# QCon 2009

Diseases in Management Methods

Martine.devos@teamgenius.eu

# W. EDWARDS DEMING'S SEVEN DEADLY DISEASES

1. **Lack of constancy of purpose to plan product and service that will have a market and keep the company in business, and provide jobs.**

- **2. Emphasis on short-term profits: short-term thinking (just the opposite of constancy of purpose to stay in business), fed by fear of unfriendly takeover, and by push from bankers and owners for dividends.**

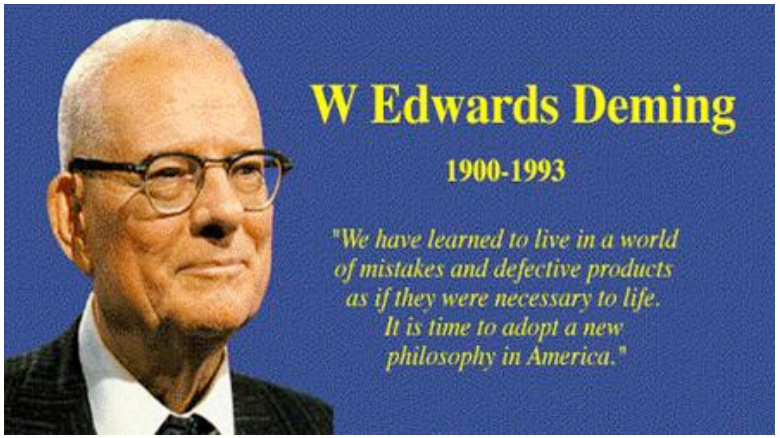
- **3. Personal review systems, or evaluation of performance, merit rating, annual review, or annual appraisal, by whatever name, for people in management, the effects of which are devastating. Management by objective, on a go, no-go basis, without a method for accomplishment of the objective, is the same thing by another name. Management by fear would still be better.**

- **4. Mobility of management; job hopping, the same thing by another name.**

- **5. Use of visible figures only for management, with little or no consideration of figures that are unknown or unknowable.**

- **6. Excessive medical costs.**

- **7. Excessive costs of litigation**


W Edwards Deming
1900-1993
"We have learned to live in a world of mistakes and defective products as if they were necessary to life. It is time to adopt a new philosophy in America."


plan
do
act
study

# Solving problems

| Efforts directed | Origin of problem | |
|---|---|---|
| | Common cause | Special cause |
| At the cause-system (common causes) | Good | Disappointment |
| At the special cause | Disappointment | Good |

# Solving problems – Effect of misdirected efforts

| Efforts directed | Origin of problem |
| --- | --- |
| At the cause-system (common causes) | |
| At the special cause | |

Blame, firefighting,
lay-off, outsource,
schedule pressure,…

“the problems start with the first line of code”
(an executive)

