Webinar

- First time: don't know if all the material can be covered in 45-50 minutes.
- Condensed tutorial: wordy slides for archive viewing w/o voice over.

Agile Systems and Processes – Driving Architecture with ConOps and Response Situation Analysis (Agile 102)

Enchantment Chapter

11 September 2013

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Download 102 webinar slides: www.parshift.com/s/AgileSystems-102.pdf
Download 101 webinar slides: www.parshift.com/s/AgileSystems-101.pdf
(updated asynchronously from time-to-time)

Agile 102: Agile Systems and Processes – 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, the subject of the INCOSE Agile 101 webinar that is 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 highly distributed resilient network anomaly detection. 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. He chairs the INCOSE working groups on Agile Systems and Systems engineering, and on Systems Security Engineering.

Recapping Agile 101…

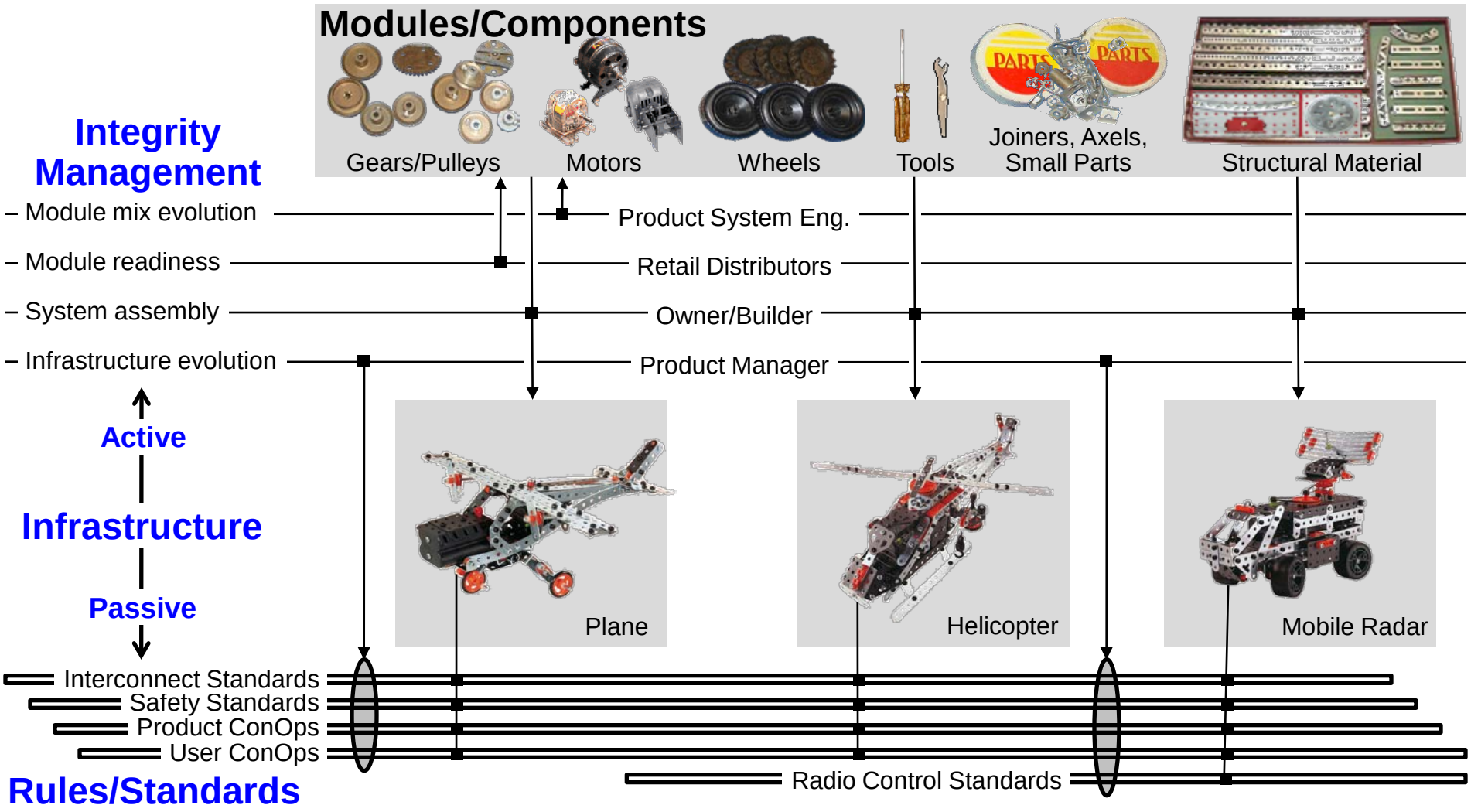
Objective: Agile-System X-Ray Vision

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


http://www.vintagetoys.com/toys/classified/962
Here's a Box of Bones
Sensational New
ERECTOR
DEVELOPED AT THE GILBERT HALL OF SCIENCE
GILBERT
ERECTOR
No 10052
THE ROCKET LAUNCHER SET
Exciting Action
Rocket Launcher!
POWERFUL ELECTRIC MOTOR
PARTS
PARTS
www.girdersandgears.com/erector-1958-10052.html

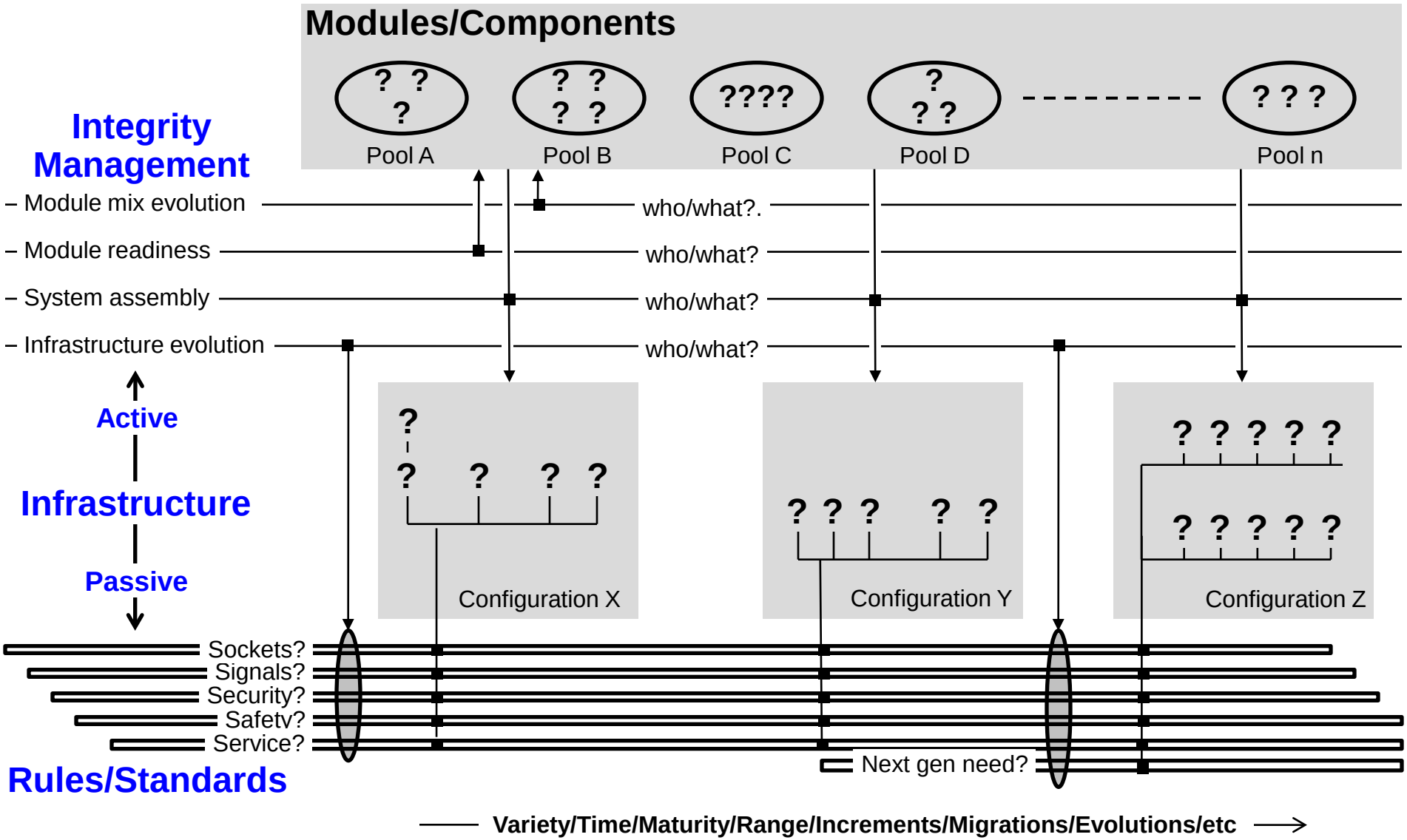
Here is a System Construction-Kit System

