Webinar

Agile Systems & Processes 102: Driving Architecture with ConOps and Response Situation Analysis

18-Sep-2013 (original INCOSE webinar)

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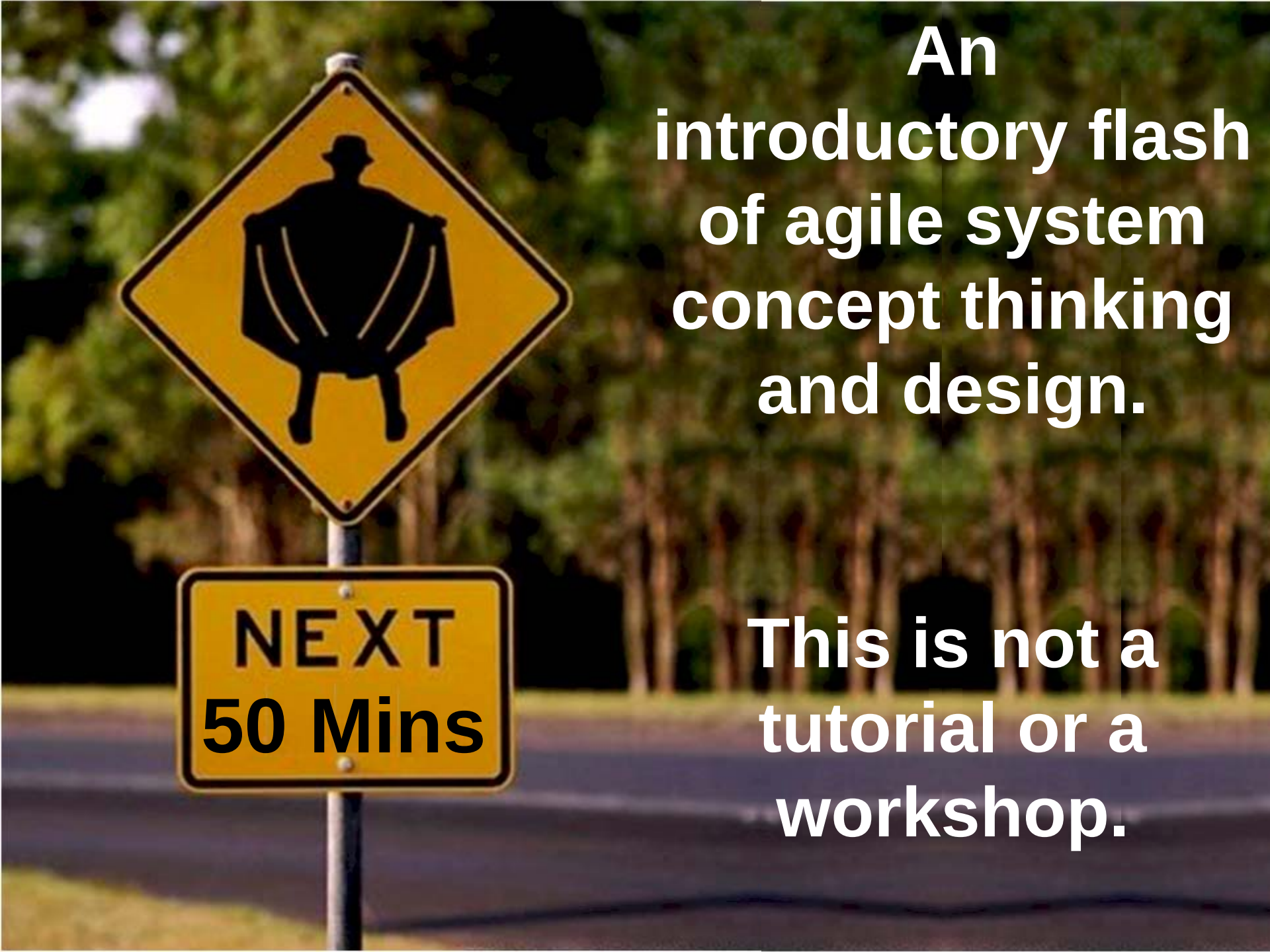
Download 104 webinar slides: Agile System/Process Engagement Quality
Download 103 webinar slides: Agile System/Process Design Principles
Download 102 webinar slides: Agile System/Process Design Requirements
Download 101 webinar slides: Agile System/Process Architecture Pattern
(updated asynchronously from time-to-time)

Agile Systems & Processes 102:
Driving Architecture with ConOps and Response Situation Analysis

Abstract: Agility is enabled and maintained by a fundamentally necessary and sufficient common architecture in systems of all kinds; from agile development and deployment processes, to the agile systems and products that are deployed. This webinar will focus on tools and methods for developing a concept of (agile) operations, conducting response situation analysis, and identifying reality factors in the operational environment. These tools and methods are precursors necessary to inform the development of an agile system or process architecture, which is the subject of the INCOSE Agile 101 webinar available as slides (no audio) at www.parshift.com/s/AgileSystems-101.pdf. Examples will be drawn from agile systems and from agile engineering processes in a variety of domains.

Bio: Rick Dove was co-PI on the original work which identified Agility as the next competitive differentiator, funded by the US Office of the Secretary of Defense through the Navy in 1991 at Lehigh University. He went on to organize and lead the US DARPA-funded industry collaborative research at Lehigh University's Agility Forum, developing fundamental understandings of what enables and characterizes system's agility. He authored *Response Ability – The Language, Structure, and Culture of the Agile Enterprise* (Wiley, 2001). He has employed these agile concepts in both architecture and program management for large enterprise IT systems, for rapid manufacturing systems and services, and for self-organizing security strategies. Through Stevens Institute of Technology he teaches two 40-hour graduate courses in basic and advanced agile-systems and agile systems-engineering, at client sites. Through Paradigm Shift he provides training workshops and strategy development services. He chairs the INCOSE working groups on Agile Systems and Systems engineering, and on Systems Security Engineering.



An introductory flash of agile system concept thinking and design.

This is not a tutorial or a workshop.

Recapping Agile 101…

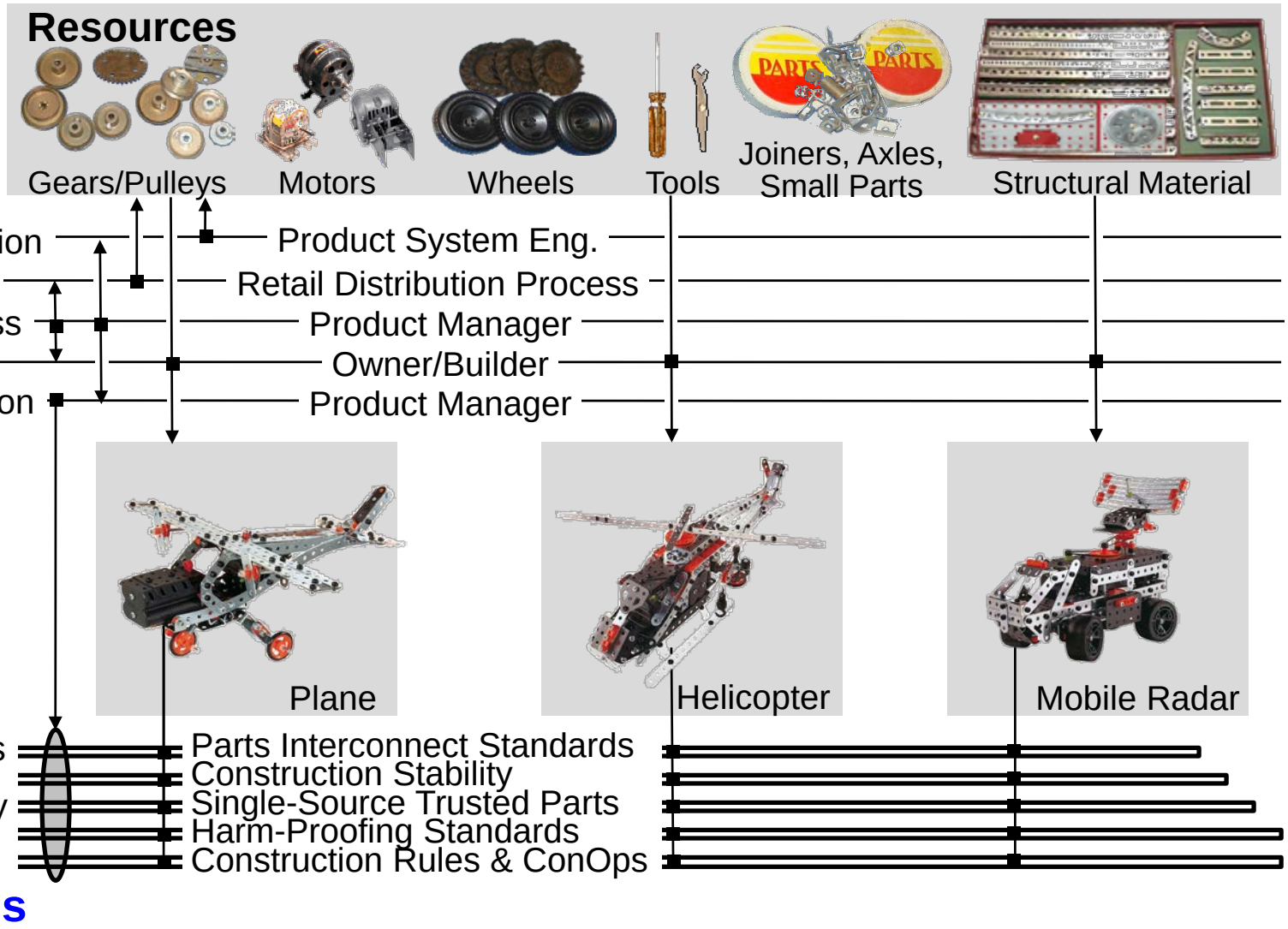
A system's "bone structure" is depicted in the Agile Architecture Pattern. All truly agile systems have the same basic structure and strategy. Knowing this will change the way you "see" and evaluate a system.

http://awespendo.us/animemangacomics/kermit-at-the-doctor/

Here's a Box of Bones

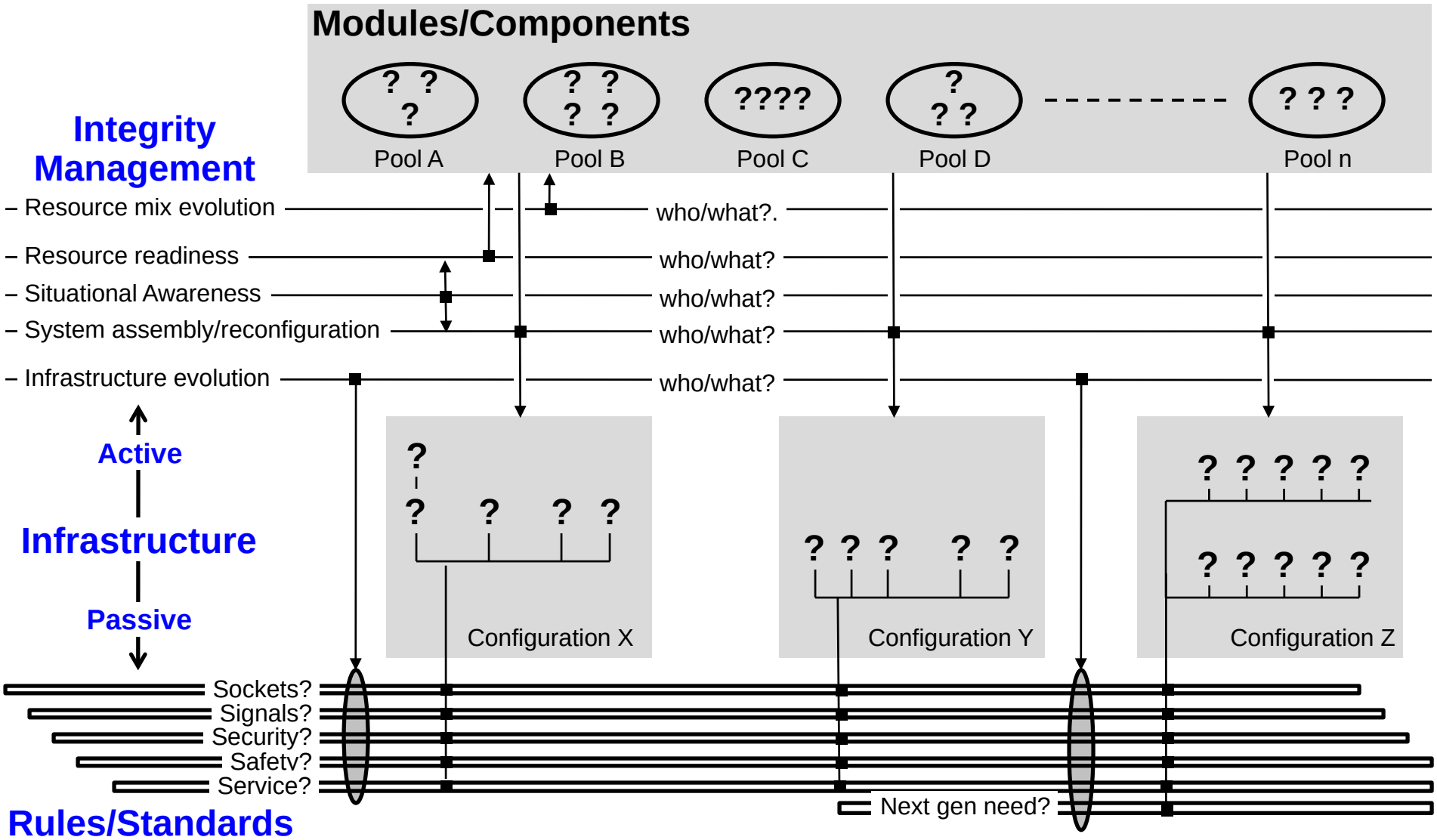
Agile Architecture Pattern (AAP)
Notional Concept: System Response-Construction Kit

Details in www.parshift.com/s/140630IS14-AgileSystemsEngineering-Part1&2.pdf



Developing the System-Construction-Kit System Architecture

…how do we answer the questions? (Agile 102)



Sorting Out the Architectures

Ferris wheel has a functional architecture.

