

Agile Enterprise Cornerstones Knowledge, Values, and Response Ability

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**Opening Keynote at
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Business Agility and IT Diffusion
Atlanta May 8-11, 2005**

Backup Paper at

www.parshift.com/Files/PsiDocs/Rkd050508IfipKeynote.pdf

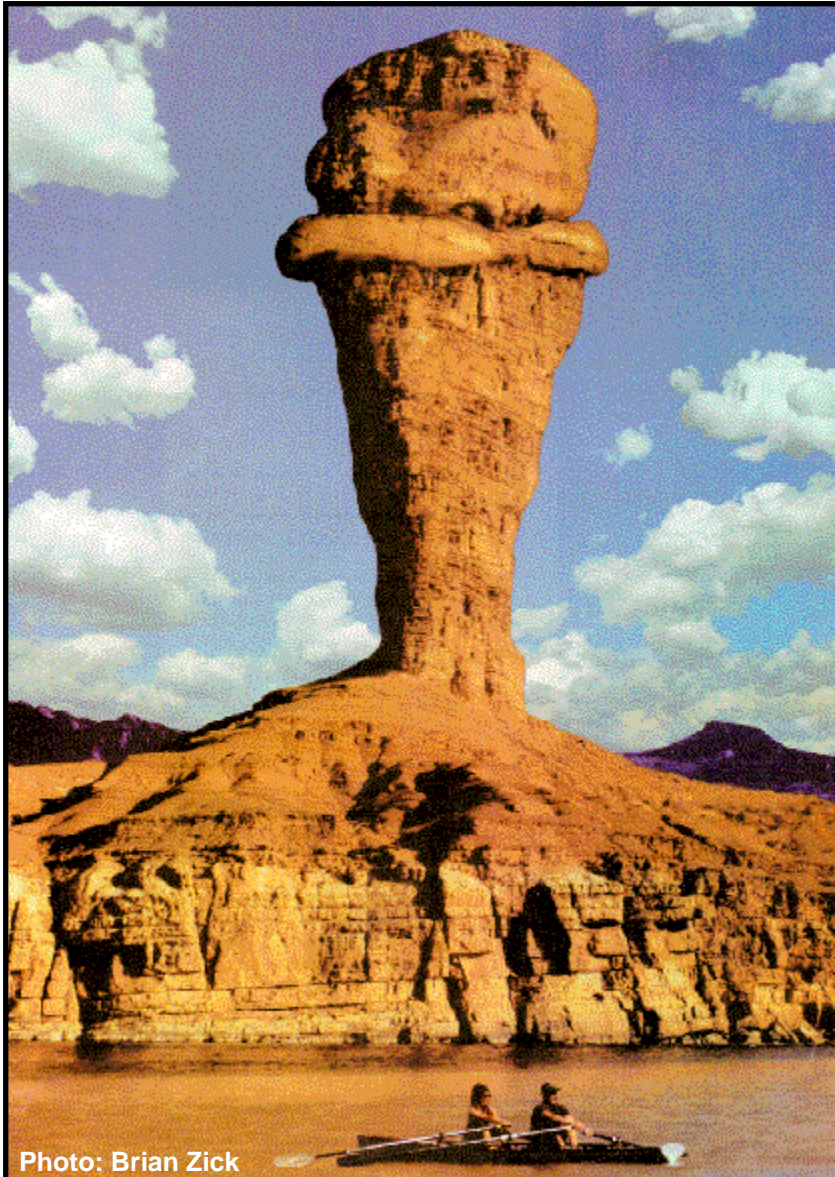


Photo: Brian Zick

Rick Dove

- CEO, Paradigm Shift International
 - Chairman, Agile Security Forum
- Recent Interim Exec Engagements:
- CIO/CSO at Silterra, 1999-2002
 - President at ProMetal, 2002-2003

Carnegie Mellon: BSEE

UC Berkeley: unfinished PhD in
Computer Science

30+ years of start-ups and turnarounds

Co-founder of *Agile Enterprise* concept
in '91 at Lehigh Univ.

Author: "**Response Ability: The
Language, Structure, and Culture of
Agile Enterprise**", Wiley, 2001.

New Book: "**Value Propositioning:
Perception and Misperception in
Decision Making**", Jan 2005

Lives in Taos, New Mexico, at 8200 feet
.....Land of Enchantment.



The Nature of the Business Environment

Unpredictable and Unexpected



©Kurt Jones 2003

How many organizations are older than 100 years?

- Why is this? (What kills them off)**
- How is this? (What keeps them alive)**

We are watching the death-slide of General Motors.

- Why is this happening? Is it reversible?**
- Has an IT mess caused GM's death slide?**
- What role *would* IT play in GM's recovery?**

IT is a Key Element of Today's Enterprise Infrastructure

Art: Jamcracker

Enterprise Infrastructure - Change Management



Breaking The Log Jam

Where is our research and knowledge base?

- How to break them.**
- What causes them?**
- How to avoid them?**

We have no clue.

We run up against the social and cultural issues ... and run away.

The solution requires systems and engineering science....

If we won't deal with it, who will?

Today's Agility Interest – Origin

- 1991** – SecDef funded project at Lehigh University to identify next manufacturing competitive focus beyond Lean
 - 13 companies participated full-time in 3-month workshop
 - Two volume report: 21st Century Manufacturing Enterprise Strategy
 - Problem and opportunity defined
- 1992** – Agility Forum founded at Lehigh, funded by a few participants
 - Purpose: Identify nature of Agile solution
 - Method: Industry collaborative workshops
- 1994** – DARPA/NSF fund Agility Forum - \$25 Million
 - Research steering group and agenda established
 - >250 orgs and >1000 participants in focused workshop groups
 - Conferences, papers, reference base, tools, reference model
- 1998** – Mission accomplished, Agility Forum dissolved
 - Agility pursuit by industry and IT vendors entrenched

Defining Systems Agility

Observation: Business systems are ill-prepared to respond to changing needs in the unpredictable and uncertain business environment.

Accepted definition: "the ability of an organization to thrive in a continuously changing, unpredictable business environment." [various]

Systems specific: "The technical subsystems of communication, information, engineering, and manufacturing, will be built from modules such that they can be easily and rapidly reconfigured so as to seize business opportunities.

My working definition: Agile systems are ones that can respond to both reactive needs and proactive opportunities - when these are unpredictable, uncertain, and likely to change.

**Agility is Risk Management:
it decreases vulnerability and risk by
increasing response options and response predictability**

Agile-Systems Analysis Research

Problem:

- Technology and markets changing faster than enterprise ability to employ and accommodate**
- Requirements of enterprise-systems are uncertain and unpredictable**
- Flexible systems inadequate when requirements change**
- New approach needed that could extend usefulness/life of systems**

Note: This research took place at the Agility Forum 1992-1996, and in the author's independent research 1997-1999



Agile-Systems Analysis Research

Solution Search:

- ❑ Looked for systems that responded *effectively* to changing requirements
- ❑ Hypothesized *effectively* as sufficient response when measured by:
1) response time, 2) response cost, 3) response quality, 4) response scope
- ❑ Hypothesized categories for system-requirements-change as:
1) reactive/demanded and 2) proactive/initiated
– with 4 sub-categories each
- ❑ Hypothesized nature of response-enabling design principles
- ❑ Examined 100s of systems of various types
(products, processes, procedures, peopled)

Agile-Systems Analysis Research

Methodology:

- ❑ Collaborative knowledge-development workshops with 10-20 "responsible" people, analyzing 2-3 systems:
Realsearch = real people, real problems, real-time
- ❑ Framework driven analysis: metrics(4), change(2x4), principles (10)
- ❑ Evolved the analysis frameworks throughout
- ❑ Captured results in Papers, Benchmark Report, Reference Model, and Book

Publications available at www.parshift.com/library.htm and www.parshift.com/publications.htm



What Analysis Found – System Requirements

Proactive response-needs adequately encompassed by four categories:

Creation Improvement Migration Modification

Reactive response-needs adequately encompassed by four categories:

Correction Variation Expansion Reconfiguration

Response effectiveness adequately encompassed by four metrics:

Time Cost Quality Scope

Note: *Adequately* means we found no issues or metrics that couldn't fit within the categories, yet found sufficient uniqueness of issues to warrant the variety of categories.

What Analysis Found – System Design

One general strategy:

1. **Reusable modules reconfigurable in a scalable framework.**

Two general concepts:

1. **Scalable Framework**
2. **Pool of modules**

Three general capabilities:

1. **Assembly of new system configurations from existing modules**
2. **Augmentation of module pool with new module type or version.**
3. **Evolution of framework to accommodate new requirements**

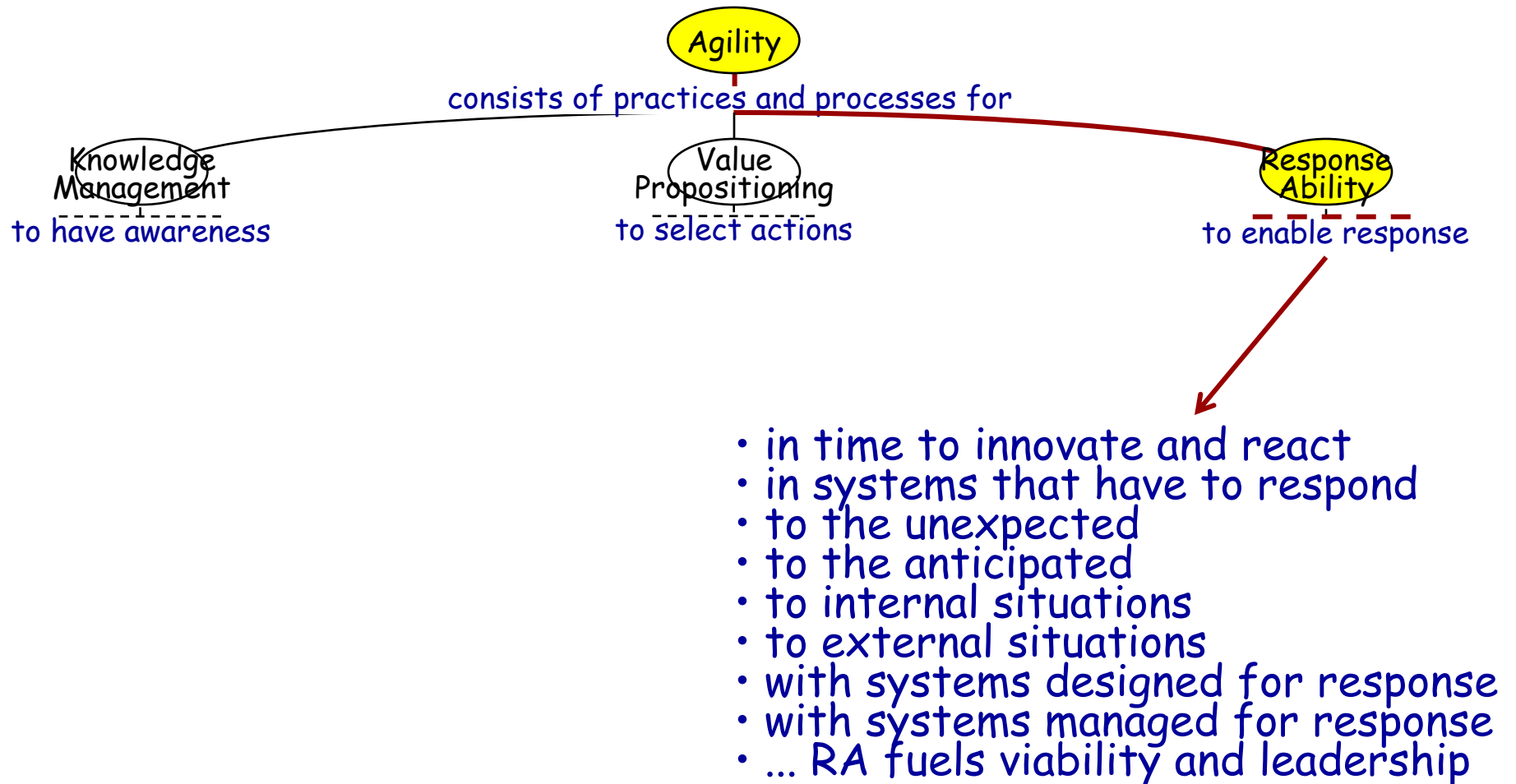
Ten general design principles:

