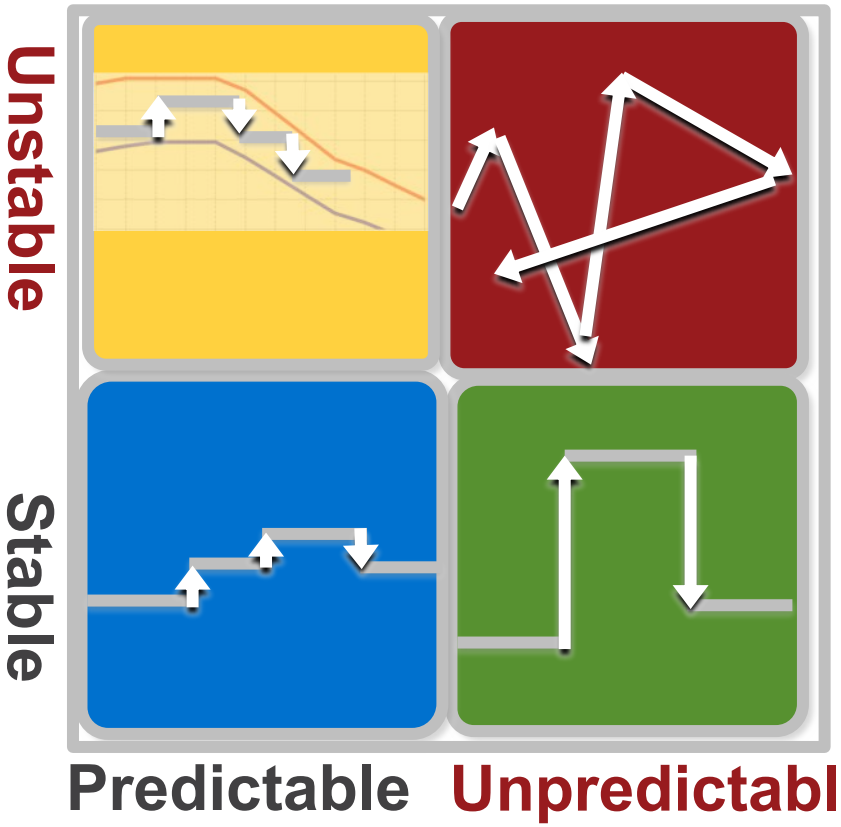


Space Dynamics: Stability-Predictability Grid

How Agile do you need to be?
This tool highlights four distinct types of dynamic behavior

Frequent changes follow predictable trends
example: introduction of a new technology

Changes are infrequent and predictable
example: regulatory environment



Changes are frequent and unpredictable
example: global competitive environment

Changes are infrequent but do not follow trends
examples: platform or market innovation

