Webinar

Agility Strategies 303:
Agile SE Strategies – Agility as Resilient Emergent Behavior

2-Sep-2026

Rick Dove
Chair: INCOSE WG for Agile Systems & Systems Engineering

Agile 303 webinar slides: Agility Strategies – Agility as Resilient Emergent Behavior
Agile 302 webinar slides: Agility Strategies – Systems Thinking in Practice
Agile 301 webinar slides: Agility Strategies Purpose and Values
Agile 206 webinar slides: Agile SE … It's Not Your Father's Oldsmobile
Agile 205 webinar slides: Agile SE in the Future of Systems Engineering
Agile 204 webinar slides: Agile SE Life Cycle Model
Agile 203 webinar slides: Agile SE Agility as a System
Agile 202 webinar slides: Agile SE Continuous Integration
Agile 201 webinar slides: Agile SE Problem Space Requirements
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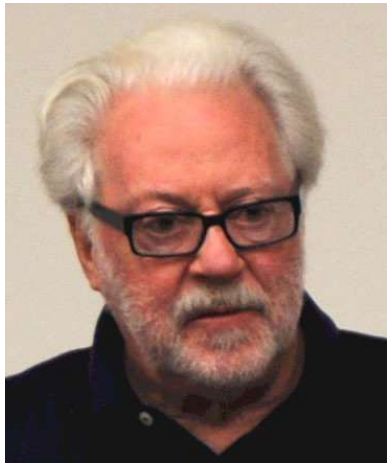
Agile 105 webinar slides: Agile System/Process Operational Awareness
Agile 104 webinar slides: Agile System/Process Engagement Quality
Agile 103 webinar slides: Agile System/Process Design Principles
Agile 102 webinar slides: Agile System/Process Design Requirements
Agile 101 webinar slides: Agile System/Process Architecture Pattern



Abstract

Eight strategies have been identified as fundamental core aspects for systems engineering agility: Attentive Situational Awareness, Common-Misson Teaming, Shared-Knowledge Management, Iterative Incremental Development, Adaptable Modular Architectures, Attentive Decision Making, Continual Integration & Test, and Being Agile.

These aspects are described as a collection of individual concepts in an INCOSE Primer, the SEBoK, and an ISO/IEC/IEEE standard.

But operational agility is not evident in any one aspect. Agility emerges as an effect of harmonious collective behavior.

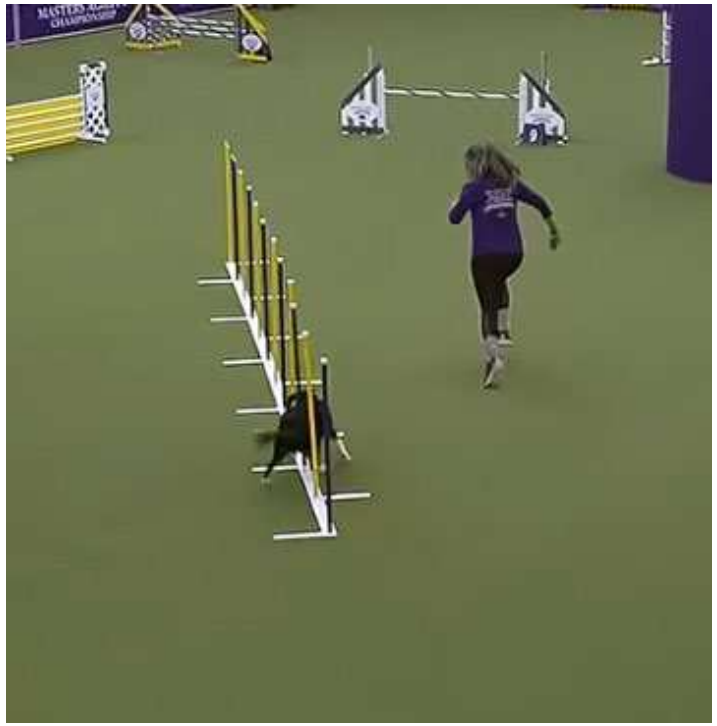
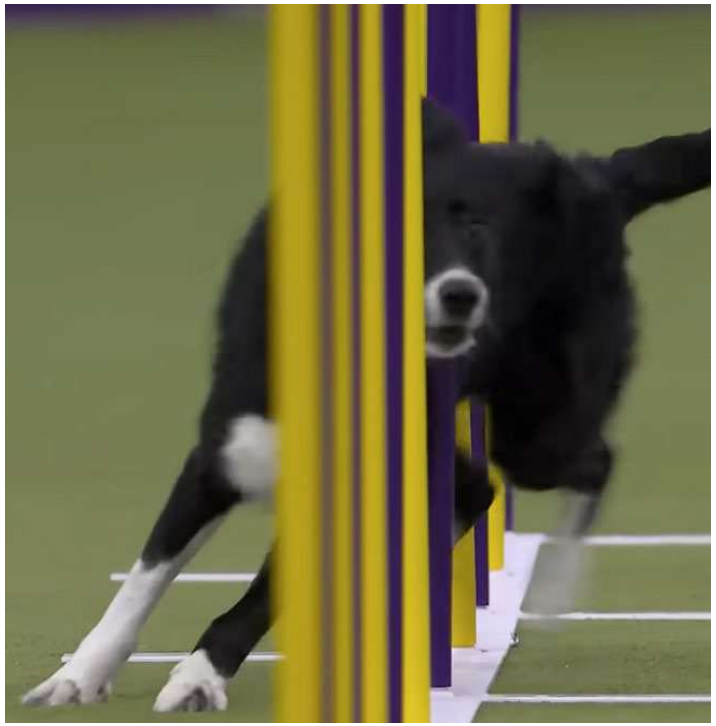
As an emergent phenomenon in an evolving dynamic uncertain environment there is a need to foster and sustain agility-positive emergence.

This discussion will explore the vulnerability and nurturing of emergent agility.

INCOSE Systems Engineering Agility Primer: INCOSE Store
ISO/IEC/IEEE 24748-10:2026 – Guidelines for systems engineering agility: https://www.iso.org/standard/90086.html
SEBoK: Agile Systems Engineering https://sebokwiki.org/wiki/Agile_Systems_Engineering

Agility Went to the Dogs in 1980 …

www.youtube.com/watch?v=bRV-zcsJhnE

… when the Kennel Club of the United Kingdom recognized dog agility as a sport.

Dogs run through a set of obstacles to evaluate their effectiveness, maneuverability and efficiency.

Scoring for agility is based on the fastest time through the obstacles without errors.