Erector set has an adaptable architecture.

The adaptable architecture enables the building and changing of the functional architecture.

One could argue that the adaptable architecture is also a functional architecture.
(but why bother?)

Agile-Systems Research Focus – 1991+

Problem:

- Technology and markets are changing faster than the ability to employ/accommodate
- Life cycle requirements are uncertain and unpredictable
- Flexible system approaches inadequate when requirements change
- New approach needed that could extend usefulness/life of systems

Solution Search:

- Examined 100s of systems of various types
- Looked for systems that responded *effectively*
- Looked for metrics that defined *effectively*
- Looked for categories of response types
- Looked for principles that enabled response

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

Essays chronicle knowledge development at www.parshift.com/library.htm

Agility - Fundamentally

The Ability to Thrive in a Continuously Changing, Unpredictable Environment.

**Agility is *effective response* to opportunity and problem,
within mission ... always … no matter what.**

An *effective response* is one that is:	**Metric**
■ **timely (fast enough to deliver value),**	**time**
■ **affordable (at a cost that leaves room for an ROI),**	**cost**
■ **predictable (can be counted on to meet expectations),**	**predictability**
■ **comprehensive (anything/everything within mission boundary).**	**scope**

You can think of Agility as Requisite Variety.

You can think of Agility as proactive Risk Management.

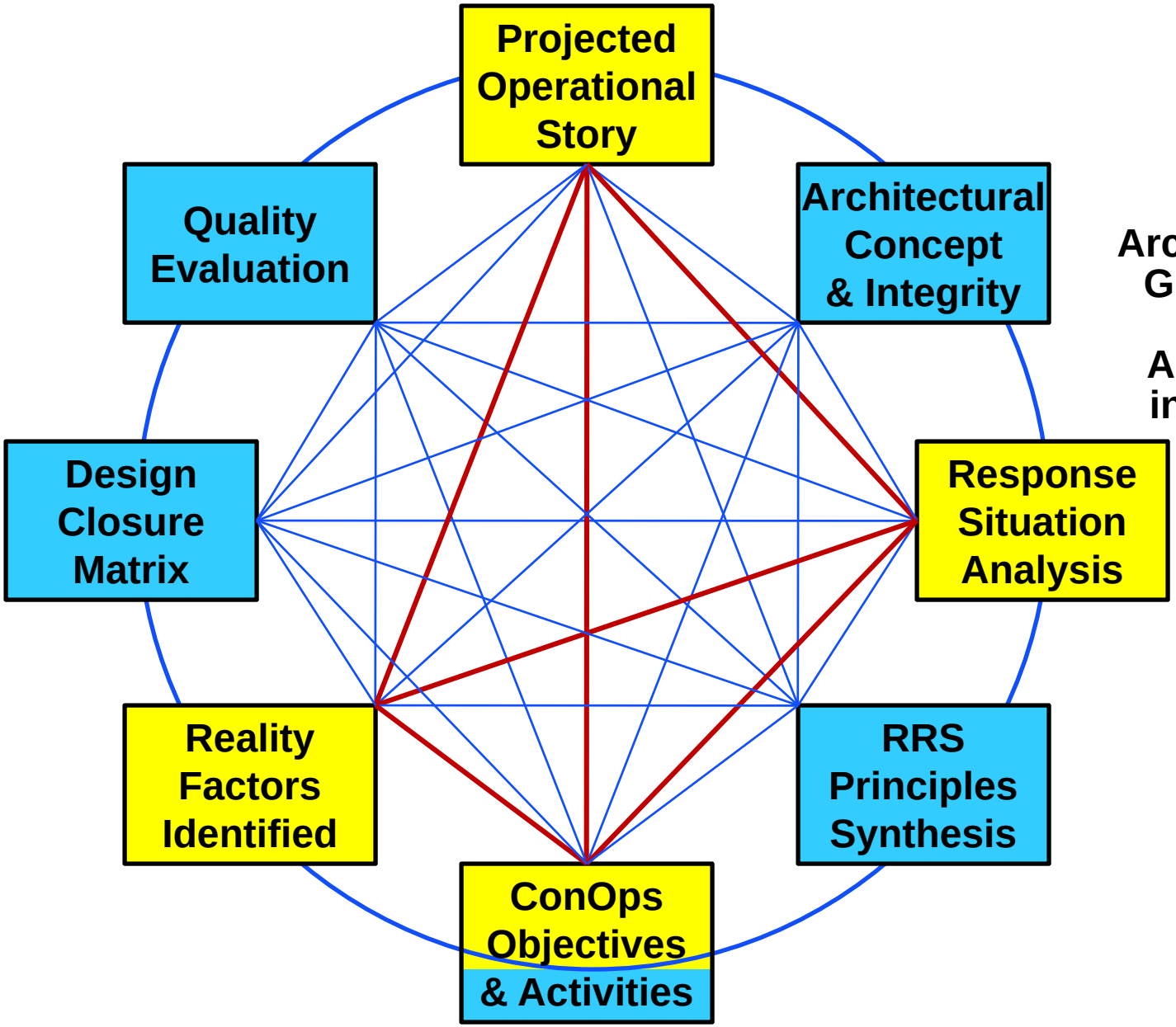
You can think of Agility as Innovative Response in unpredictable situations.

You can think of Agility as Life Cycle Extension.

**The trick is understanding the nature of agile-enabling fundamentals,
and how they can be applied to any type of system/process.**

Domain Independent

Four tools for guiding *agile architecture pattern* development



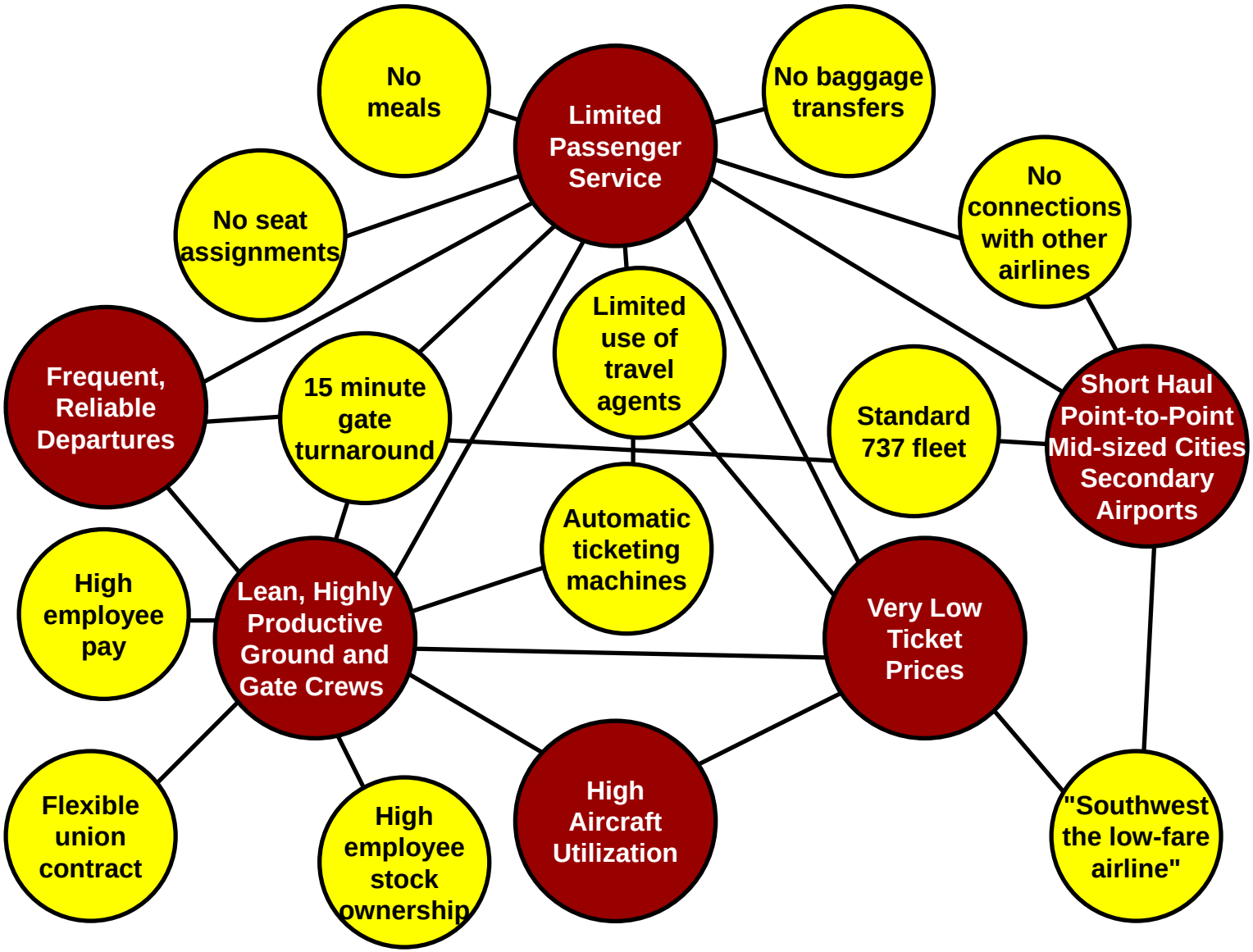
Architecture Guidance
...
Agile 102 in Yellow

Developing a Concept of Agile Operations

Strategy Web
Operational Story

Southwest Airlines
(Concept of Operations)

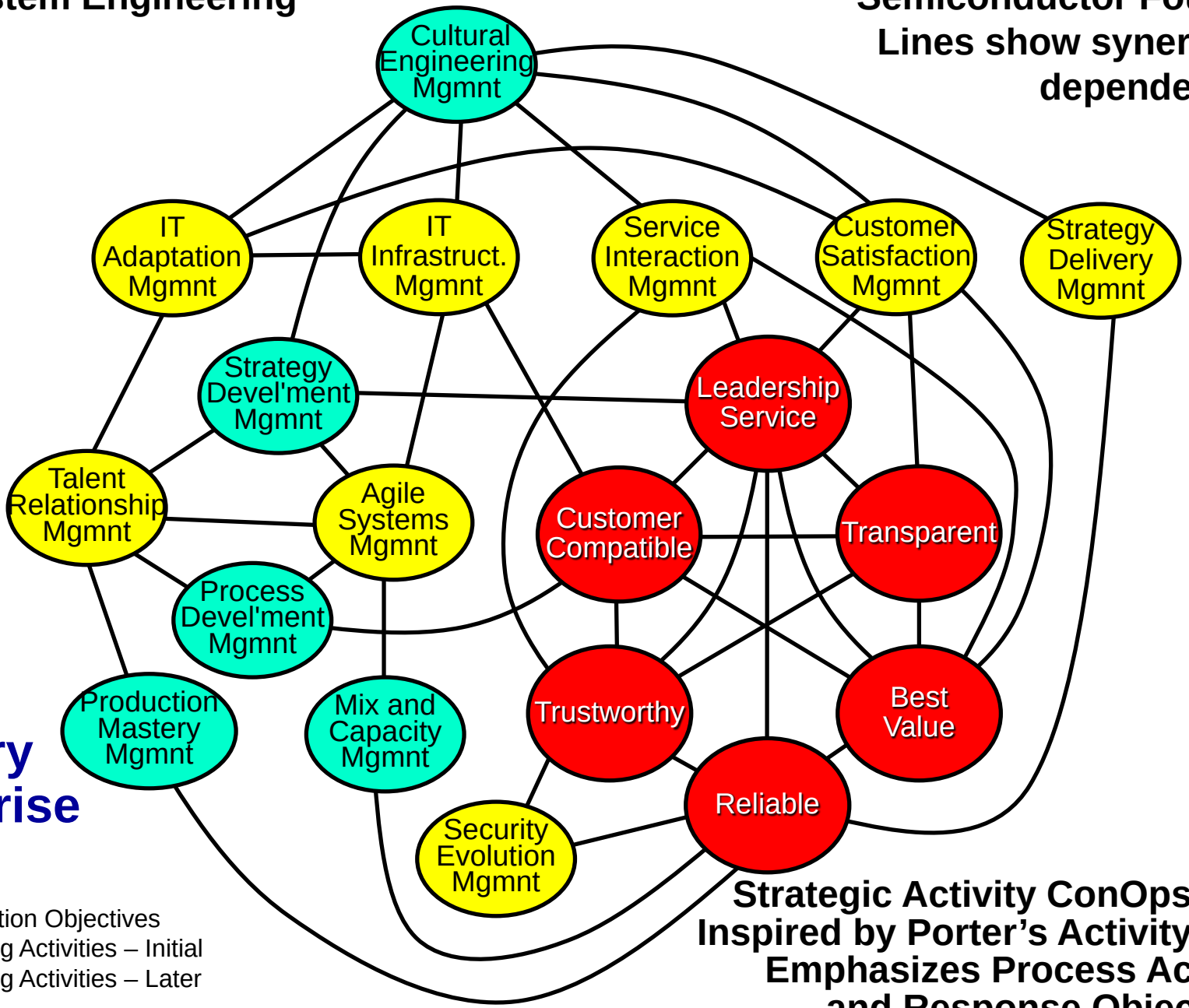
Reputation Perceptions (Objectives)
Causal Enablers (Activities)