Stability-Predictability Grid - Results

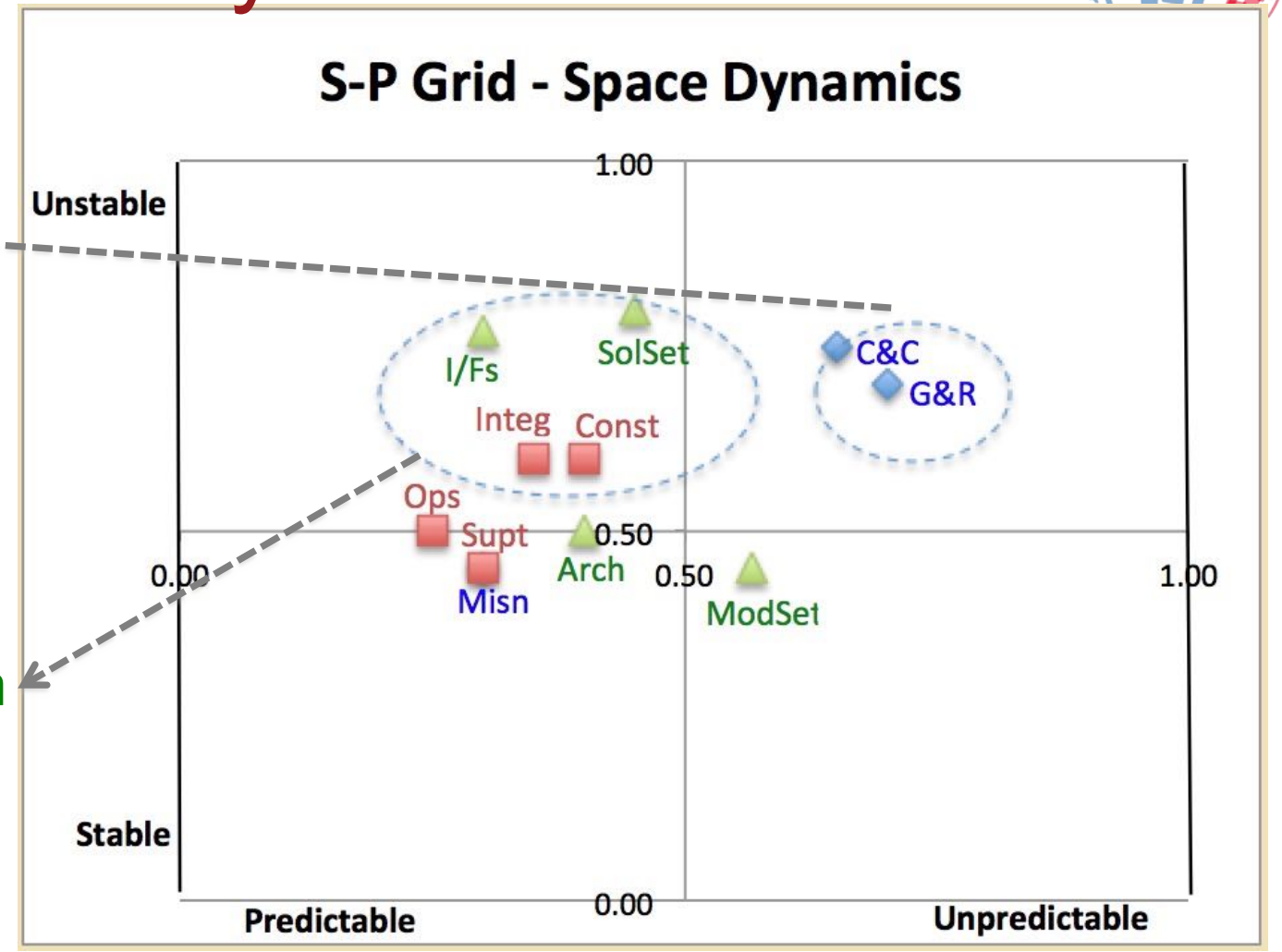
Factors are mapped to the S-P Grid, showing observation space dynamics

Goals & Requirements, Challenges & Constraints fall in the most dynamic quadrant:

- *Consider project design improvements for faster monitoring and response*

Solution and Development System factors fall in the upper-left (pattern) quadrant:

- *Associate with known patterns and monitor for emerging trends*



Response Capacity - Results

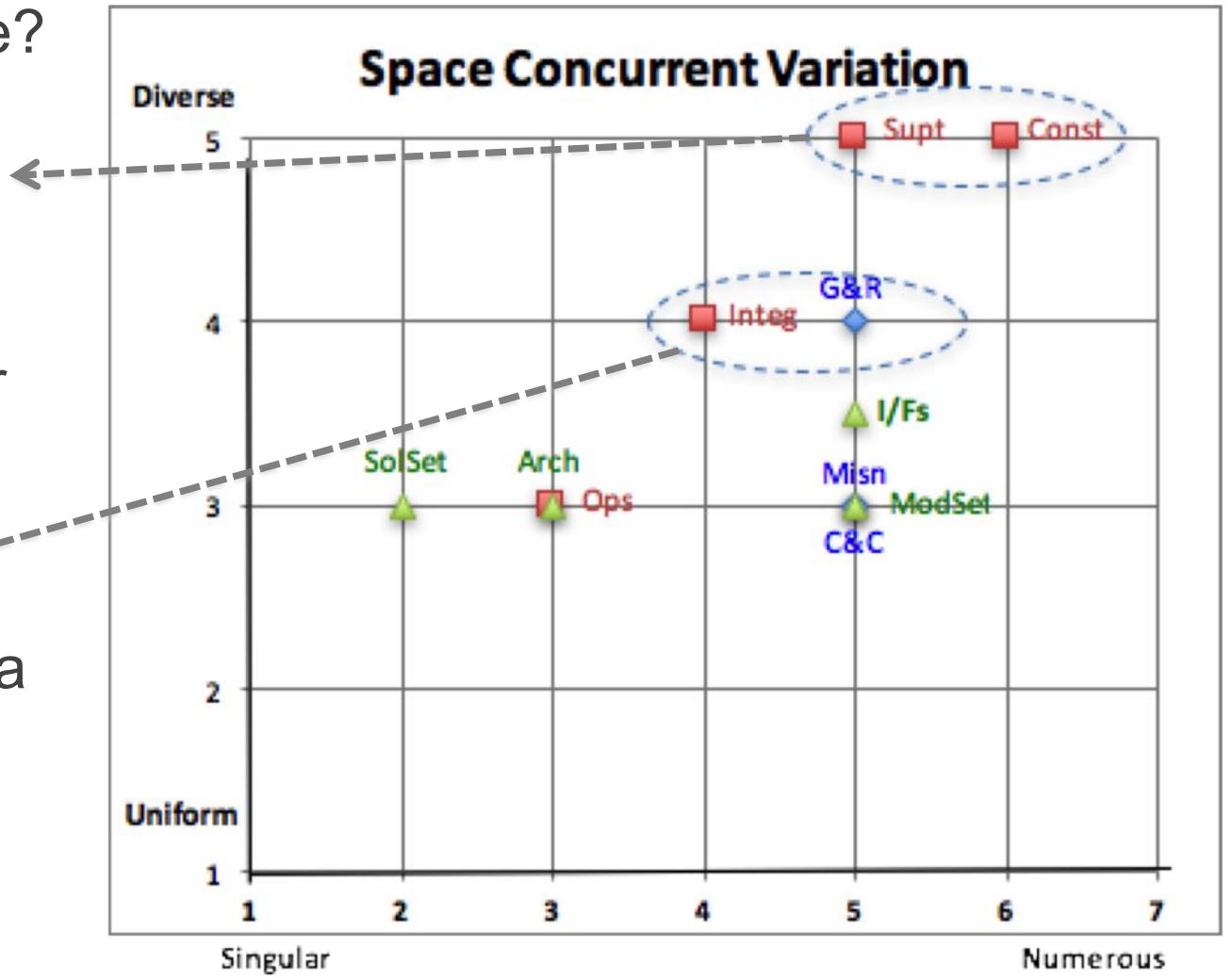
How many unique instances are there?

Construction and Support Environments are highly varied and numerous

- Design the project to allow for enough capacity to support many concurrent variations

Goals and Requirements and Integration Environment are only a little less varied and numerous