“The dog's physical ability to navigate obstacles safely and efficiently is more important than aesthetic grace.”

www.thetrainingofdogs.com

Agility Went to the Dogs in 1980 …

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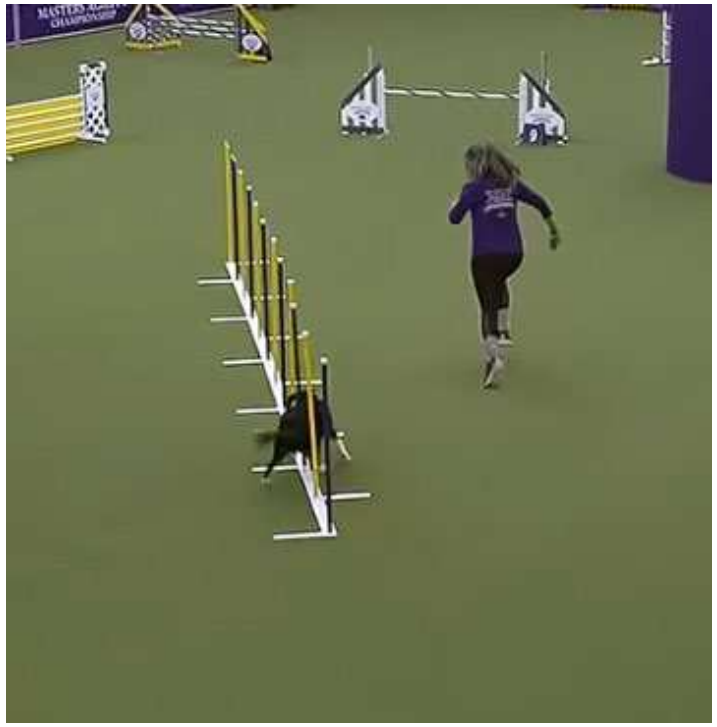
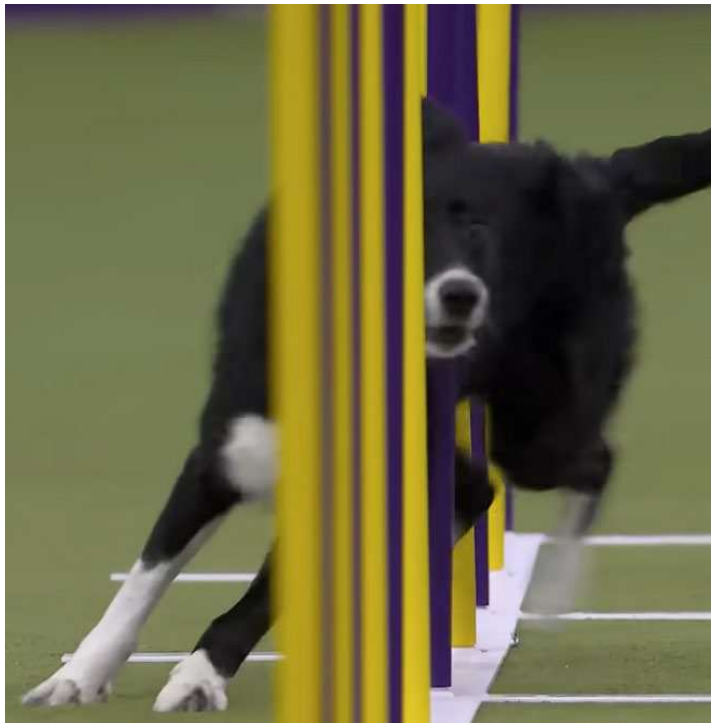




These dogs demonstrate agility as a quality of operational behavior, effectively and efficiently dealing with obstacles.

In engineering, agility can be enabled by architecture and facilitated by experience, but it's manifestation is expressed as

effective efficient engagement with dynamic situations

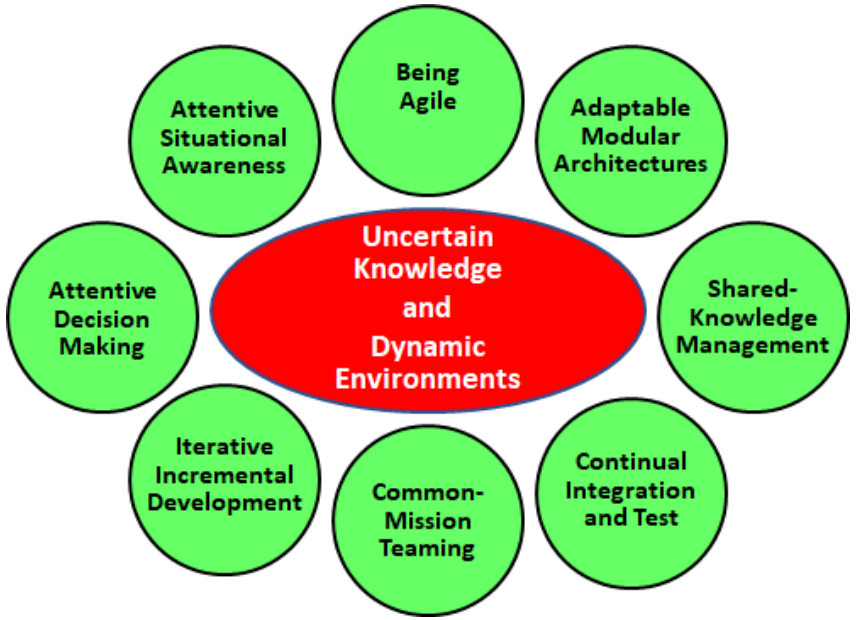
– an operational behavior.

Agility

Agility is not a procedure or process or framework or mindset.

Agility is effective efficient engagement with dynamic uncertain situations … an operational behavior.

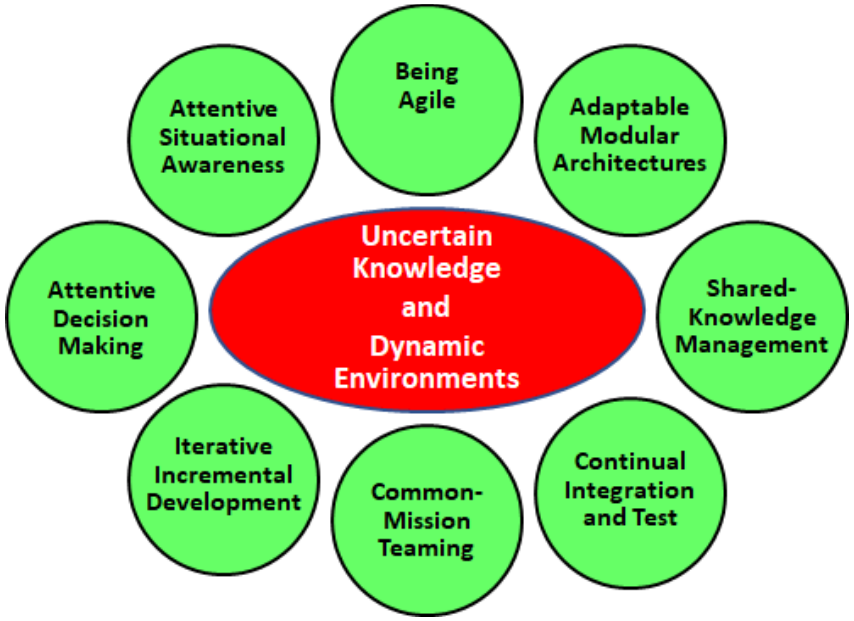
Agility in systems engineering has eight Aspects.