1. **Evolving Standards**
2. **Encapsulated Modules**
3. **Facilitated Plug Compatibility**
4. **Facilitated Module Reuse**
5. **Module Redundancy/Diversity**
6. **Elastic Capacity**
7. **Distributed Control/Info**
8. **Facilitated Deferred Commitment**
9. **Flat Interaction**
10. **Self Organization (simple, rare)**



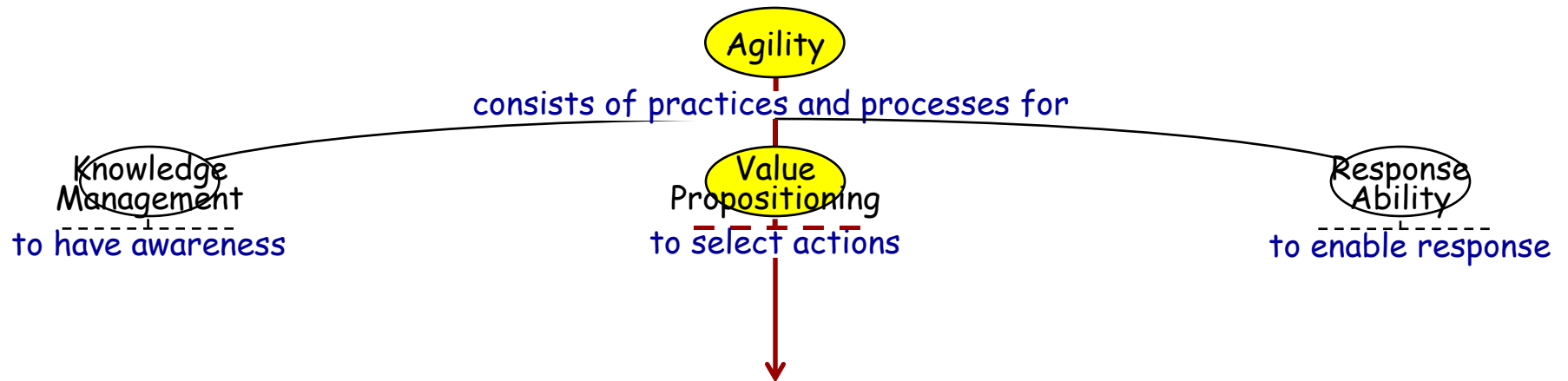
Agility Fundamentals

Enterprise Agility



Concepts That Enable Agility

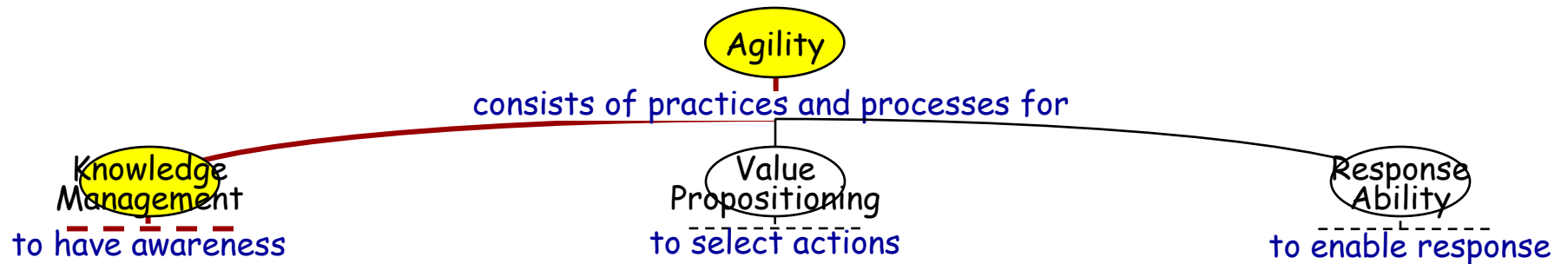
Enterprise Agility



- in time to respond effectively
- establish/change value targets
- establish/change excellence definitions
- build new business processes
- evolve business process framework
- which standards to adopt
- seek/abandon/align with new partner
- seek/abandon/align with new market
- assemble new configuration
- prioritize/reprioritize development
- how to mitigate risks
- ... VP-ing fuels effective response

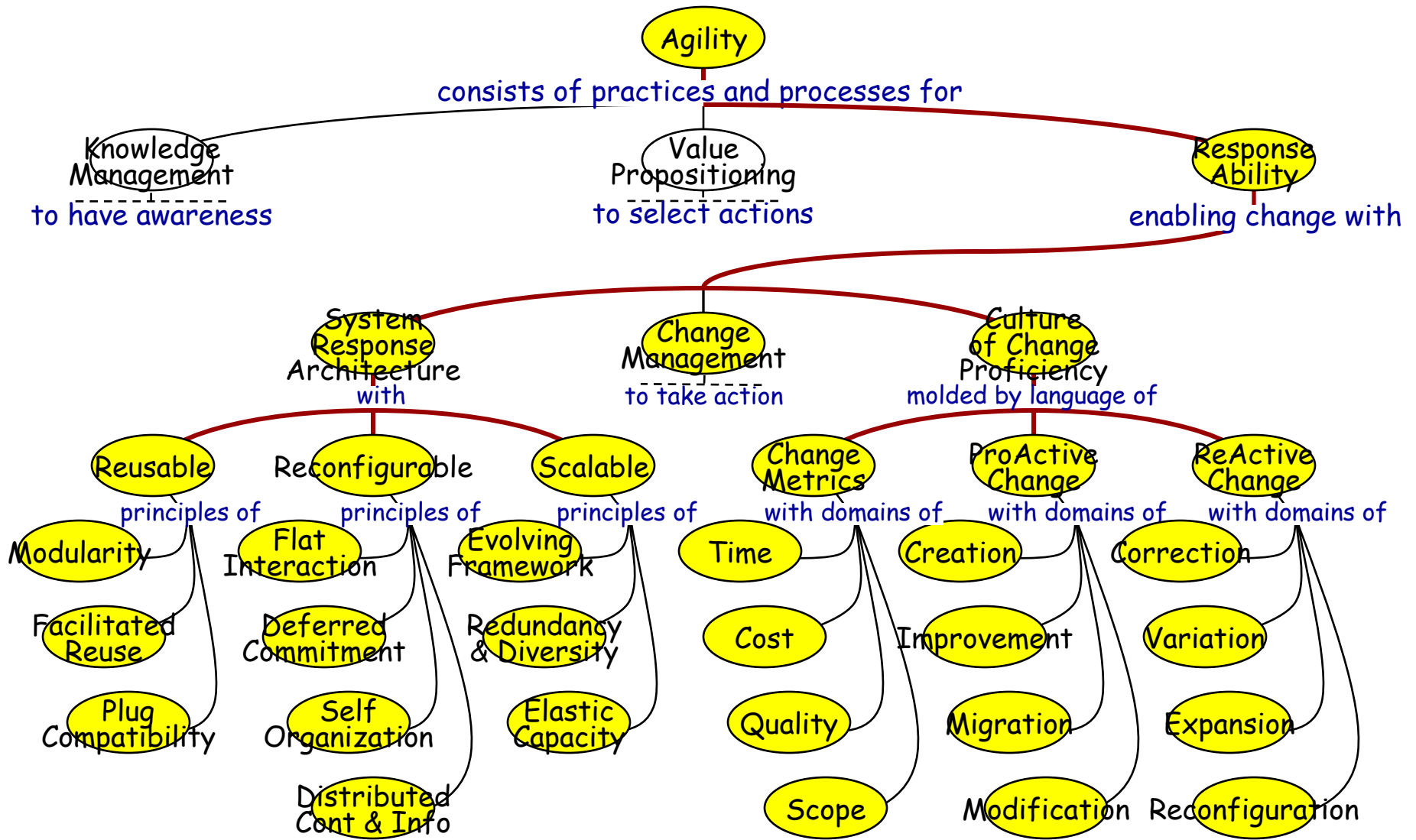
Concepts That Enable Agility

Enterprise Agility

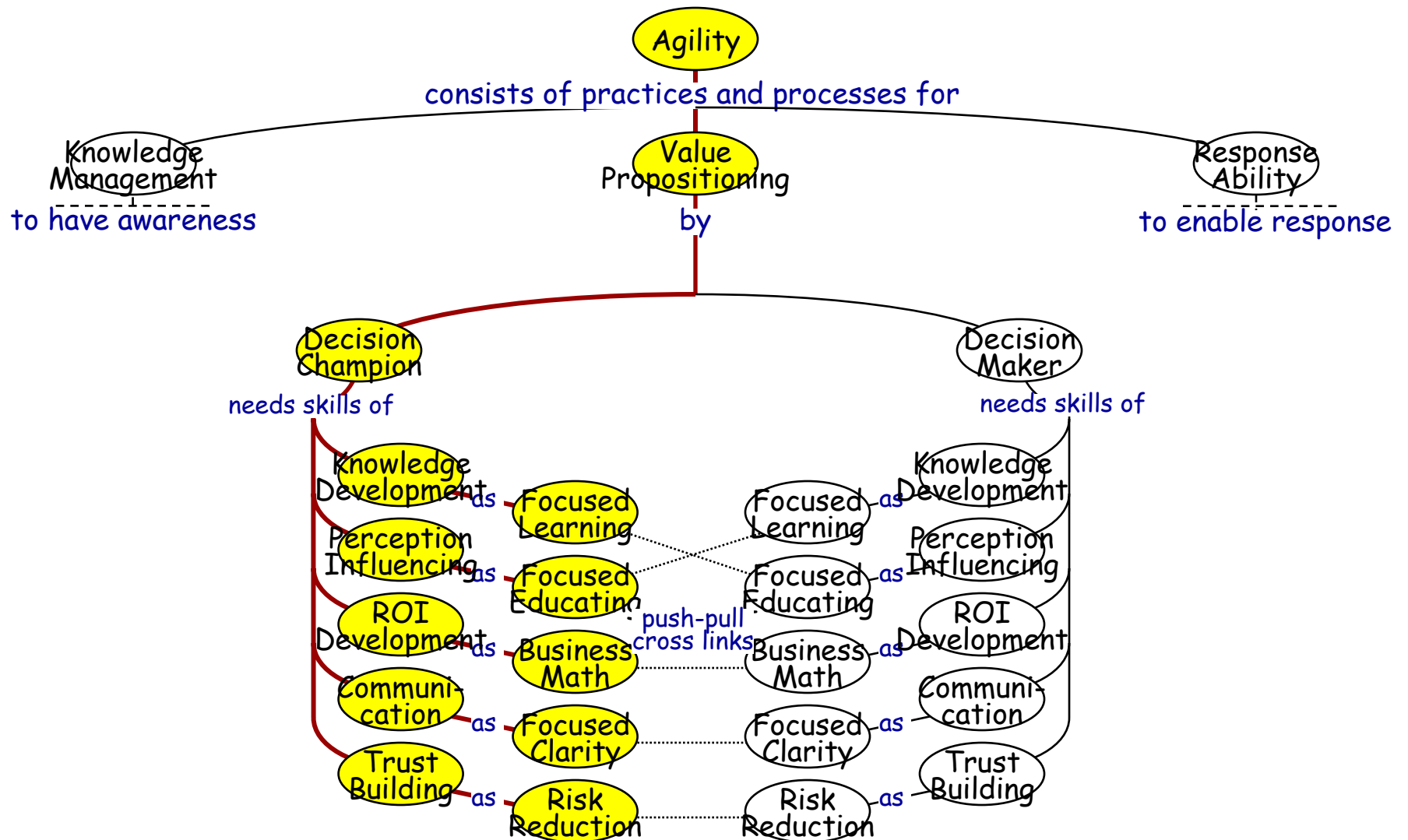


- in time to select actions
- of what markets (will) need and why
- of what customers (will) value and why
- of what partners (will) value and why
- of what you (will) need and why
- of your capabilities/competencies/talents
- of what has to be learned/unlearned
- of who needs to learn/unlearn something
- of the risks
- of the dynamics
- of reality and how it bites
- ... KM fuels effective decisions