"What is Strategy?", Michael Porter, Harvard Business Review, Nov-Dec '96

Agile-System Engineering

Semiconductor Foundry
Lines show synergistic dependencies

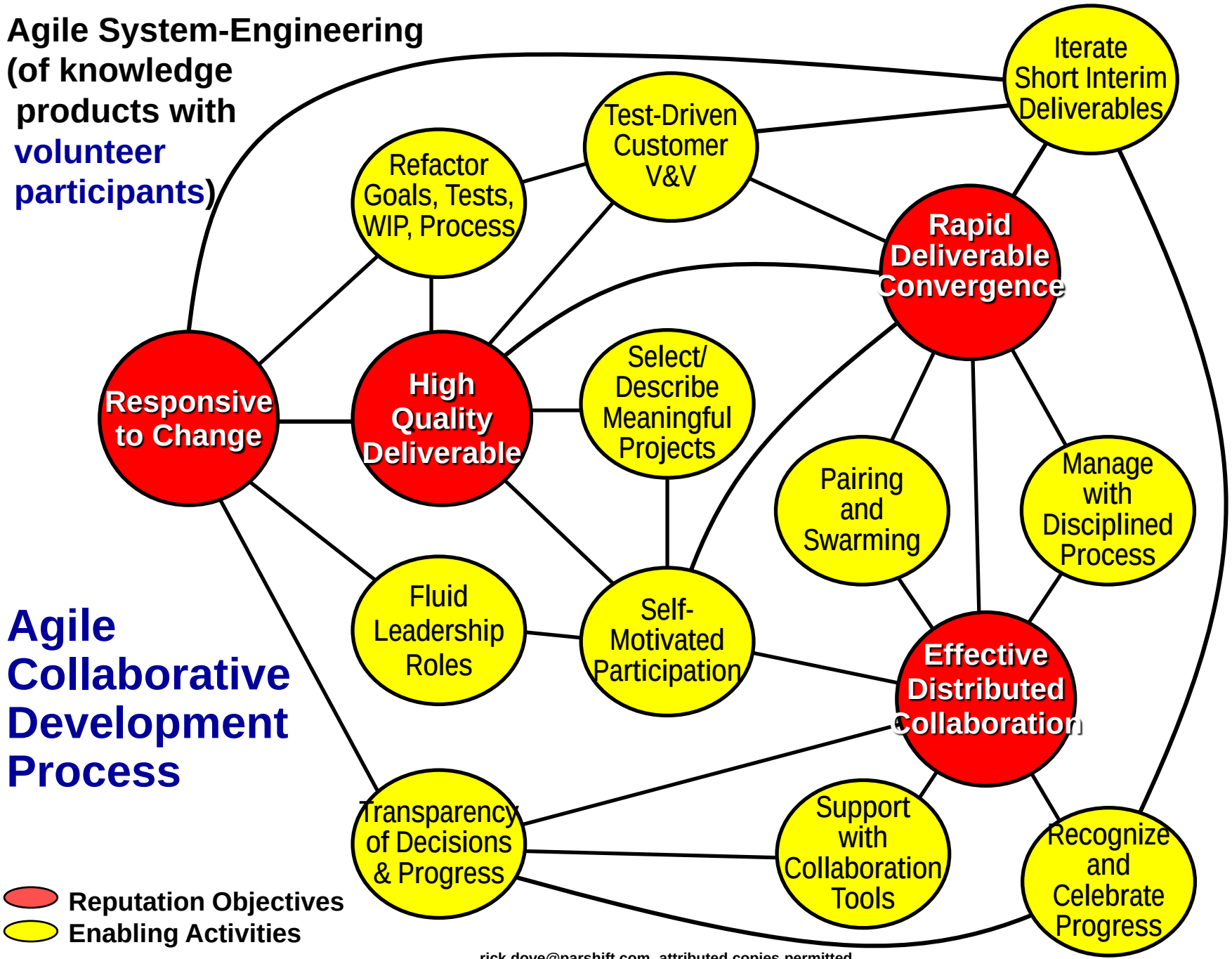


Agile Foundry Enterprise

- - Reputation Objectives
- - Enabling Activities – Initial
- - Enabling Activities – Later

Strategic Activity ConOps Web
Inspired by Porter's Activity Web
Emphasizes Process Activity and Response Objectives

Agile System-Engineering (of knowledge products with volunteer participants)



Agile Collaborative Development Process

On the Strategic Activity ConOps Web

This web of synergistic activities should depict the desired value-based public reputation, and the activities that cause that reputation.

It is the architecture of a ConOps.

Reputation objectives (red): a few, 3-7, or focus is lost.

Activities (yellow): these are continuous day-in-and-day-out processes that ensure the objectives are realized. They are not things or concepts. Again, keep the number smallish or the critical activities get lost in the noise.

The few words used to label a red or yellow bubble are critical – they must capture and focus the essence of intent succinctly.

Synergistic Dependencies: more is (often) better - multiple lines attached to every bubble – this provides robustness. And, according to Porter, makes it a lot harder for any competitor to duplicate.

Note that this is not an agile architecture if Porter's advice is taken.

Porter encourages dependencies and tight coupling as ways to make competitor duplication difficult – providing a meaningful *strategy*.

Not a good idea if the ConOps values (environment) evolve faster than the ConOps activities (system) can.

So … carefully choose timeless values; and design activity-relationships that are synergistic but not tightly dependent.

You Are There – Inside The System, Watching it Work

al-Qaeda: An Agile Terrorist Enterprise

By Nicole Long and Vicente Tur-Rojas, Analytic Services Inc., Arlington, Virginia

An al-Qaeda Agent Handler receives instructions to carry out a suicide bombing at a local market at a specified time.The future martyr is a member of the Agent Handler's Operational Cell "A". The Agent Handler selects and activates an Improvised Explosive Device (IED) maker operational cell "B" and a surveillance team from operational cell "C".

During the cell's surveillance of local citizens recognize unusua enforcement intercepts and deta team. The Agent Handler pulls team from Sleeper Cell "A" and c surveillance tactics to better avoid before the attack, military operatio maker; the Agent Handler select from Operational Cell "B".

Two days later, the attack is carried out successfully, killing four people and injuring dozens; several nearby businesses sustain damage. The market is deserted for days and local businesses do not recover financially for 2 months following the attack.

al-Qaeda is a focused, effective, and agile enterprise that can not be defeated using conventional means

More than six years post-September 11, images of the attacks still remain vivid for most Americans: the shocking footage of planes destroying our national landmarks and killing thousands of innocent people in a systematic process. The heroic response from our first response community. And then the recognition that this was the work of a terrorist group that was not a popularized or well-known threat. Up until then, many thought al-Qaeda to be a stereotypical group of religious zealots living primitively and occasionally causing minor problems far from our shores. But what we have slowly come to realize is that al-Qaeda is a focused, innovative, effective, and agile organization that can not be quickly or easily defeated using our convention approaches.

The cost of the September 11 attacks to America? Nearly 3000 people killed instantaneously, several billions of dollars in infrastructure damage, and hundreds of billions of dollars of collateral effects to an already waning financial market. The cost to al-Qaeda? Nineteen minimally-equipped and moderately-trained terrorists, for a cost of less than $500,000. The planning for the operation was conducted covertly in only two years.

Al Qaeda's two primary founding fathers, Abdullah

The Operational Story: Imagine yourself as the person who IS ASSEMBLING the drag-and-drop, plug-and-play responses to a variety of "situations" in real time … and tell us what you are doing.

The al-Qaeda decentralized central model is an important starting point for the discovery of what makes al-Qaeda so agile. Operatives are assigned to cells of varying sizes depending on their experience, know-how, and availability. They typically are given little information and are directed to live normal lives; they only sporadically perform operational tasks. A cell will be facilitated by an Agent Handler—a "commando" of considerable experience, training, and trust—who receives basic instructions from the al-Qaeda central command, evaluates intelligence from his theater of operations, conducts planning, obtains resources, and then carries out operation.

The commandos are spread out in various theaters of operations. Cells are known to be established in North America, Latin America, Europe, the Middle East, Africa, Asia, and Australia. Some cells fall under the al-Qaeda Central Command while some are only loosely affiliated groups aligned under other terrorist organizations. However, al-Qaeda can fund these "sister" organizations to conduct operations in the event their own operatives are unable to carry them out.

Another hallmark of the al-Qaeda enterprise is the training provided to their operatives. Many of them receive rigorous training, to include espionage, concealment, communication, counterfeiting, transportation, and weapons training. This training is offered to prospective operatives for al-Qaeda and its sister organizations alike. Thus, all potential operatives receive the same basic education, and this gives al-Qaeda the opportunity to reinforce its ideology, which helps maintain retention, sustains morale, and reinforces individual focus to complete difficult and potentially life-ending tasks.

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[illegible] the best of his/her abilities. In the event the local al-Qaeda labor pool is lacking in a specialized expertise necessary to conduct a particular operation, the agent handlers can leverage external cells, sleeper cells, sister organizations or request that the command structure quickly provide the proper personnel.

None of the al-Qaeda operation requires a large bureaucracy; instead operational units exist more as a decentralized network. Their ideology reinforces a Spartan lifestyle for their operatives. Thus, commandos are not hindered by the requirement to sustain large resource requirements, and innovative means of operations are considered to obtain spectacular results from limited means. For example, it is estimated that the full al-Qaeda costs to plan and execute the 9-11 attacks cost them anywhere from $250,000 to $500,000. In the U.S. government, that amount might buy the services of two contractors for one year. This high level of innovative use of available resources allows requisite variety to carry out operations while still allowing parsimony within the organization, meaning that their resources are generally flexible.

This level of ingenuity with resources is also contributes to al-Qaeda's ability as an organization to change tactics and techniques quickly in response to external factors or to take advantage of environmental changes. For example, al-Qaeda operatives who learn of planned attacks through connections with other Islamic terrorist organizations are able to "piggy back" on these organizations. Because they have more flexible resources, al-Qaeda can provide appropriate additional capabilities to other organizations when needed for a planned attack. Likewise, because most of their tactics involve plentiful and inexpensive multipurpose components, if law enforcement or military actions change so that one technique is no longer feasible (e.g. mitigation techniques have been created) or that the likelihood of the attack being detected is increased (e.g. new chemical detectors are utilized), then operatives can quickly and easily adjust their strategy to counter these obstacles.

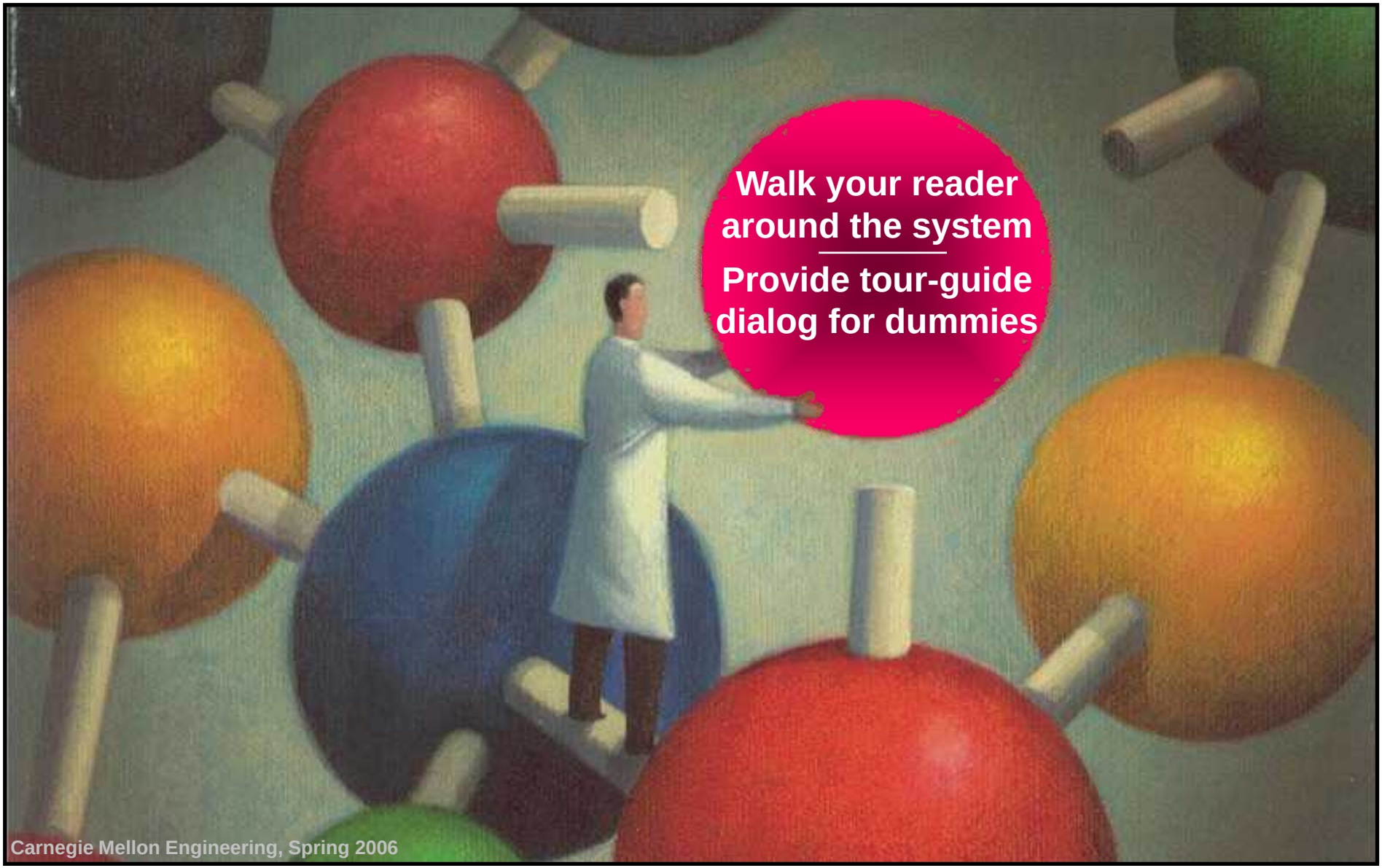
[illegible] should come as no surprise that al-Qaeda's [illegible]der, Osama bin Laden, has an education [illegible] in economics and business administration, [illegible] from a family that owns one of the largest [illegible] companies in the Islamic world. Both of [illegible] grounds suggest an early exposure and [illegible] to agile practices. In addition, studies by [illegible]man show that a significant portion of al-[illegible]erational members also have engineering [illegible]s and/or business experience, which helps [illegible] understanding of agile principles throughout the organization.