Strategic Aspects

Agile Systems Engineering – Eight Core Aspects, INCOSE 2023 Symposium, www.researchgate.net/publication/373092973
ISO/IEC/IEEE 24748-10:2026, Guidelines for systems engineering agility. February 2026. www.iso.org/standard/90086.html
SEBoK: Agile Systems Engineering https://sebokwiki.org/wiki/Agile_Systems_Engineering

Aspect	Strategy/Intent/Behavior
Adaptable Modular Architectures	Compose and reconfigure systems from evolving variations of reusable assets
Iterative Incremental Development	Perform incremental loops of building, evaluating, correcting, and improving capabilities
Attentive Situational Awareness	Actively monitor and evaluate relevant internal and external environment factors
Attentive Decision Making	Systemically link situational awareness to decisive action
Common-Mission Teaming	Engage collaboration, cooperation, and teaming among all relevant stakeholders
Shared-Knowledge Management	Facilitate communication, collaboration, and knowledge curation
Continual Integration & Test	Demonstrate integrated test of work-in-process
Being Agile	Nurture sense-respond-evolve engagement with a dynamic environment



Aspect Contribution to Effectiveness

certainty and range of efficient engagement with dynamic situations

Aspect	Strategy	Effectiveness
Adaptable Modular Architectures	Compose and reconfigure systems from evolving variations of reusable assets	Provides a variety of previously-successful response options
Iterative Incremental Development	Perform incremental loops of building, evaluating, correcting, and improving capabilities	Enables learn-by-doing convergence on successful responses
Attentive Situational Awareness	Actively monitor and evaluate relevant internal and external environment factors	Reveals threats and opportunities in time to successfully respond
Attentive Decision Making	Systemically link situational awareness to decisive action	Optimizes decision timing to leverage the most knowledge
Common-Mission Teaming	Engage collaboration, cooperation, and teaming among all relevant stakeholders	Adds depth and breadth to situational understanding and response capability
Shared-Knowledge Management	Facilitate communication, collaboration, and knowledge curation	Engages multiple minds in needs and response collaboration
Continual Integration & Test	Demonstrate integrated test of work-in-process	Maximizes feedback frequency on work in process function and feature
Being Agile	Nurture sense-respond-evolve engagement with a dynamic environment	Maintains and improves competency at response effectiveness

Dynamic environments present the *risk* of exceeding depth & breadth of response competency.

Aspect Contribution to Efficiency

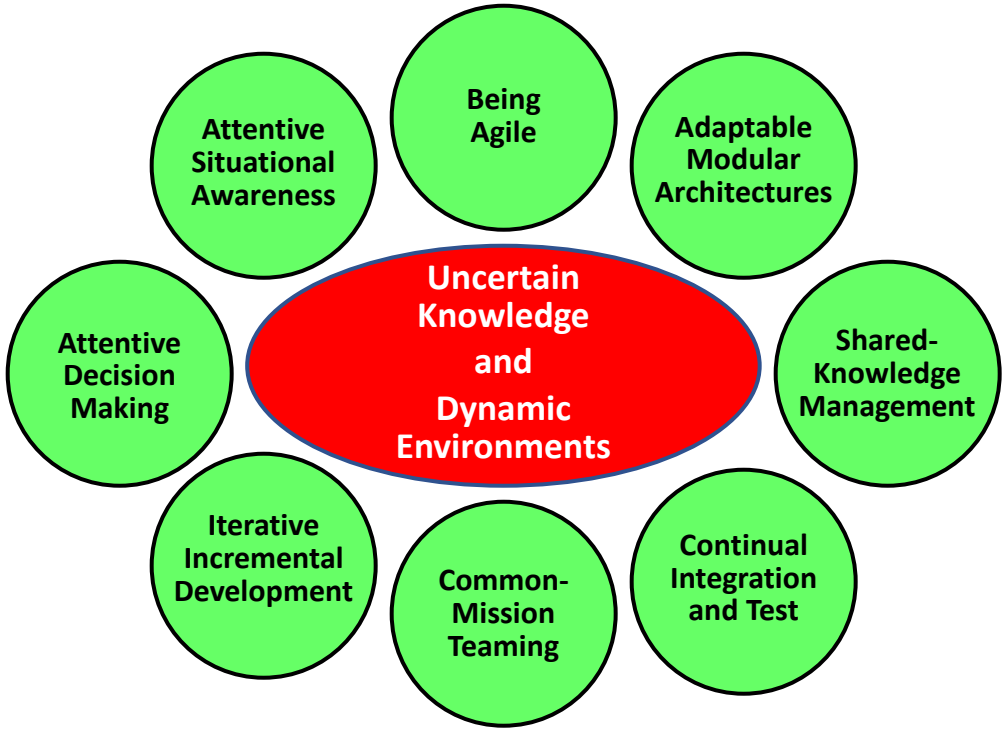
time and cost of effective engagement with dynamic situations

Aspect	Strategy	Efficiency
Adaptable Modular Architectures	Compose and reconfigure systems from evolving variations of reusable assets	Streamlines systems composition with reusable and modifiable parts
Iterative Incremental Development	Perform incremental loops of building, evaluating, correcting, and improving capabilities	Minimizes time and cost of rework by eliciting usage feedback frequently
Attentive Situational Awareness	Actively monitor and evaluate relevant internal and external environment factors	Reveals threats and opportunities early that would consume more time and cost later
Attentive Decision Making	Systemically link situational awareness to decisive action	Optimizes decision timing to minimize no-return expenditures
Common-Mission Teaming	Engage collaboration, cooperation, and teaming among all relevant stakeholders	Minimizes counter productive effort by aligning teamwork
Shared-Knowledge Management	Facilitate communication, collaboration, and knowledge curation	Minimizes incompatible effort that would incur rework
Continual Integration & Test	Demonstrate integrated test of work-in-process	Minimizes effort and cost to mitigate integration issues
Being Agile	Nurture sense-respond-evolve engagement with a dynamic environment	Maintains and improves competency at response efficiency

Dynamic environments present the *risk* of exhausting time & budget resources.

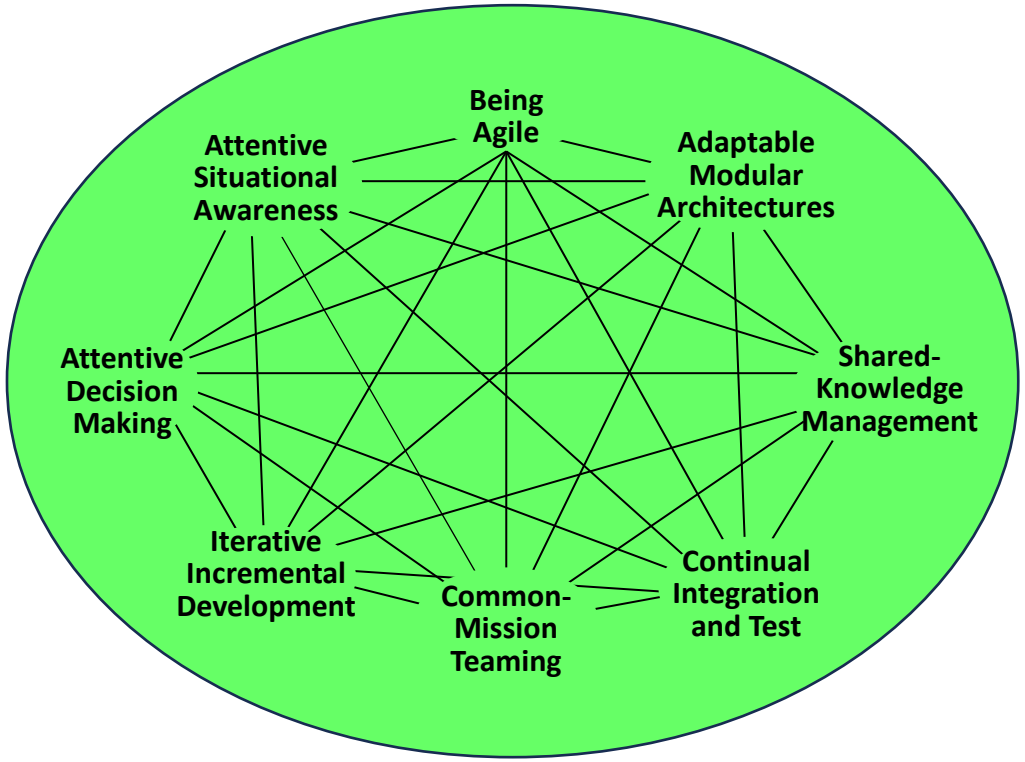
Agility is Emergent Behavior of Harmonious Relationships

Agility as an Emergent Behavior. *INSIGHT 29 (4)*, INCOSE, August, 2026. www.researchgate.net/publication/412328910



Reductionist (Structural) View

Characterizes an aspect's nature in isolation independent of its relationships.