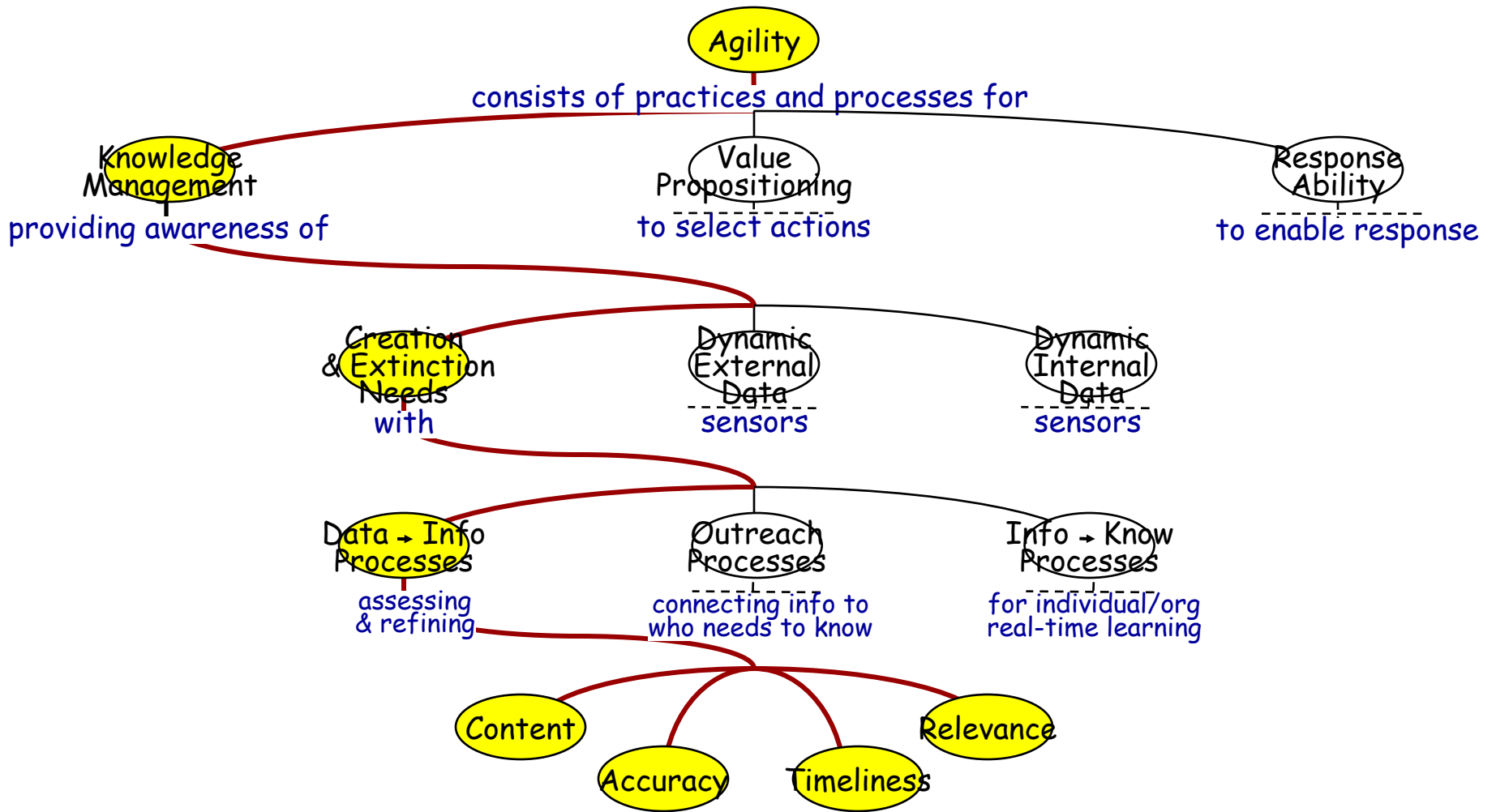
Concepts That Enable Agility



Concepts That Enable Agility



Concepts That Enable Agility



Concepts That Enable Agility

Fundamental Problem

- ❑ **Decreasing technology cycles**
- ❑ **Evolving business models**
- ❑ **Changing customer expectations**
- ❑ **Changing market profiles**
- ❑ **Increasing reliance on increasingly complex technology**

How do these affect the Enterprise?

How do these affect IT requirements?

How do these affect the IT mission?

Language

Change Comes in 2 Flavors...

Proactive changes are

generally triggered internally

by the application of new knowledge to generate new value.

Proactive change proficiency: wellspring of leadership and innovative activity.

Reactive changes are

generally triggered by events which demand a response:

problems that must be attended to or fixed,

opportunities that must be addressed.

Reactive change proficiency: foundation of viability and opportunistic activity.



...and 8 Domains...

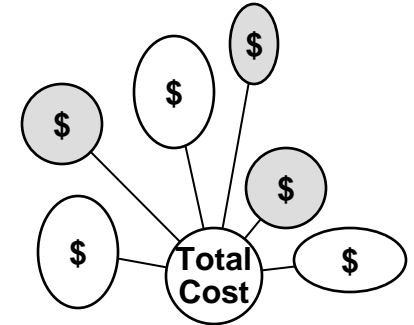
Change Domain		Definition
Proactive	Creation (and Elimination)	Build new capability (or eliminate some).
	Improvement	Continuous daily incremental upgrade.
	Migration	Foreseen, eventual, and fundamental change.
	Modification (Add/Subtract Capability)	Addition or subtraction of unique capability.
Reactive	Correction	Rectify a dysfunction.
	Variation	Real-time operating change within mission.
	Expansion (and contraction of capacity)	Increase or decrease existing capacity.
	Reconfiguration	Change relationships among modules.

...and 4 Metrics

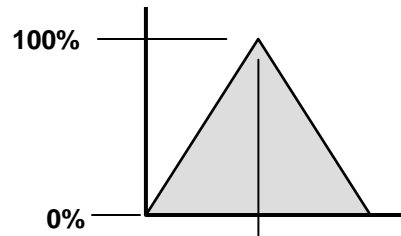
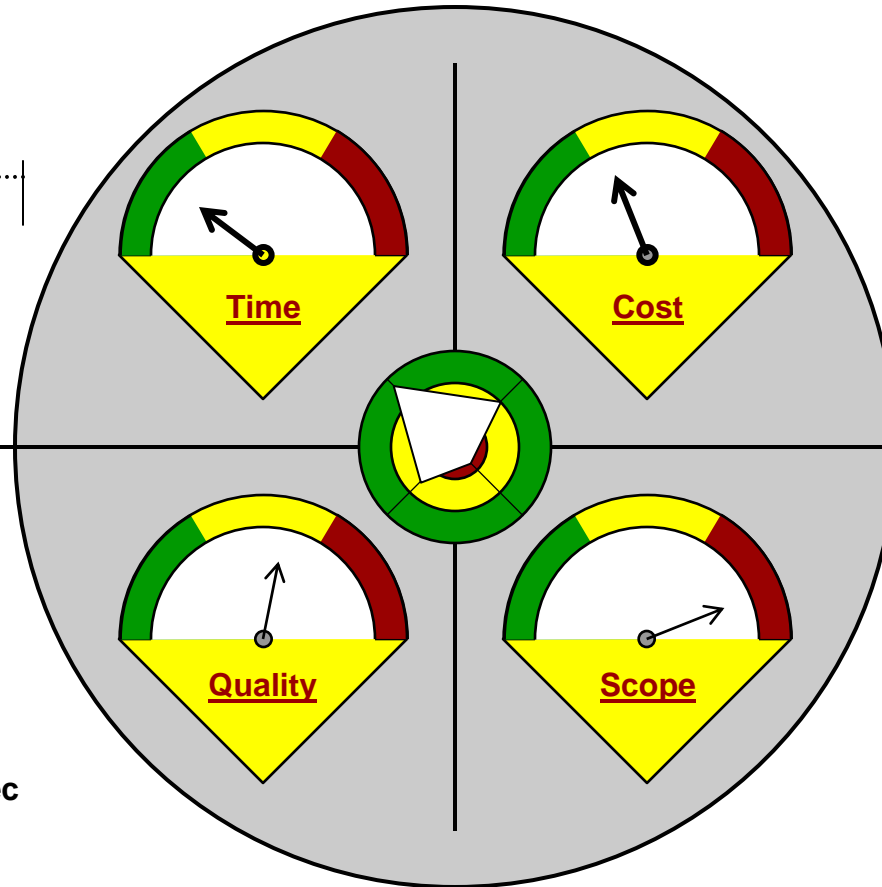
Time



Cost

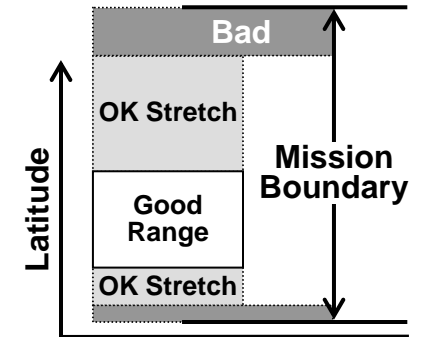


Activity Based Change-Costing



On-Time, On-Budget, On-Spec

Predictability



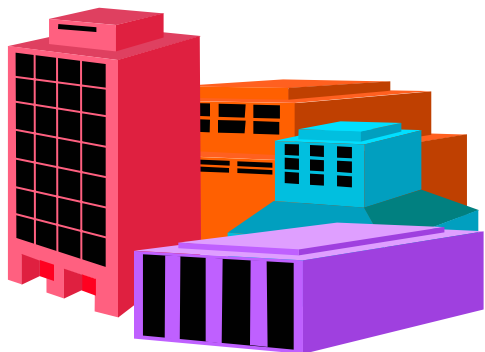
Sufficient Economic Range?

Quality

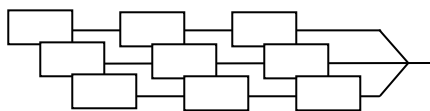
Scope

Structure

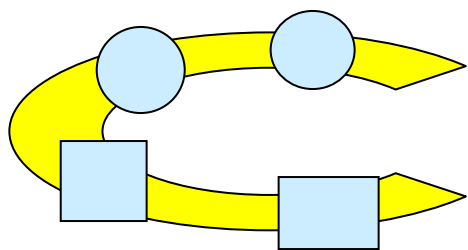
Basic Definitions



Company of Divisions



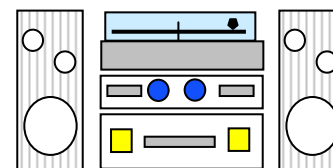
Chain of Suppliers



Cell of Workstations

System

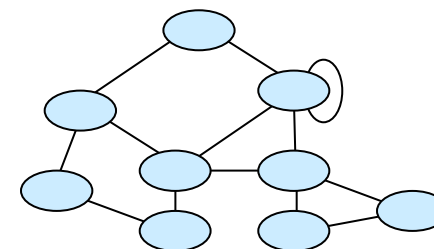
A group of modules sharing a common interaction framework and serving a common purpose.