# Stable Systems (Deming)

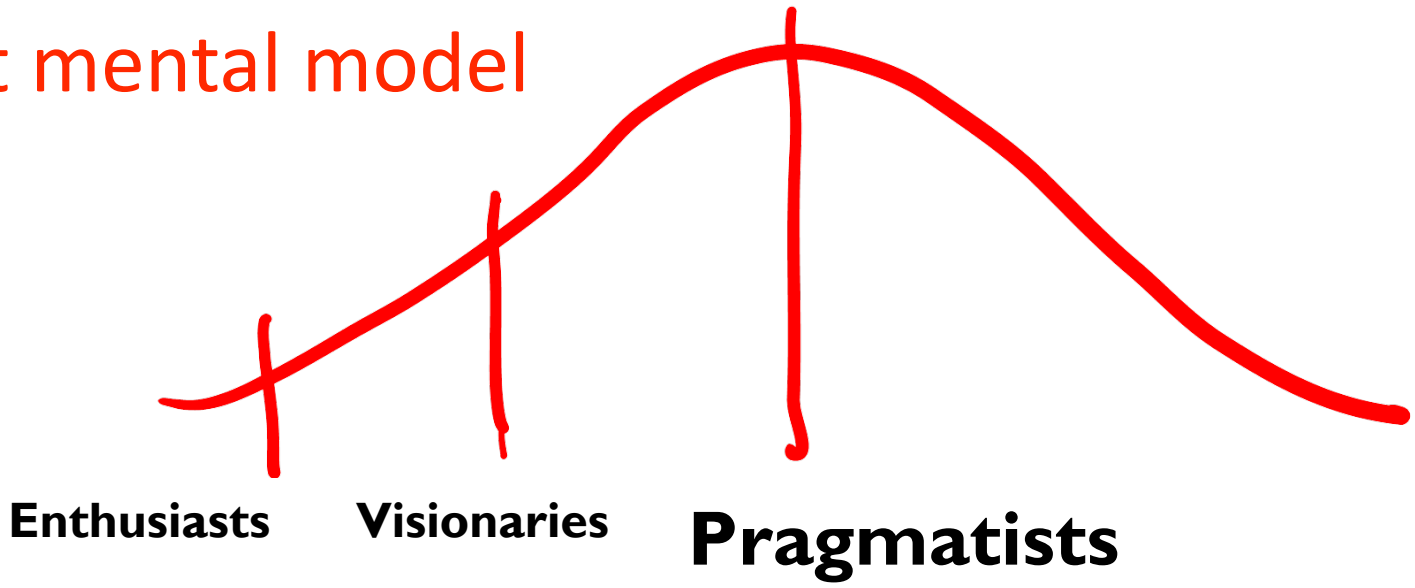
- Recognition of the distinction between a stable system and an unstable one is vital for management.
- The responsibility for improvement of a stable system rests totally on management.
- A stable system is one whose performance is predicable. It is reached by removal, one by one, of special causes of trouble.

# Expectations changed

Based on Moore
Crossing the Chasm

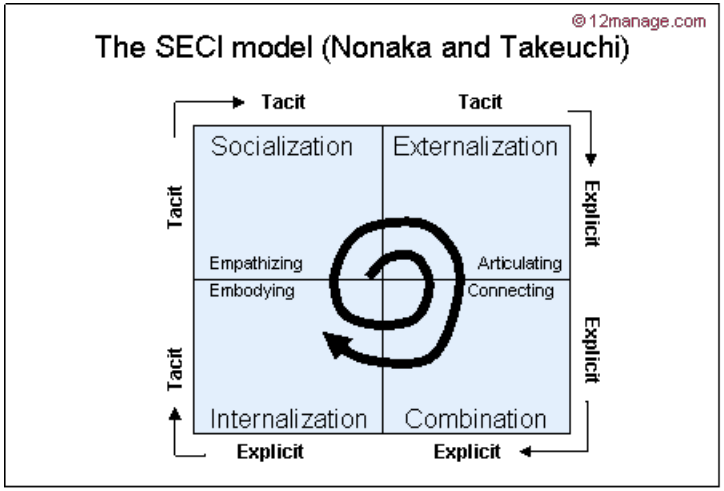
Obsession with prediction (!=) predictability
Looking for cause and effect (preferably close to each other in space and time)
Now maybe calling organizations living but still wanting to threat them as machines
Expectations of linear effects

