Agile IS Risk Management
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by Ken Rubin

www.innolution.com

Background of Ken Rubin

Author

Trainer Coach

ScrumAlliance Certified Scrum Trainer

- Trained more than 20,000 people
- Coach developers and executives

Exp

- 1st Managing Director — ScrumAlliance transforming the world of work
- 1st Scrum project was in 2000 for bioinformatics — GENOMICA
- SMALLTALK
- IBM

Agenda

- Uncertain Events
- Maximize Expected Monetary Value
- Traditional Risk Management
- Managing Risk via the Product Backlog
- Using Agile to Avoid Some Uncertain Situations
- Agile Principle-based Risk Management

Some questions… and discussion…

We outsource stress-testing of our application to a third-party and there is a risk it won't be done when promised. How do we handle this?

We lack knowledge to make an informed technical choice. So there is a risk of a bad decision. How should we proceed?

How do we manage the risks of a fixed-price contract?

Should we try to avoid the risk of building the wrong product by working longer and harder up front to get its specification right?

How to handle these risks — a roadmap for our discussion

When appropriate, apply simple traditional risk management techniques in a good-enough (barely sufficient) manner

Manage risk via the product backlog

Apply agile principles to avoid the self-creation of inherently risky or uncertain situations

Apply agile principles to avoid the harm (be robust) and reap the benefits (be antifragile) from uncertainty in the environment

Many words for the same concept

- Risk
- Randomness
- Volatility
- Variability
- Uncertainty

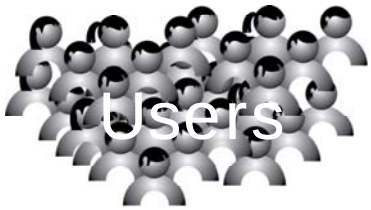
For our purposes we will treat them the same

Lack of knowledge regarding uncertain events

Some more uncertain events

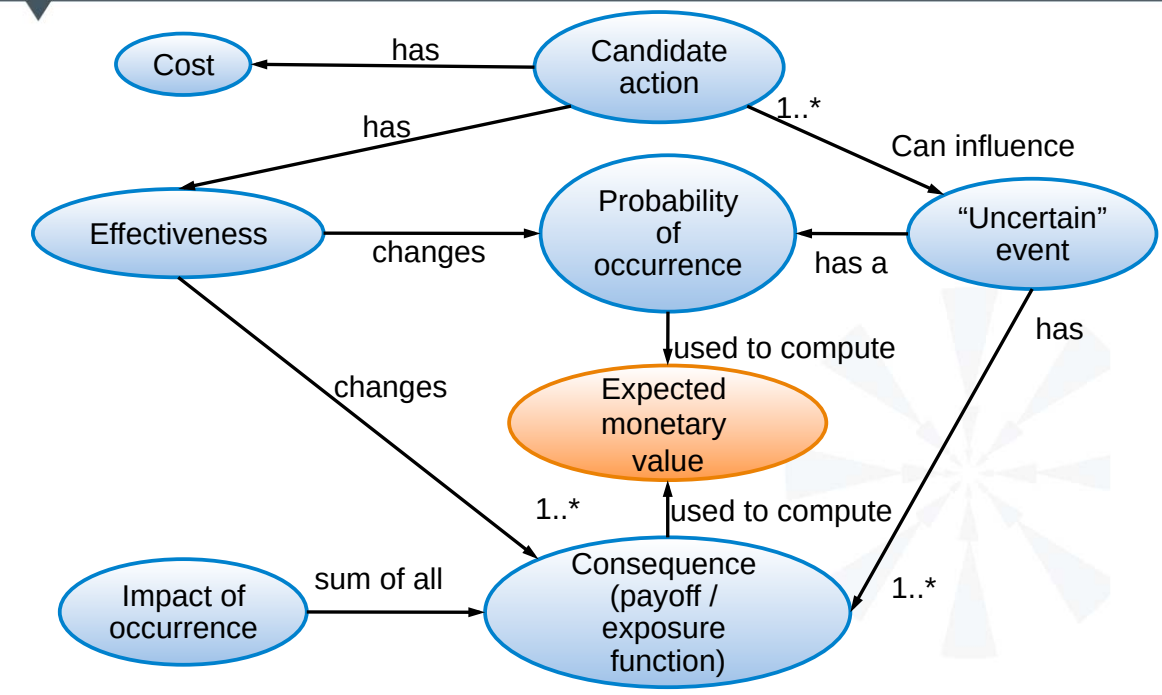
Earthquake disables California data center housing the development servers

Vendor fails to deliver a component when promised



Application fails to scale to 10 million current users

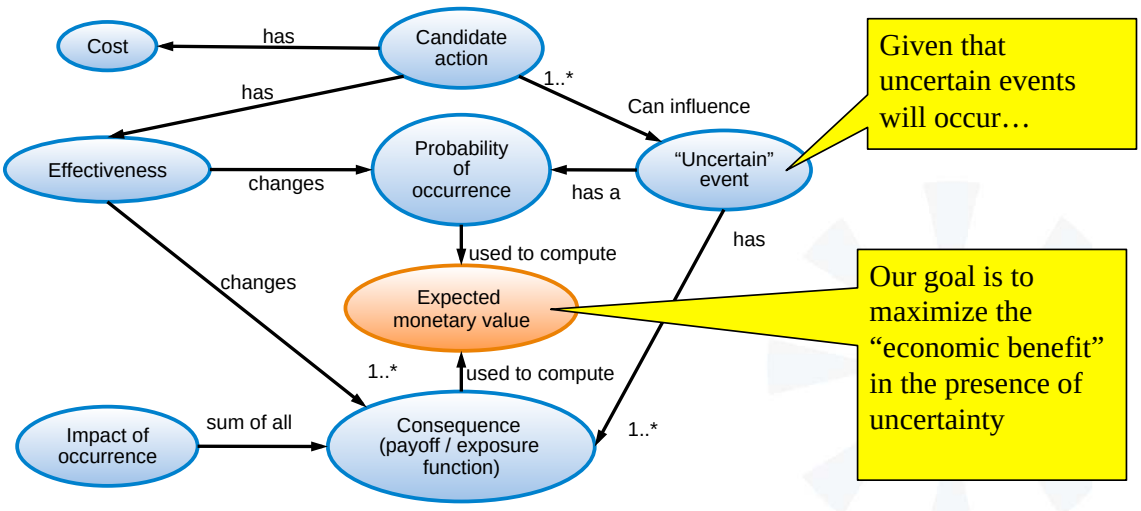
Typical mental model of uncertain events



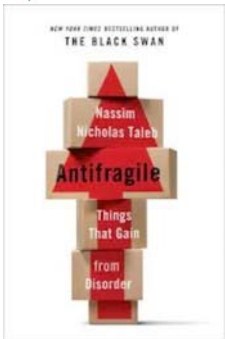
Source: Based on paper by Jerry Gilland, Engineering Management Services, 1996.