the agile architecture pattern (AAP) provides structure and strategy

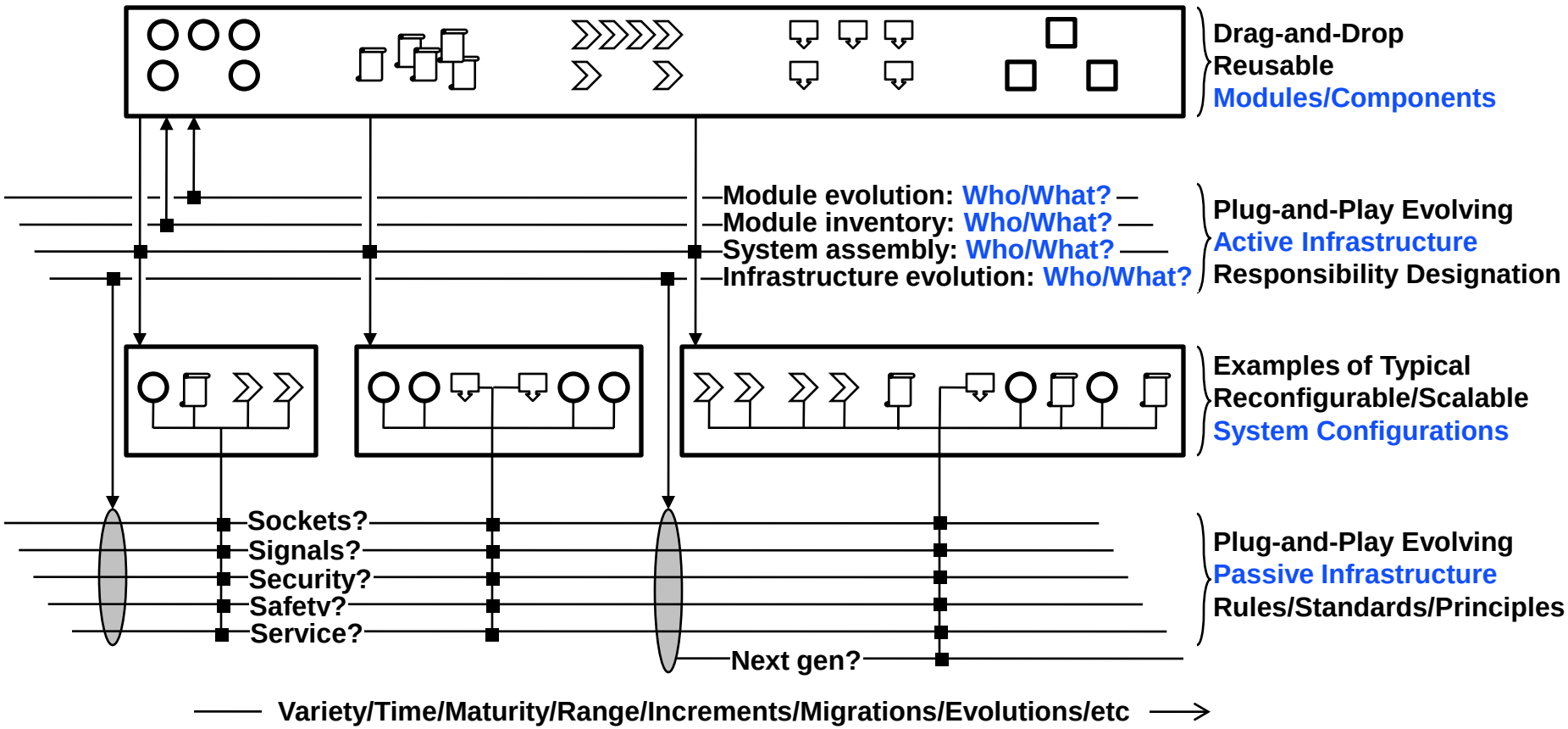


Designing a System Construction-Kit System

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



Generic Agile Architecture Pattern



Passive Infrastructure – at least five categories of standards and rules should be considered:

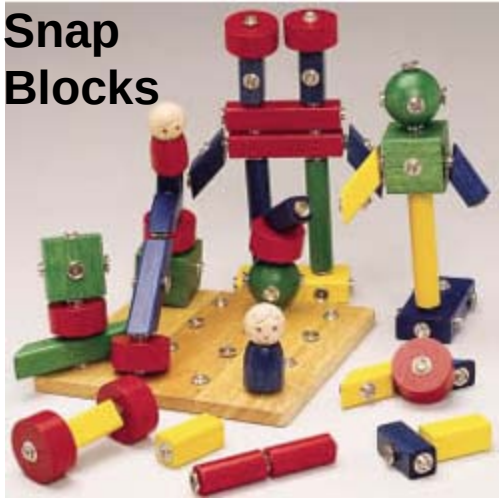
- Sockets: Module physical interconnection standards
- Signals: Module data interconnection standards
- Security: Module (dis)trust interconnection standards
- Safety: user, system, and environment safety principles/standards/regulations
- Service: system operations manual with ConOps and agility sustainment concepts/principles/rules

Bendables

Straws and Connectors

Marble Run

Snap Blocks



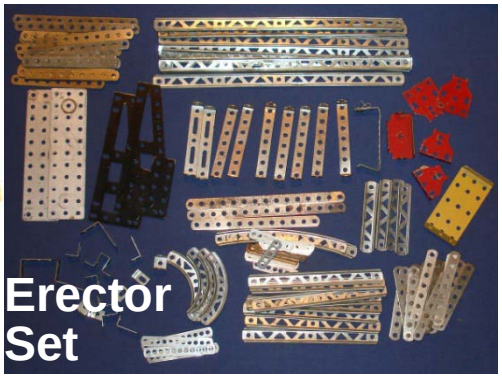
Woodbuilders

Design the Elements of Your Construction Set

Tinker Toy

Log Builder

Lego



Erector Set

Bristle Blocks

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

Sorting Out the Architectures

Ferris wheel has a functional architecture.

Erector set has an agile architecture.

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

One could argue that the agile 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),	quality
■ comprehensive (anything/everything within mission boundary).	scope

You can think of Agility as Requisite Variety.

You can think of Agility as proactive Risk Management.

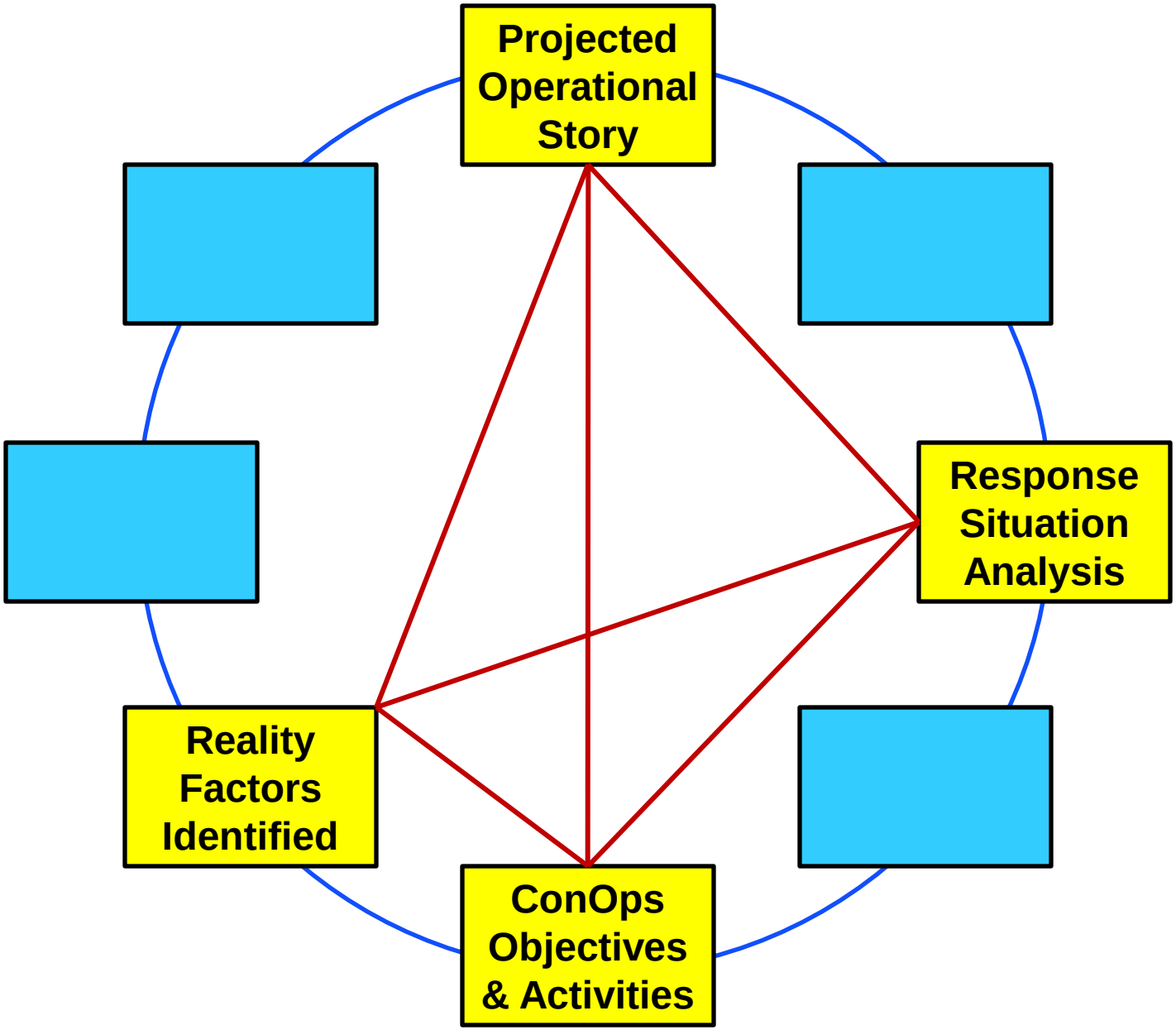
You can think of Agility as Innovative Response in unpredictable situations.

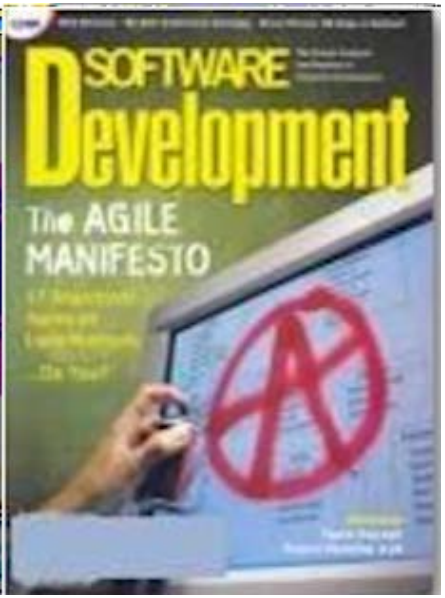
You can think of Agility as Life Cycle Extension.

**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





Behind The Agile Manifesto

www.drdobbs.com/open-source/the-agile-manifesto/184414755?queryText=the+agile+manifesto

The original Agile Manifesto article published in Dr Dobbs
By Martin Fowler and Jim Highsmith, August 01, 2001

Facilitating change is more effective than attempting to prevent it. Learn to trust in your ability to respond to unpredictable events; it's more important than trusting in your ability to plan for disaster.