Stereo System of Components

Framework

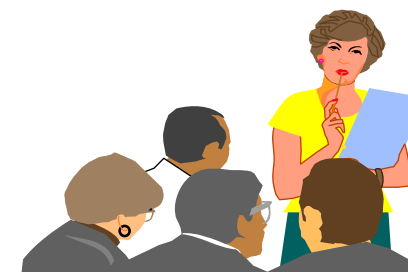
A set of standards constraining and enabling the interactions of compatible system components.



Practice of Procedures

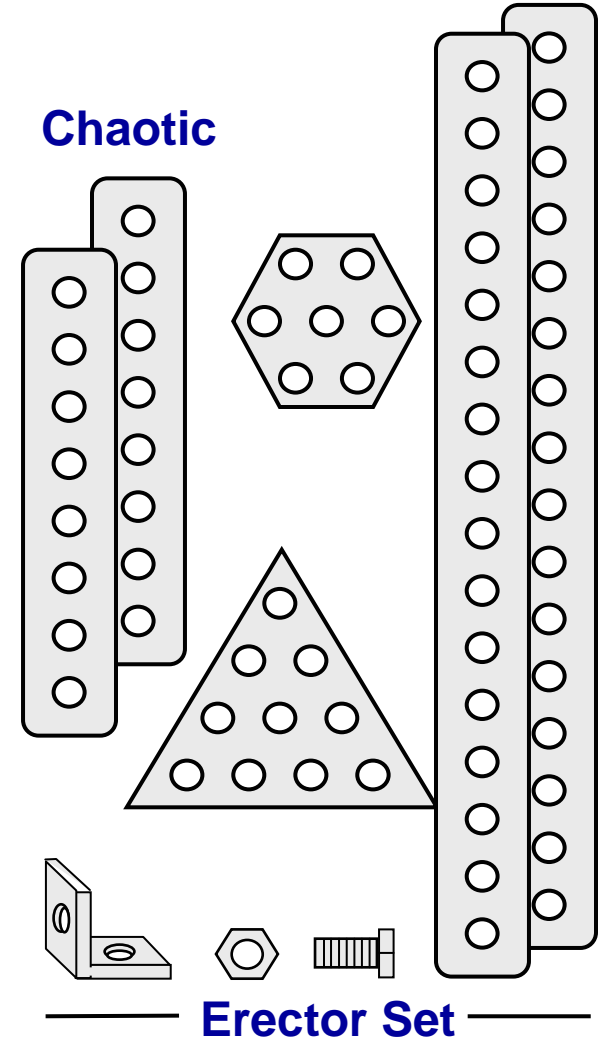
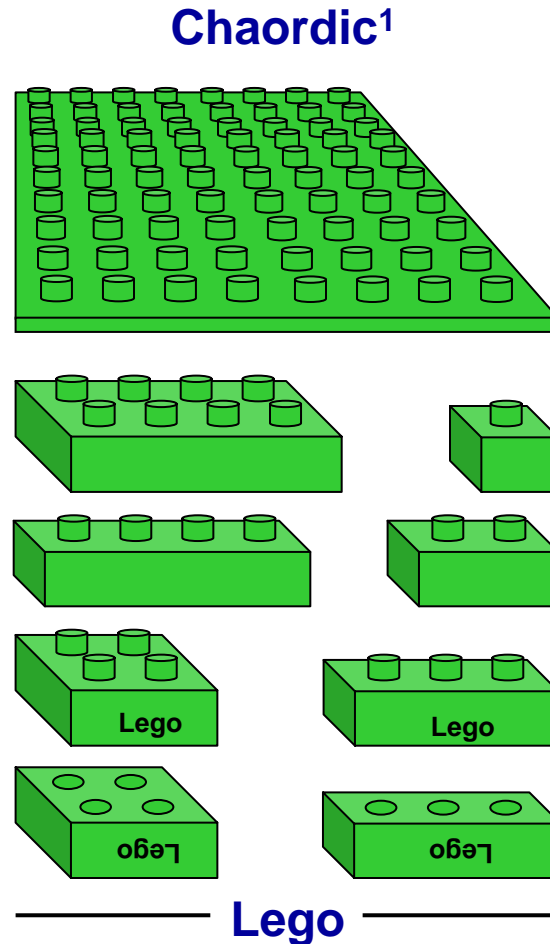
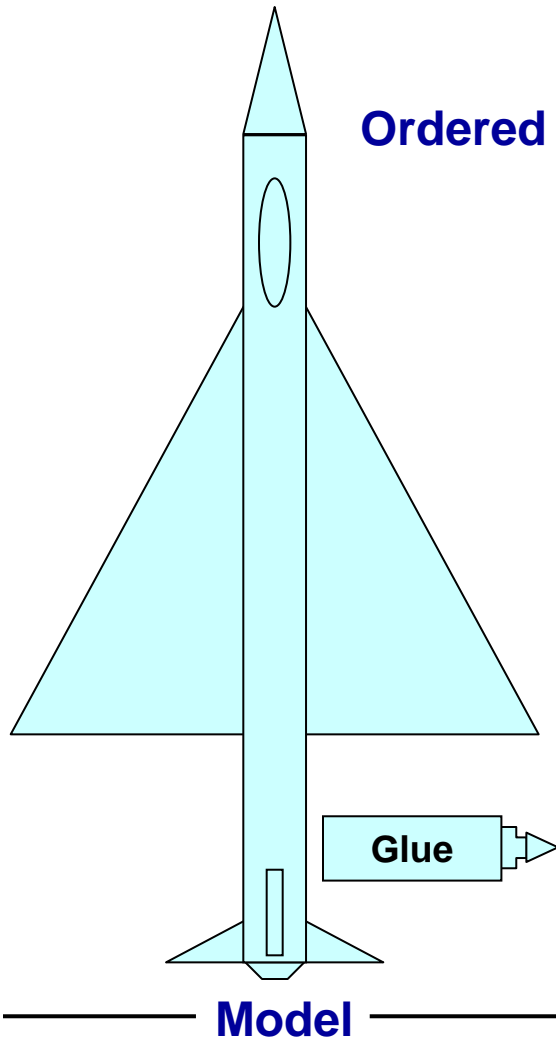
Module

A separable system sub-unit with a self-contained capability/purpose/identity, and capable of interaction with other components.



Team of People

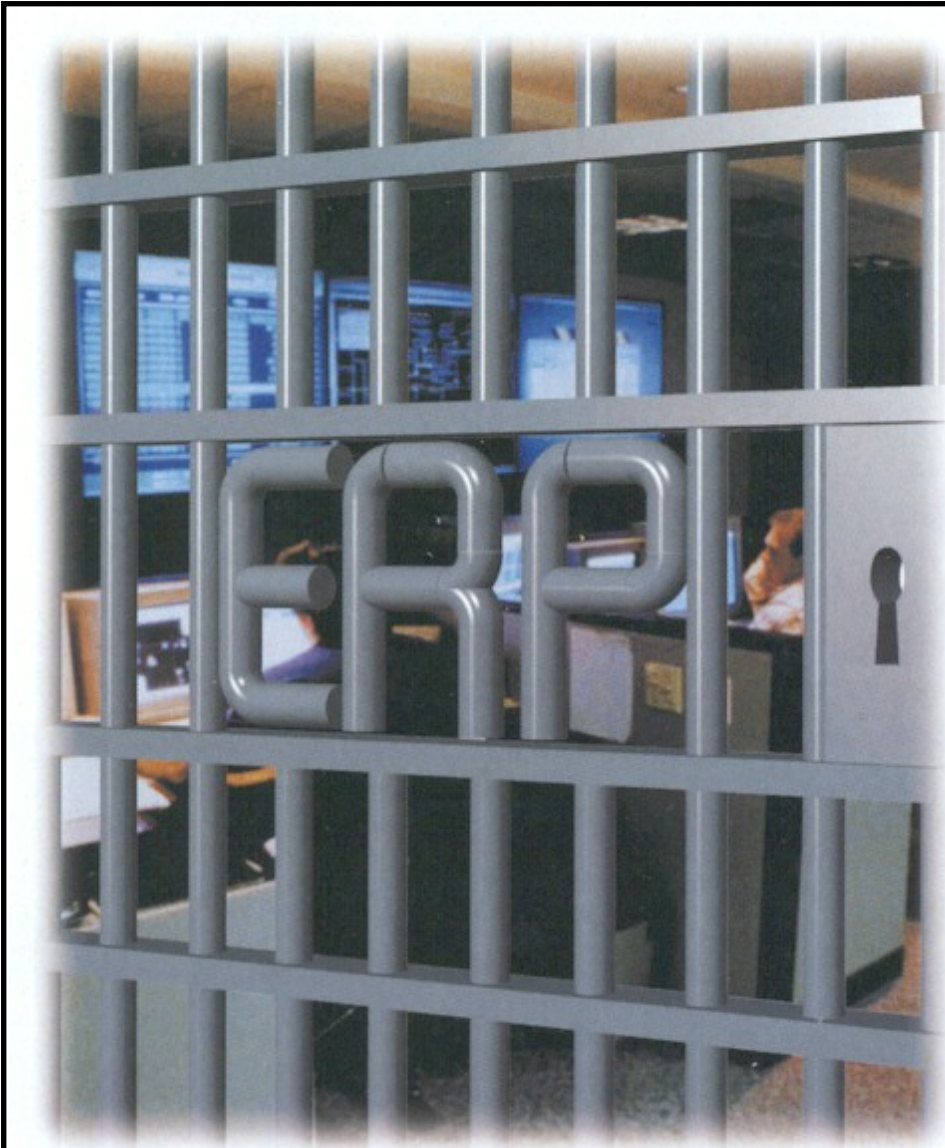
Frameworks: Three Types of Construction Toy Systems



Note: ¹ Dee Hock coined the word *chaord* for organisms, organizations, and systems which harmoniously exhibit characteristics of both order and chaos. *The Birth of the Chaordic Century: Out of Control and Into Order*, Chaordic Alliance, 1997, www.chaordic.org.