Maximize Expected Monetary Value

We strive to maximize economic benefit



Fragile, Robust, Antifragile



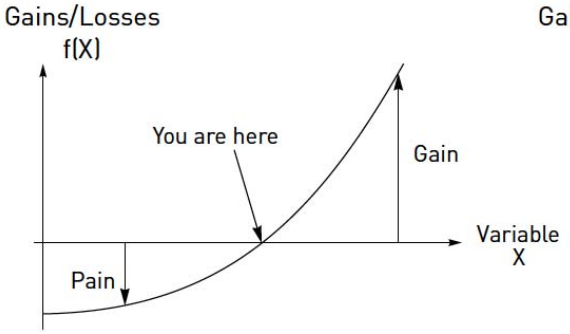
Goal is not to eliminate uncertainty, risk, or variability, but to protect ourselves against the variability that harms us and to promote and exploit the variability that benefits us

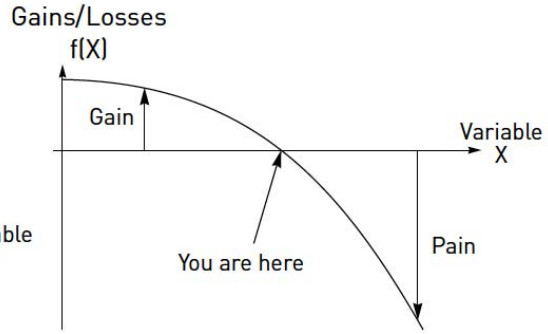
Waterfall

Agile

Fragile	Robust	Antifragile
Harmed by disorder	Resilient to disorder	Benefits from disorder

Asymmetric payoffs create economic value or harm





Positive asymmetric payoff (**antifragile**) anything that has more upside than downside from random events (variability)

Negative asymmetric payoff (**fragile**) anything that has more downside than upside from random events (variability)

Source: Taleb, Nassim, Antifragile: Things That Gain from Disorder, Random House, 2012.

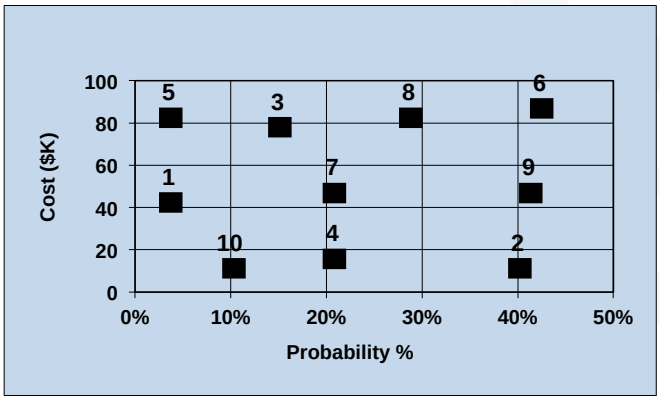
Traditional Risk Management

Traditional risk management process

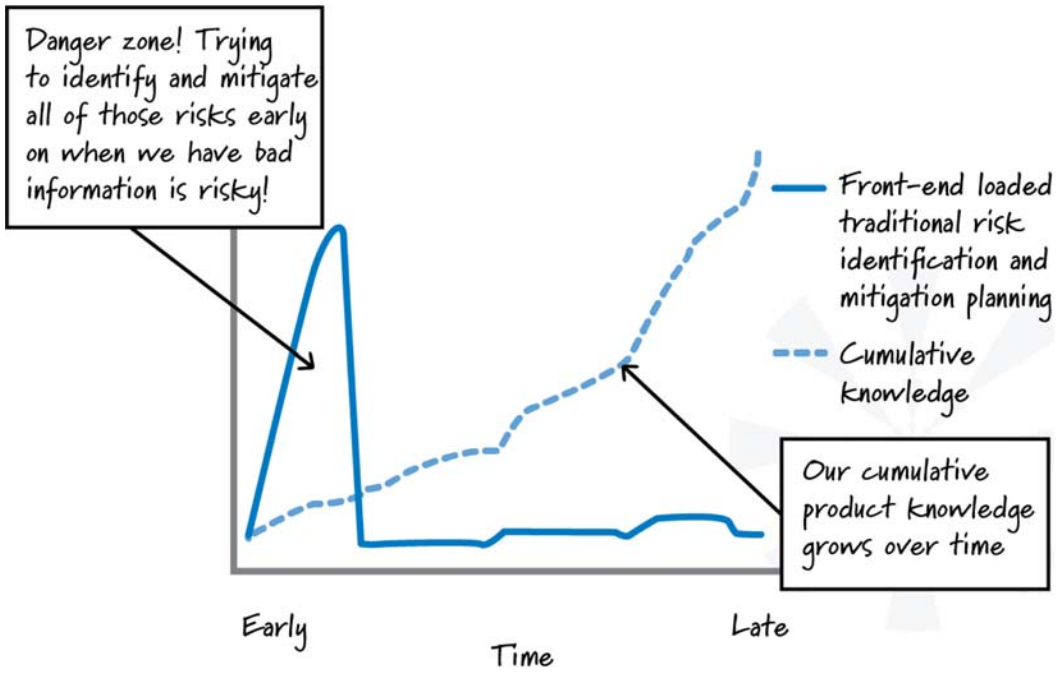
Example traditional risk-management artifacts