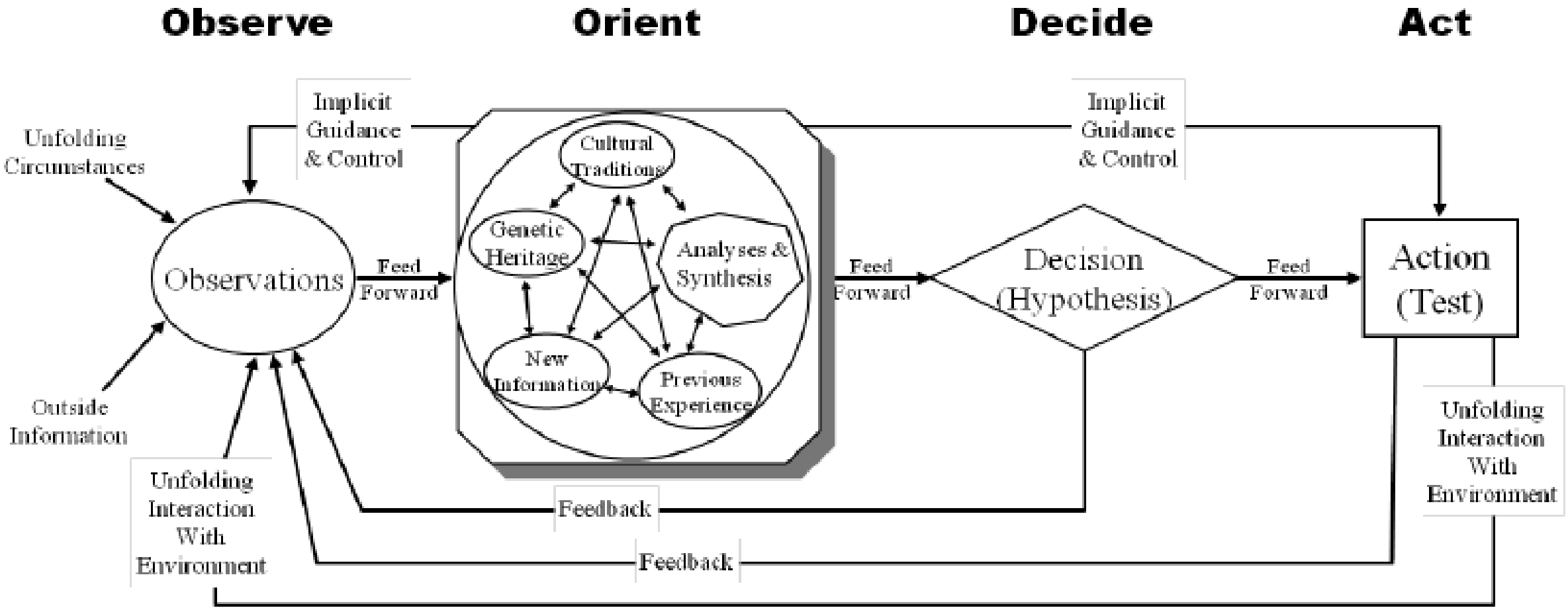


Holistic (Behavioral) View

A network of interactive aspect relationships that manifest as holistic systemic behavior.

Agility and OODA

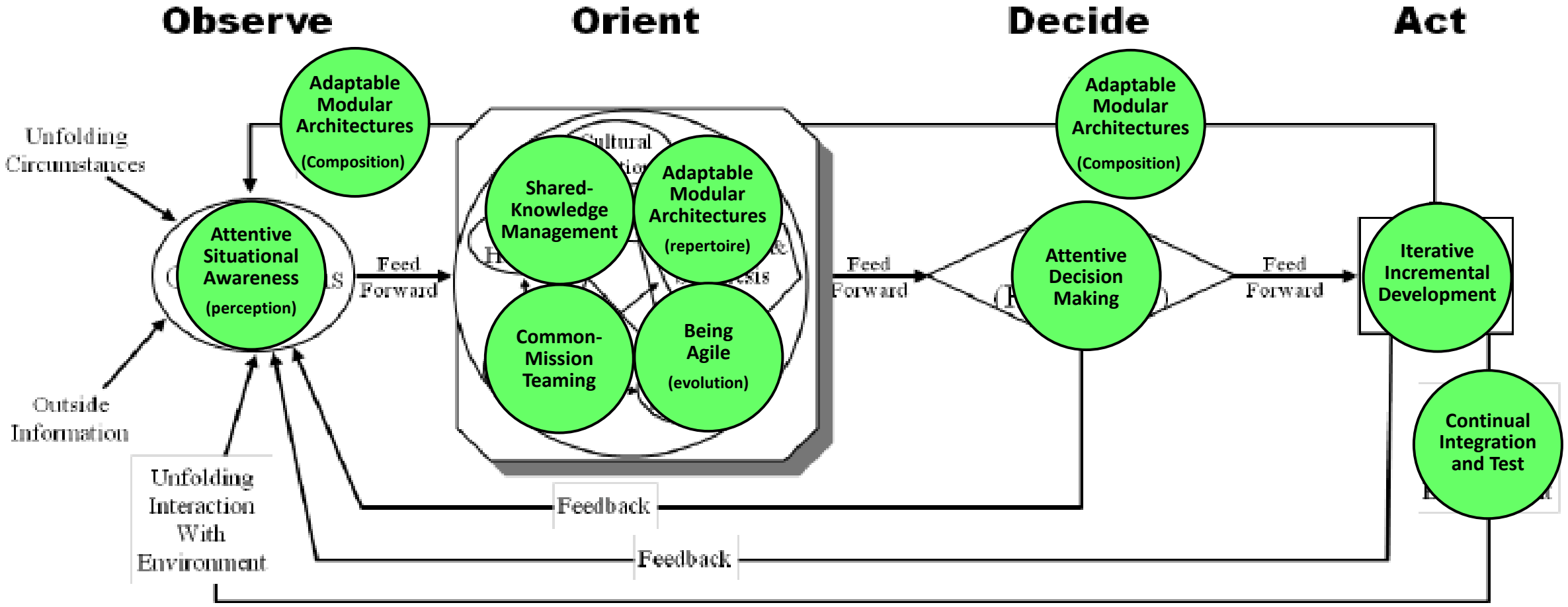
INCOSE Webinar 17-Sep-2025 www.researchgate.net/publication/401806746



OODA is a fundamental reference architecture of how cognitive entities interact with dynamic, uncertain environments.