Response Able System Principles (RRS Principles)

<p>Self-Contained Units (Modules) Components are distinct, separable, loosely-coupled, self-sufficient units cooperating toward a shared common purpose.</p>	<p>Reusable Scalable</p>	<p>Evolving Standards (Framework) - Frameworks standardize inter-component communication and interaction; define component compatibility; and are monitored/updated to accommodate old, current, and new components.</p>
<p>Plug Compatibility Components share defined interaction and interface standards; and are easily inserted or removed.</p>		<p>Redundancy and Diversity Duplicate components provide capacity right-sizing options and fail-soft tolerance; diversity among similar components employing different methods is exploited.</p>
<p>Facilitated Reuse Components are reusable/replicable; and responsibilities for ready re-use/replication and for management, maintenance, and upgrade of component inventory is specifically designated.</p>		<p>Elastic Capacity Component populations in <i>response able</i> systems may be increased and decreased widely within the existing framework.</p>
<p>Reconfigurable</p>		
<p>Peer-Peer Interaction Components communicate directly on a peer-to-peer relationship; and parallel rather than sequential relationships are favored.</p>	<p>Distributed Control and Information Components are directed by objective rather than method; decisions are made at point of maximum knowledge; information is associated locally, accessible globally, and freely disseminated.</p>	
<p>Deferred Commitment Component relationships are transient when possible; decisions and fixed bindings are postponed until immediately necessary; and relationships are scheduled and bound in real-time.</p>	<p>Self-Organization Component relationships are self-determined; and component interaction is self-adjusting or negotiated.</p>	

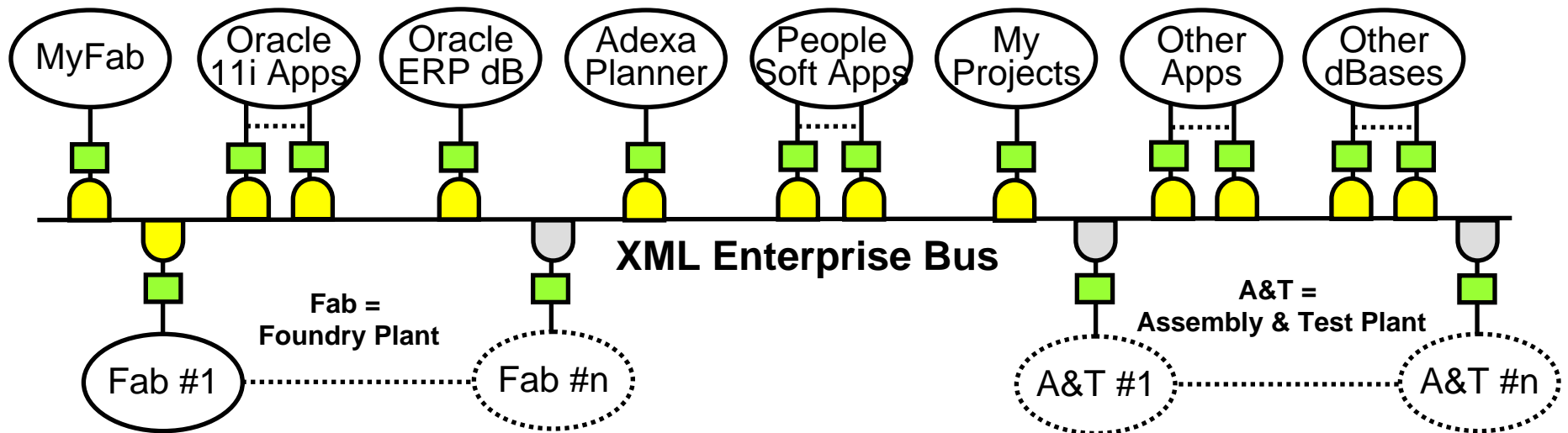




A Look At Silterra Strategy

**A semiconductor foundry
in Malaysia**

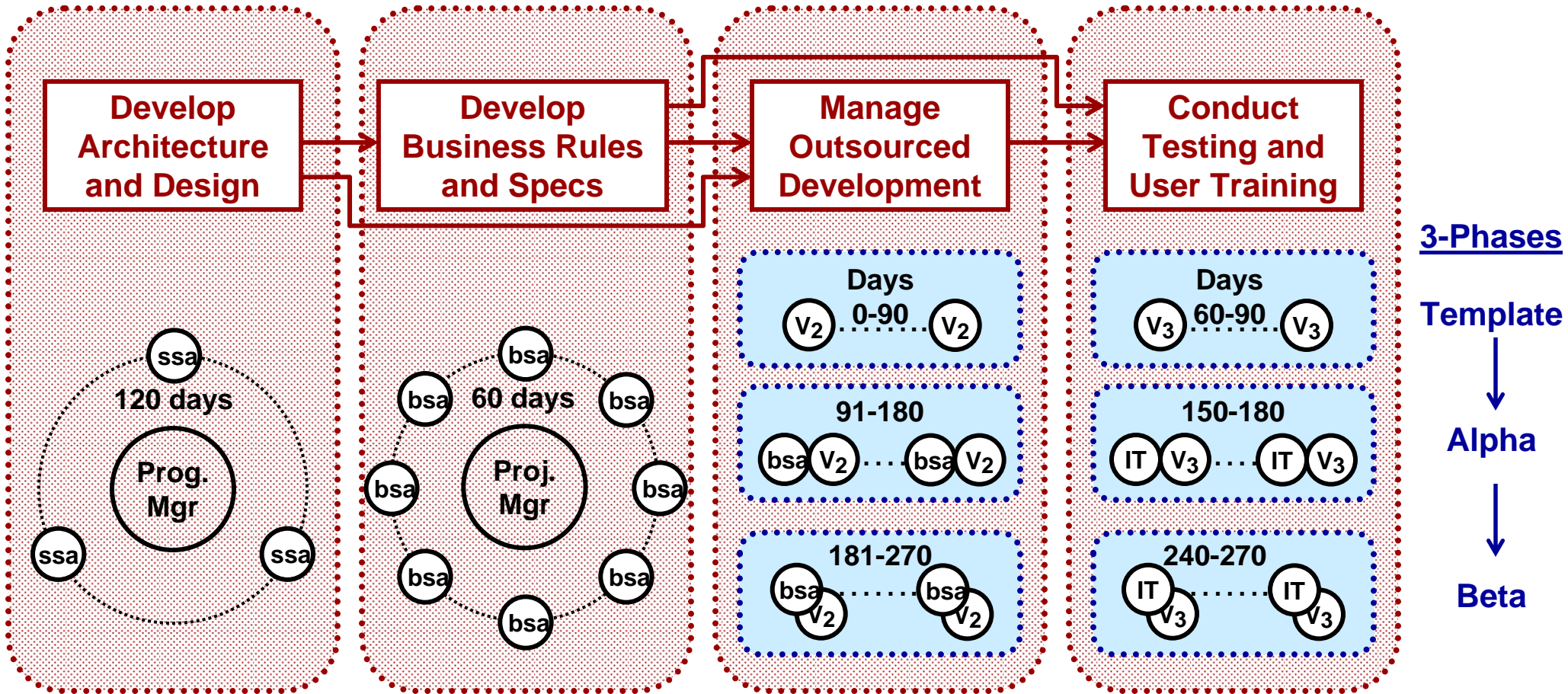
Art: Energy IT

Infrastructure Design



-  = Bus Interface Module (BIM)
-  = ETL Interface Modules
- MyProjects = Web-accessible strategic-project portfolio manager
- MyFab = Web-accessible operations transparency

www.parshift.com/Files/PsiDocs/Rkd050324CserPaper.pdf



**Encapsulated ERP Implementation Process
 - Designed to Accommodate Requirement Evolution -**

www.parshift.com/Files/PsiDocs/Rkd050324CserPaper.pdf

Effective Predictability

ERP on time, below budget, on spec

- 3 months functional ERP "best practice" (Phase 1)
- 3 months later preferred business processes (Phase 2)
- 3 months later refined business processes (Phase 3)

**HRM modularized and
added below time, on budget, on spec**

**Adexa planner
added on time/budget/spec**

**Existing Time and Attendance system
modularized and integrated on time/budget/spec**

Effective Predictability

<u>Wish</u>	<u>Typical Imp</u>	<u>Actual Imp</u>
ERP in 12 mos total	24-36 mos	12 ^{1,2}
75% of license budget	200-300%	75%
\$10 Million (5 + 5)	\$15-25 Million	\$9 Million
HRM in 6 mos	12-18 mos	5 mos

HOW??

- Principle-based integration process methodology and management
- Adherence to methodology (ie, effective management)
- BSAs utilizing MBW tool to develop and capture business processes
- BSAs taking responsibility for integrating ERP with users
- Bus architecture connecting ERP with HRM
- Experienced outsource to help integrate ERP/CIM^{2,3} (did it before)
- Expertise in agile system design and implementation

Notes: 1) 12 months = 3 mo concept design and vendor selection + 9 mo implementation, time included infrastructure bus/ETL/BMI implementation, but not shop floor (CIM) integration (+6)
2) New Oracle 11i ERP with typical bugs and lack of documentation of new systems
3) Additional 6 mos due to independent CIM system shake out

Employment of principles...

Forces consideration of each principle: better design-for-agility

**Values: increases scope of response options,
reduces future cost and time**

Defines clear framework: integration rules don't change

**Values: increases predictability of project,
reduces current cost and time**

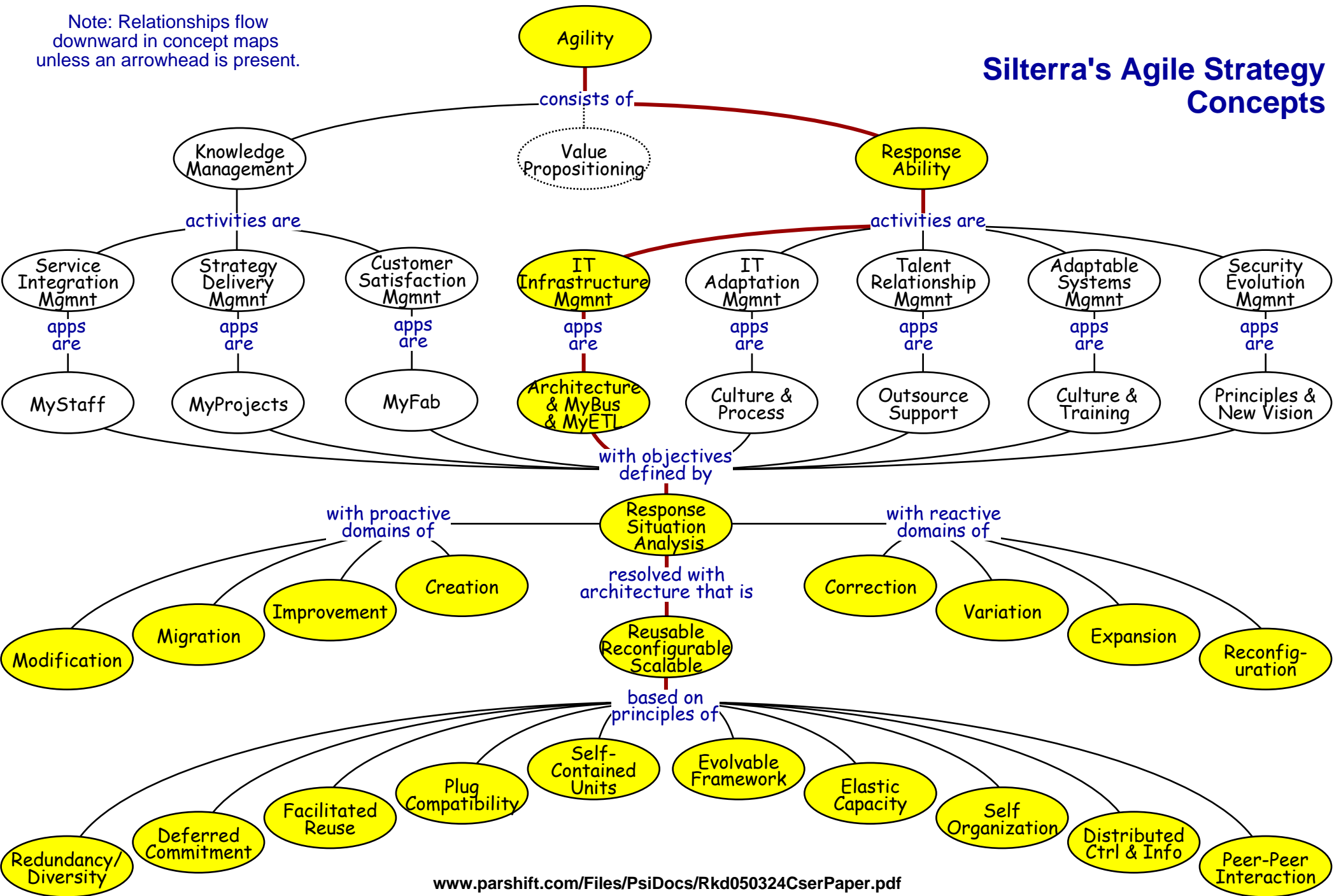
Defines encapsulated modules: requirements don't change

**Values: increased predictability of project,
increased options for alternatives,
reduces current cost and time**



Note: Relationships flow downward in concept maps unless an arrowhead is present.