Risk	Prob	Exposure	Mitigation

Risk Management Plan

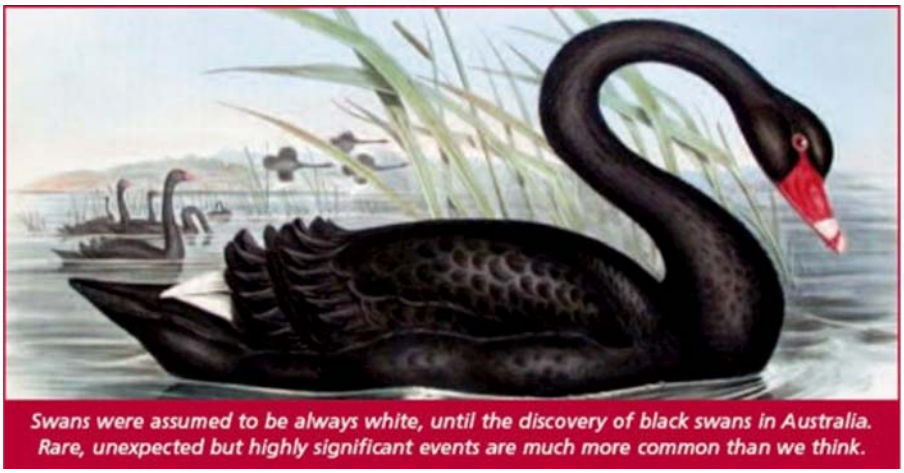


Assumption – early on we can identify the uncertain events



Assumption – we can identify all uncertain events

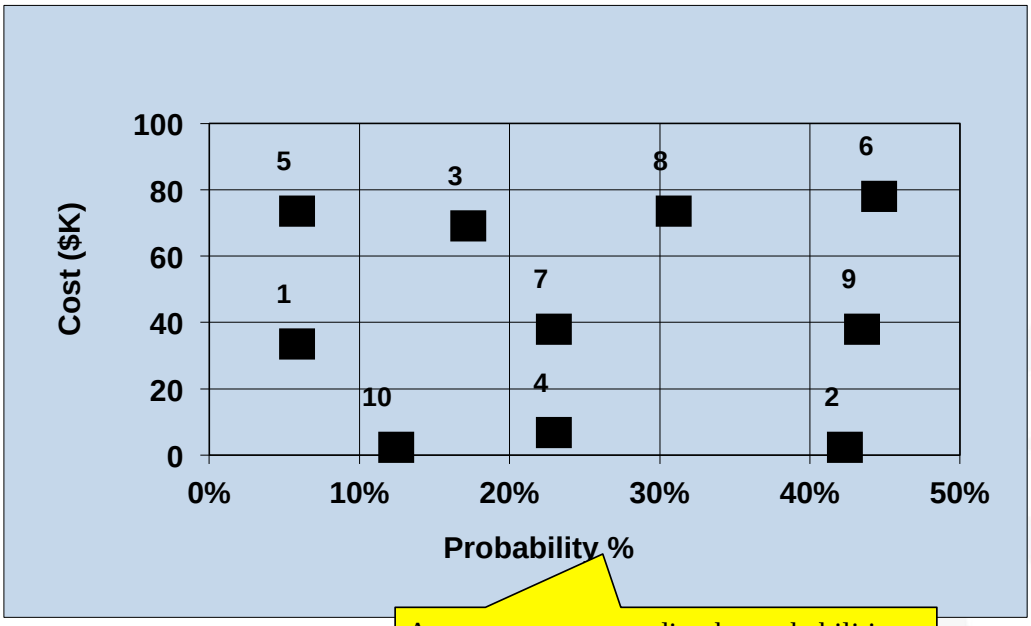
Large-scale unpredictable
(or very hard to predict)
events of massive consequences



Swans were assumed to be always white, until the discovery of black swans in Australia. Rare, unexpected but highly significant events are much more common than we think.

Source: Taleb, Nassim, The Black Swan: The Impact of the Highly Improbable Fragility , Random House, 2010.

Assumption — we can accurately calculate probabilities



Assumes we can predict the probabilities

Example – we can predict the event, but we can't predict or change probabilities

We can predict earthquakes will happen in California

We can't predict the occurrence of a specific earthquake of a given magnitude, or change the probability of it happening

We can describe the consequences to our business via a disruption in our California-based data center if we are affected by an earthquake

More sophisticated process does NOT solve these problems

Mistaken belief that we need better computation in order to more accurately predict the event and figure out the probabilities

Better approach is to modify our exposure and learn to get out of trouble fast

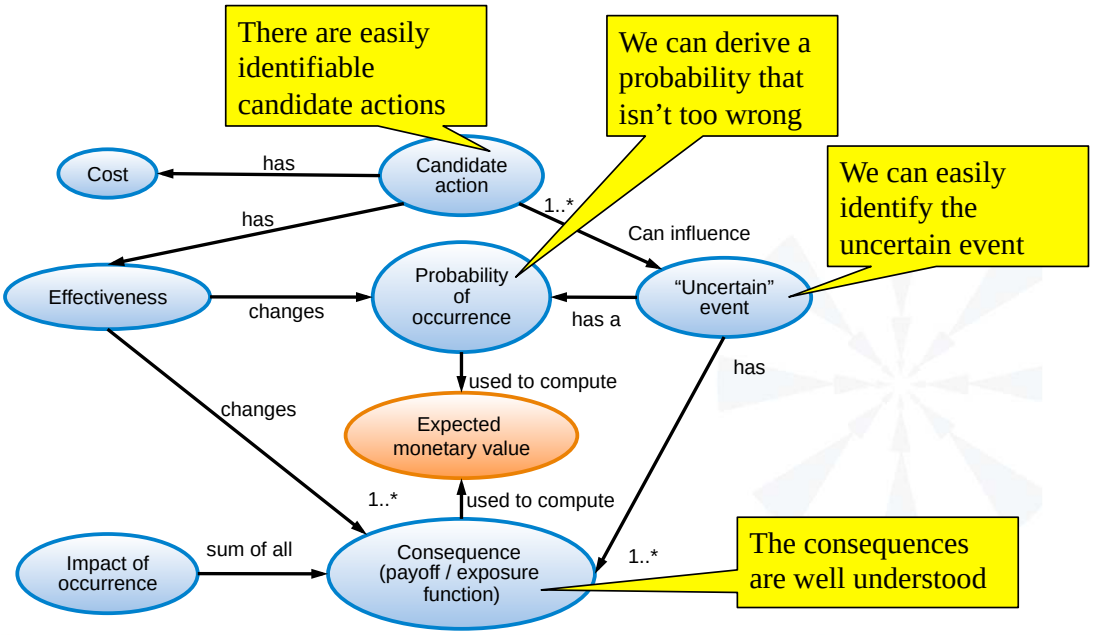
So, do we employ traditional risk management in Agile?

Like anything else in Agile, we would embrace the minimum (barely sufficient) amount of process that would be sufficient for dealing with the risks in our particular environment

Domains where human lives are at risk might choose to employ a more intense risk management process

Example of a simple risk

Vendor might fail to deliver a component on a promised date



Candidate action 1 – traditional risk management

Send one or more of our employees to vendor to help expedite

Risk	Prob	Exposure	Mitigation
Vendor fails to deliver Component X	50%	$1m/month	Send Barbara to vendor to help expedite

Manage risk via lightweight traditional techniques

Candidate action 2 – also traditional risk management

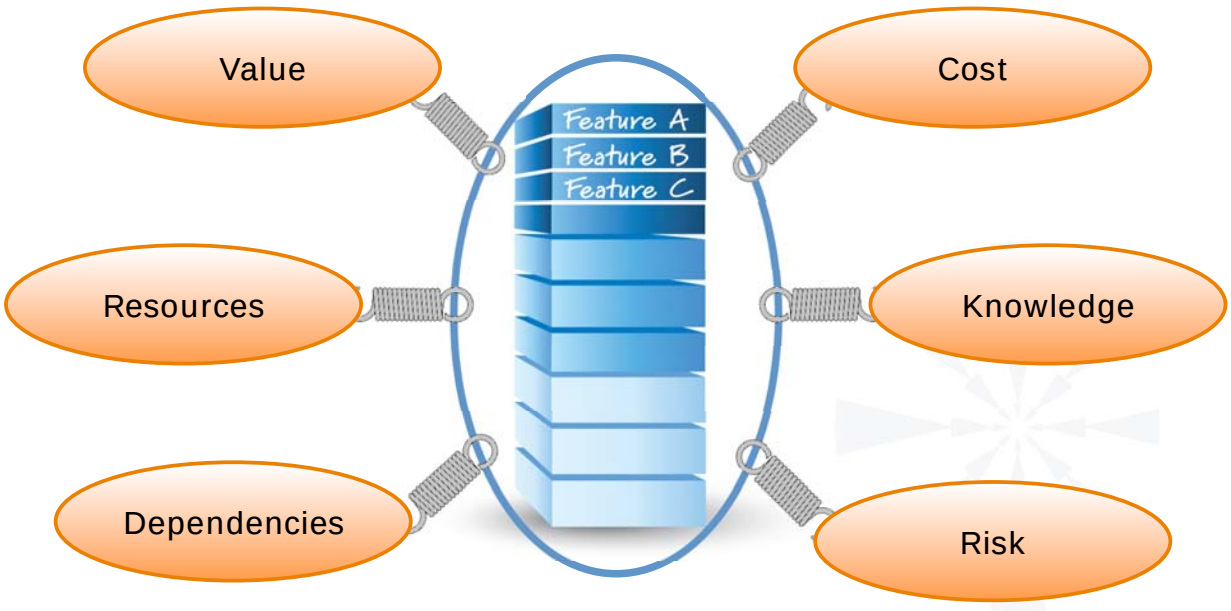
Pay expedited charge to move to head of queue

Risk	Prob	Exposure	Mitigation
Vendor fails to deliver Component X	50%	$1m/month	Pay more money to get head of queue privileges