…we all enjoyed working with people who shared compatible goals and values based on mutual trust and respect, promoting collaborative, people-focused organizational models, and building the types of professional communities in which we would want to work.

The agile methodology movement is not anti-methodology; in fact, many of us want to restore credibility to the word. We also want to restore a balance: We embrace modeling, but not merely to file some diagram in a dusty corporate repository. We embrace documentation, but not to waste reams of paper in never-maintained and rarely-used tomes. We plan, but recognize the limits of planning in a turbulent environment.

No one can argue that following a plan is a good idea—right? Well, yes and no. In the turbulent world of business and technology, scrupulously following a plan can have dire consequences, even if it's executed faithfully. However carefully a plan is crafted, it becomes dangerous if it blinds you to change. We've examined plenty of successful projects and few, if any, delivered what was planned in the beginning, yet they succeeded because the development team was agile enough to respond again and again to external changes.

The volatility associated with today's projects demands that customer value be reevaluated frequently, and meeting original project plans may not have much bearing on a project's ultimate success.

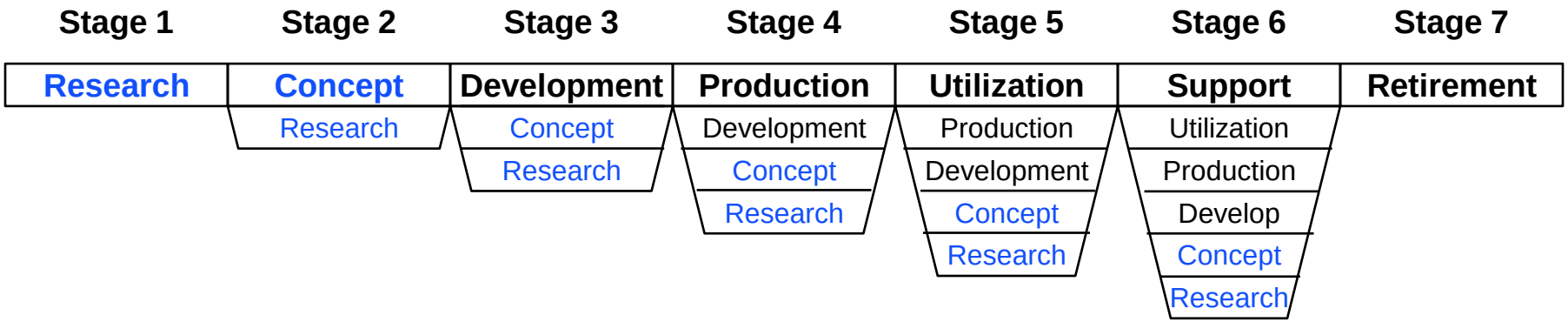
The growing unpredictability of the future is one of the most challenging aspects of the new economy. Turbulence—in both business and technology—causes change, which can be viewed either as a threat to be guarded against or as an opportunity to be embraced.

We favor iterative development primarily because it provides milestones that can't be fudged, which imparts an accurate measure of the progress and a deeper understanding of the risks involved in any given project. As Chet Hendrickson, coauthor of *Extreme Programming Installed* (Addison-Wesley, 2000), remarks, "If a project is going to fail, I'd rather know that after one month than after 15."

While the group believes that a set of common purposes and principles will benefit the users of agile methodologies, we are equally adamant that variety and diversity of practices are necessary. When it comes to methodologies, each project is different and each project team is different—there's no one-size-fits-all solution.

What of the future? We can confidently say that we don't know. Agility is all about trusting in one's ability to respond to unpredictable events more than trusting in one's ability to plan ahead for them. We also know that the personal relationships formed by our collaboration matter far more than the document that we've produced. One thing is clear: we've only just started.

Agile Systems-Engineering Lifecycle



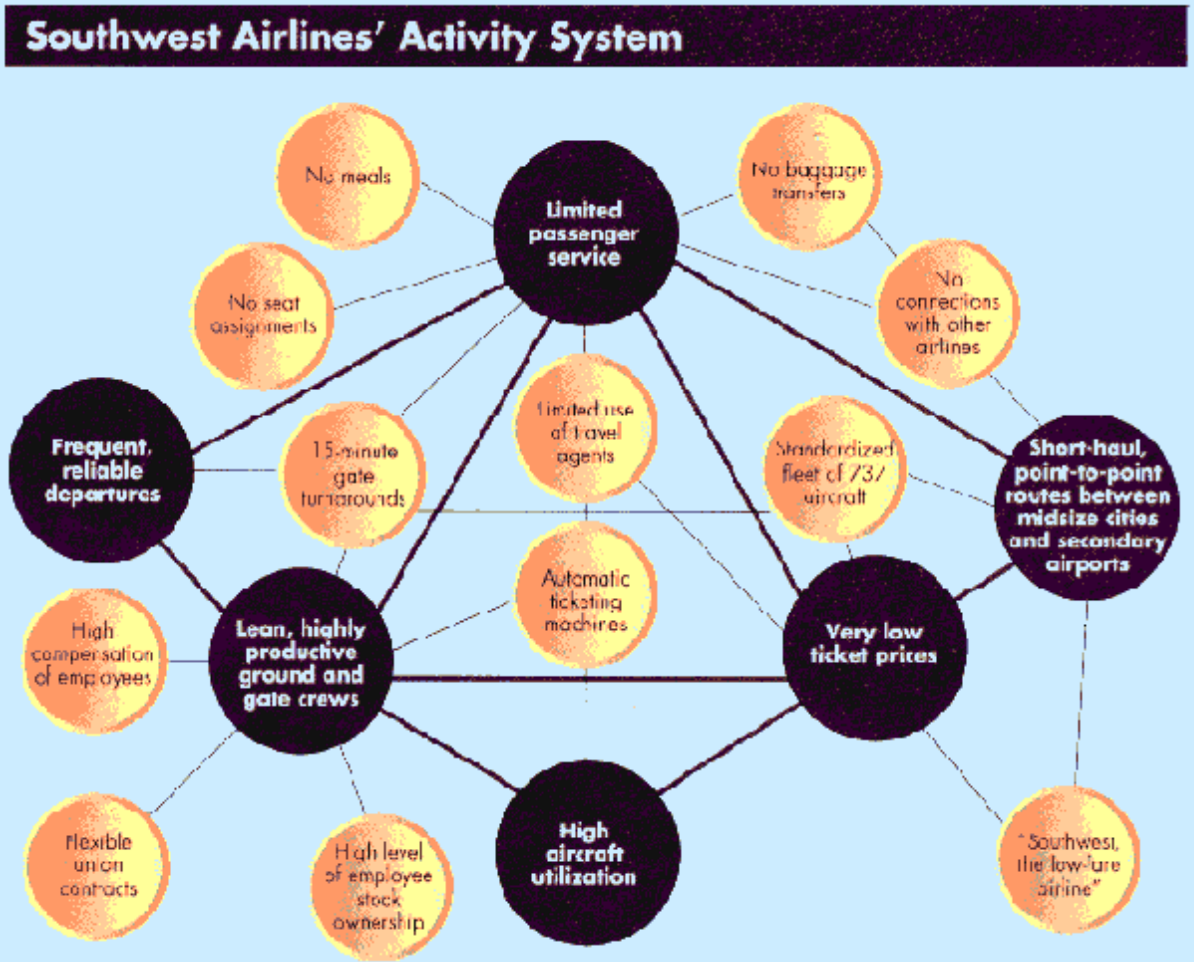
Though the focus is on Stage 1 and 2 (getting started with design concepts), these activities will run concurrently throughout the project lifecycle

Developing an Agile ConOps

Strategy Web
Operational Story

Porter on Strategy

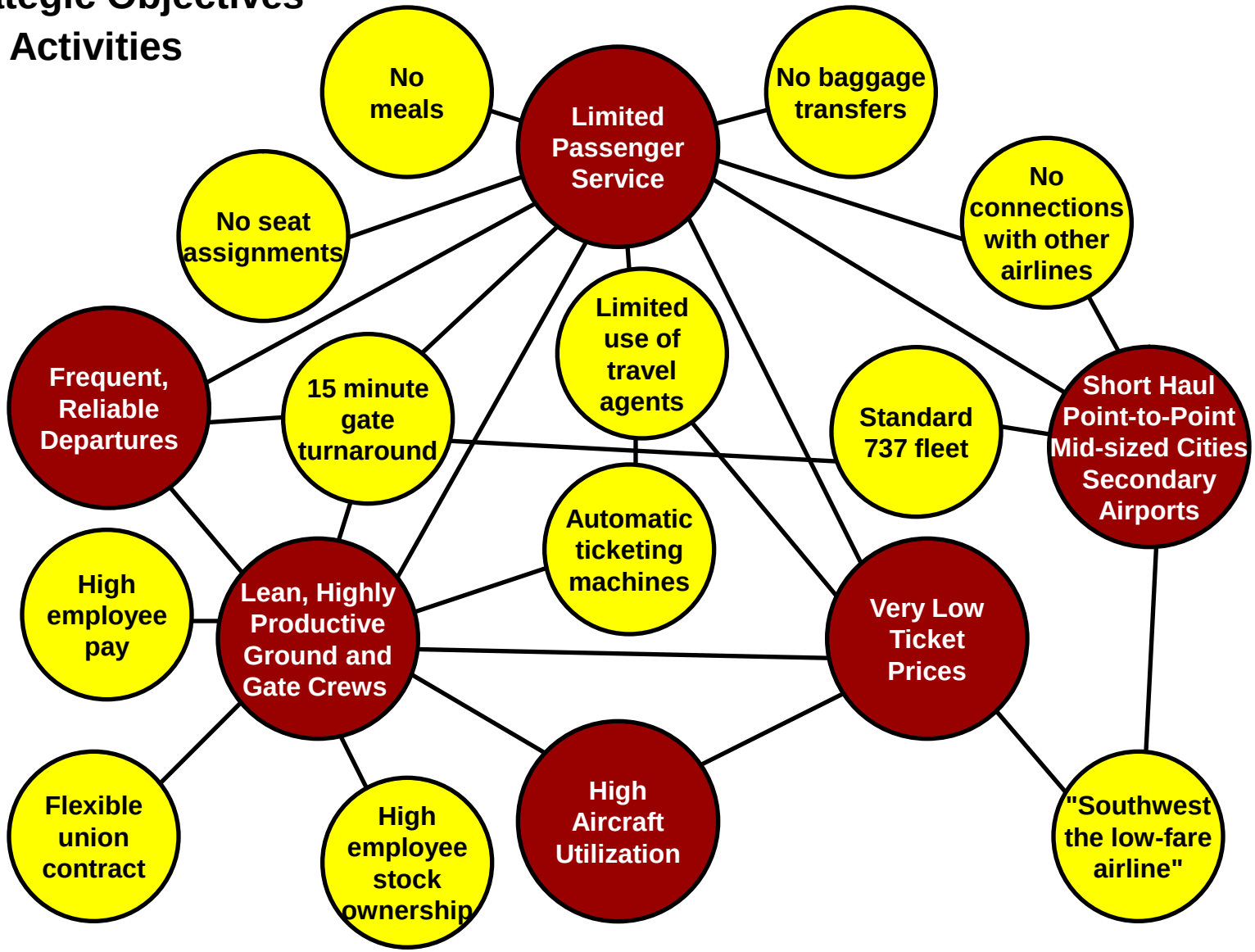
"What is Strategy?", Michael Porter, Harvard Business Review, Nov-Dec '96