Overlaying the Aspects Reveals Close Relationships

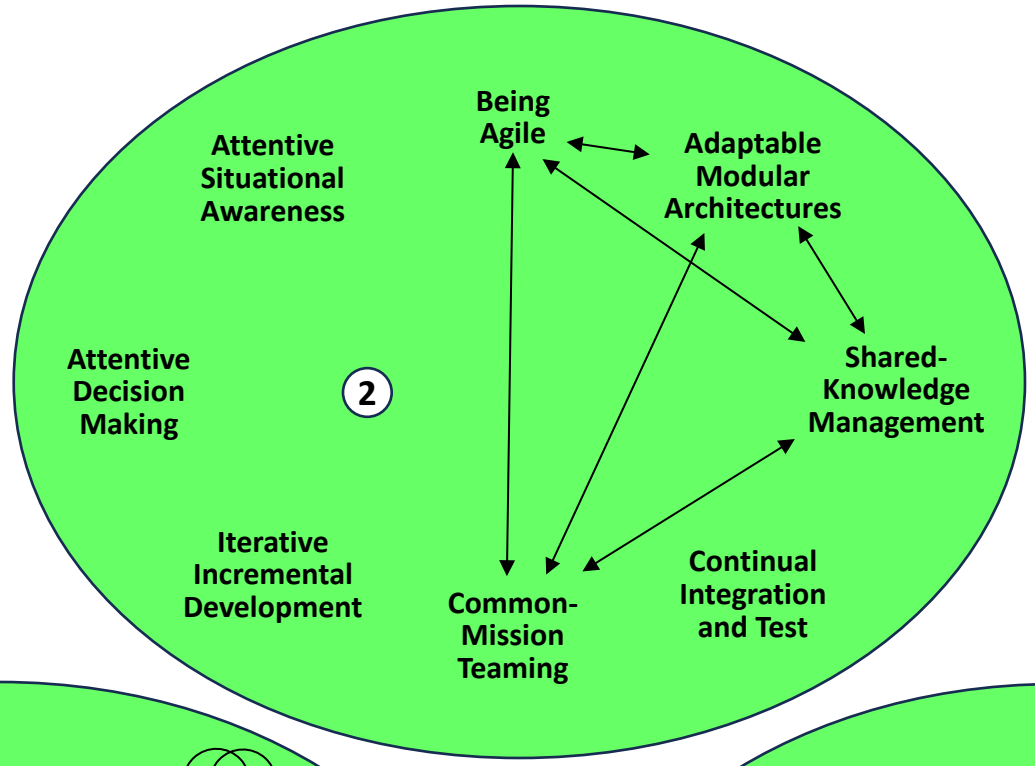
If You Know OODA, Like Boyd Knew OODA. *INSIGHT 29 (4)*, INCOSE, August, 2026. www.researchgate.net/publication/412328910

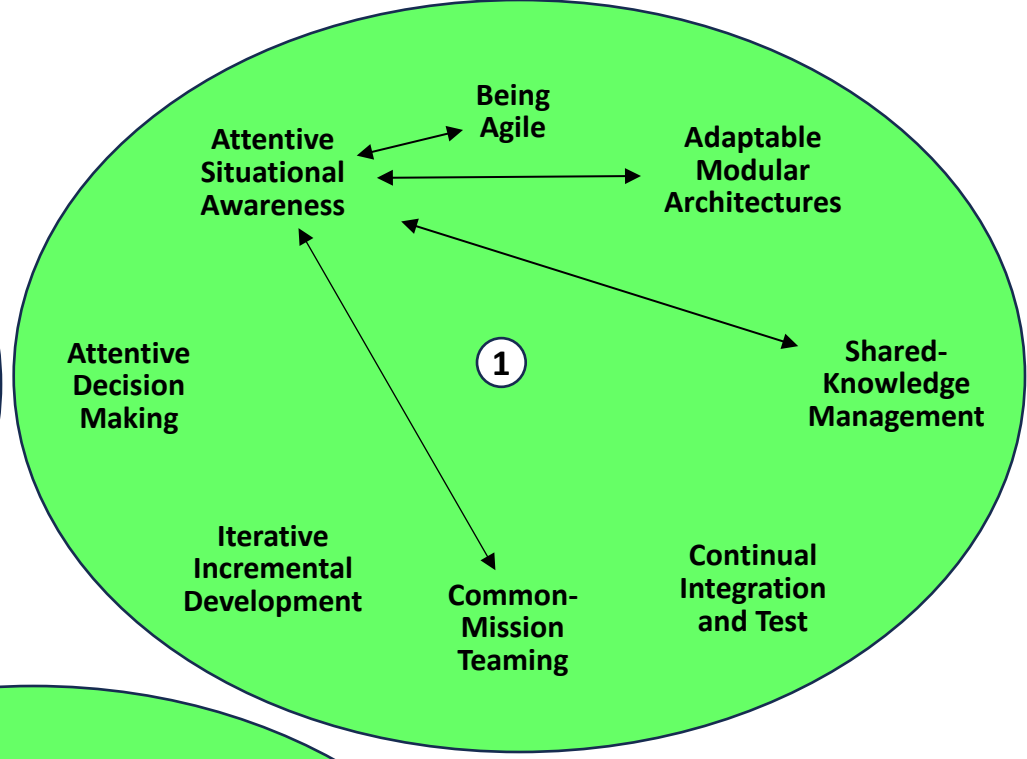


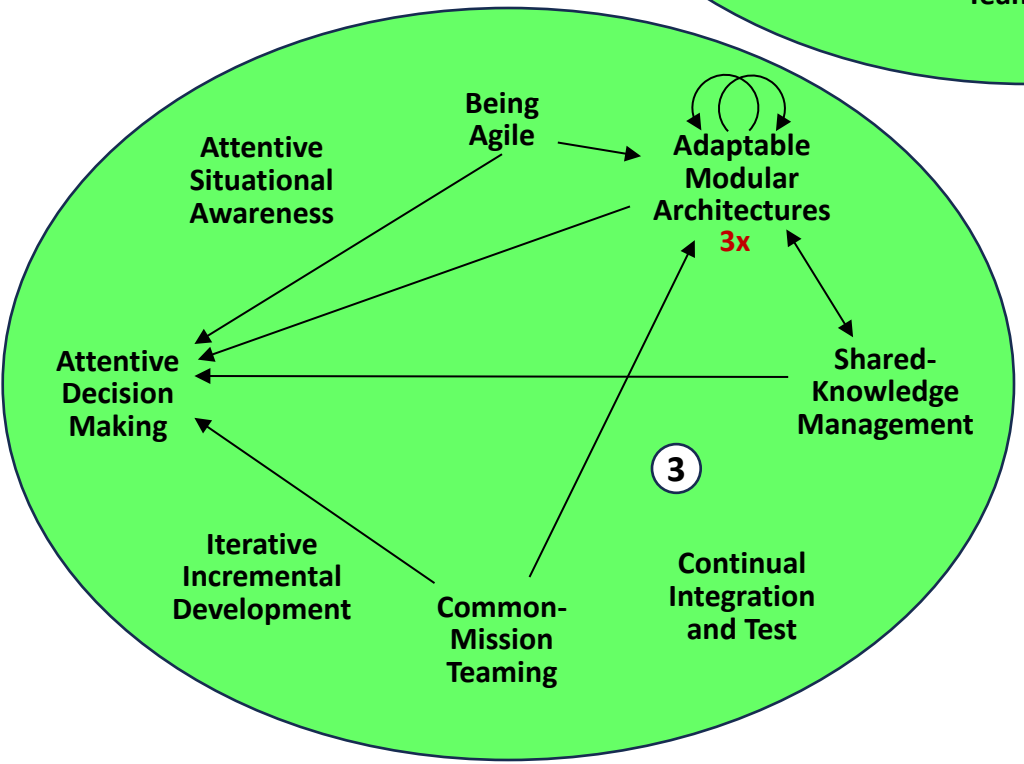
How well Aspects work together determines effectiveness of emergent agility.