In essence, al-Qaeda's agility is the primary contributor to its generally accepted resilience. Without its ability to be agile in the face of threats from the military and law enforcement might of the strongest nations in the world, it would not have been able to plan, coordinate, and execute intricate and effective operations such as the 9-11 attacks, the 2000 USS Cole bombing, or the 1998 U.S. Embassy bombings in Kenya and Tanzania. The world's superpowers continue to utilize traditional military and law enforcement means to counter this threat, but these methods are not designed to counter such newer, more agile threats. It seems that al-Qaeda will, for now, remain a constant menace.

The intent of this analysis is not to admire or laud al-Qaeda, but to characterize it, without bias, as an agile enterprise. By understanding what elements of the al-Qaeda organization create agility, it may be possible to destabilize the organization and as al-Qaeda's agility is weakened, its resilience may also diminish. It is the authors' hope that by contributing to the discussion and debate, we can assist in al-Qaeda's eradication.

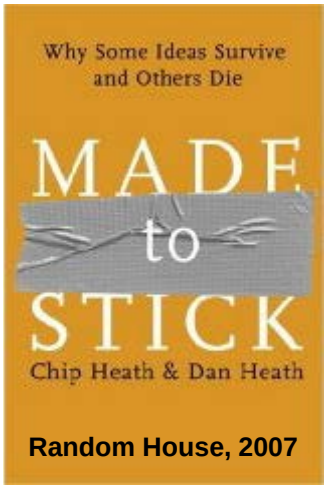
Analytical Services, Oct. 2007
Nicole Long
Vince Tur Rojos

Reusable Modules, Reconfigurable, In A Scalable Framework



Your Operational Story Should be *Sticky*
- bring it to life -

http://heathbrothers.com/books/made-to-stick/



- **Simplicity**: the idea must be stripped to its core, and the most important concepts should jump out.
- **Unexpectedness**: the idea must destroy preconceived notions about something. This forces people to stop, think, and remember.
- **Concreteness**: avoid statistics, use real-world analogies to help people understand complex ideas.
- **Credibility**: if people don't trust you, they'll ignore you. In some cases, they will be openly hostile, which means they'll actively try to dispute your message!
- **Emotional**: information makes people think, but emotion makes them act. Appeal to emotional needs, sometimes even way up on Maslow's hierarchy.
- **Stories**: telling a story [gets] people into paying closer attention, and feeling more connected. Remember the Jared Subway commercials?

One or two pages of sticky U-R-There,
and your "proposed" future-vision will be understood (and funded)

Response Situation Analysis (RSA)

CURVE
Metrics
8 domains

The CURVE Environment Drives the Response Need

Agile systems are defined in counterpoint to their operating environments.

Words used to describe the general nature of the target environment often include and combine dynamic, unpredictable, uncertain, risky, variable, and changing, with little attention to clear distinction among them.

To design and develop a system that can deal effectively with changing environments it is useful to articulate the nature of changes that should be considered.

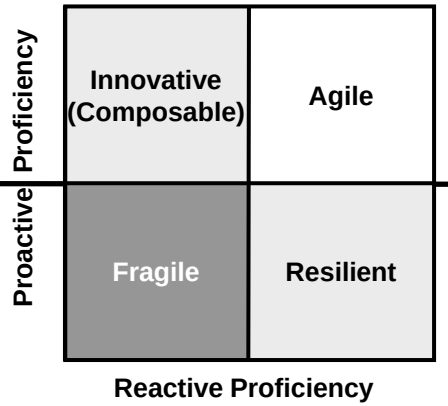
Agile systems have effective situational response options, within mission, under:

- **Caprice: randomness among unknowable possibilities.**
- **Uncertainty: randomness among known possibilities with unknowable probabilities.**
- **Risk: randomness among known possibilities with knowable probabilities.**
- **Variation: randomness among knowable variables and knowable variance ranges.**
- **Evolution: gradual (relatively) successive developments.**

The difference between risk and variation in this framework is that risk is viewed as the possible occurrence of a discrete event (a strike keeps all employees away), while variation is viewed as the intensity of a possible event (absenteeism varies with the season).

8 Response-Requirement Domains
for Response Situation Analysis (RSA)

	Change Domain	General Characteristic
Proactive	Creation (and Elimination)	Proactive Innovative/Composable Creates Opportunity Takes Preemptive Initiative
Proactive	Improvement	
Proactive	Migration	
Proactive	Modification (of Capability)	
Reactive	Correction	Reactive Resilient Seizes Opportunity Copes with Adverse Events
Reactive	Variation	
Reactive	Expansion (of Capacity)	
Reactive	Reconfiguration	

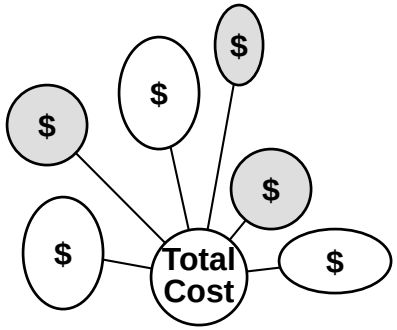


Change/Response Metrics

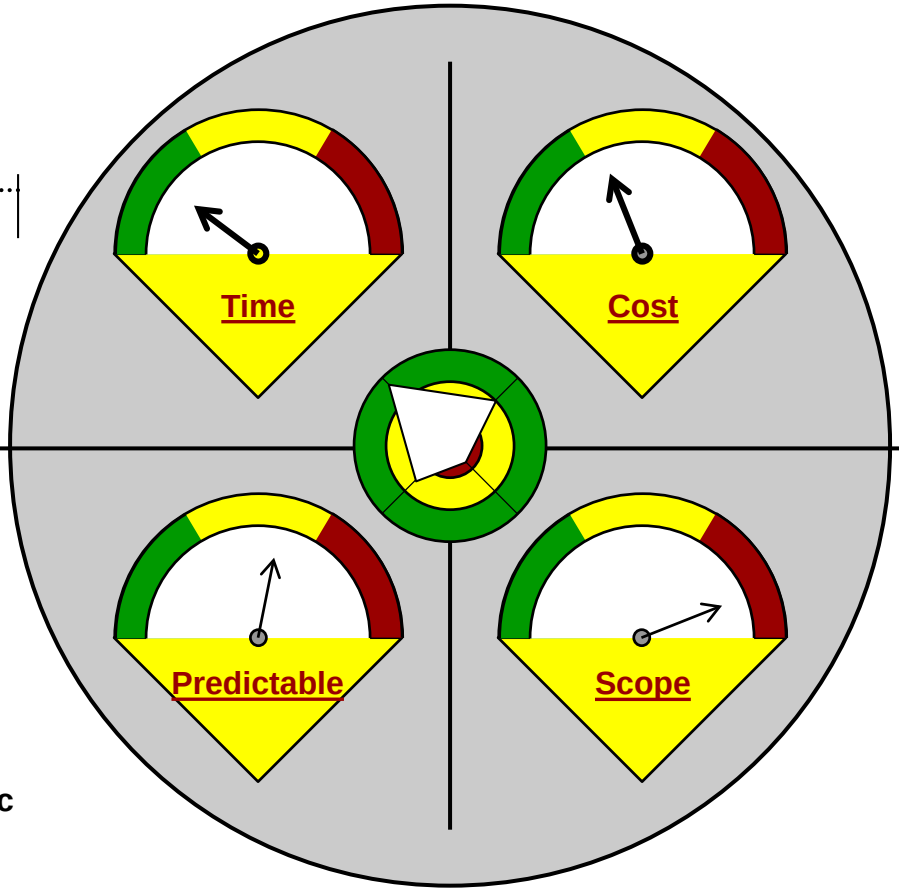
Identify initial metric priorities (t-c-p-s) for each response situation

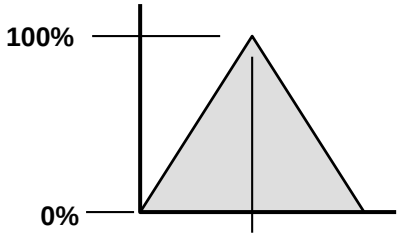
Time

Cost



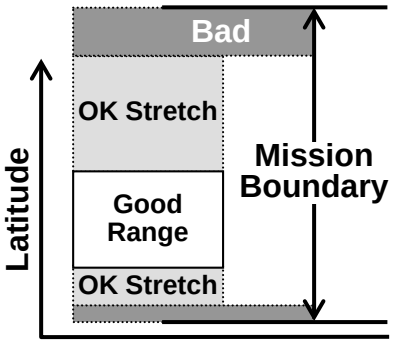
Activity Based Change-Costing





On-Time, On-Budget, On-Spec

Response Quality



Sufficient Response Range?

Predictability

Scope

Change/Response Domains

Change Domain		
Proactive	Creation (and Elimination)	**Proactive responses** are generally triggered internally by the application of new knowledge to generate new value. They are still proactive responses even if the values generated are not positive and even if the knowledge applied is not new – self initiation is the distinguishing feature here. A proactive change is usually one that has effect rather than mere potential; thus, it is an application of knowledge rather than the invention or possession of unapplied knowledge. Proactive change proficiency is the wellspring of leadership and innovation in system capability.
	Improvement	
	Migration	
	Modification (of Capability)	
Reactive	Correction	**Reactive responses** are generally triggered by events which demand a response: problems that must be attended to or fixed, opportunities that must be addressed. The distinguishing feature is little choice in the matter – a reaction is required. Reactive responses often address threatening competitive or environmental dynamics, new customer demands, agility deterioration/failure, legal and regulatory disasters, product failures, market restructuring, and other non-competitor generated events. Reactive change proficiency is the foundation of resilience and sustainability in system capability.
	Variation	
	Expansion (of Capacity)	
	Reconfiguration	

Creation/Elimination

What range of opportunistic situations will need modules assembled into responsive system configurations; what elements must the system create during operation that can be facilitated by modules and module pools; what situational evolution will cause obsolesce of modules which should be removed?

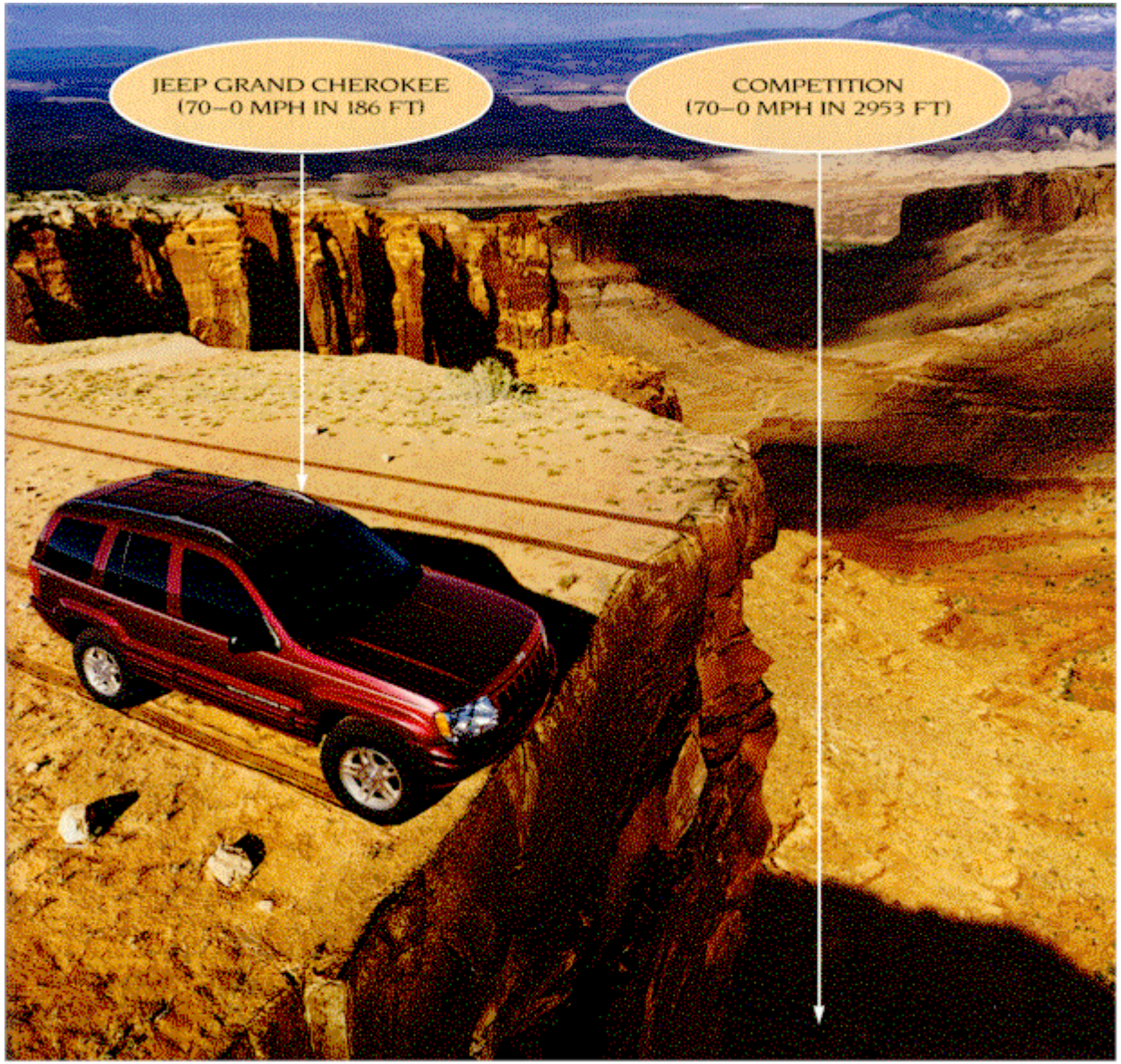
The distinguishing feature is the creation of something new or reincarnated that is not currently present. To note, this is not about the situation that calls for the original creation of an agile system, but rather about the evolution of the agile system during its operational period.

Situations to identify are those that require system configuration assemblies during operation, and those that require new modules for employment in those assemblies.