- Project design should plan adequate capacity to accommodate them



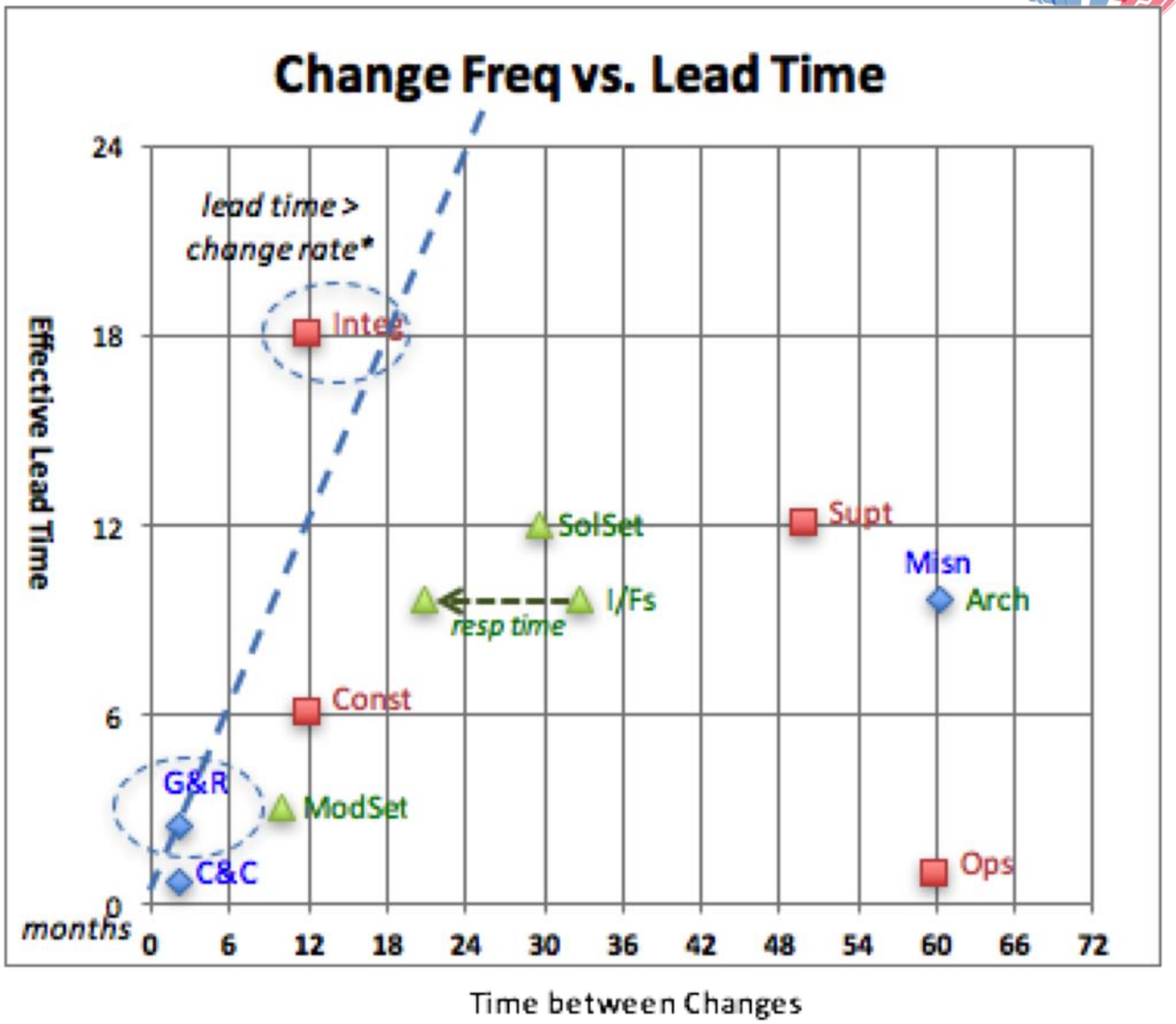
Change Visibility - Results

Do you know soon enough? Is observation lead-time less than the rate of change?

Total Time To Respond = lead-time + response time

When total response time exceeds change rate, the project will be one or more change cycles behind

- Circled factors are too slow, even without considering time to respond Design project to improve monitoring lead time



Findings and Future Work

Findings – Efficacy Of Method

Values	Initial Prototype Experience
Directionally Correct Decisions	Assessment casts a broad net S-P grid mapping allows teams to see/discuss areas to focus on
Wide Range Applicability	Observation spaces not tied to specific industry. Need more trials to prove
Simple and Quick To Use	Effort = story + assessment + mapping = apprx 12-16 hours Basis for group discussion/validation and synthesis leading to decisions
Agile SE Community Work Product Integration	Agile fundamentals integration Capability portfolio for capturing patterns, examples, life cycles

Invitation and Future Work

- We have a prototype – Do you want to be an early adopter?
  - Create a story, use the assessment, map answers to the S-P grid
  - Use as basis for team/group discussion
  - Support a debrief to the team
  - Make improvement recommendations
- Next work phase – work the deciding phase activity of the OODA loop
  - Organizational behavior and service model patterns
  - Form of the playbook
  - Look at populating a capability portfolio with known examples

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