Silterra's Agile Strategy Concepts



Value Propositioning

Reality and Responsibility

Individual Decision Logic

Kaheman & Tversky: Prospect Theory

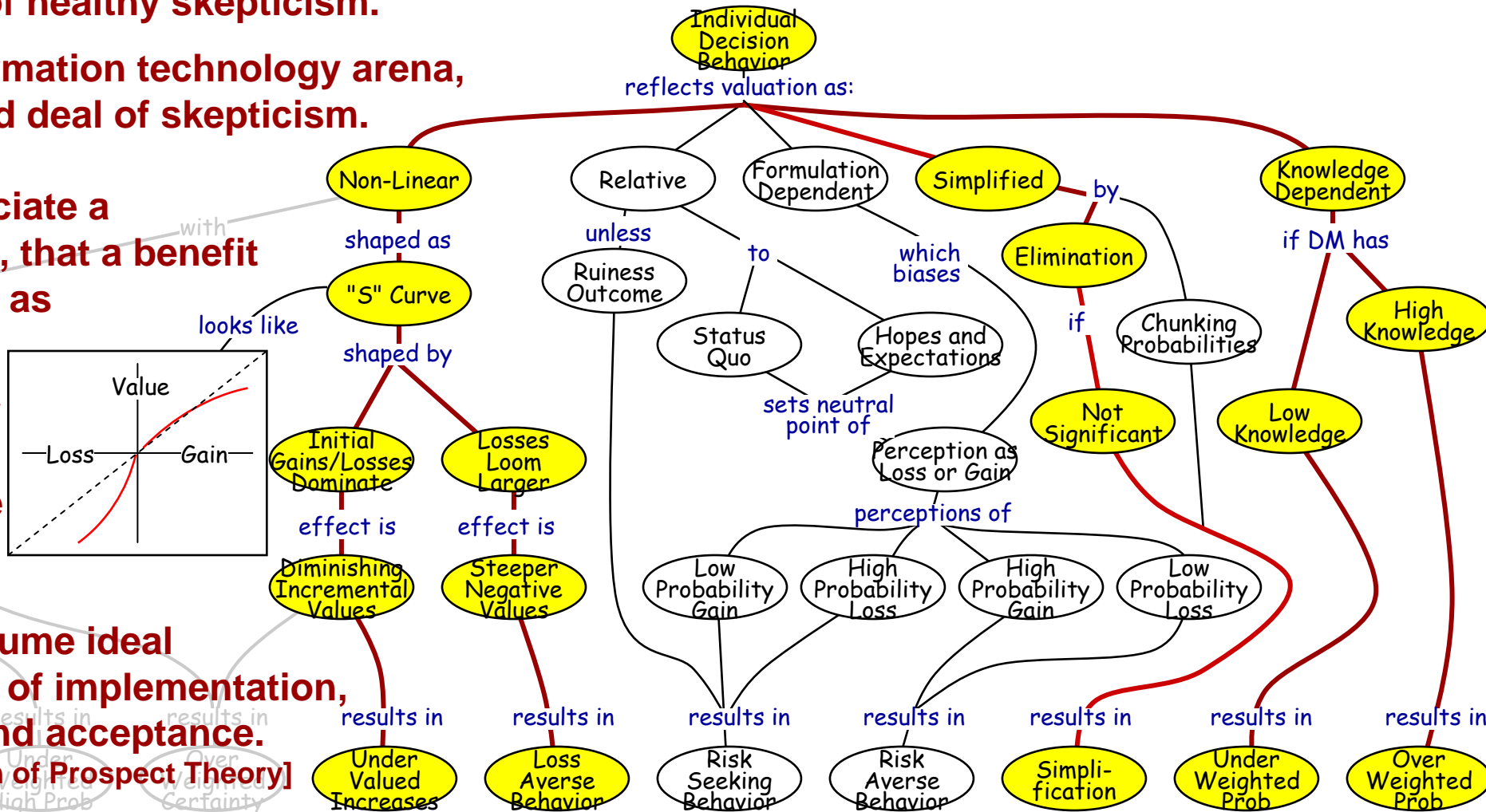
Decision Makers hear promised benefits with a bit of healthy skepticism.

In the information technology arena, with a good deal of skepticism.

They associate a probability, that a benefit will deliver as promised.

They know from experience that honest claims assume ideal conditions of implementation, transfer, and acceptance.

[Interpretation of Prospect Theory]



Details at: www.parshift.com/ValueProp

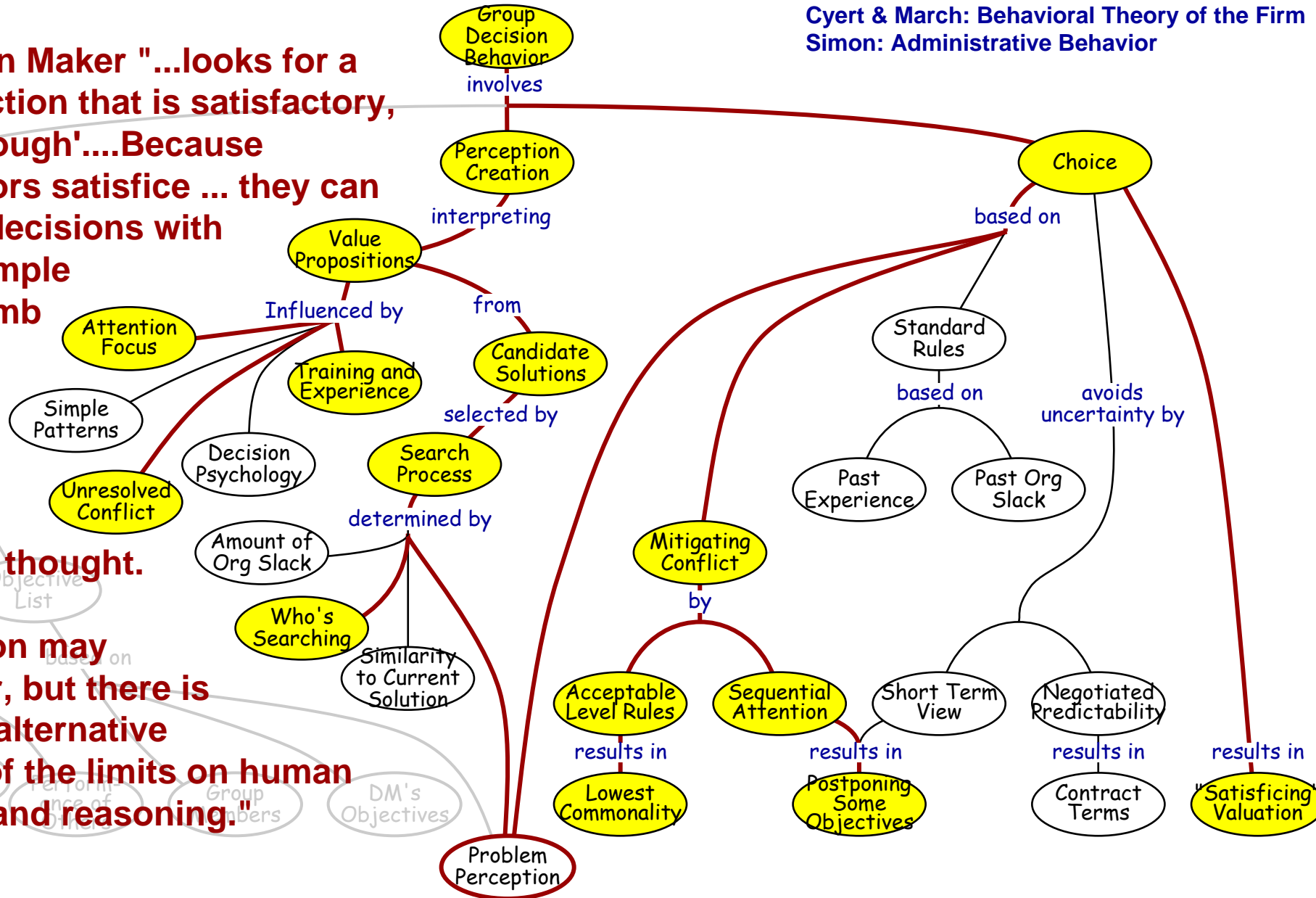
Probability (Prob) is the subjective likelihood, assumed by a Decision Maker, that a proposed benefit will deliver as promised.

Group Decision Logic

Cyert & March: Behavioral Theory of the Firm
Simon: Administrative Behavior

The Decision Maker "...looks for a course of action that is satisfactory, or 'good enough'....Because administrators satisfice ... they can make their decisions with relatively simple rules of thumb that do not make impossible demands upon their capacity for thought.

Simplification may lead to error, but there is no realistic alternative in the face of the limits on human knowledge and reasoning."
[Herb Simon]

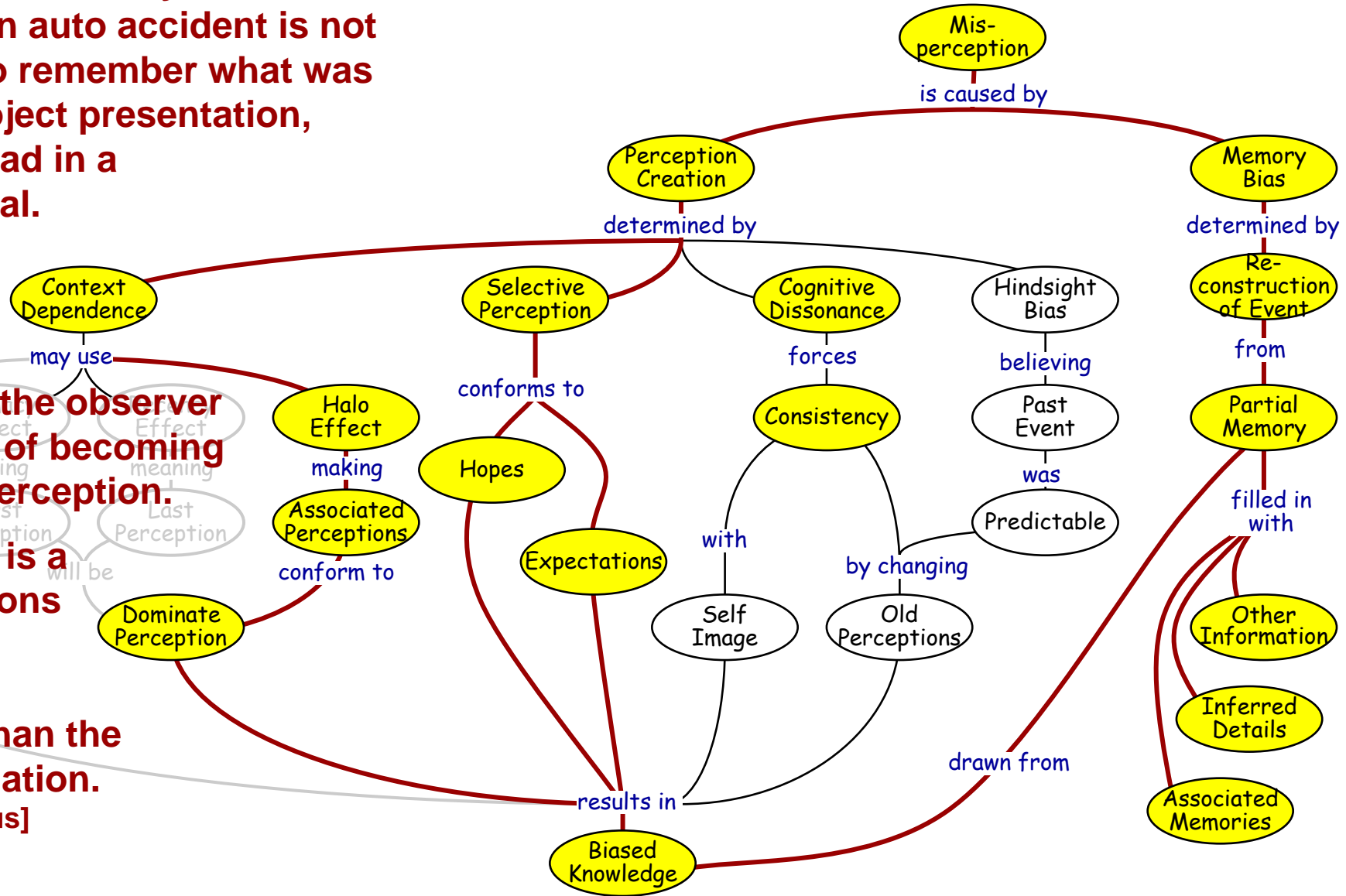


Misperception Logic

Plous: Behavioral Psychology of Decision Making

Recreating from memory what was witnessed at an auto accident is not unlike trying to remember what was shown in a project presentation, or what was read in a written proposal.