Manage risk via lightweight traditional techniques

Managing Risk via the Product Backlog

Risk as a factor in prioritization



Example: Develop email system for 10 million concurrent users

Option 1

Spend a lot of money early on to develop core and advanced email features

Then, perform scale-up testing late and hope it works

Option 2

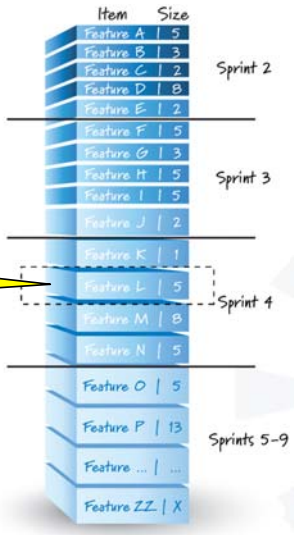
Run tests earlier to determine if scaling to 10m users is possible

Then, start building email features with confidence system will scale up to 10m users

Manage dependency risk via product backlog grooming

Vendor might fail to deliver a component on a promised date

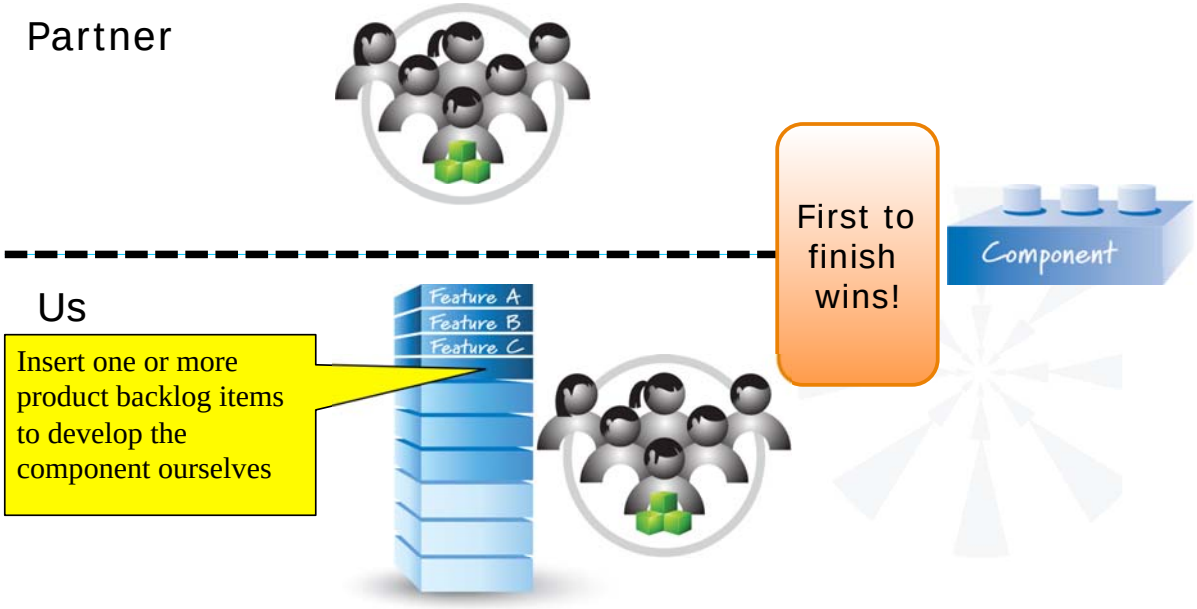
This feature is dependent on delivery of the component



Affects prioritization of other items in the product backlog

Manage risk by creating risk-mitigation items in product backlog

Employ the parallel hedge strategy



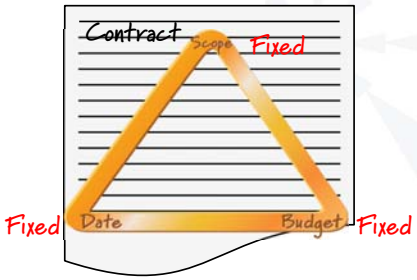
Using Agile to Avoid Some Uncertain Situations

Some uncertain events can be avoided altogether

Avoid the self-creation of inherently risky or uncertain situations

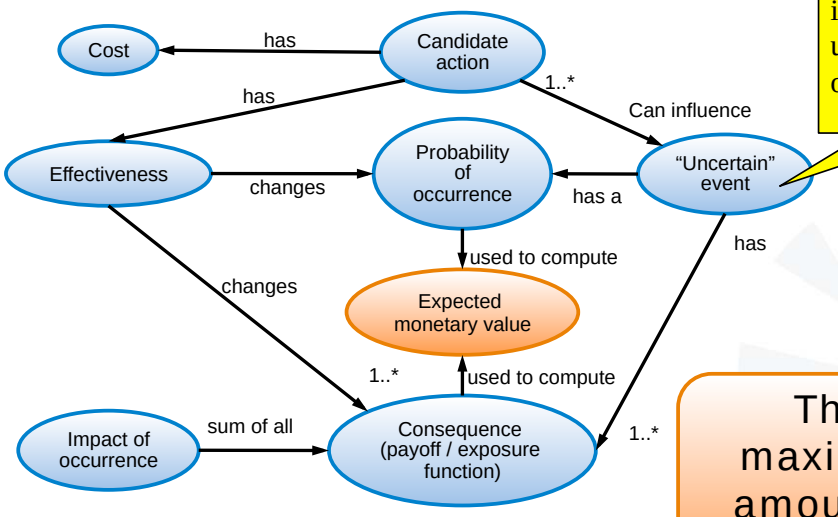
If we don't go into space, we don't have to worry about the risk that our spaceship could run out of fuel

If we don't write fixed price subcontracts, we can avoid the risks of fixed price contracts!



Effort saved not having to "manage" uncertain events

Think of the effort saved if we end up injecting less uncertain events into our environment!!!

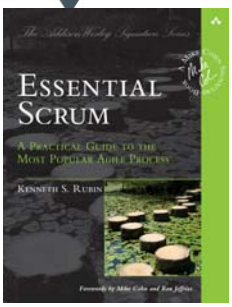


The art of maximizing the amount of work not done!

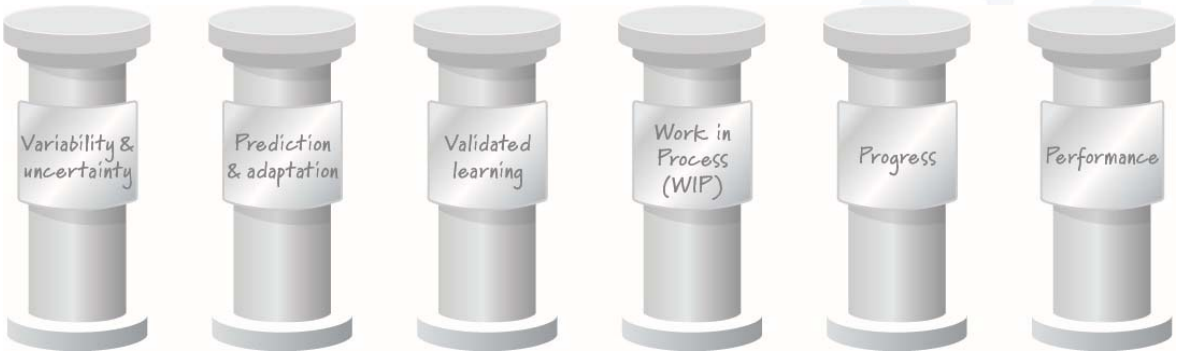
Exercise – identifying uncertain events avoidable by Agile

What are some known risks or uncertainties that we can avoid just by applying Agile development?