- All differences in cost or price derive from hundreds of activities required to create, produce, sell, and deliver.
- Activities are the basic units of competitive advantage.
- Overall advantage or disadvantage results from all of a company's activities, not only a few.
- Strategic positioning means performing *different activities* from rivals' or performing similar activities in *different ways*.

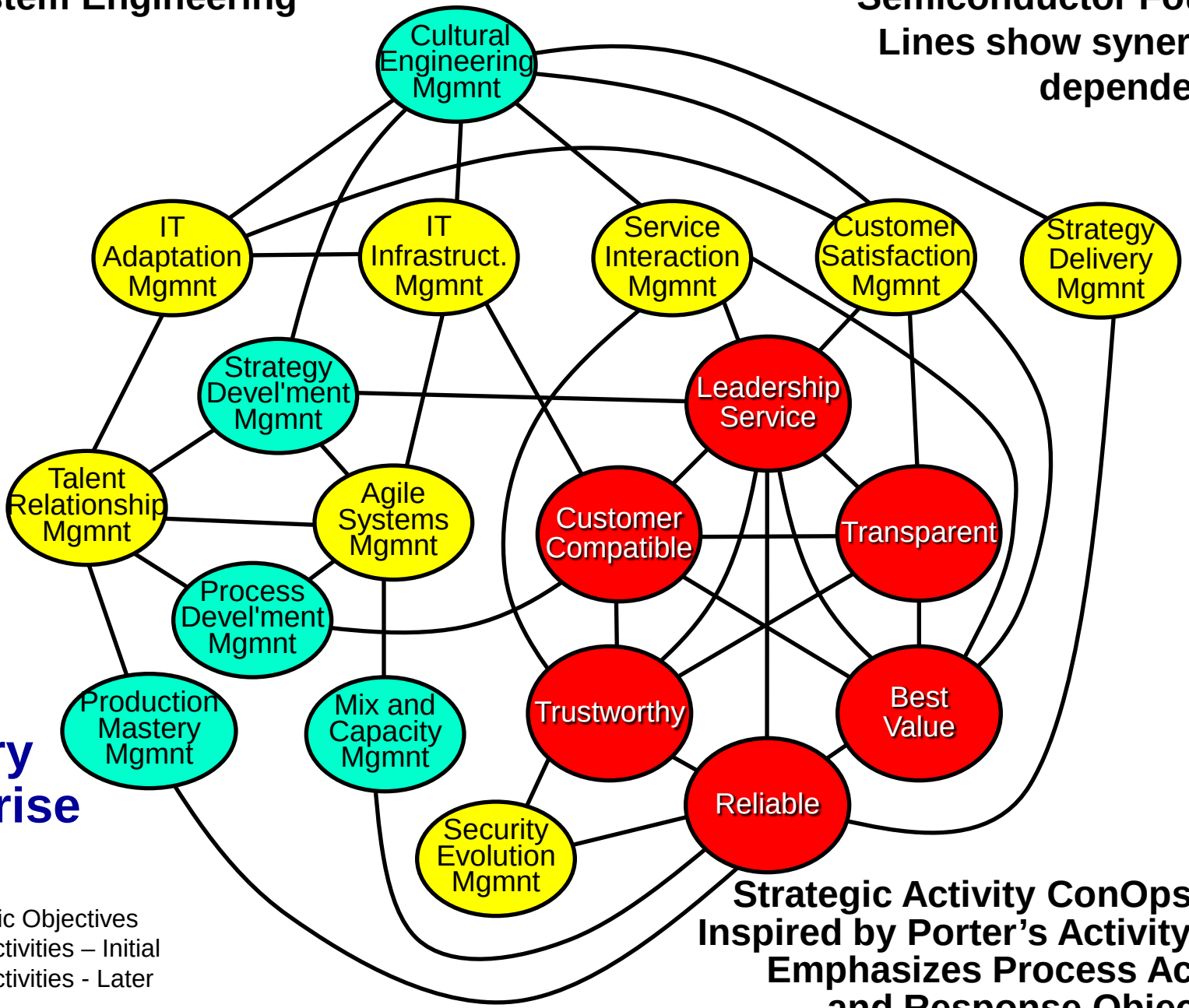
Southwest Airlines
(Concept of Operations)

- Strategic Objectives
- Key Activities



Agile-System Engineering

Semiconductor Foundry
Lines show synergistic dependencies

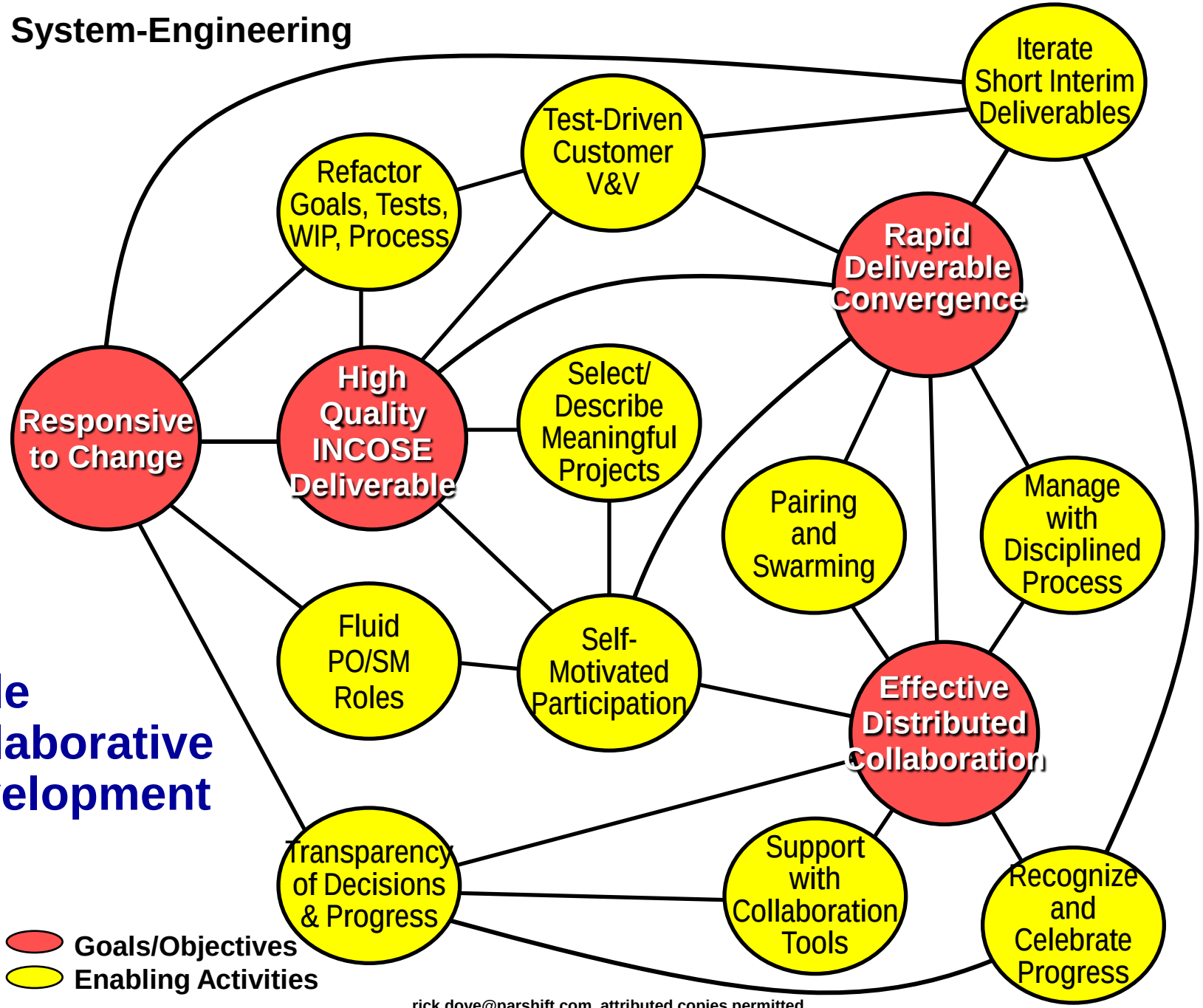


Agile Foundry Enterprise

- Strategic Objectives
- Agile Activities – Initial
- Agile Activities - Later

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

Agile System-Engineering



On the Strategic Activity ConOps Web

This web of synergistic activities, that creates values, is a system in its own right.

This web graphic is a way of depicting the architecture of a ConOps.

Strategic objectives/values (red): do not have a large number, 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 think about the activity relationship interfaces.