Agile Systems-Engineering (Project Mgmnt)

- project management strategy (t);
- project team (t, c); • system requirements (t, p);
- system architecture (t, s);
- system design (t, c, p);
- development activity plans (t);
- V&V/test plans (t);
- team collective understanding and learning (t, p);
- product development [software code, hardware build documentation] (t, c, p).

Inertia – The Bane of Agility



Ceasing prior activity

quickly and cleanly

is just as important as

starting new activity.

Bane: a cause of death, destruction, ruin (Webster)

Improvement

What improvements in system response performance will be expected over the system's operational life?

The distinguishing feature is performance of existing response capability, not the addition of new capability.

Situations to identify are generally those involving competencies and performance factors, and are often the focus of continual, open-ended campaigns.

Agile Systems-Engineering (Project Mgmnt)

- activity effort estimating (p);
- activity completion to plan (t, c, p);
- reducing uncertainty and risk (t, p, s).

Migration

What evolving technologies and opportunities might require future changes to the infrastructure?

The distinguishing feature is a need to change the nature of the plug-and-play infrastructure, not the addition of new modules.

Situations to identify are generally those that enable the transition to possible and potential next generation capabilities.

Agile Systems-Engineering (Project Mgmnt)

- compelling new technology availability (t, c, s);
- project scope change (s);
- lean process principles (p).

Modification (of capability)

What evolving technologies and opportunities might require modification of the available modules and roster of module pools?

The distinguishing feature is a necessary change in available module capabilities.

Situations are generally those that require something unlike anything already present, or the upgrade or change to something that does exist.

Agile Systems-Engineering (Project Mgmnt)

- new added team member unfamiliar/uncomfortable with management strategy (t);
- new environmental dynamics (t, c, p, s).

Change/Response Domains

Change Domain		
Proactive	Creation (and Elimination)	**Proactive responses** are generally triggered internally by the application of new knowledge to generate new value. They are still proactive responses even if the values generated are not positive and even if the knowledge applied is not new – self initiation is the distinguishing feature here. A proactive change is usually one that has effect rather than mere potential; thus, it is an application of knowledge rather than the invention or possession of unapplied knowledge. Proactive change proficiency is the wellspring of leadership and innovation in system capability.
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	Variation	
	Expansion (of Capacity)	
	Reconfiguration	

Correction

What types of response activities might fail in operation and need correction?

The distinguishing feature is a dysfunction or inadequacy during attempted response.

Situations to identify are those that require a recovery from response malfunction, recovery from unacceptable side effects of a response, and inability to assemble an effective response.

Agile Systems-Engineering (Project Mgmnt)

- wrong requirement (t);
- inadequate developer (t);
- failed V&V/test (t, c);
- non-compliant supplier (t, c).

Variation

What aspects of operational conditions and resources vary over what range when response capabilities must be assembled?

The distinguishing feature is predictable but uncertain variance.

Situations to identify are those that manifest as variances in module availability, module performance, and module interactions.

Agile Systems-Engineering (Project Mgmnt)

- expertise and skill levels among team members (p);
- grace period on schedule (t, c);
- deliverable performance range (p);
- availability, interaction, and expertise of customer involvement (s).

Expansion/Contraction

What are the upper and lower bounds of response capacity needs?

The distinguishing feature is capacity scalability.

Situations to identify are those that can be satisfied with planned capacity bounds, as well as those that have indeterminate and unbounded capacity needs.

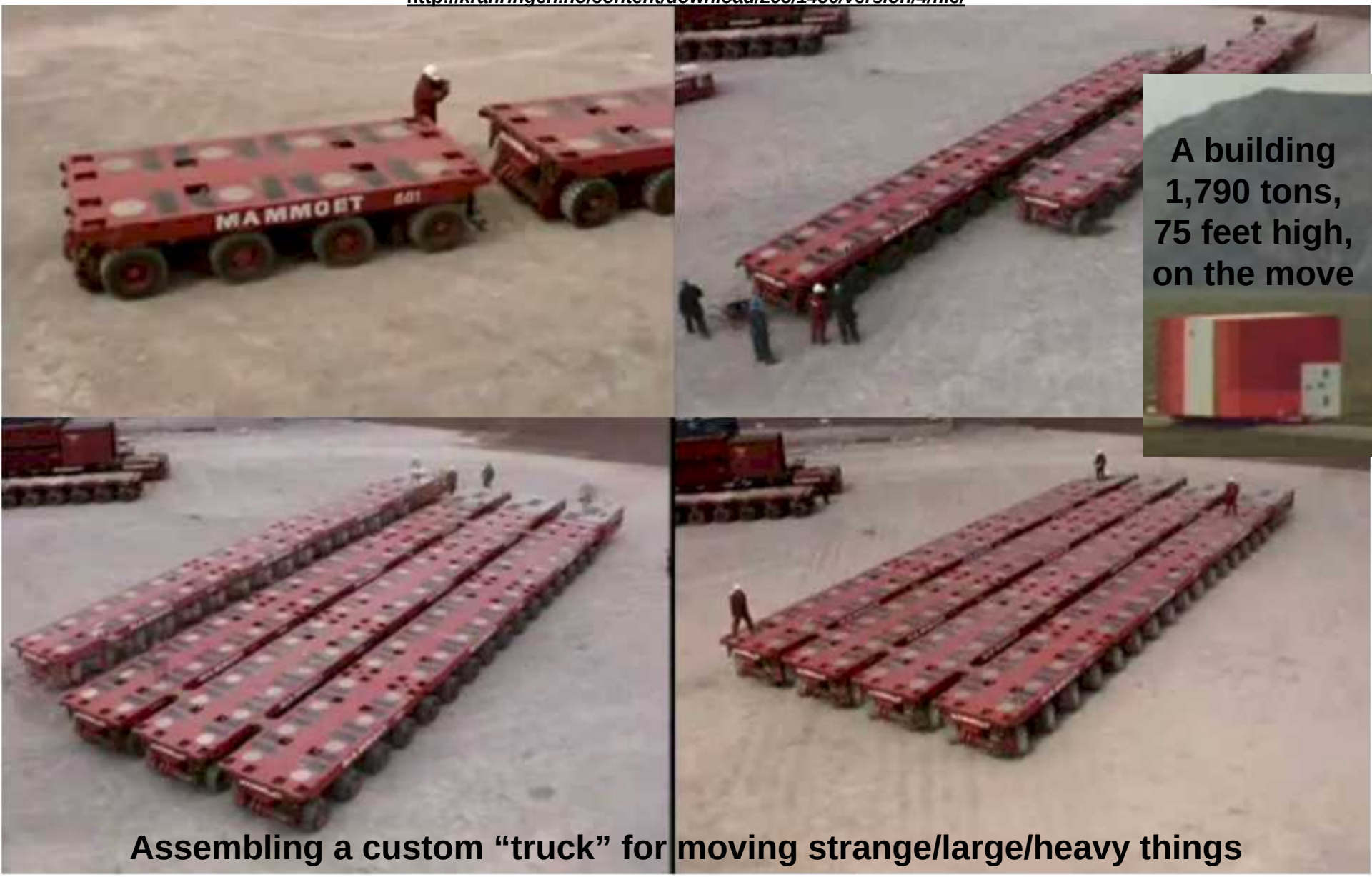
Agile Systems-Engineering (Project Management)

- 2x project scope change (t, c, p, s);
- team-size changes of x-y engineers distributed across n-m locations (t, s).

Reusable, Reconfigurable, Scalable Expansion/Contraction: Unbounded Capacity

File5.5
File8.25

http://videos2view.net/xM-WLT.htm
http://kranringen.no/content/download/295/1456/version/4/file/



Assembling a custom “truck” for moving strange/large/heavy things

Reconfiguration

What types of situations will require system reconfiguration in order to respond effectively?

The distinguishing feature is the configuration and employment of available modules for new or reincarnated response needs.

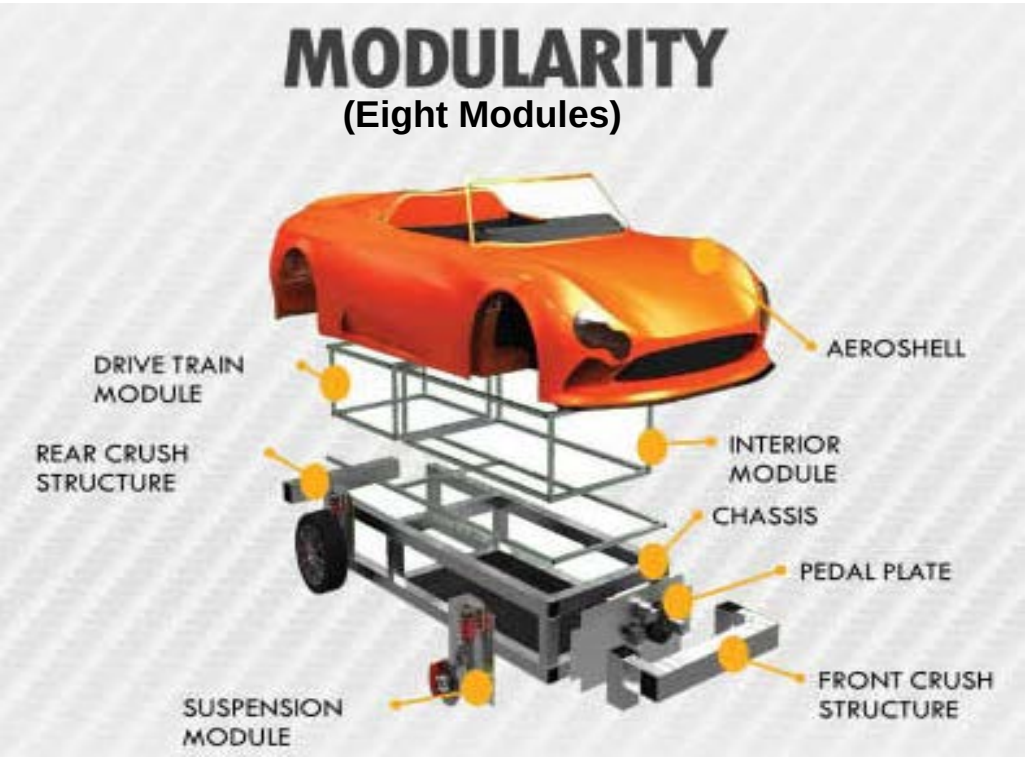
Situations to identify are those that are within the system mission boundaries, and that may require a reconfiguration of an existing system assembly, perhaps augment with removal of modules or addition of available modules.

Agile Systems-Engineering (Project Mgmnt)

- unanticipated expertise requirement (t);
- development activity-sequence priority change (t).

Wikispeed's Modular Cars

Detroit Auto Show, 11Jan2011



Modular design – Development is rapid because the design of the car is modular.

The engine is able to be switched from a gasoline to an electric engine in about the time it takes to change a tire. The car body can be switched to a pickup truck.

Modular design enables Wikispeed to make changes and develop quickly.

Simplicity and modularity reduce costs in making changes, in tooling, in machinery and in complexity.

Accelerating the response to problems – Wikispeed has steadily increased its velocity in resolving issues. For instance, on one occasion, within hours of getting a video back from a side impact test, the team realized that there was four inches of penetration into the cabin. It was still survivable, and still road-legal, but it wasn't the five star crash rating that the team wanted. So within hours, they had a volunteer team update the side impact crash structure and bolt it onto the car. The first time Wikispeed did a safety iteration like this, it took many weeks. Now they are able to accomplish it within a seven day sprint cycle.

Video and text at: www.youtube.com/watch?v=tTDCQMjbc40

Pro Forma RSA for Agile SE Project Management

with [t,c,p,s] metric-priorities for each issue, t = time of change, c = cost of change, p = predictability of change, s = scope of change

Change Domain		
Proactive	**Creation (and Elimination)**	• project management strategy (t); project team (t, c); system requirements (t, p); • system architecture (t, s); system design (t, c, p); development activity plans (t); • V&V/test plans (t); team collective understanding and learning (t, p); • product development [software code, hardware build documentation] (t, c, p).
	Improvement	• activity effort estimating (p); • activity completion to schedule (t, c, p); • reducing uncertainty and risk (t, p, s).
	Migration	• compelling new technology availability (t, c, s); • project scope change (s); • lean process principles (p).
	Modification (of Capability)	• new added team member unfamiliar/uncomfortable with management strategy (t); • new environmental dynamics (t, c, p, s).
Reactive	**Correction**	• wrong requirement (t); • inadequate developer (t); • failed V&V/test (t, c); • non-compliant supplier (t, c).
	Variation	• expertise and skill levels among team members (p); • grace period on schedule (t, c); • deliverable performance range (p); • availability, interaction, and expertise of customer involvement (s).
	Expansion (of Capacity)	• 2x (or half x) project scope change (t, c, p, s); • team-size changes of x-y engineers distributed across n-m locations (t, s).
	Reconfiguration	• unanticipated expertise requirement (t); • development activity-sequence priority change (t).

Getting it Right

Requirements *shall statements* define

exactly what must be accomplished.

If you miss even one you could have a dysfunctional result.