Applying agile principles to be robust and antifragile

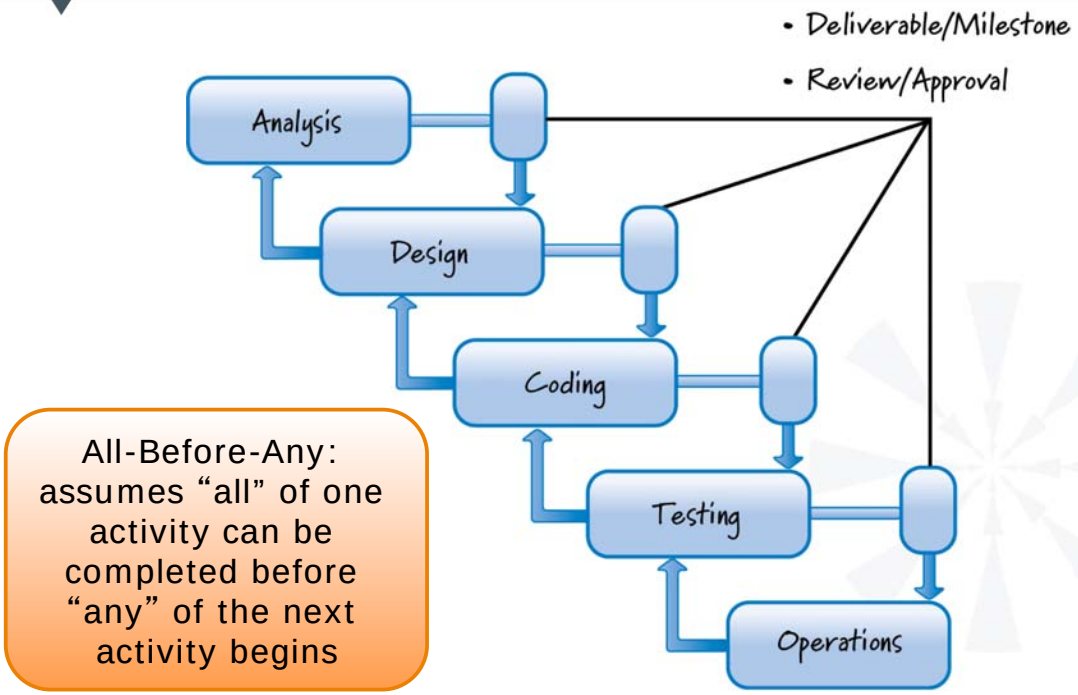


Applying agile principles make the development process robust and at times antifragile to the disorder of uncertain events, allowing us to avoid harm and reap the benefits of uncertainty, without the need for heavyweight risk management processes



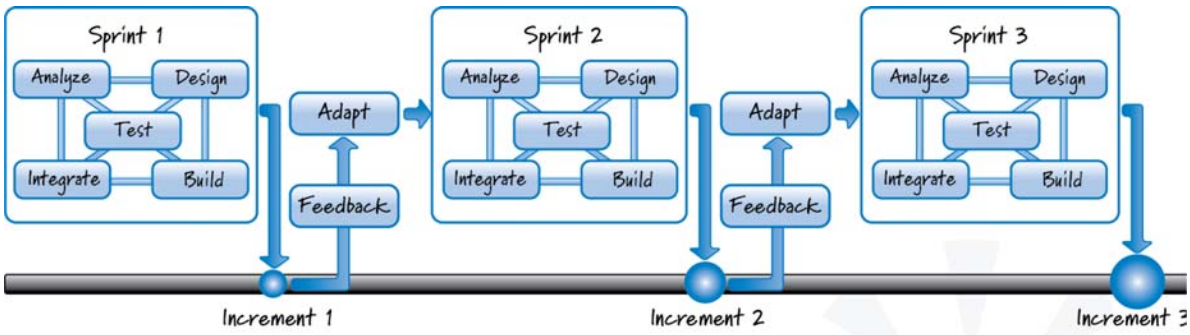
Variability and Uncertainty

All before any is “risk generating”



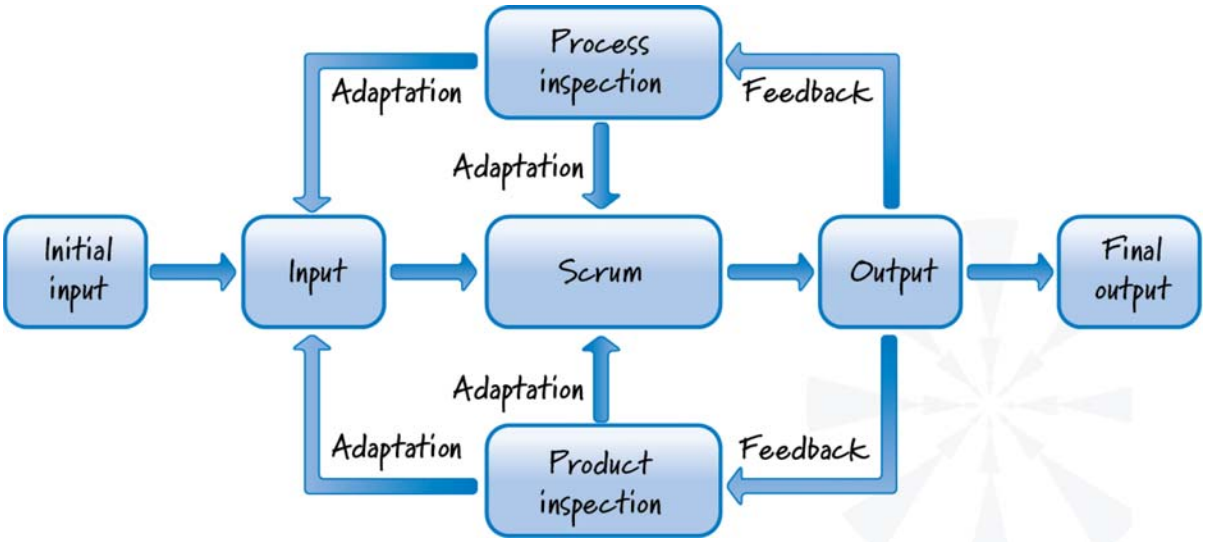
All-Before-Any: assumes “all” of one activity can be completed before “any” of the next activity begins