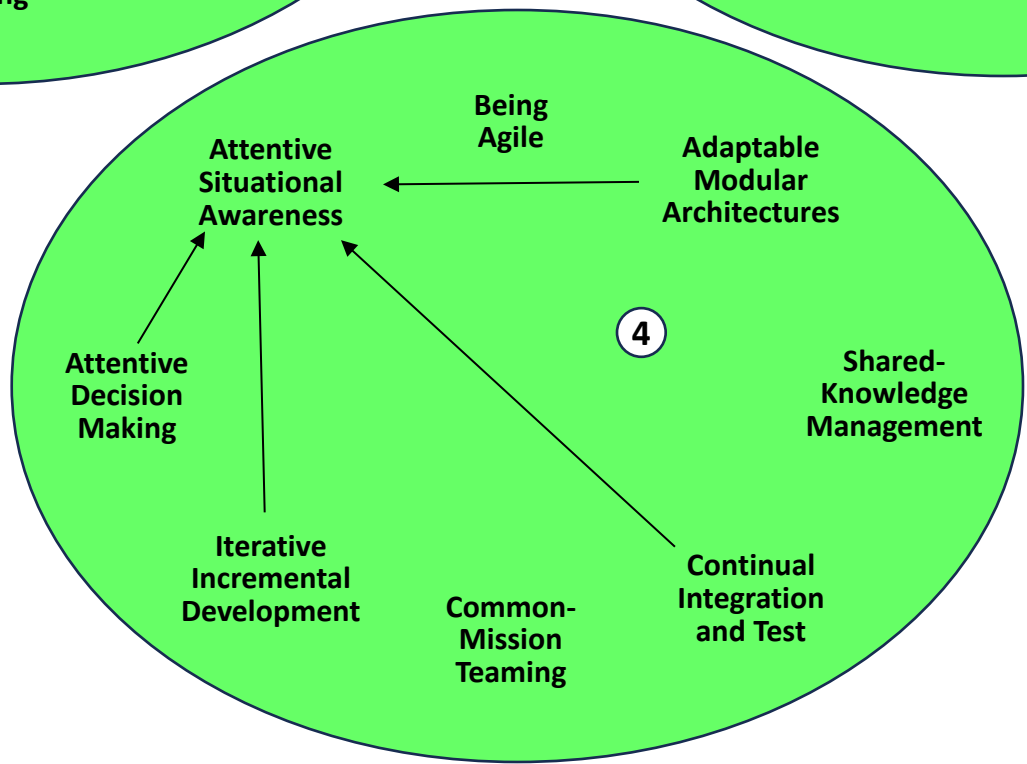
Direct feed-line and close-proximity relationships may warrant closer attention.

Four Relationship Clusters of Potential High Interest









Relationships

Relationships between Aspects come in three basic types: harmonious, discordant, and harmoniously discordant.

- **Harmonious has a positive effect.**
- **Discordant has a negative effect.**
- **Harmoniously discordant can have a balancing effect.**

As examples, Shared Knowledge Management and Common Mission Teaming can be

- **harmonious when sharing multiple perspectives on mission understandings,**
- **discordant when mission knowledge is shared arbitrarily, and**
- **harmoniously discordant when need-to-know constraints determine prudent scope of sharing.**

These distinctions can nurture resilient* emergent agility:

- **sensing and mitigating discordance**
- **sensing and leveraging opportunities for harmony.**

* Resilient: self repairing

Scrum Smells (similar to Aspect Relationship Discord)

Google AI Overview – "Scrum smells" refer to warning signs or anti-patterns in your Agile workflow indicating deeper issues. Like a bad odor, they don't break the process immediately, but signal something is wrong. Catching them early prevents your team's process from becoming a bureaucratic nightmare. Keep an eye out for these common red flags:

Meeting & Ritual Smells

- The "Stateless" Standup: The Daily Scrum devolves into a forced status update to the manager rather than a quick synchronization between peers to plan the day.
- Zombie Retrospectives: The team skips retrospectives, or meetings yield no actionable improvements. Nobody cares enough to change the broken process.
- Scrum-Fall Sprints: Requirements are finalized by management before the sprint, turning the sprint into a mini-waterfall rather than an iterative discovery phase.

Backlog & Delivery Smells

- Product Owner Bottlenecks: The team can’t pull work because the Product Owner isn't providing clear requirements or prioritizing the backlog.
- Bloated Backlogs: The backlog is a dumping ground for hundreds of old ideas, rather than a refined, actionable, and customer-focused plan.
- Constantly Shifting Scope: Sprints are repeatedly interrupted by ad-hoc, urgent requests, making it impossible to forecast what the team can actually deliver.