For Response Situation Analysis…

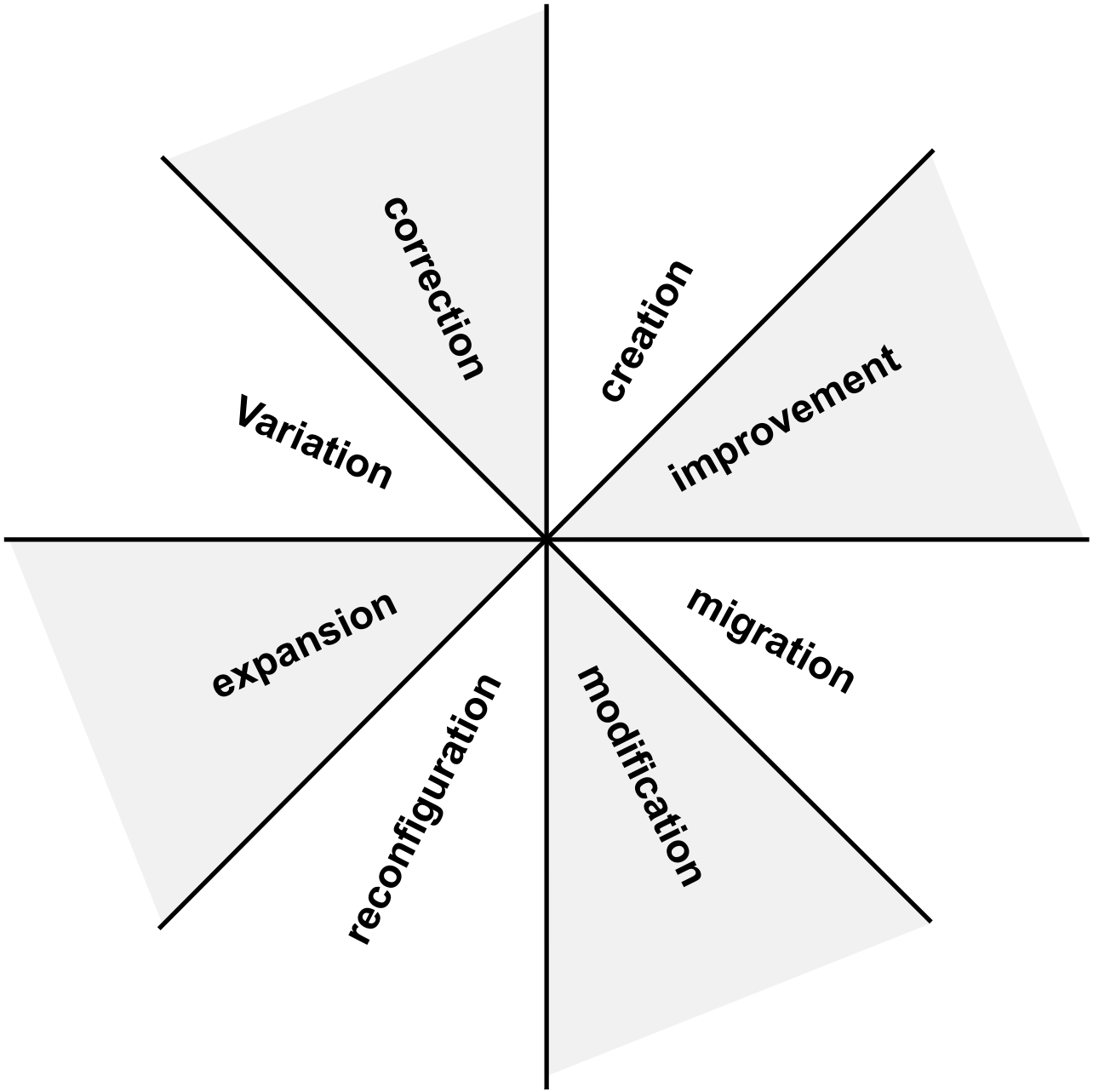
you do not need to develop a *comprehensive* list of shall statements, but rather a *sufficient* list of *response capabilities* –

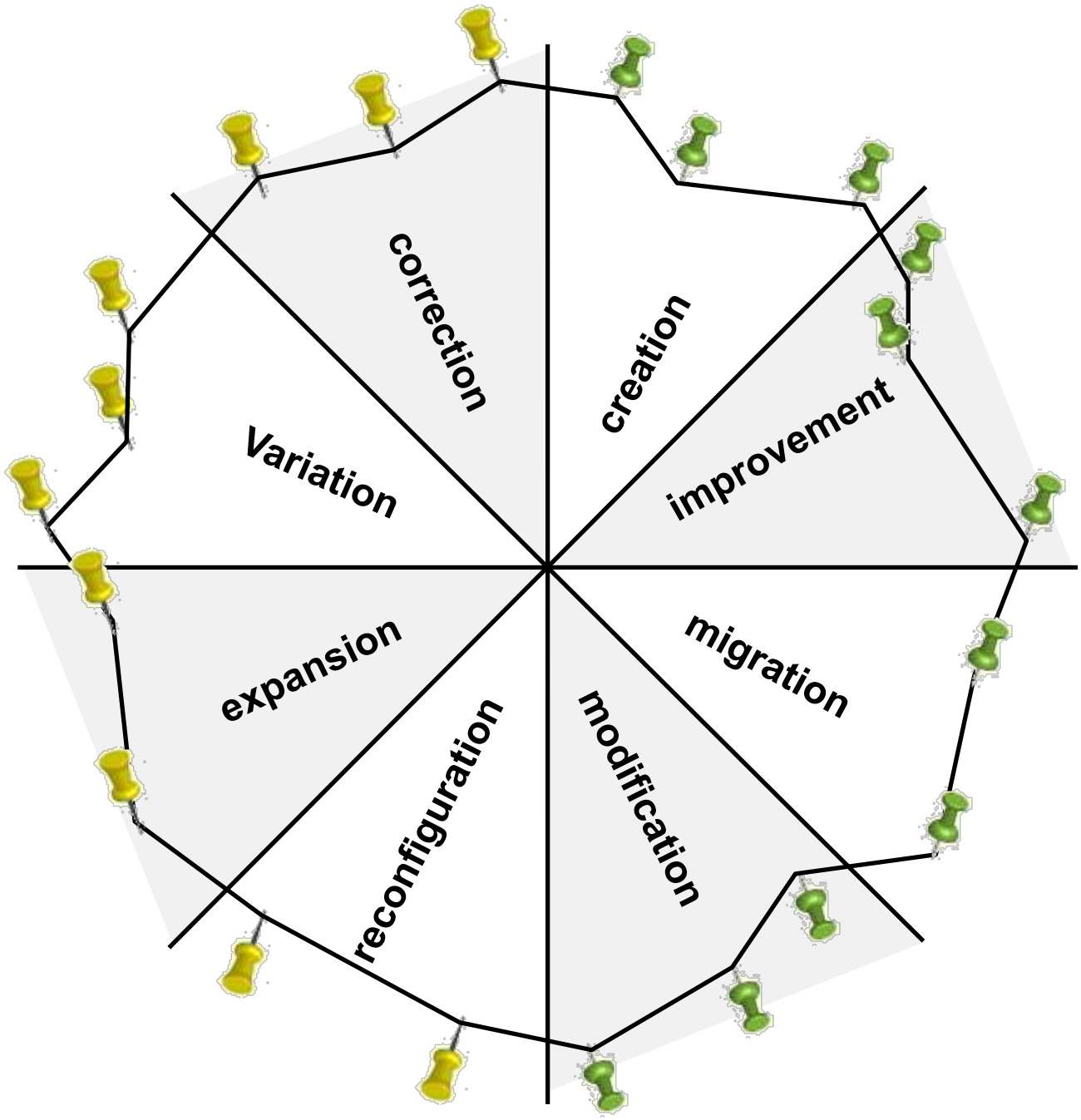
which if accomplished,

will stretch the envelope of agile response capability

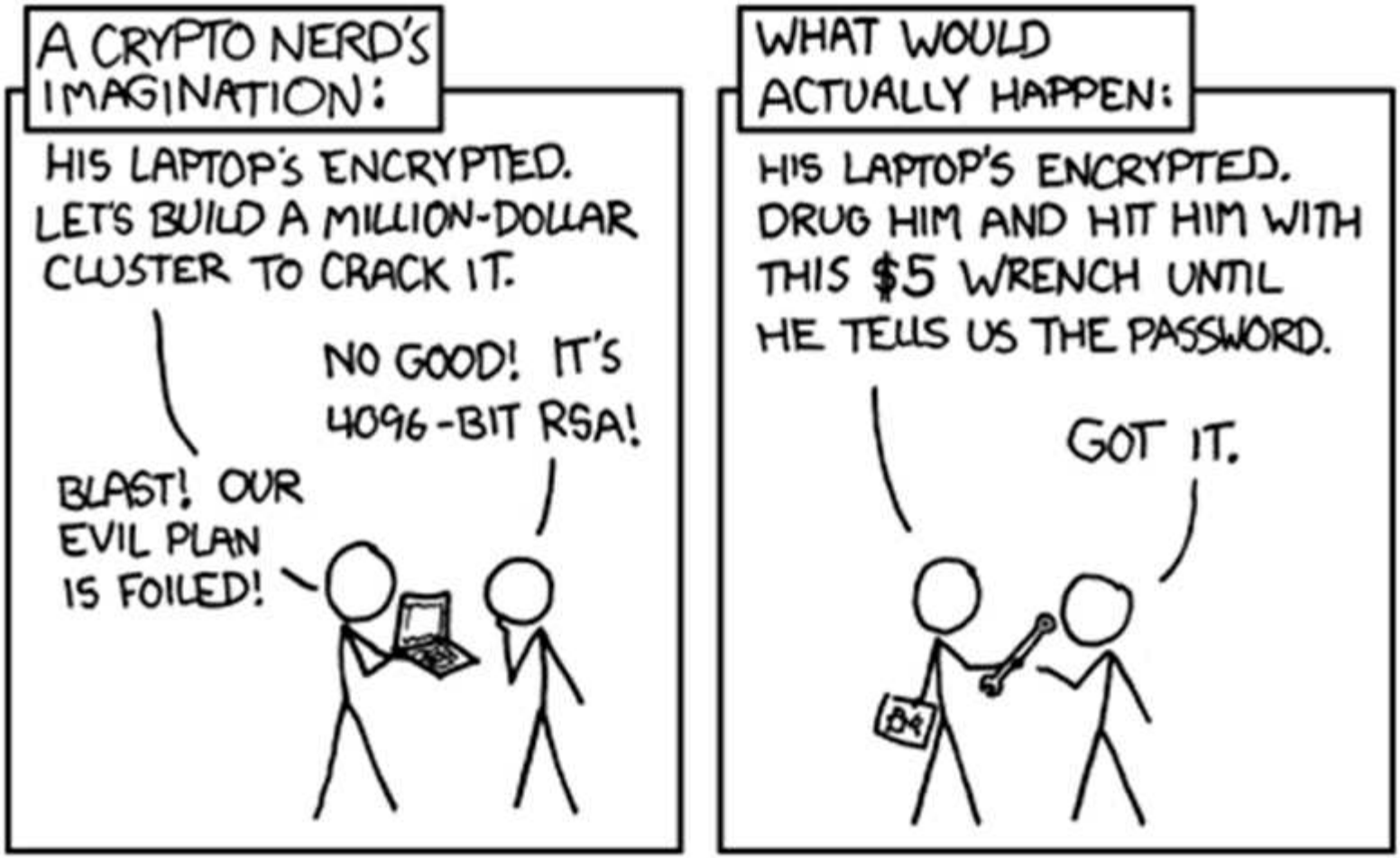
to encompass all necessary response needs,

even if they were not on the list.





Reality Factors



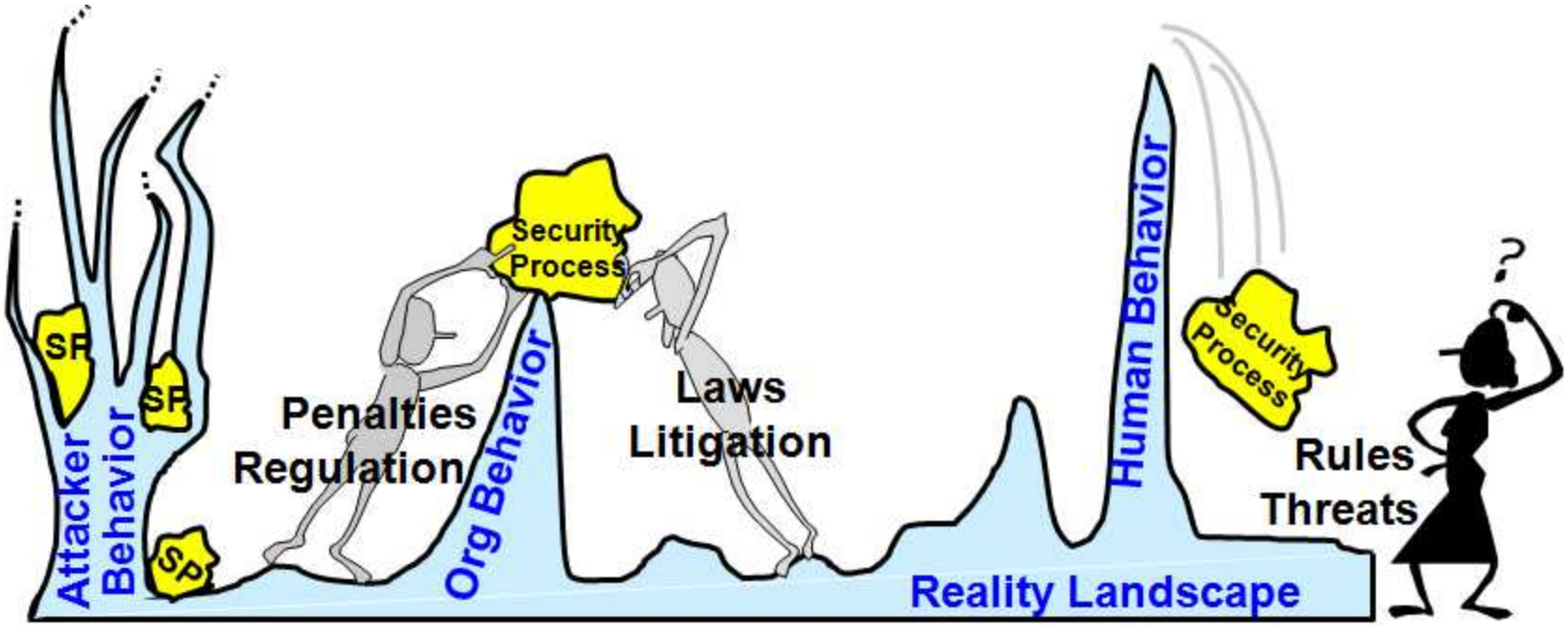
A padlock on a straw hut

http://xkcd.com/538/

Agility is All About Dealing With Reality

Security strategy often ignores reality:

eg., maintaining systems in unstable states takes constant energy input



Expecting or enforcing ideal and repetitive behavior ignores reality... not a substitute for effective strategy

If you are a **paying customer**, this is what you get:

Insert DVD

I don't see the point but oh well...