Iterative & incremental is antifragile



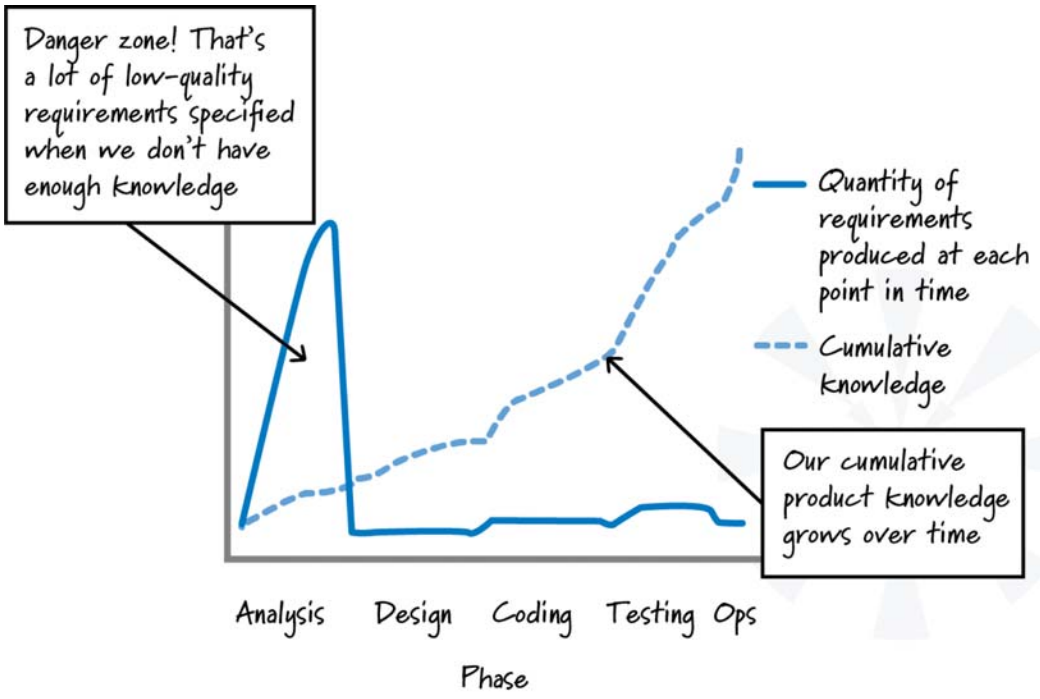
- Get things wrong before we get them right
- Build some of it before we build all of it
- Reduces forecasting errors
- Offers opportunity for continuous deployment

Inspect and adapt is antifragile

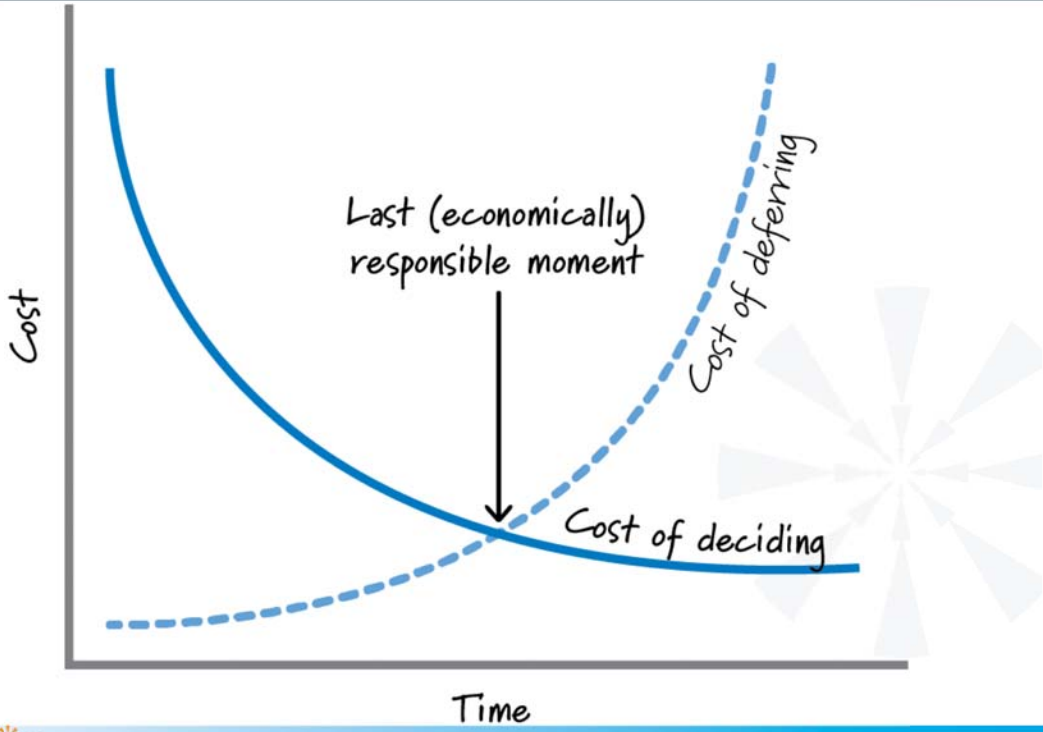


Prediction and Adaptation

Risk of trying to get it right upfront



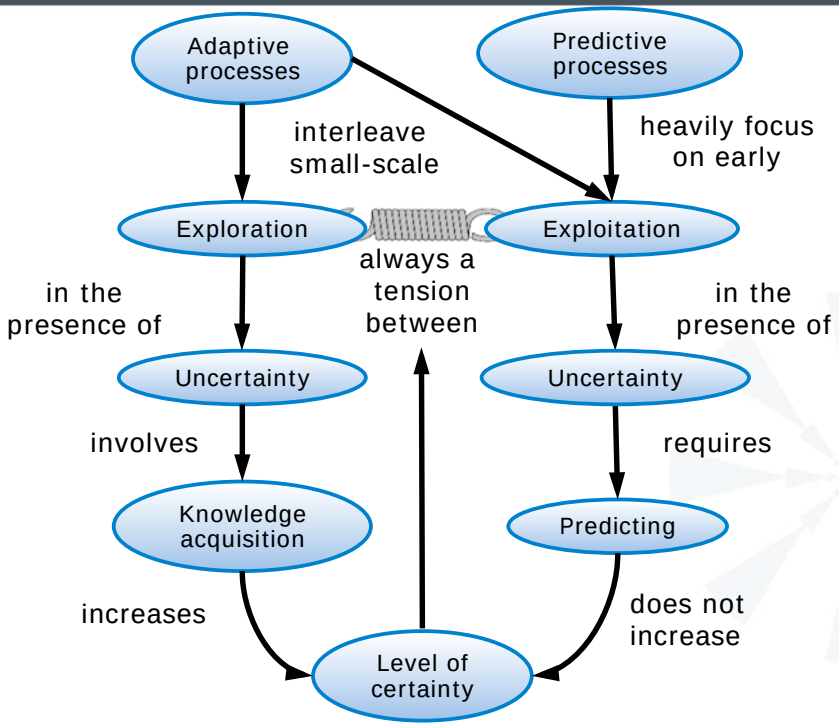
Keep options open (last responsible moment)



Exercise – Architecture A vs. B

First day of a new product development effort. There are two architectural choices: A or B. Each appears to have viable characteristics. Which one should we select?