You Are There – Inside The System Looking Out

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 DOING the dragging-and-dropping to make the system respond to all manner of interesting "situations" in real time.

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.

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.

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

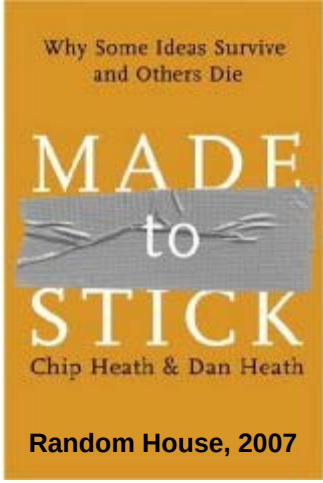
The intent of this analysis is not to admire or laud al-Qaeda, but to characterize it, without bias, as an agile enterprise. By understanding what elements of the al-Qaeda organization create agility, it may be possible to destabilize the organization and as al-Qaeda's agility is weakened, its resilience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

678 Operational Story, Oct. 2007

Nicole Long
Vince Tur Rojos

The Curse of Knowledge

www.madetostick.com/thebook/



"In 1990, Elizabeth Newton earned a Ph.D. in psychology at Stanford by studying a simple game in which she assigned people to one of two roles: "tappers" or "listeners." Tappers received a list of twenty-five well-known songs, such as "Happy Birthday to You" and "The Star Spangled Banner." Each tapper was asked to pick a song and tap out the rhythm to a listener (by knocking on a table). The listener's job was to guess the song, based on the rhythm being tapped.

The listener's job in this game is quite difficult. Over the course of Newton's experiment, 120 songs were tapped out. Listeners guessed only 2.5 percent of the songs: 3 out of 120.

But here's what made the result worthy of a dissertation in psychology. Before the listeners guessed the name of the song, Newton asked the tappers to predict the odds that the listeners would guess correctly. They predicted that the odds were 50 percent. The tappers got their message across 1 time in 40, but they thought they were getting their message across 1 time in 2. Why?

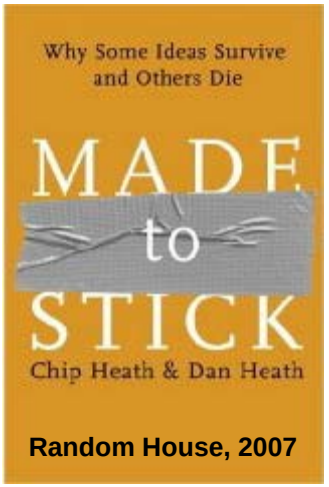
When a tapper taps, she is hearing the song in her head. Go ahead and try it for yourself — tap out "The Star-Spangled Banner." It's impossible to avoid hearing the tune in your head. Meanwhile, the listeners can't hear that tune — all they can hear is a bunch of disconnected taps, like a kind of bizarre Morse Code.

In the experiment, tappers are flabbergasted at how hard the listeners seem to be working to pick up the tune. Isn't the song obvious? The tappers' expressions, when a listener guesses "Happy Birthday to You" for "The Star-Spangled Banner," are priceless: How could you be so stupid?

It's hard to be a tapper. The problem is that tappers have been given knowledge (the song title) that makes it impossible for them to imagine what it's like to lack that knowledge. When they're tapping, they can't imagine what it's like for the listeners to hear isolated taps rather than a song. This is the Curse of Knowledge. Once we know something, we find it hard to imagine what it was like not to know it. Our knowledge has "cursed" us. And it becomes difficult for us to share our knowledge with others, because we can't readily re-create our listeners' state of mind.

Your Operational Story Should be Sticky

www.madetostick.com/thebook/



- **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?**

Two pages of sticky U-R-There, and your proposal will be funded

RSA

UURV
Metrics
8 domains

The UURV Environment Drives the 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:

- **Unpredictability: 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.**

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).

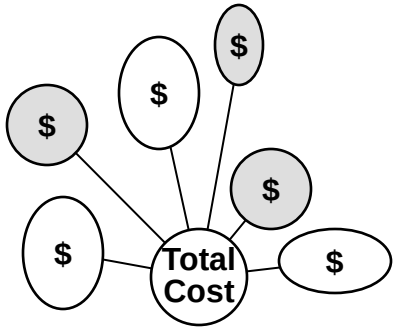
Change/Response Domains

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

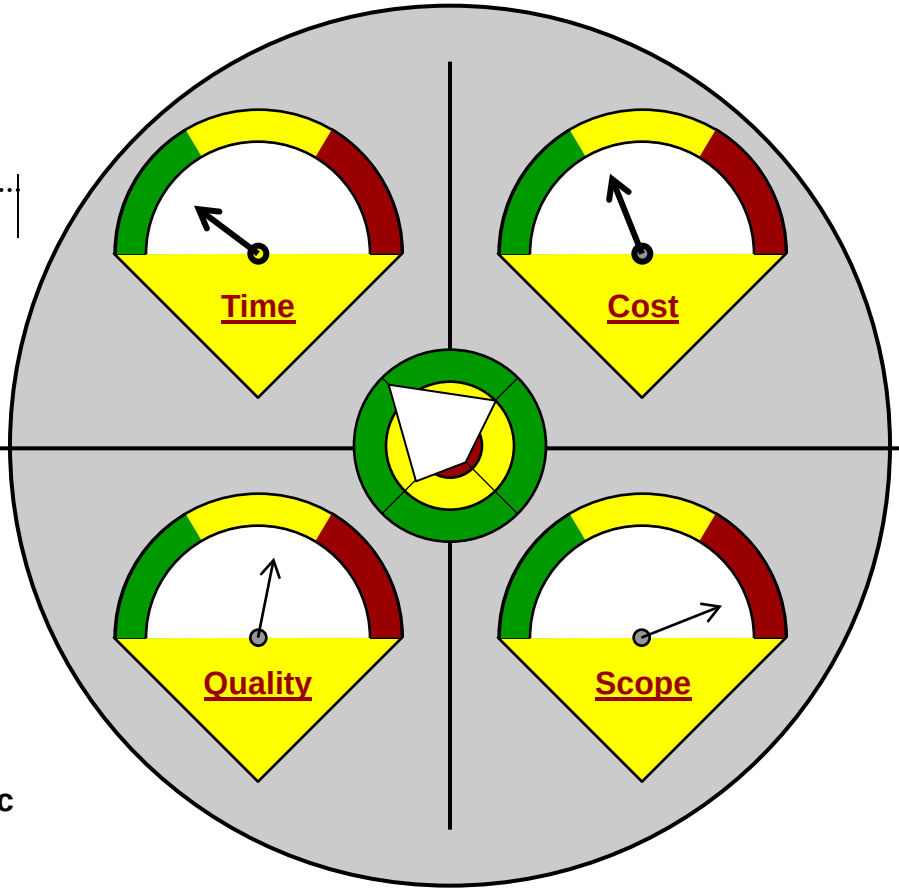
Change Response Metrics

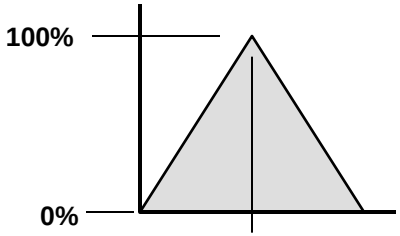
Time

Cost



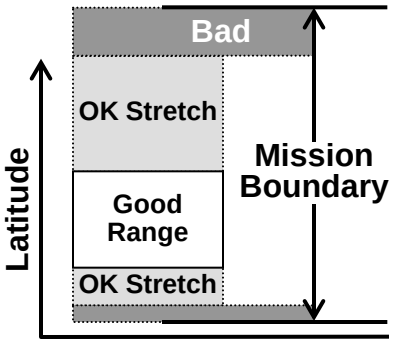
Activity Based Change-Costing





On-Time, On-Budget, On-Spec

Response Quality



Sufficient Economic 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, equipment malfunctions, 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?

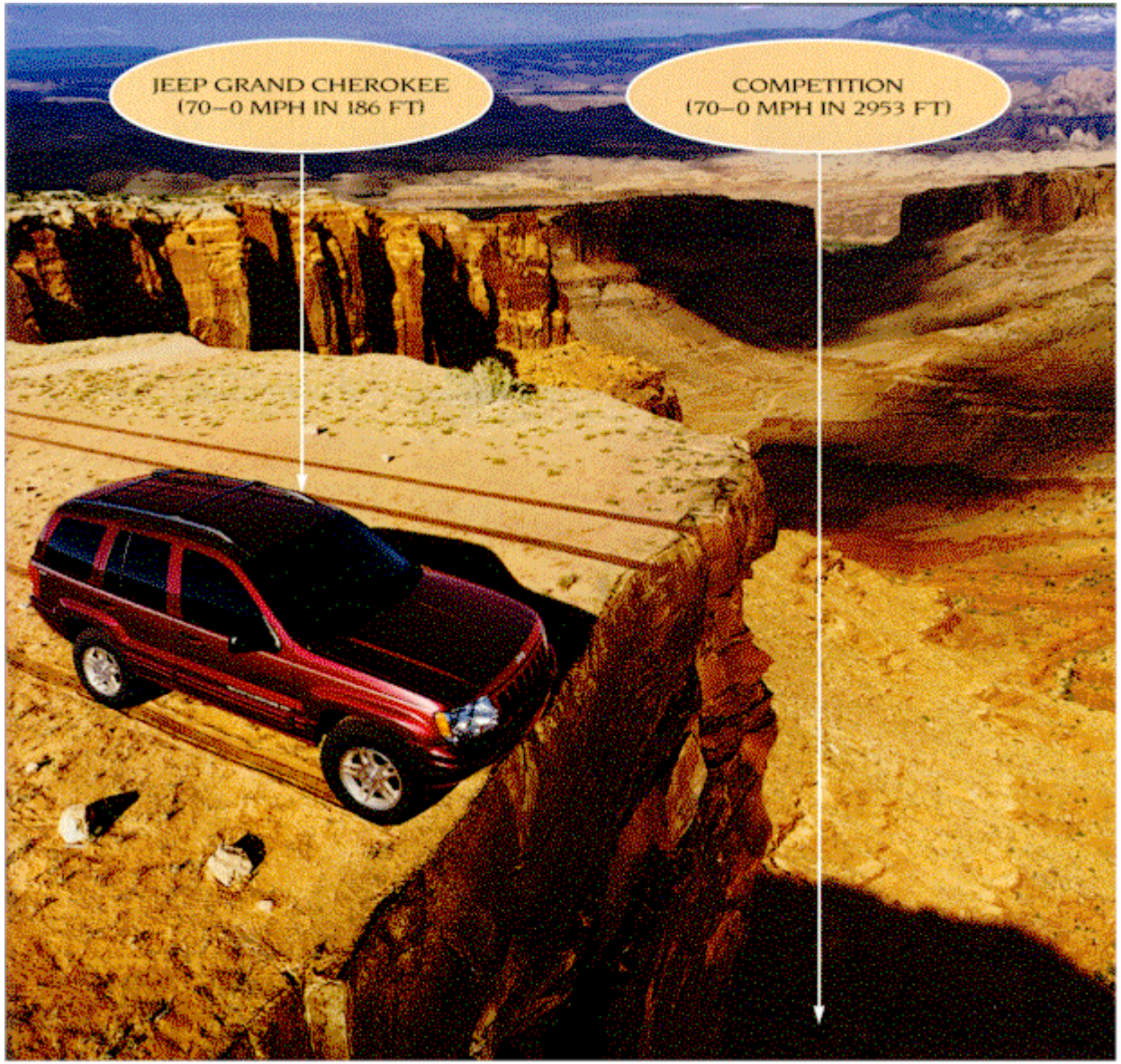
The distinguishing feature is the creation of something new or reincarnated that is not currently present. To note, this is not about the situation that calls for the original creation of an agile system, but rather about the evolution of the agile system during its operational period.