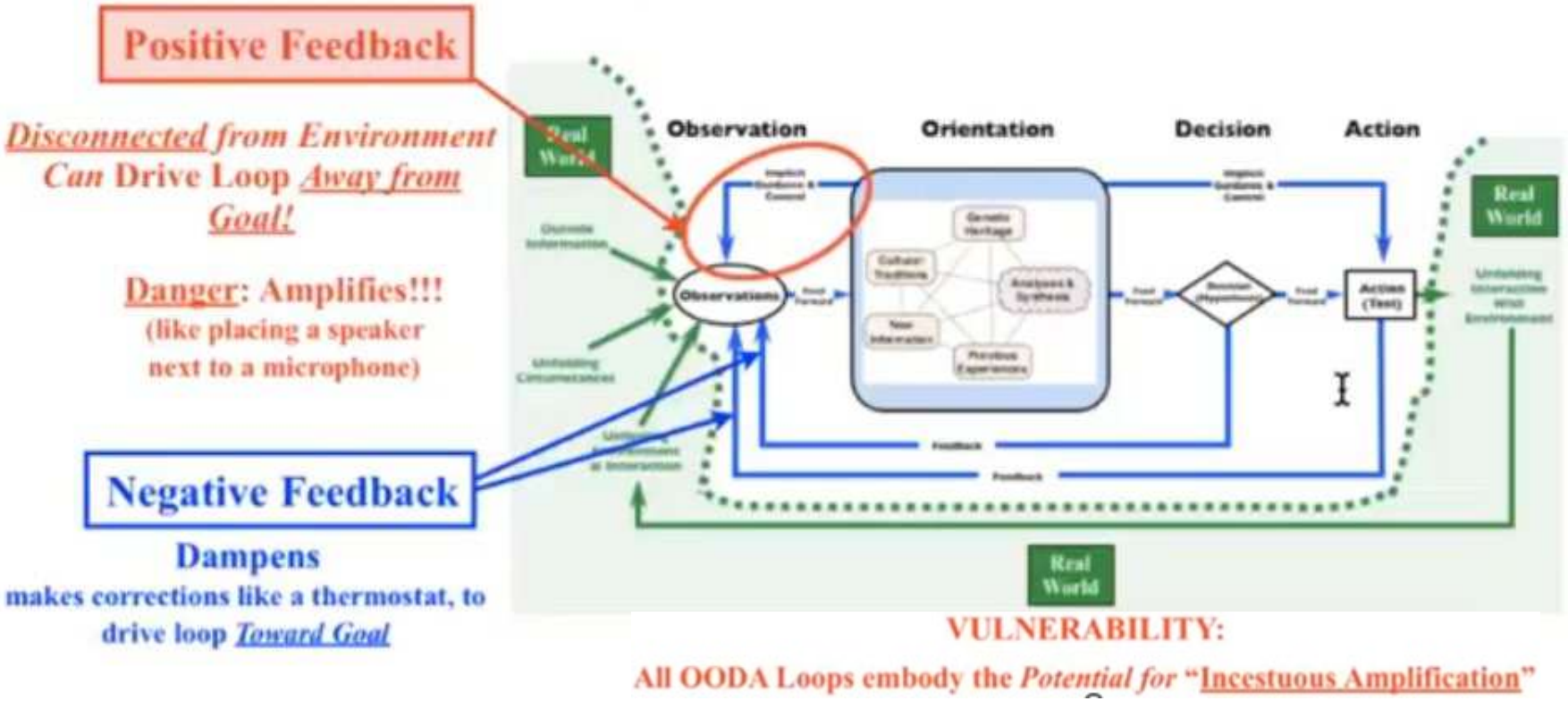
Team & Culture Smells

- Passive Passiveness: Team members never push back. They accept unrealistic workloads to avoid conflict.
- The Dual-Hat Trap: One person plays both the Scrum Master and the Product Owner. The team loses the vital balance between execution speed and business value.
- "Resources" Instead of People: The organization treats developers like interchangeable units of capacity rather than empowered, self-organizing humans.

But … OODA Has a Natural Vulnerability

Chuck Spinney, 2020 – Evolutionary Epistemology of John Boyd (video)

- A positive feedback loop disconnected from the environment. But it shapes the observations. It can drive OODA away from the goal.
- This is natural. It can happen to anybody. If you're in a close group, the groupthink phenomenon is an example.



Positive Feedback can Seduce the loop into '**Seeing What it 'Wants' to See**' as Opposed to What '**Is**'
ORIENTATION can ***Distort*** Observations to ***Disconnect*** the Organism from its *Environment*
... thus isolating the loop ...
Making All OODA Loops **Prone to Collapsing** into *Confusion & Disorder*

Vulnerability Example: Selective Attention

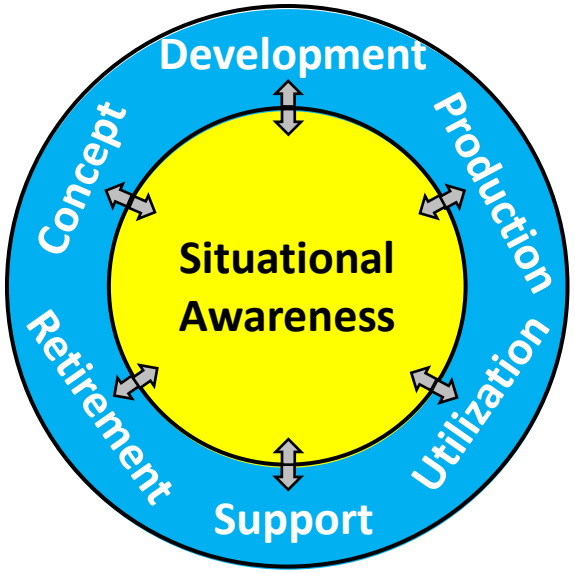
Your attention is on the counting and you don't see the gorilla-suited person walking among them.

Implicit Guidance and Control (IG&C) for *Observe* is all those filtration mechanisms that inhibit the ability to see what's really going on, constrain what to look for, and what to sense.

https://www.youtube.com/watch?v=vJG698U2Mvo

Simons, D. J. & Chabris, C. (1999). Gorillas in Our Midst: Sustained Inattentional Blindness for Dynamic Events. Perception 28(9):1059-1074. www.chabris.com/Simons1999.pdf

Agility and Situational Awareness



Knowing what has happened, is happening, or might happen internally and externally that could affect the outcome of goals and activities,

so that problems can be avoided or mitigated and opportunities seized

Systemic Examples

- Air traffic control sensitive to aircraft landing opportunities and conflicts.
- System intrusion and anomaly detectors sensitive to known threat patterns and unknown behaviors.
- Systems operations centers that monitor and manage industrial processes.
- Software development reviews and retrospectives probing product quality and process effectiveness.
- Burn-down charts that monitor and display task progress toward planned completions.
- DevOps integration of development and operations that reveals operational issues before delivery.
- Continual integration, test, and demonstration that reveals requirements and integration issues early.

Air Traffic Control is
Attentive Situational Awareness

Harmonious Situational Awareness

Aspect	Strategy	Situational Awareness is Harmonious
Adaptable Modular Architectures	Compose and reconfigure systems from evolving variations of reusable assets	Awareness of reusable assets
Iterative Incremental Development	Perform incremental loops of building, evaluating, correcting, and improving capabilities	Awareness of path appropriateness
Attentive Situational Awareness	Actively monitor and evaluate relevant internal and external environment factors	Awareness that every complex problem has a solution that is clear, simple, and wrong
Attentive Decision Making	Systemically link situational awareness to decisive action	Awareness of decision effectiveness
Common-Mission Teaming	Engage collaboration, cooperation, and teaming among all relevant stakeholders	Awareness of misaligned goals and actions
Shared-Knowledge Management	Facilitate communication, collaboration, and knowledge curation	Awareness of relevant knowledge
Continual Integration & Test	Demonstrate integrated test of work-in-process	Awareness of pending discordant system interactions
Being Agile	Nurture sense-respond-evolve engagement with a dynamic environment	Awareness of harmony and discord in effectiveness and efficiency of agility