Rapidly intermingle exploration and exploitation to address uncertainty



Real options

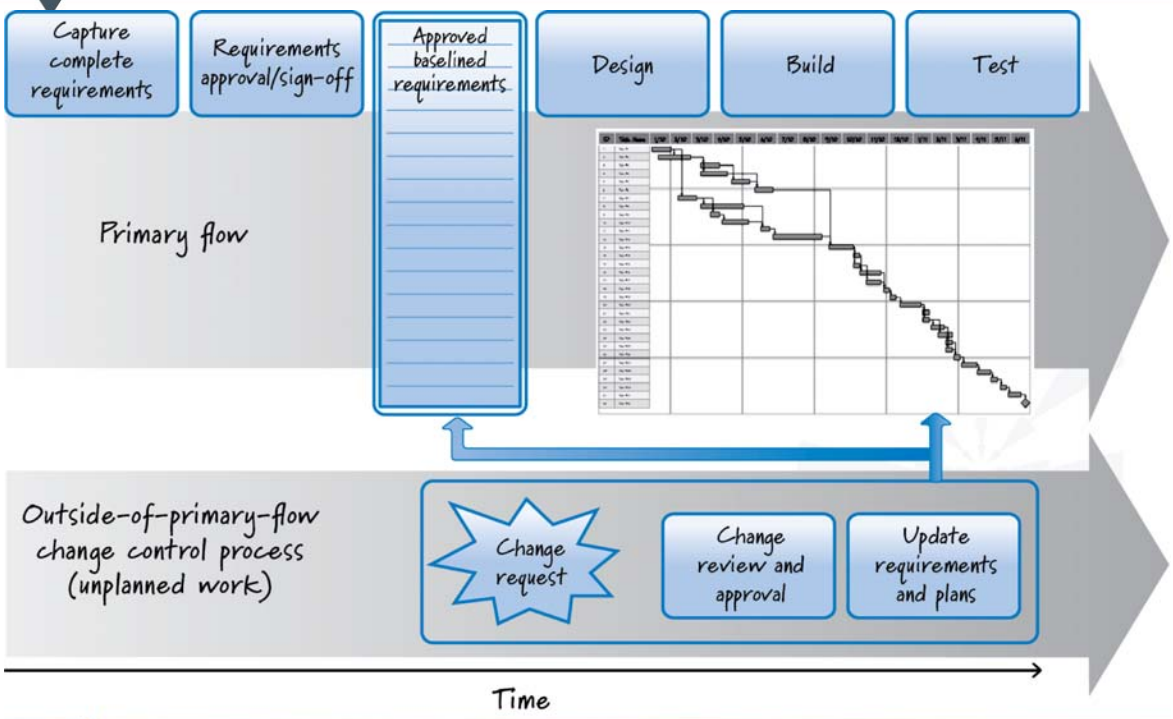
The right but not the obligation to do something

Options have value

Options expire

Never commit early to an option unless we know why

Managing change risk during a traditional development project



Managing change risk using Scrum

Validated Learning

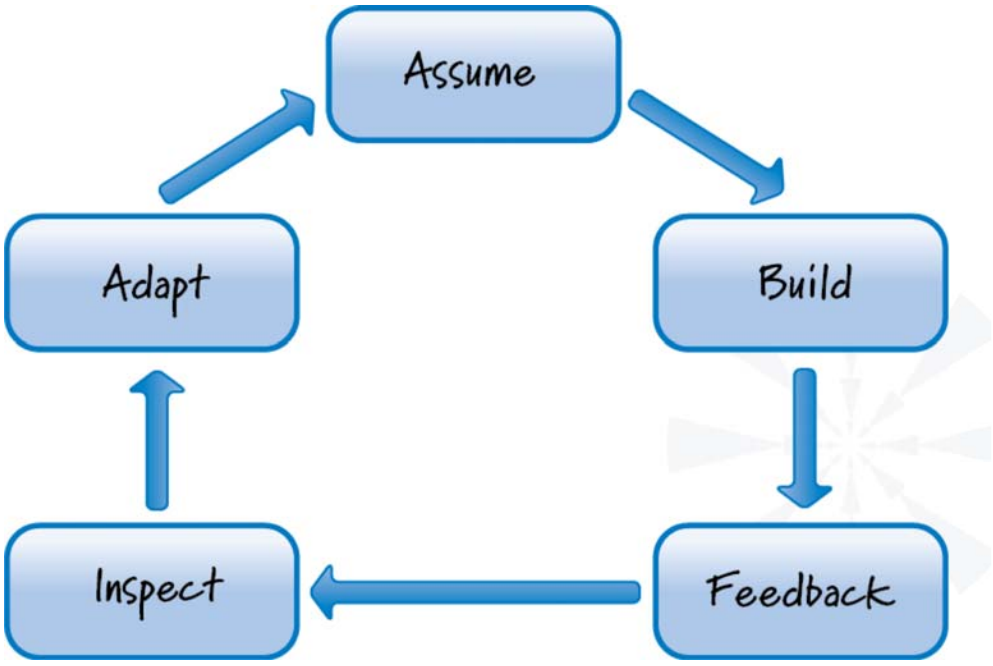
Assumptions = accrued risk

Assumption is a guess or belief that is assumed true, real, or certain

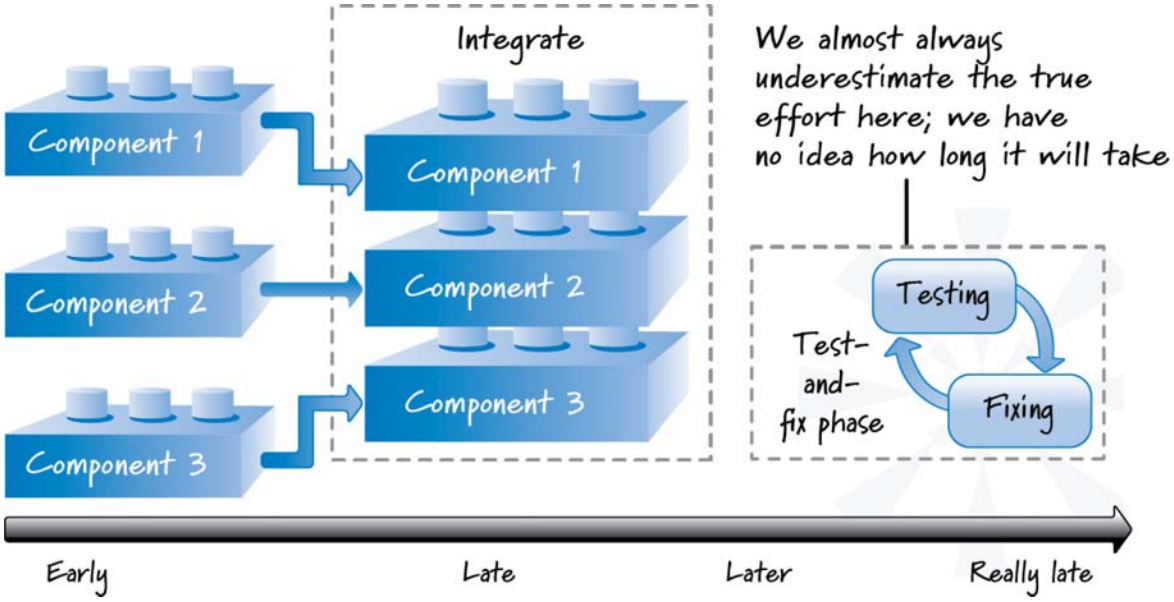
Not-yet-validated assumptions represent significant accrued risk during development