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 (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.

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.
	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, equipment malfunctions, 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	

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

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)

- project scope change (t, c, p, s);
- system output demands (t, p, s)

Expansion/Contraction: Unbounded Capacity

File5.5

http://videos2view.net/xM-WLT.htm

Reconfiguration

What types of situations will require system reconfiguration 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.

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…

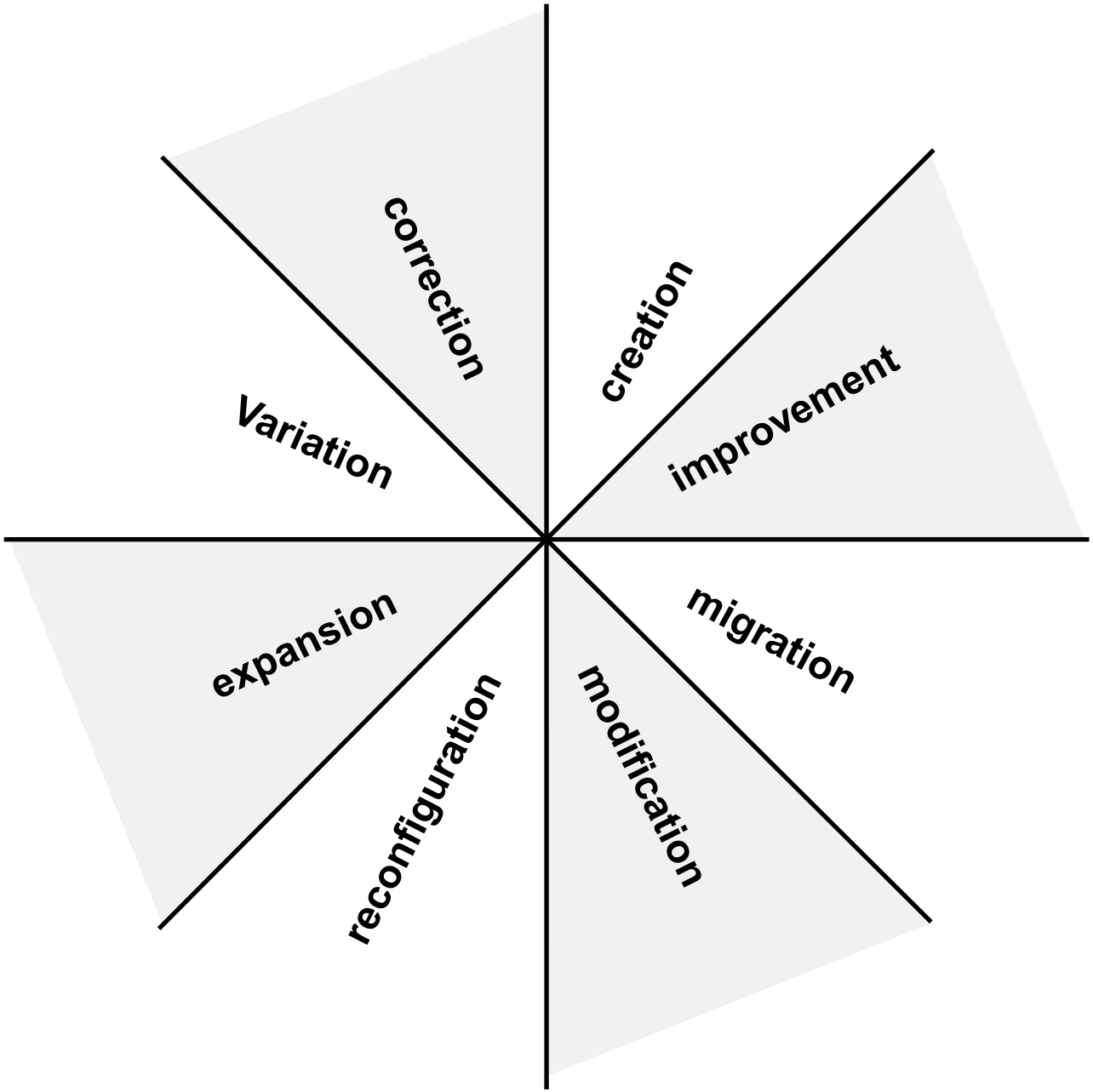
you do not need to develop a *comprehensive* list of shall statements, but rather a *sufficient* list of *response capabilities* –