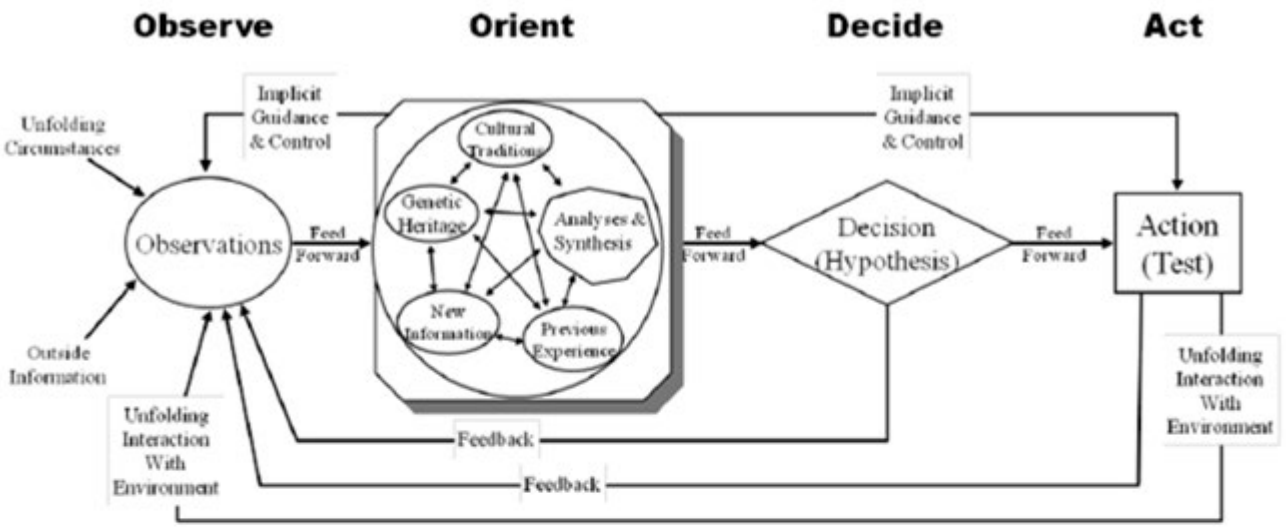
Relevant Conceptual Examples

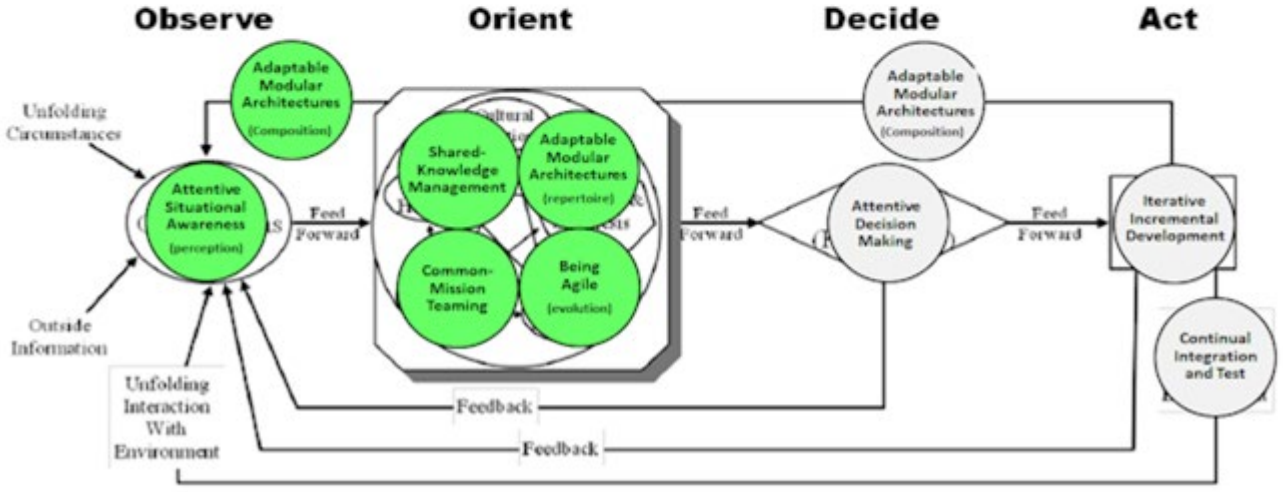
Discordant and Harmoniously Discordant Situational Awareness

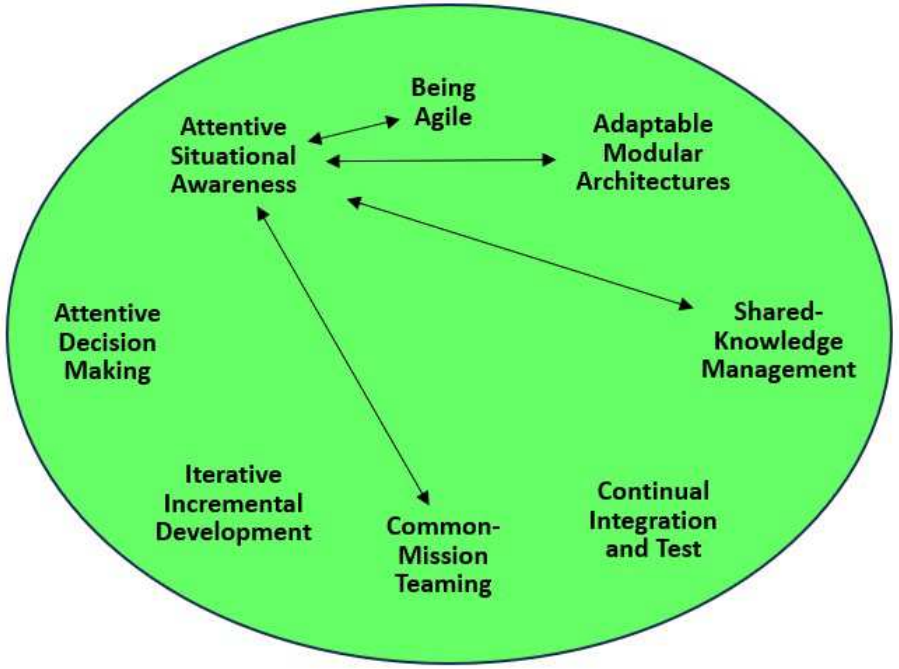
Aspect	Awareness is Discordant	Awareness is Harmoniously Discordant
Adaptable Modular Architectures	Inattentive to expansion opportunities or contraction needs of reusable module inventory	Balancing awareness of architecture specs with potential third-party module replacement
Iterative Incremental Development	Inattentive to iteration needs and opportunities	Balancing awareness of increment outcomes with ability and desire to employ and feed back
Attentive Situational Awareness	Inattentive to identifiable significant threats and opportunities	Balancing awareness attention scope to avoid cognitive overload
Attentive Decision Making	Inattentive to decision procrastination	Balancing awareness of decision need with awareness of allowable timing
Common-Mission Teaming	Inattentive to mission divergence or misalignment	Balancing awareness of mission statement succinctness with multiple aligned perspectives
Shared-Knowledge Management	Inattentive to knowledge sharing inadequacy	Balancing awareness of knowledge with need, to avoid individual overload and distraction
Continual Integration & Test	Inattentive to effectiveness and rate of test integration evolution	Balancing awareness of integration revelations with readiness to utilize incremental knowledge
Being Agile	Inattentive to situational response effectiveness and efficiency competency trend	Balancing awareness of Aspect strategies with project goals, needs, and constraints

Relevant Conceptual Examples

Situational Awareness Aligns Orient's Reality







No Aspect is more important than any other, but relationships can have varying criticality.

Relationships that Attentive Situational Awareness has with the four *Orient* Aspects would seem most critical of all , else *Orient* is flying blind .

Wrap Up

Agility Competency Metrics:

Effectiveness – certainty and range of efficient engagement with dynamic situations

Efficiency – time and cost of effective engagement with dynamic situations

Attentive Situational Awareness

- **Triggers activity**
- **Delimits agility effectiveness**
- **Delimits agility efficiency**

Develop and leverage a foundation of skills and strategies for situational awareness attentiveness and cognitive relevance.

References

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