Different mental model



# Nonaka and Takeuchi

- **Knowledge engineers**
- **Tacit and explicit knowledge**



## Sequential – Baton Race

Aka. waterfall

**Multi-disciplinary team works together start to finish (cfr. Scrum Framework)**

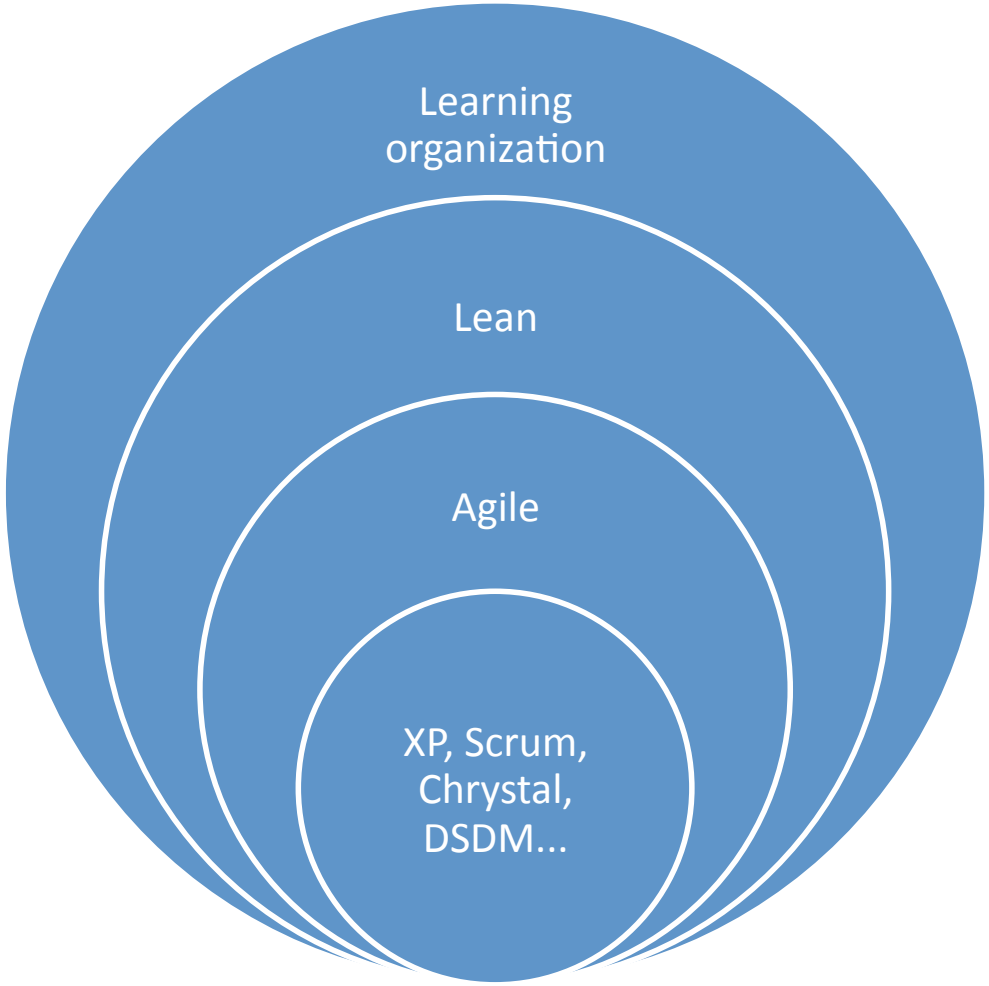
# Subtle control

- Project teams are largely on their own, but do not go un-controlled. Management establishes enough checkpoints to prevent instability, ambiguity and tension from turning into chaos.
- At the same time management avoids the kind of rigid control that impairs creativity and spontaneity. Instead the emphasis is on “self-control”, control through peer pressure, and “control by love”

# Subtle control

- Selecting the right people
- Creating an open work environment
- Encouraging engineers to work with customers
- Establish an evaluation and award system based on group performance
- Managing the differences in rhythm through the process (rhythm more vigorous early on)
- Tolerating and anticipating mistakes
- Encouraging suppliers to become self-organised – involving them early in the process