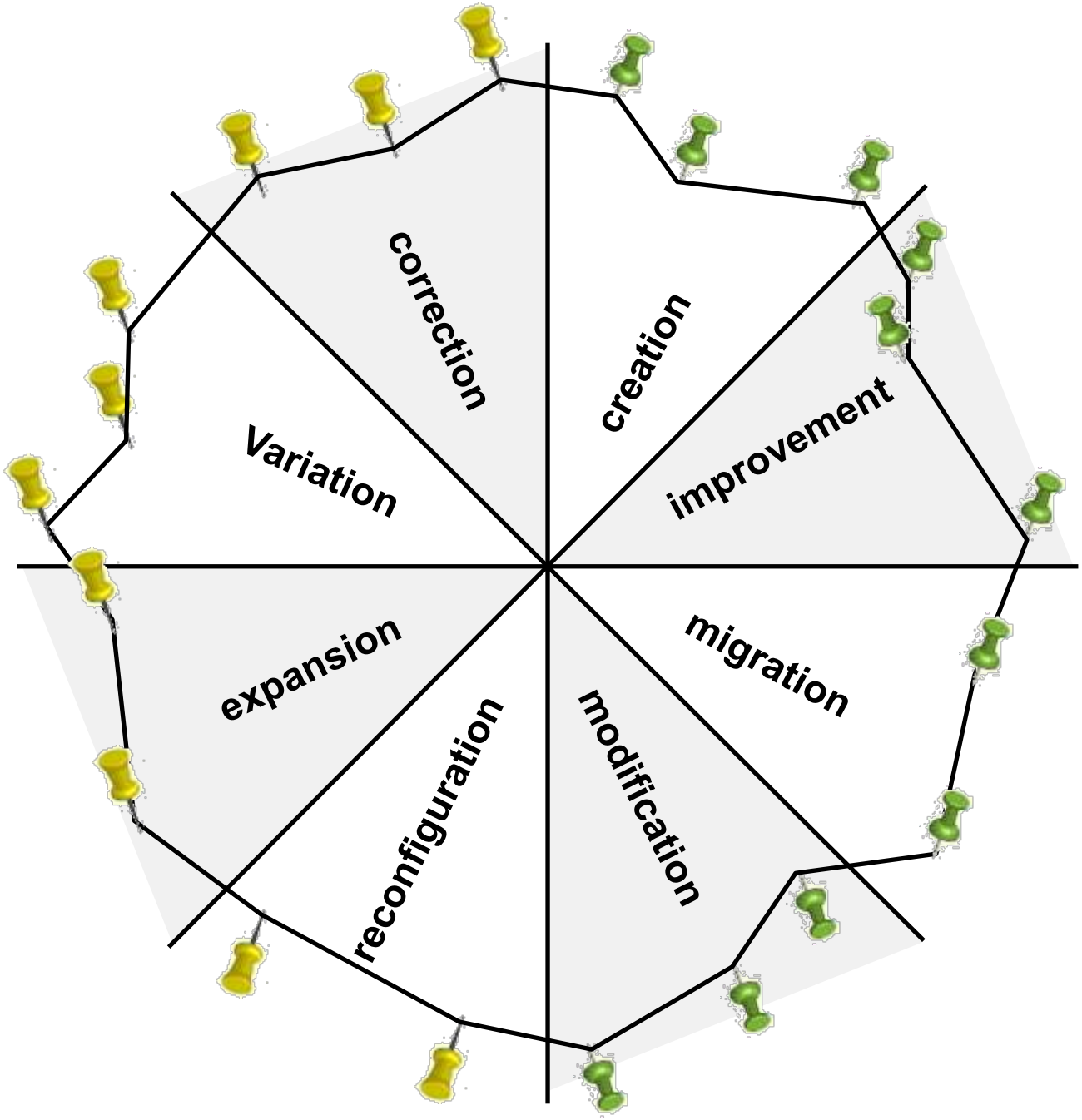
which if accomplished,

will stretch the envelope of agile response capability

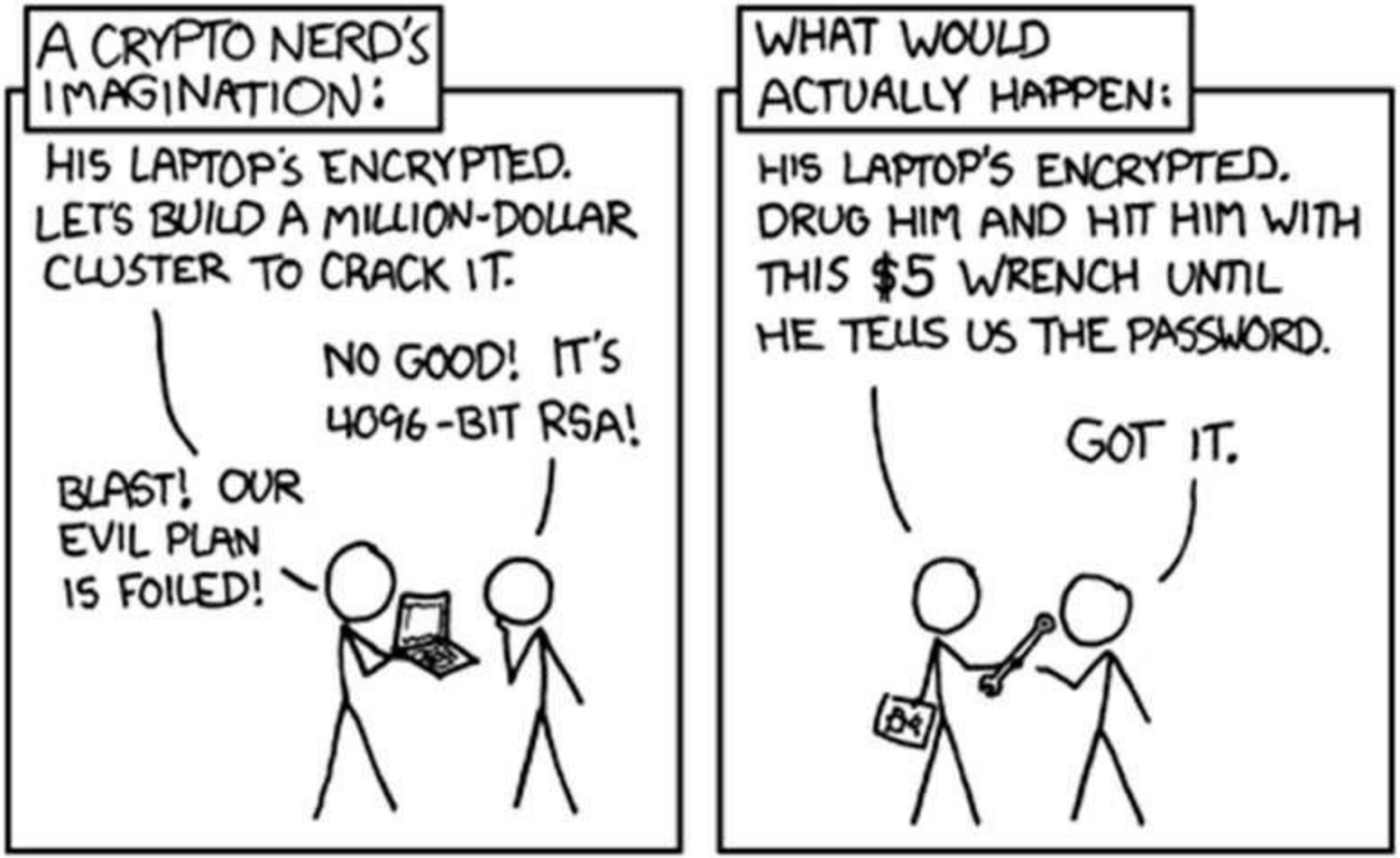
to encompass all necessary response needs,

even if they were not on the list.



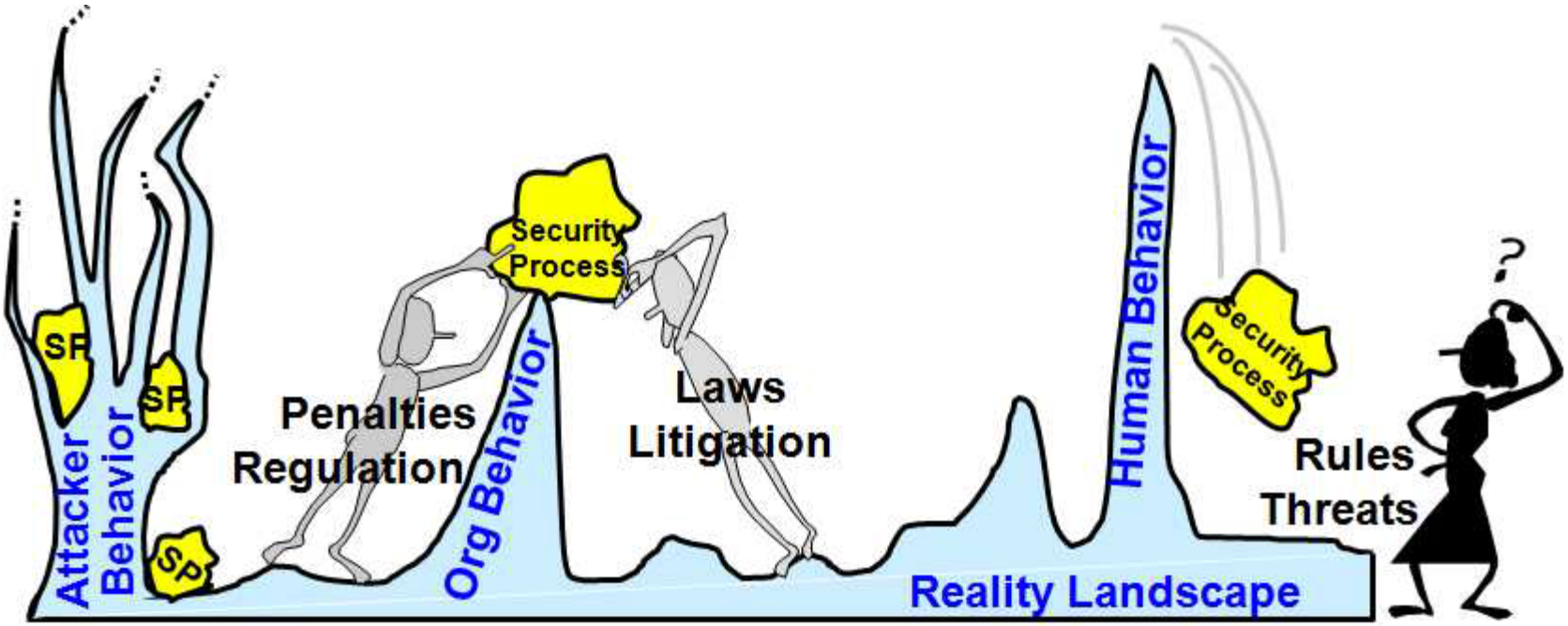


Reality Factors



Agility is All About Dealing With Reality

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

Reality Factors – Framework

Think like a red team.
Identify uncooperative environmental factors.
(fold the results back into the RSA)

Human Behavior – Human error, whimsy, expediency, arrogance...

Organizational Behavior – Survival rules rule, nobody's in control...

Technology Pace – Accelerating vulnerability-introductions...

System Complexity – Incomprehensible, unintended consequences...

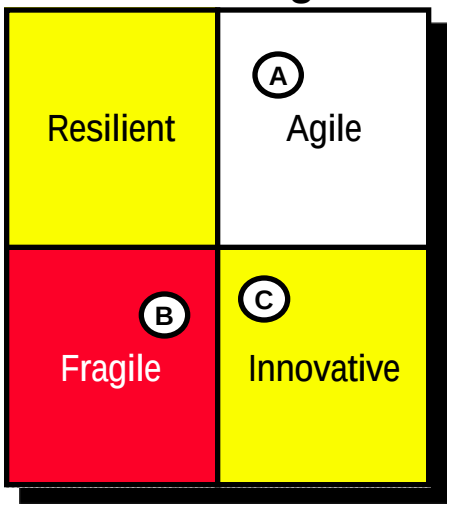
Globalization – Partners with different ethics, values, infrastructures...

Agile Enterprise – Outsourcing, web services, cots, transparency...

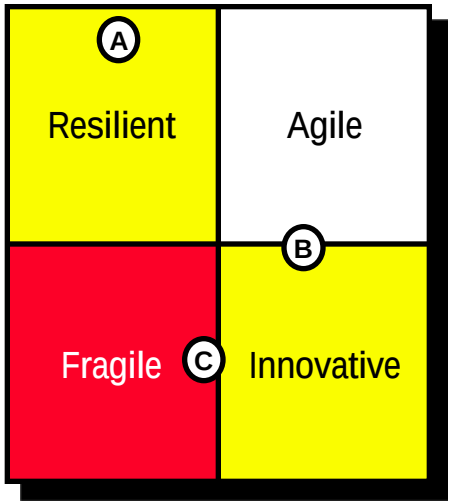
Agile Adversaries/Competitors/Customers – Distributed, collaborative, self organizing, proactive, impatient, innovative…

Wrapping it Up

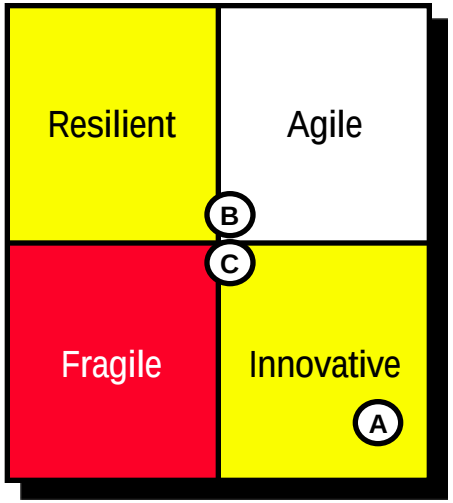
Product Management



Project Management

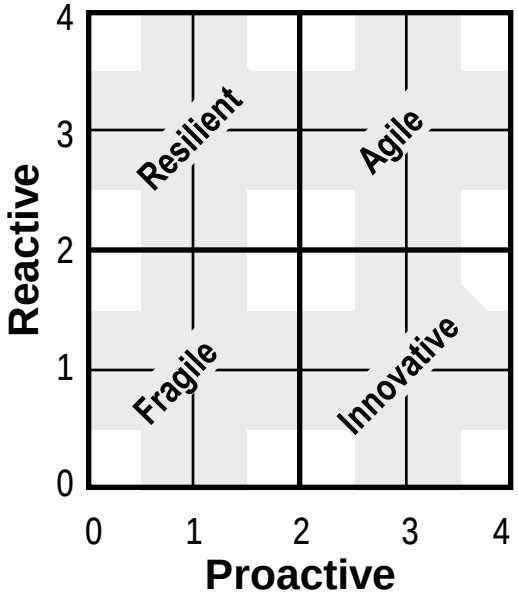


Strategy Management



Comparing Companies A, B, C.