Information is selectively filtered and interpreted by the observer in the process of becoming memory and perception. The end result is a set of perceptions that are both incomplete and different than the original information. [paraphrasing Plous]

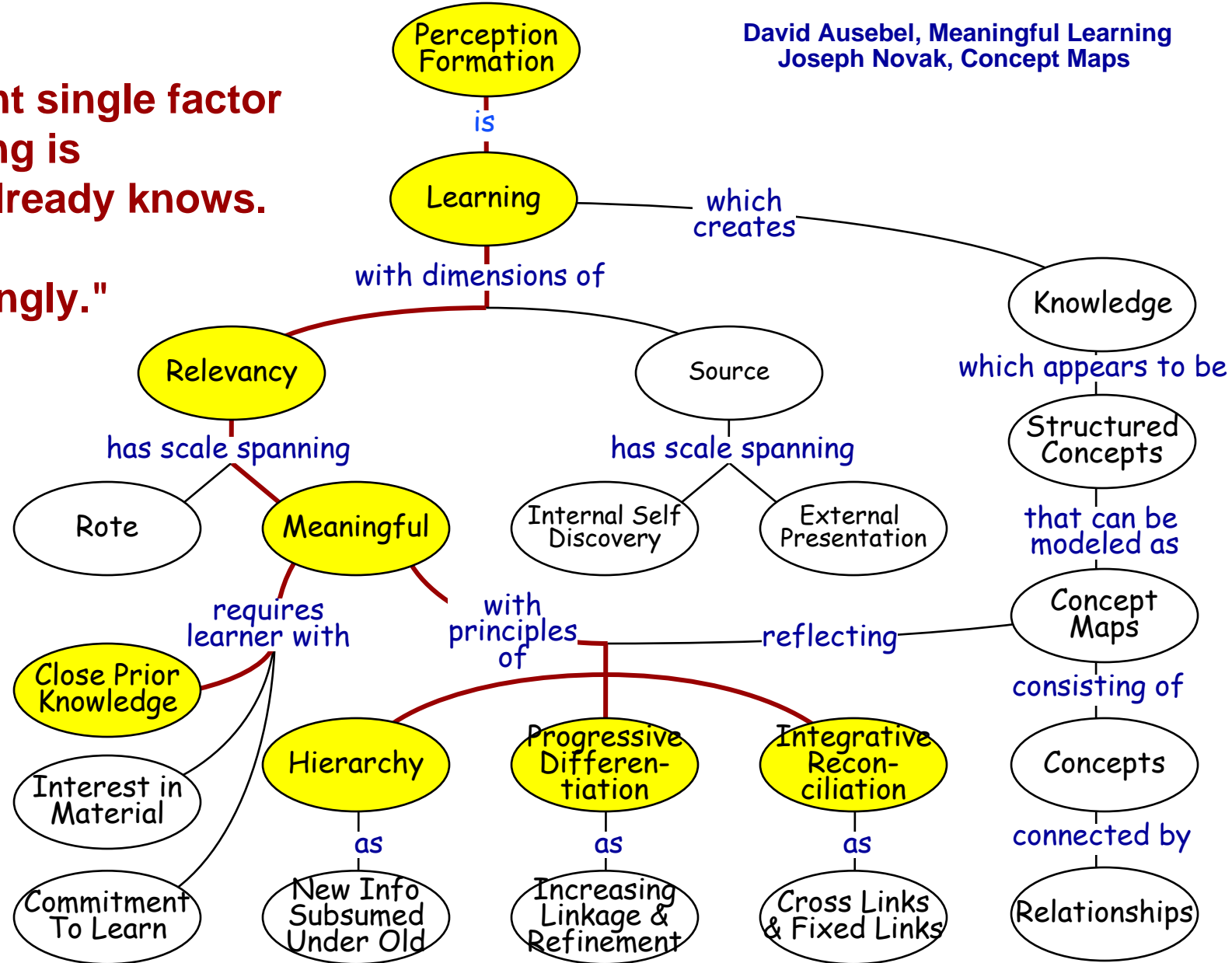


Perception Formation Logic

David Ausebel, Meaningful Learning
Joseph Novak, Concept Maps

"The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly."

[David Ausebel]



Reality Factors

Agile Security Strategy

**An Instructive Model
For Developing an Agile-Solution Strategy
(from The Agile Security Forum)**

See: www.AgileSecurityForum.com



Business Strategy Elements

Policy: Goals, and principles governing how goals may be attained.

Procedure: Prescribed method for satisfying policy.

Practice: Implementation that carries out procedure.

**Security is a Business Process
distributed and co-mingled
with other business processes**



Security Strategy eXcellence?

The Facts:

- Vulnerability – Increasing points and modes of attack
- Threat – Increasing attackers and incidents
- Risk – Increasing value available for compromise

The Value Proposition Foundation:

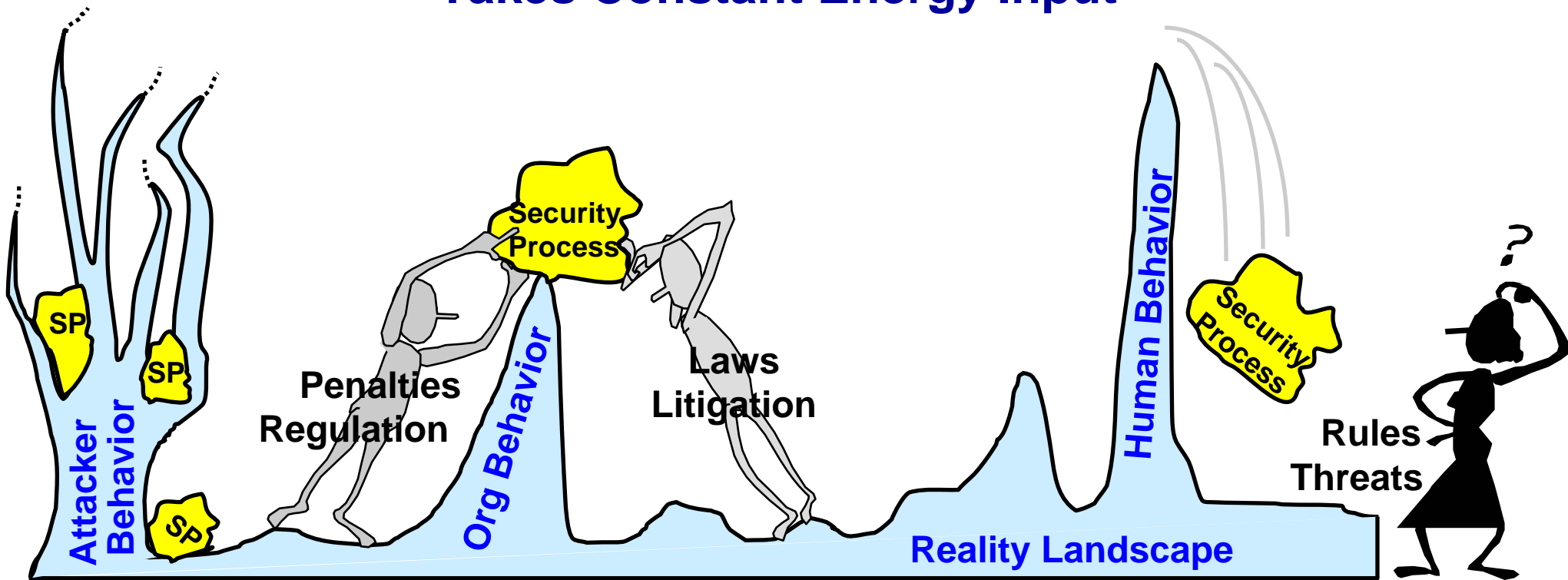
- Time stolen by security measures is increasing
- Money invested in security measures is increasing
- Effectiveness and life-cycle of security measures are decreasing

Security's Seven Ignorances of Reality

1. **Human Behavior** – Human error, whimsy, expediency, arrogance, ...
2. **Organizational Behavior** – Survival rules rule, nobody's in control, ...
3. **Technology Pace** – Accelerating vulnerability-introductions, ...
4. **System Complexity** – Incomprehensible, unintended consequences, ...
5. **Globalization** – Partners with different ethics, values, infrastructures, ...
6. **Agile Enterprise** – Outsourcing, on-demand, webservices, transparency, ...
7. **Agile Attackers** – Distributed, collaborative, self organizing, proactive, ...

For 50 years of IT-progress,
management policy/procedure/practice
has followed behind ... patching potholes.