An unskippable "coming soon" screen.

Unskippable

Unskippable
You may fast forward

Unskippable Trailer #2
This is ridiculous

Ok I get it, this next trailer may scar me for life if I am under 17

Unskippable Trailer #3
(Someone put me out of my misery)

Some Blu-Ray commercial that goes on an on about how better it is than DVD.

Finally! The menu. At this point I am not sure if I want to watch the movie anymore.

Select Play

Some fade to black or outro that is completely unnecessary

Ok enough already I am a legit customer, I paid for the damn DVD with my hard earned cash

OH COME ON!!!

FFFFFUUUUUUU!

I already finished my popcorn bucket at this point.

My soda is flat.

Meh!

If you are a **pirate** this is what you get:

Insert DVD

Watch Movie

http://www.geekologie.com/2010/02/25/piracy-full.jpg

Environmental Reality Analysis

RSA exercises often assume a reasonably behaved and supportive environment, and tend to focus on the system's internal functional response situations. This framework tool moves the analysis into the external environment.

Reality Factors
Human (including customer) Behavior Reality – Human error, whimsy, expediency, arrogance...
Organizational Behavior Reality – Survival rules rule, nobody's in absolute control...
Technology Pace Reality – Accelerating technology and security-vulnerability introductions, sparse testing, new agile SE methods and knowledge...
System Complexity Reality – Incomprehensible, highly networked, unintended consequences, emergent behavior...
Globalization Reality – Partners with different ethics, values, infrastructures, cultural assumptions...
Partially-Agile Enterprise Reality (Faddish Practices) – Outsourcing, web services, SOA, process and progress transparency, COTs policies and affects...
Agile Customers/Competitors/Adversaries – Distributed, collaborative, self organizing, proactive, impatient, innovative…

Example: Agile SE For Aircraft Refurb Company

(student master's project)

Reality Factors
Human Behavior – Human error, whimsy, expediency, arrogance... • Lack of attention to detail by production and engineers. • Fatigue due to long hours with short breaks. • Arrogant less experienced mechanics not seeking the advice of more experience mechanics.
Organizational Behavior – Survival rules rule, nobody's in control... • The "get it done, I don't care how" attitude that is sometimes present. • The idea to keep work load high but manpower minimal. • Counterproductive monetary incentives that put schedule over quality.
Technology Pace – Accelerating vulnerability-introductions, sparse testing, new agile SE methods... • Electronic drilling machine. • Work instruction-delivery changing with technology pace.
System Complexity – Incomprehensible, highly networked, unintended consequences, emergence... • High knowledge/experience required. • Level of complexity leads to unintended consequences such as additional damage by the mechanics.
Globalization – Partners with different ethics, values, infrastructures, cultural assumptions... • Diverse ethnicities and cultural beliefs and values among customers. • Priority lists are different due to diversity.
Partially Agile Enterprise (Faddish Practices) – Outsourcing, web services, SOA, process and progress transparency, COTS policies and affects... • Outsourcing manufacturing. • Using Components off the shelf (COTS).
Agile Adversaries/Competitors/Customers – Distributed, self organizing, impatient, innovative... • Competitors may provide a more agile operation. • Customer desires maximum agility.

Wrapping it Up

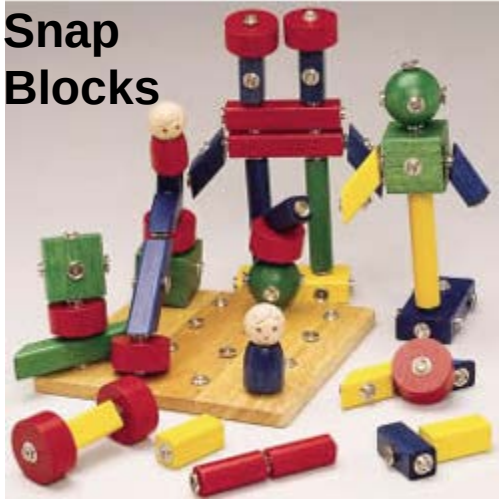
Design the Architecture of Your Construction Set

Bendables

Straws and Connectors

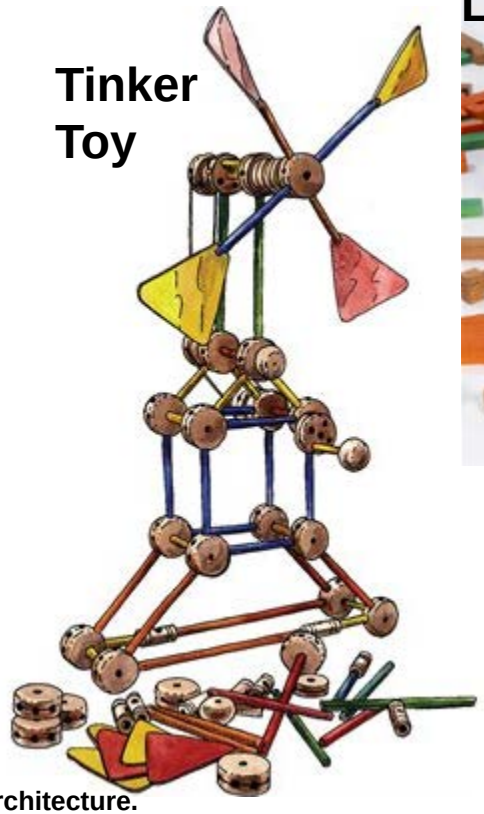
Marble Run

Snap Blocks



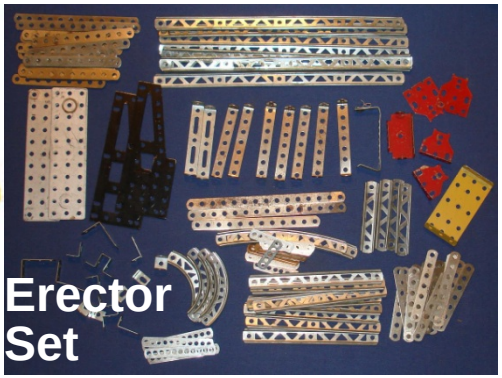
Woodbuilders

Tinker Toy



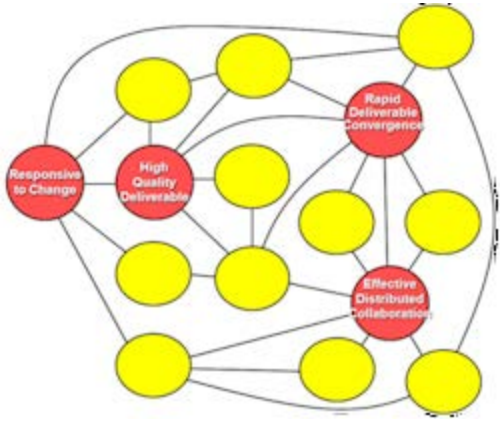
Log Builder

Lego



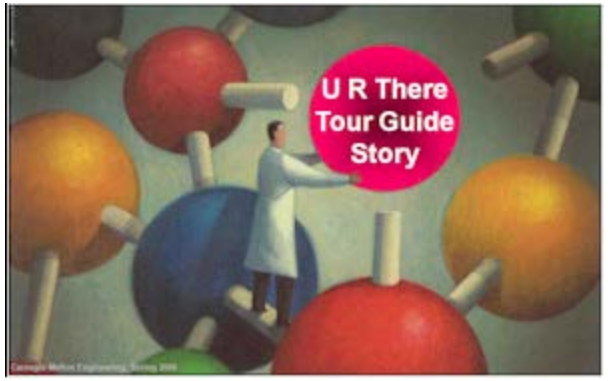
Bristle Blocks

Construction (response) architecture different from system functional architecture.
Response architecture is a domain-focused engineering architecture



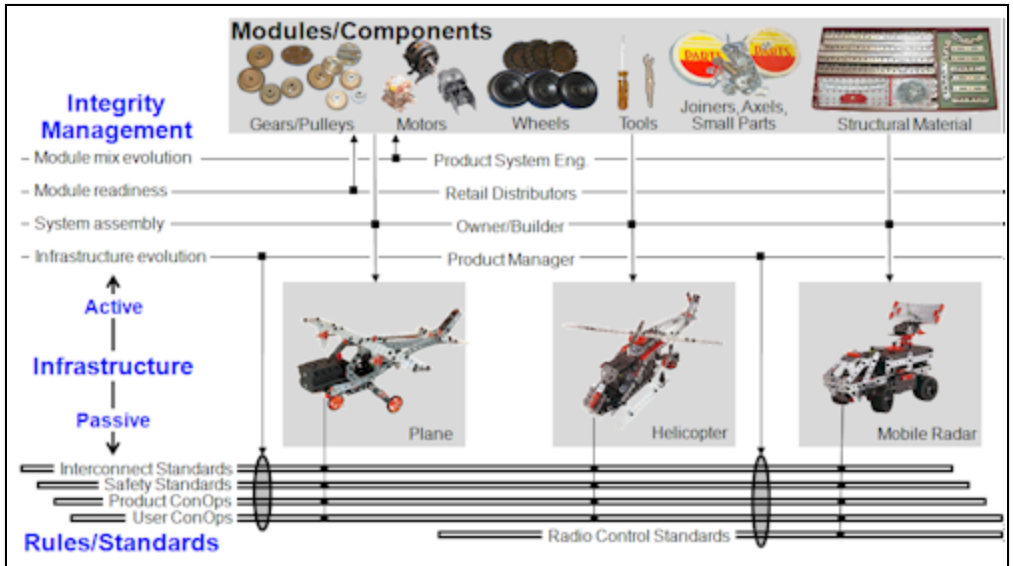
Agility ConOps

Response Requirements



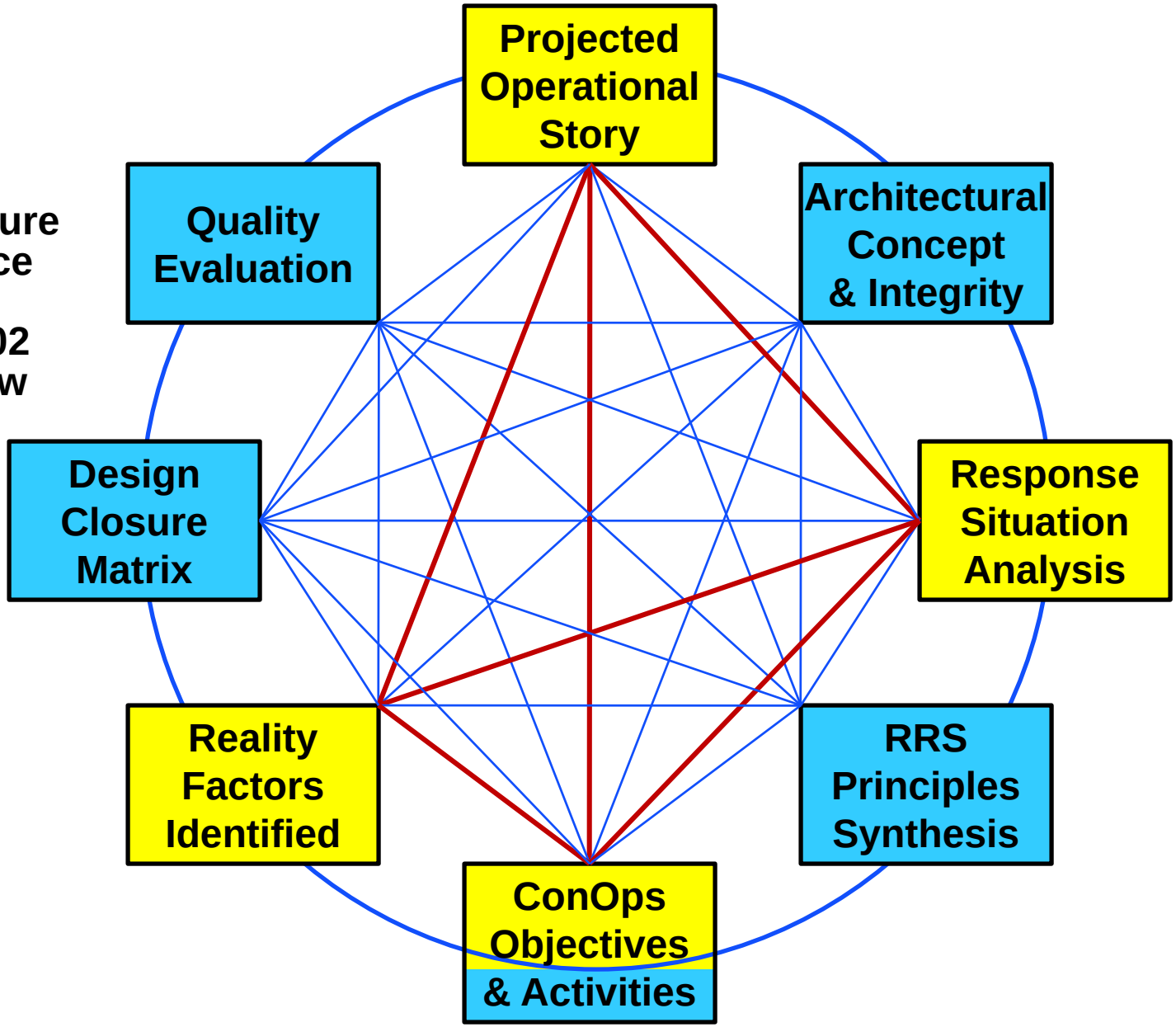
4 Thinking Tools for Guiding Architecture Pattern Development