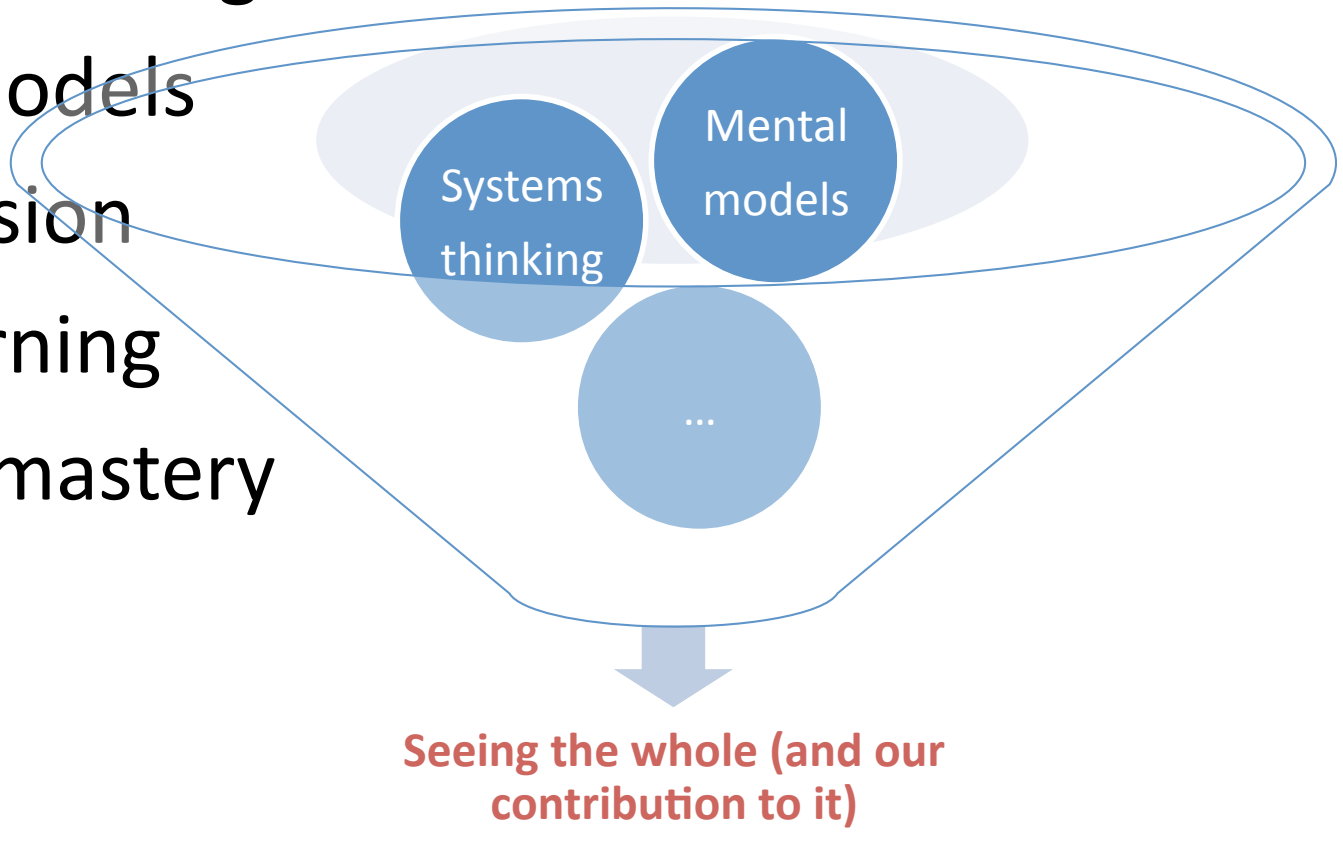
# Learning Organization



# Lean is not just software

# Learning Organization

- Systems thinking
- Mental models
- Shared vision
- Team learning
- Personal mastery