Maintaining Systems in Unstable States Takes Constant Energy Input



Expecting or enforcing ideal and repetitive behavior ignores reality...
and is not a substitute for Strategy

Strategy Requires Understanding

A rational view of the problem:

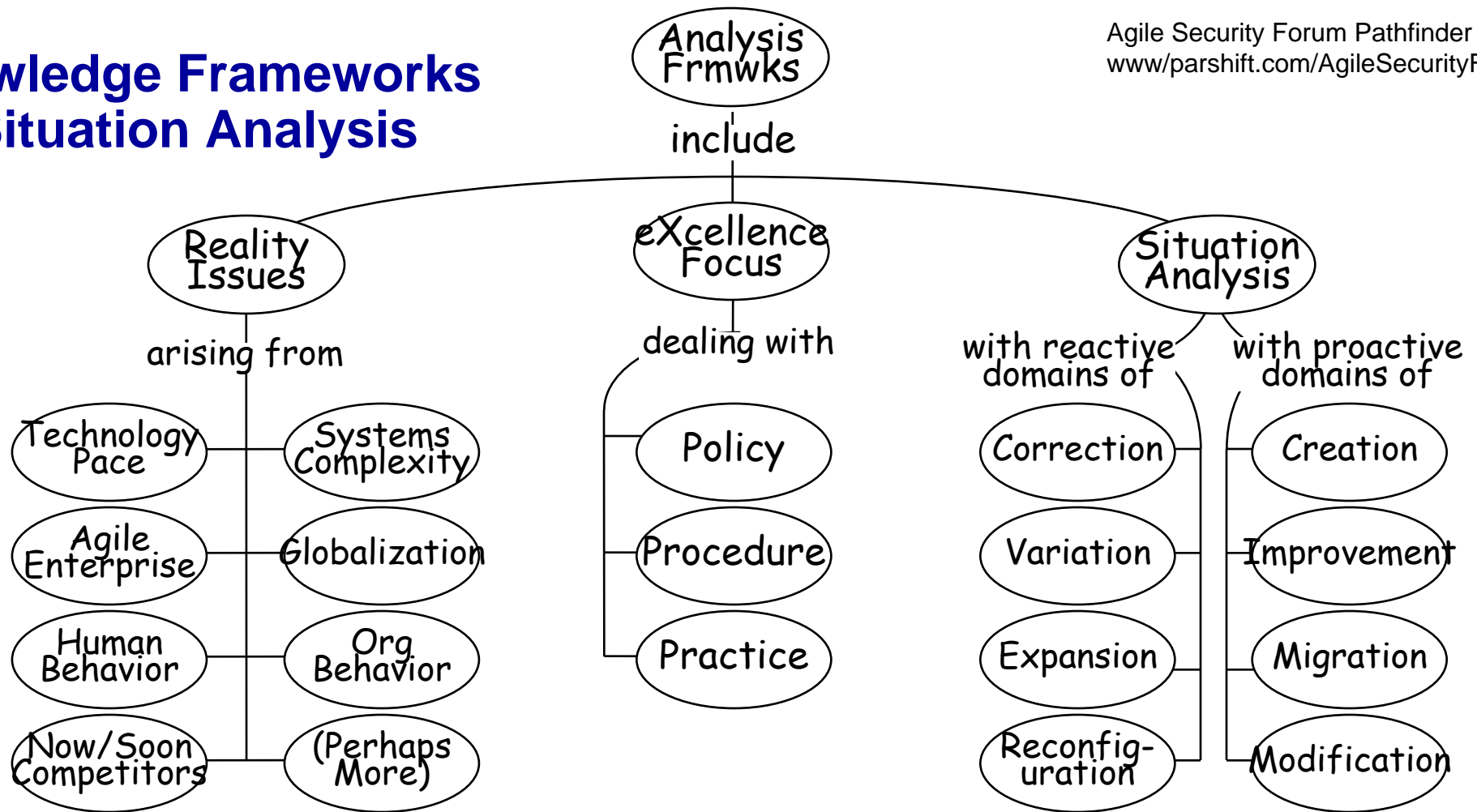
- Reality bites – what is its nature?
- The problem is bigger than technology – what is its nature?
- The situation is in constant flux – what is its nature?

A rational view of the solution:

- You are compromised – now what?
- Situation in constant flux – what is proactive response-ability?
- eXcellence – what is its nature?



Knowledge Frameworks for Situation Analysis



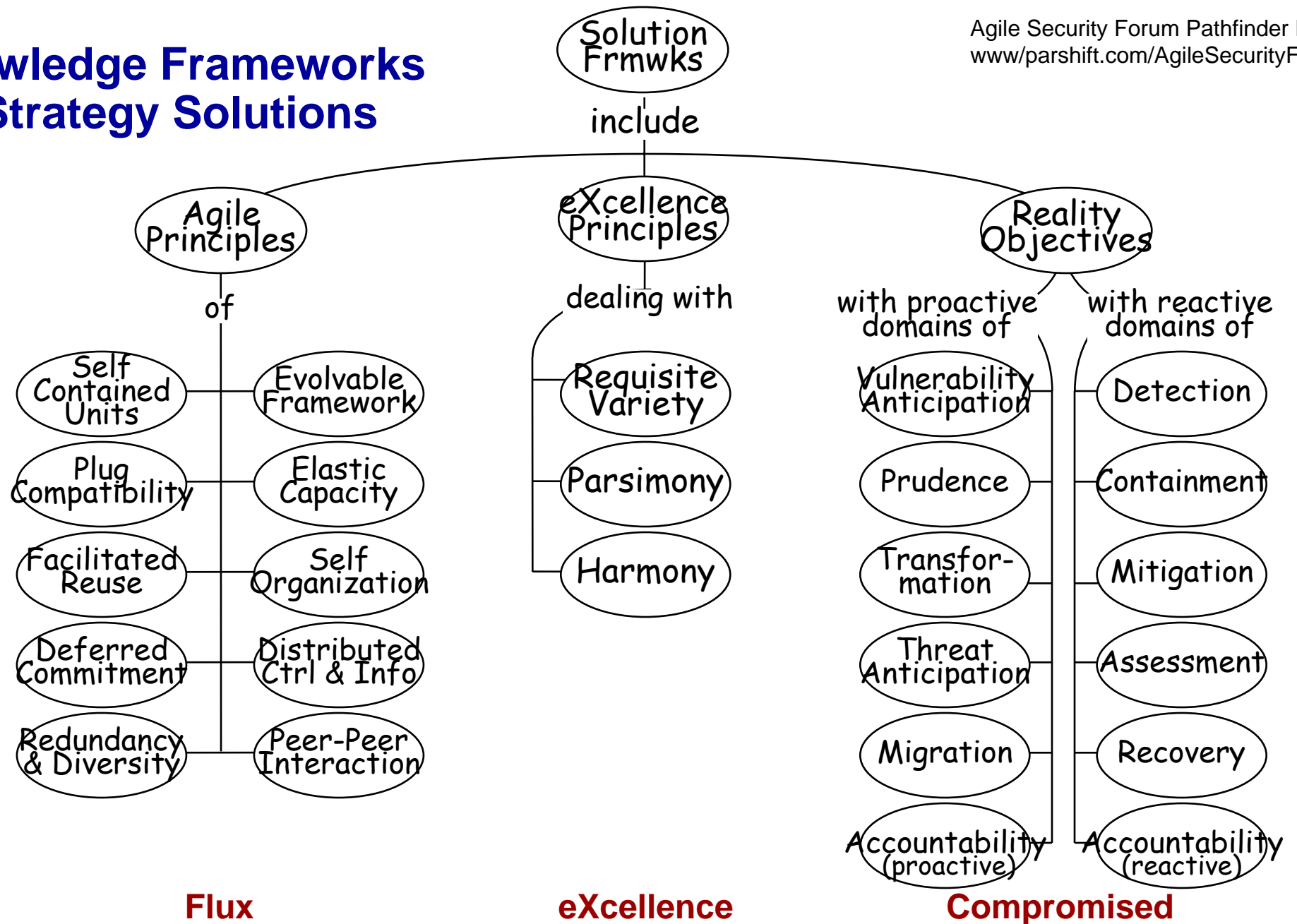
www.AgileSecurityForum.com/Docs/AsfPaperSixFrameworks.pdf

The Bite

Technology+++

Flux

Knowledge Frameworks for Strategy Solutions



Flux

eXcellence

Compromised

www.AgileSecurityForum.com/Docs/AsfPaperSixFrameworks.pdf

Suggested eXcellence Principles

Requisite Variety

- Ashby's Law: "The larger the variety of actions available to a control system, the larger the variety of perturbations it is able to compensate....variety must match variety."**
- Any effective system must be as agile as its environmental forces.**
- Reality-compatible (rational) policy, procedure, and practice.**
- Functional Quality.**

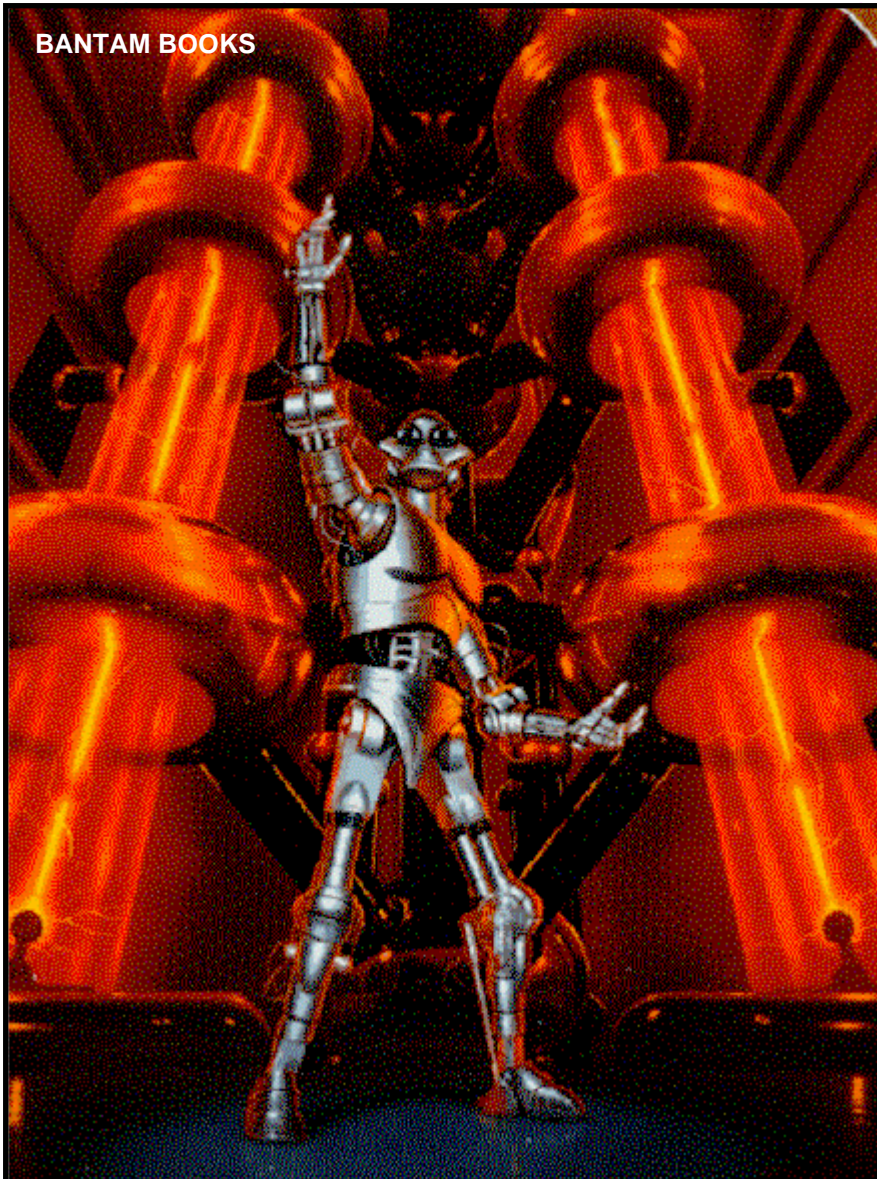
Parsimony

- Occam's Razor: Given a choice between two ... choose the simplest.**
- Unintended consequences are the result of complexity.**
- Humans can only deal with 5-9 items simultaneously.**
- Bounded rationality (Herb Simon).**
- Reduces perceived Risk.**

Harmony (.... Delight?)

- Perception: non-negative impact on personal productivity and goal priorities.**
- Perception: non-negative impact on org's productivity and goal priorities.**
- Rationalized with natural human and org behavior.**
- Engenders feelings of user Trust and Respect.**
- Aesthetic Quality.**

A Framework with Requisite Variety, Parsimony, and Harmony



The Three Laws of Robotics

(Isaac Asimov)

- 1) A robot may not injure a human being or, through inaction, allow a human being to come to harm.
- 2) A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
- 3) A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Unintended Consequences

Understand the Dynamics of the Environment



Art: Napster



**Agile IT is
Enterprise Risk Management
that
Reduces Risk by Providing Options
with Predictable Response
in an Unpredictable Environment**