Assessment/Evaluation



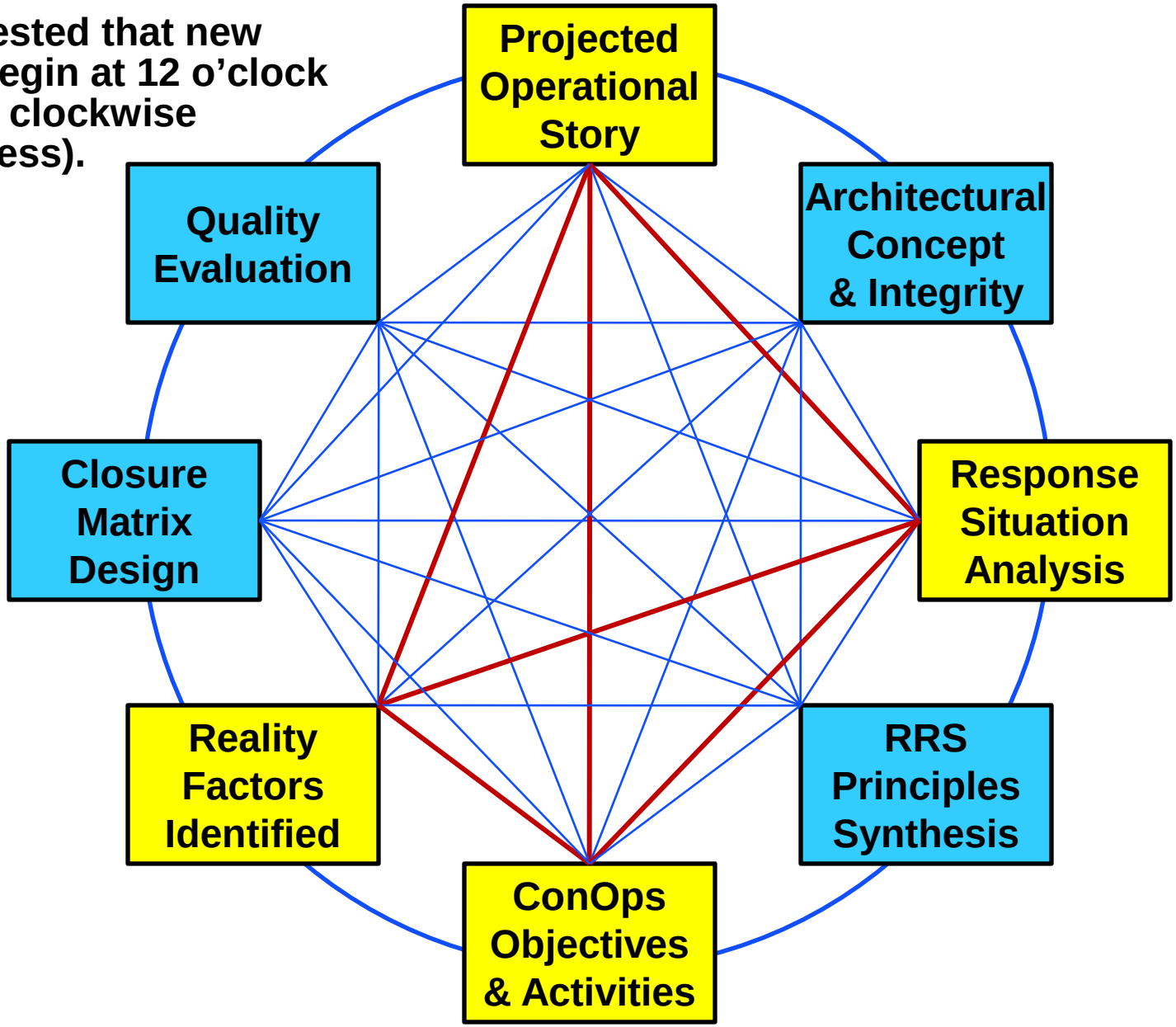
Response Proficiency Maturity Model

Stages	Metric Focus	Working Knowledge	Competitive Development Proactive	Competitive Development Reactive
0 Accidental	Pass/Fail	Examples	Lucky	None
1 Repeatable	Time	Concepts	Creation	Correction
2 Defined	Cost	Metrics	Improvement	Variation
3 Managed	Quality	Rules	Migration	Expansion
4 Mastered	Scope	Principles	Modification	Reconfig'tion

Maturity has been observed to progress sequentially

Eight principle tools are brought to bear when designing or analyzing a system for agility

It is suggested that new initiates begin at 12 o'clock and move clockwise (more or less).



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),	quality
■ comprehensive (anything/everything within mission boundary).	scope

You can think of Agility as Requisite Variety.

You can think of Agility as proactive Risk Management.

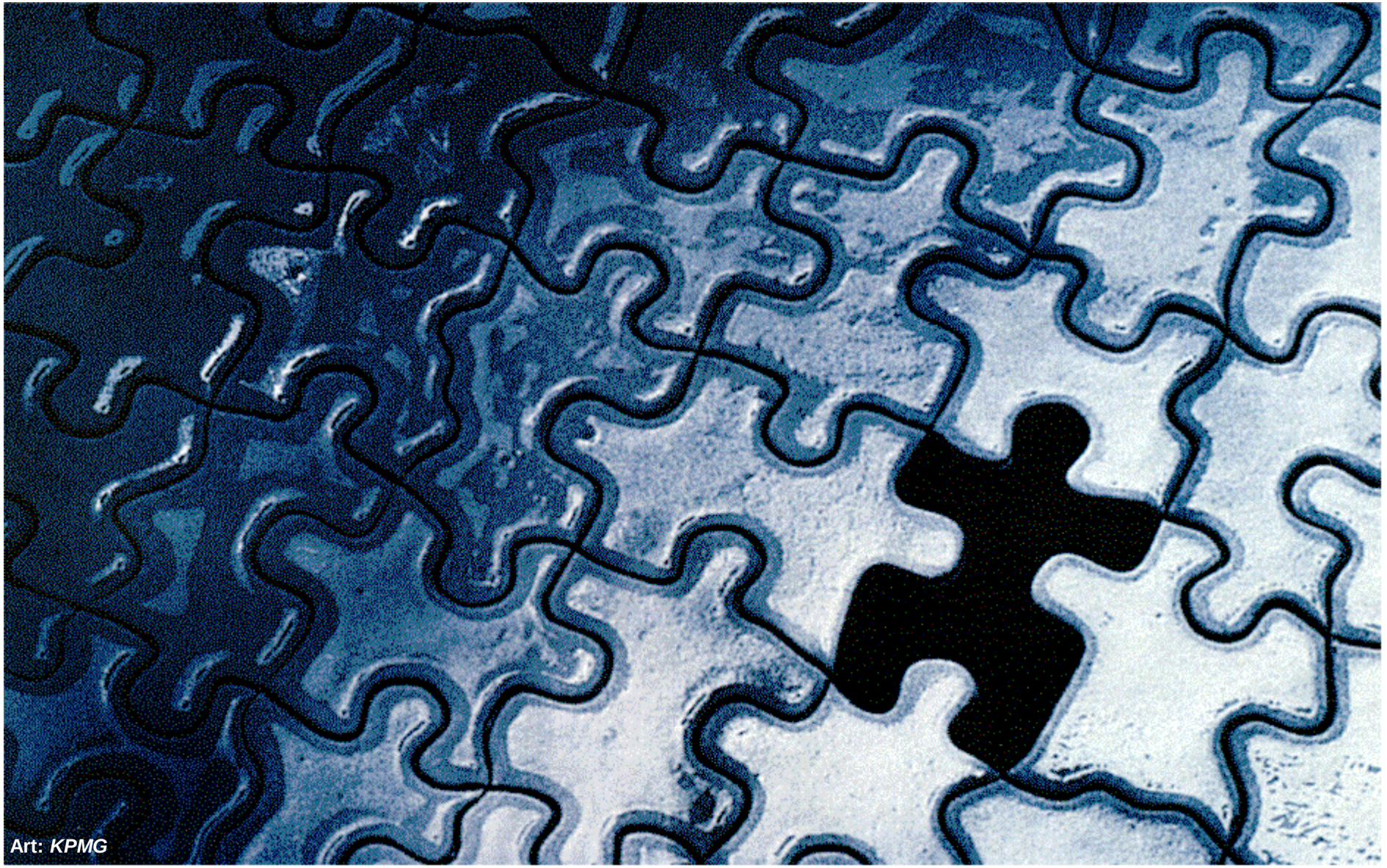
You can think of Agility as Innovative Response in unpredictable situations.

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

Modular – But Not Agile



Agile Systems and Systems Engineering (AS&SE) Working Group

A Working Group of INCOSE

(International Council on Systems Engineering)

On Request to rick.dove@parshift.com:

1. **Get on mail list for general announcements.**
2. **Participate in WG remote-collaboration projects.**
3. **Get working group charter.**

Chair: Rick Dove
Co-Chair: Ron Lyells, Honeywell
Co-Chair: Mike Coughenour, Lockheed Martin

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