Change Domain		
Proactive	Creation (and Elimination)	project management strategy (f); project team (f, c); system requirements (f, g); system architecture (f, s); system design (f, c, p); development activity plans (f); V&V/test plans (f); team collective understanding (f, p); product development (software code, hardware build documentation) (f, c, p)
Proactive	Improvement	activity effort estimating (p); activity completion to plan (f, c, p); reducing uncertainty and risk (f, p, s)
Proactive	Migration	compelling new technology availability (f, c, s); project scope change (s); lean process principles (p)
Proactive	Modification (of Capability)	new added team member unfamiliar/uncomfortable with management strategy (f); new environmental dynamics (f, c, p, s)
Reactive	Correction	wrong requirement (f); inadequate developer (f); failed V&V/test (f, c); non-compliant supplier (f, c)
Reactive	Variation	expertise and cadit levels among team members (p); place period on schedule (f, c); deliverable performance range (p); availability, interaction, and expertise of customer involvement (s)
Reactive	Expansion (of Capacity)	2x project scope change (f, c, p, s); team size changes of x y engineers distributed across n-m locations (f, s)
Reactive	Reconfiguration	unanticipated expertise requirement (f); development activity sequence priority change (f)



Eight principle tools to employ when designing or analyzing a system for agility

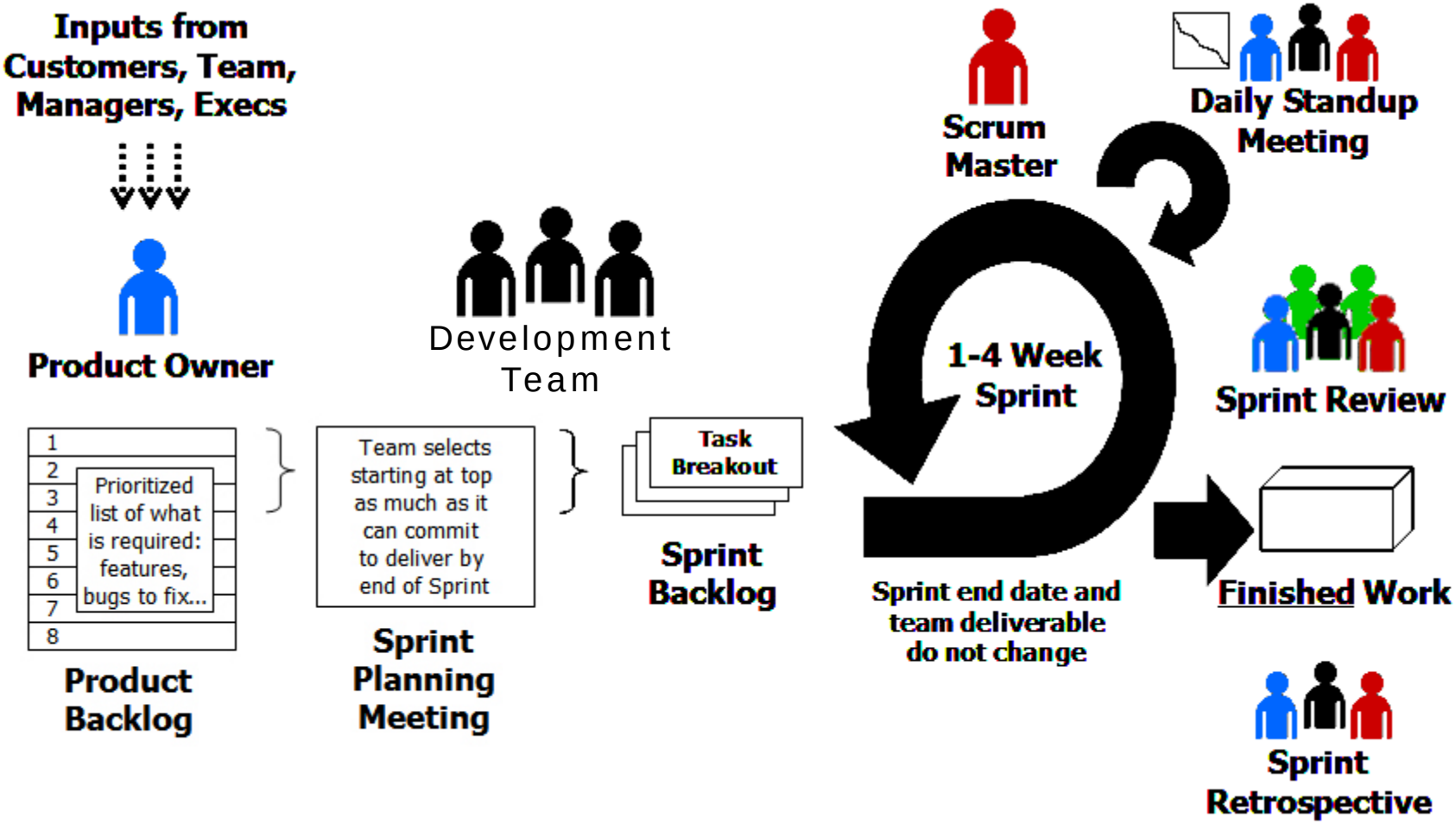
Architecture Guidance
...
Agile 102 in Yellow



“Classic” Scrum

Ken Schwaber, Jeff Sutherland. 2013. The Scrum Guide. www.scrum.org/

Jeff Sutherland, Ken Schwaber. 2007. The Scrum Papers: Nuts, Bolts and Origins of an Agile Process. Scrum Foundation. http://scrumfoundation.com

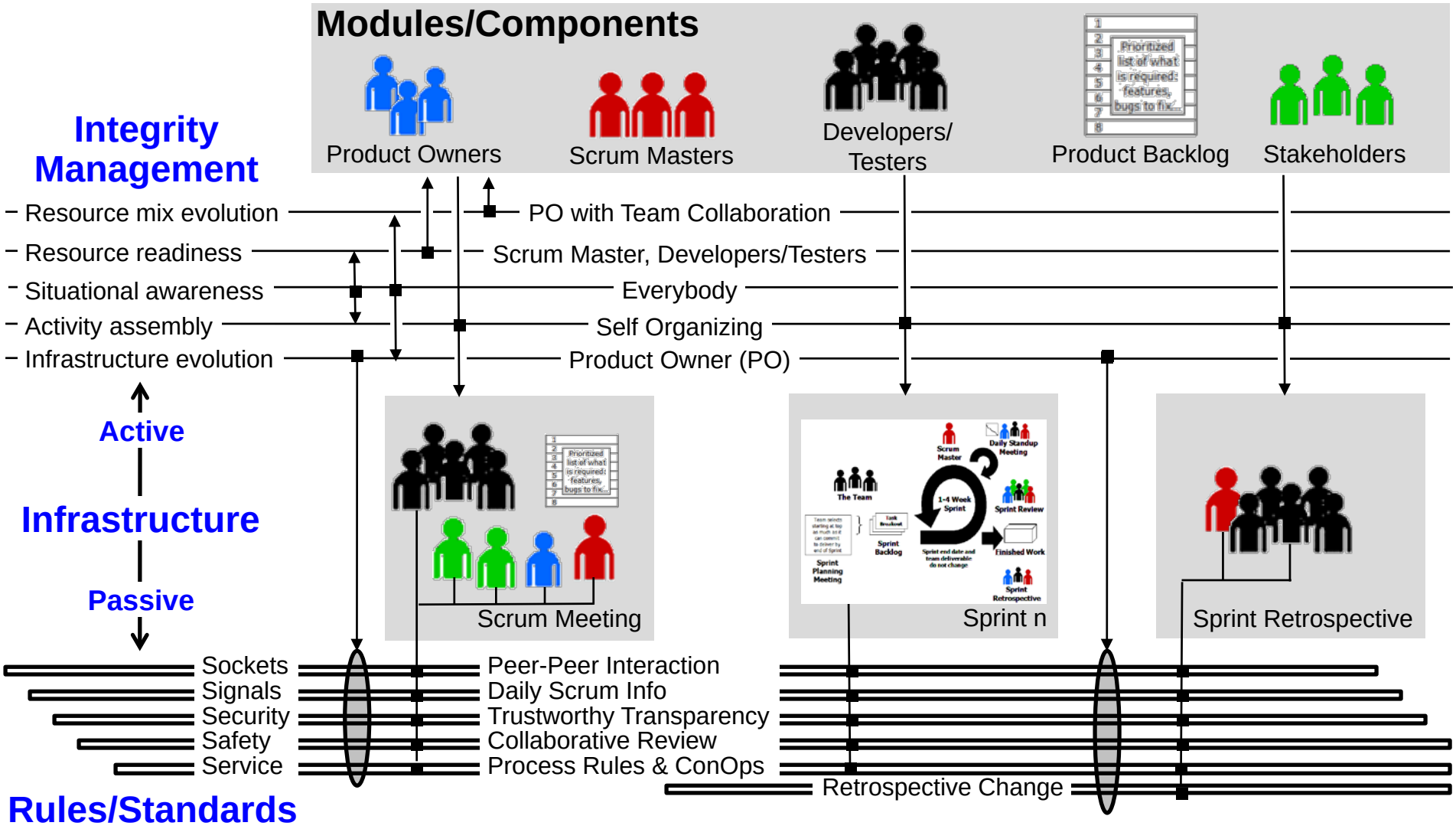


“Scrum’s roles, artifacts, events, and rules are immutable, and although implementing only parts of Scrum is possible, the result is not Scrum.

Scrum exists only in its entirety, and functions well as a container for other techniques, methodologies, and practices.” (Schwaber and Sutherland 2013)

Scrum has an Agile Architecture Pattern (AAP) *Structure*

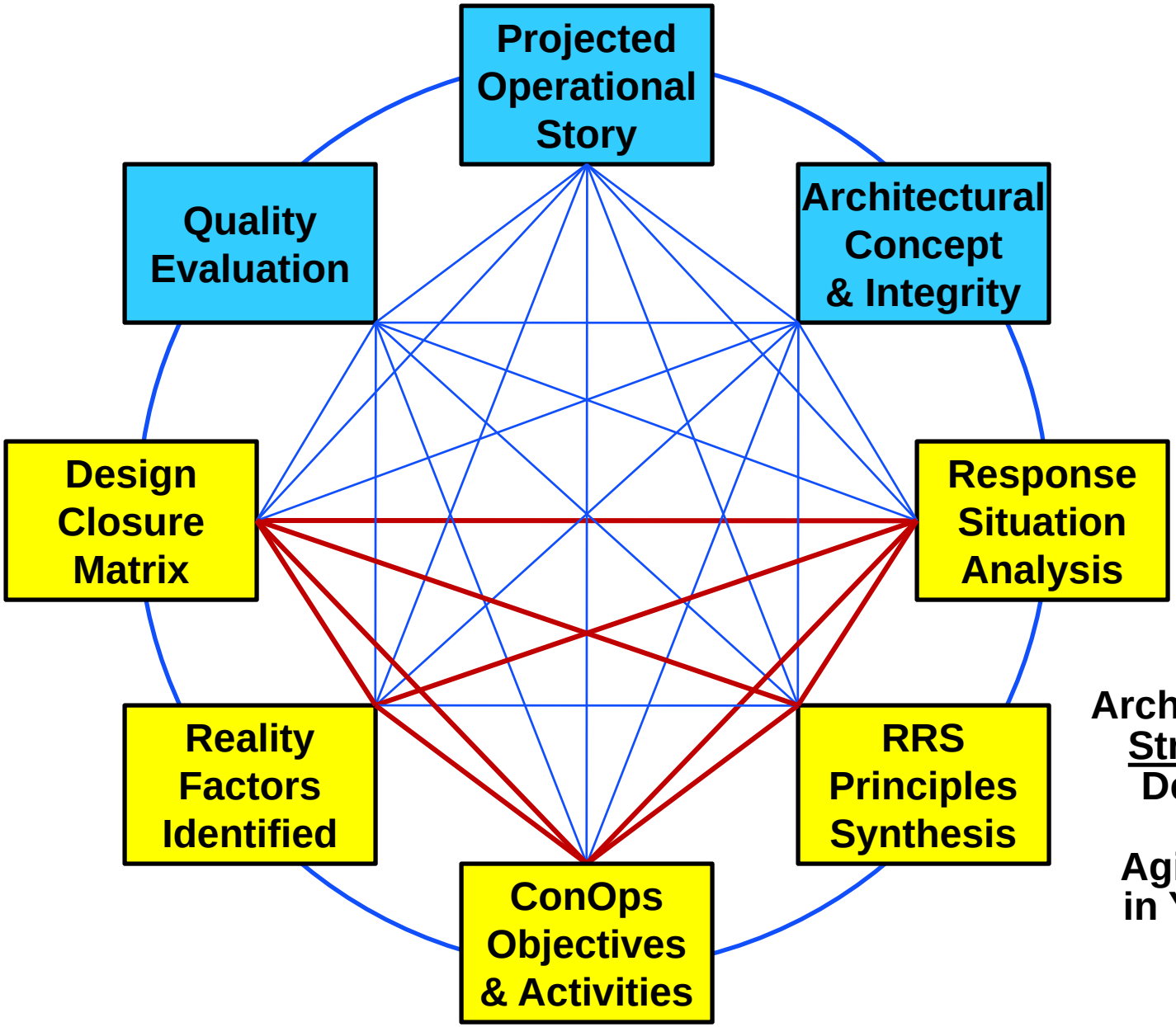
suitable for agile SW development, but not for agile systems-engineering …



… because the RSA is different for an agile systems-engineering process, and the Scrum AAP *strategy* is inadequate for systems engineering

Read the Book for – Agile 103

Rick Dove. 2001. Response Ability – The Language, Structure and Culture of the Agile Enterprise. Wiley



Architecture
Strategy
Design
…
Agile 103
in Yellow

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Download 104 webinar slides: Agile System/Process Engagement Quality
Download 103 webinar slides: Agile System/Process Design Principles
Download 102 webinar slides: Agile System/Process Design Requirements
Download 101 webinar slides: Agile System/Process Architecture Pattern
(updated asynchronously from time-to-time)