Don't let important assumptions live long without validation

Reduce risk by going fast through the loop



Organize flow of work for fast feedback



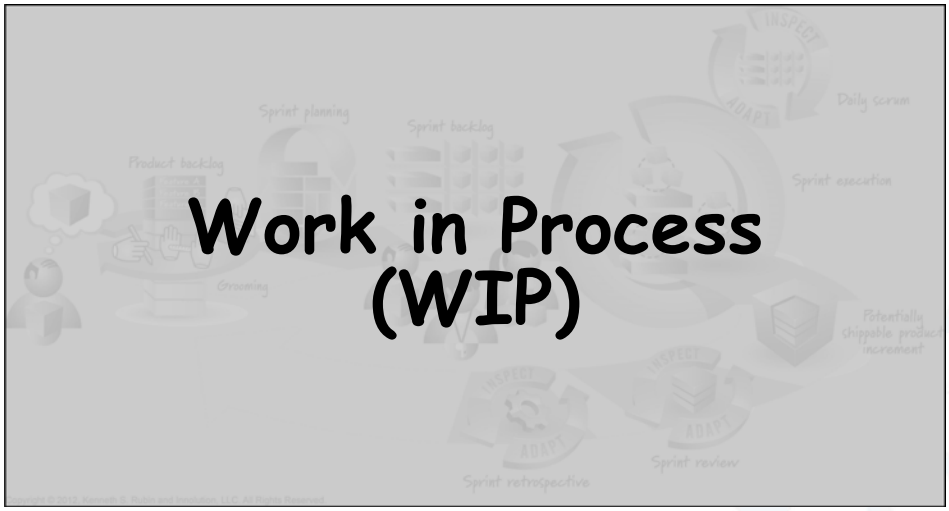
Fast feedback is antifragile

Agile benefits from the uncertainty (unpredictable things we learn) in fast, frequent feedback

Learn fast we are going down the wrong path and then truncate the path

Exploit newly acquired knowledge to realize an emergent opportunity

Asymmetric payoff by limiting downside harm and providing much greater upside potential

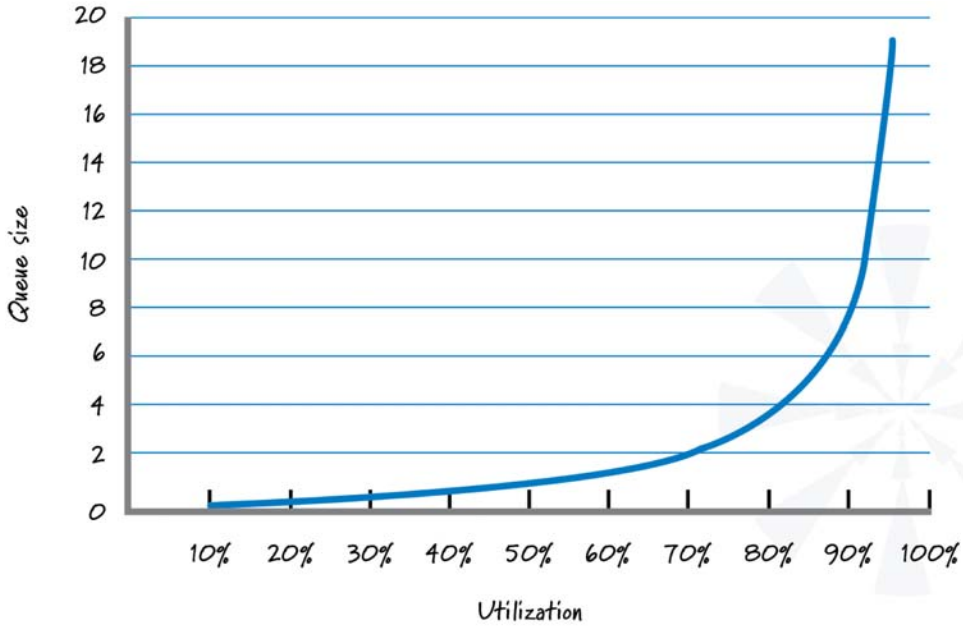


Use economically sensible (typically smaller) batch sizes

- Reduced cycle time
- Reduced flow variability
- Accelerated feedback
- Lower risk of failure
- Reduced overhead
- Increased motivation & urgency
- Reduced cost and schedule growth

Source: Reinertsen, Donald, The Principles of Product Development Flow: Second Generation Lean Product Development, Celeritas Publishing, 2009.

Inventory (WIP) represents a significant economic risk



Planning Risks

Belief that loading planning on the front-end reduces risk

Better the planning the better the understanding and therefore the better the execution

Give appearance of orderly, accountable, and predictable approach

Developing a product rarely goes as planned

Beliefs don't match uncertainty in product development

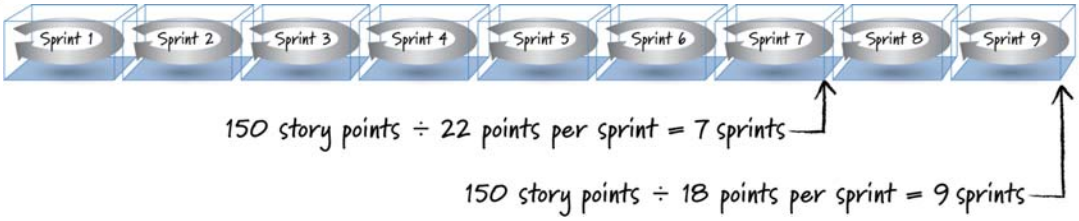
Scope is the risk-reducing degree of freedom

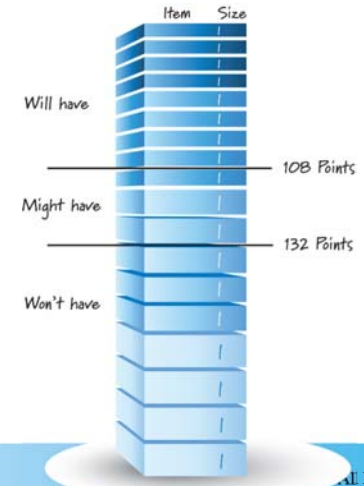
Scope can be binary

Scope can be shades of grey

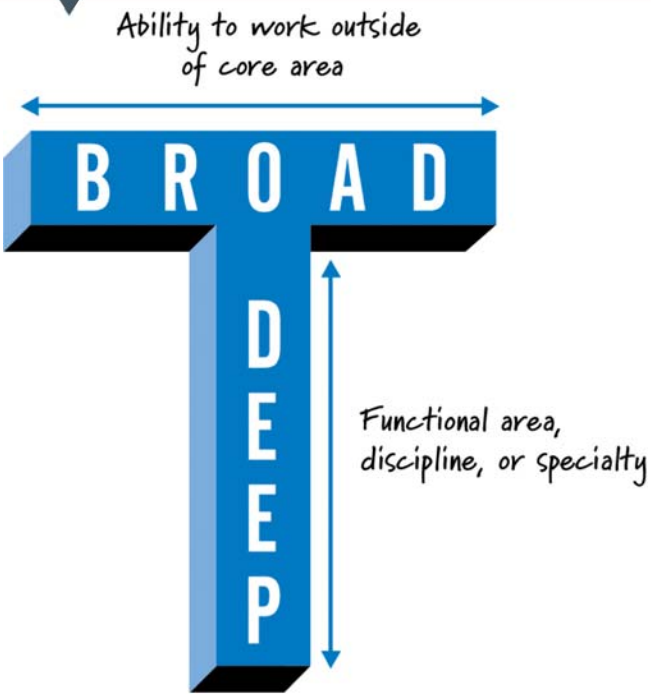
Allows us to bound the downside on the asymmetric payoff function

Communicate uncertainty with range answers to questions





Teams with T-Shaped skills



Can offset random increases in demand by quickly compensating with changes in capacity

Example of negative covariance or counter balancing. Changing capacity available to do work a given vertical area (a change in one random variable) counterbalances the variability in demand (a change in a second random variable)

Contact Info for Ken Rubin

Email:	krubin@innolution.com
Website:	www.innolution.com
Phone:	(303) 827-3333
LinkedIn:	www.linkedin.com/in/kennethrubin
Twitter:	www.twitter.com/krubinagile
Facebook:	www.facebook.com/InnolutionLLC
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