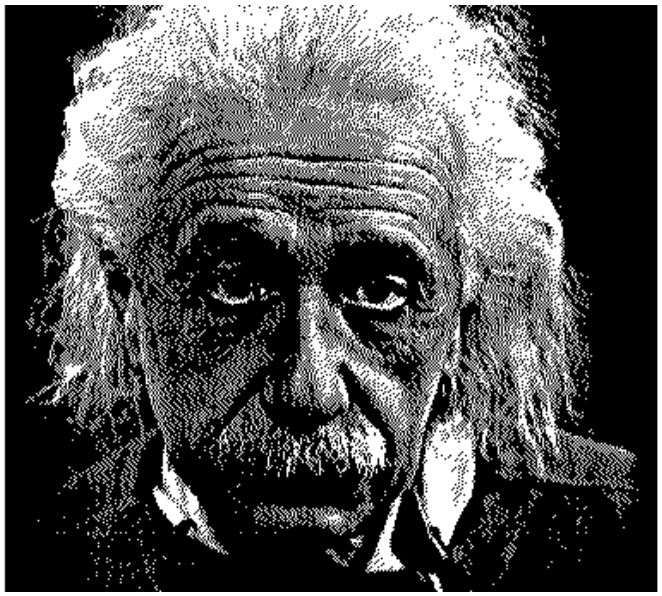


# Levels of Understanding

| *Levels of understanding* | *Action mode* | *Time orientation* | *Typical questions* |
|---|---|---|---|
| Shared vision | Generative | Future  | What are the stated and unstated visions and value systems that generate the structures? |
| Systemic structure | Creative | | What are the mental or organizational structures that create the patterns? |
| Patterns of events | Adaptive | | What kind of trends or patterns of events seem to occur? |
| Events | Reactive | Present | What is the fastest way to react to this event NOW? |

# Values

- Mental Models
  - Ability to see
  - Including our own role
- Values
- Principles
- Practices
- rules



What can be measured is not always important and what is important can not always be measured

# Words with Values

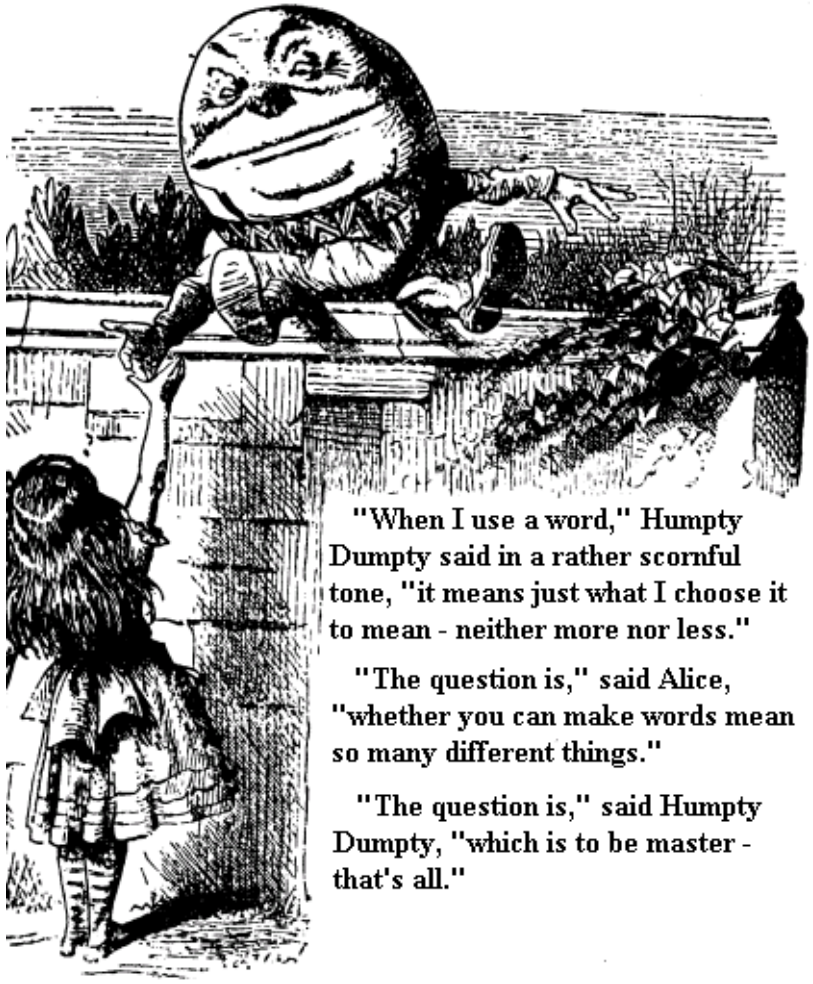
- Estimate

- Feedback
- Evaluation

- Empowerment
- Self Organization

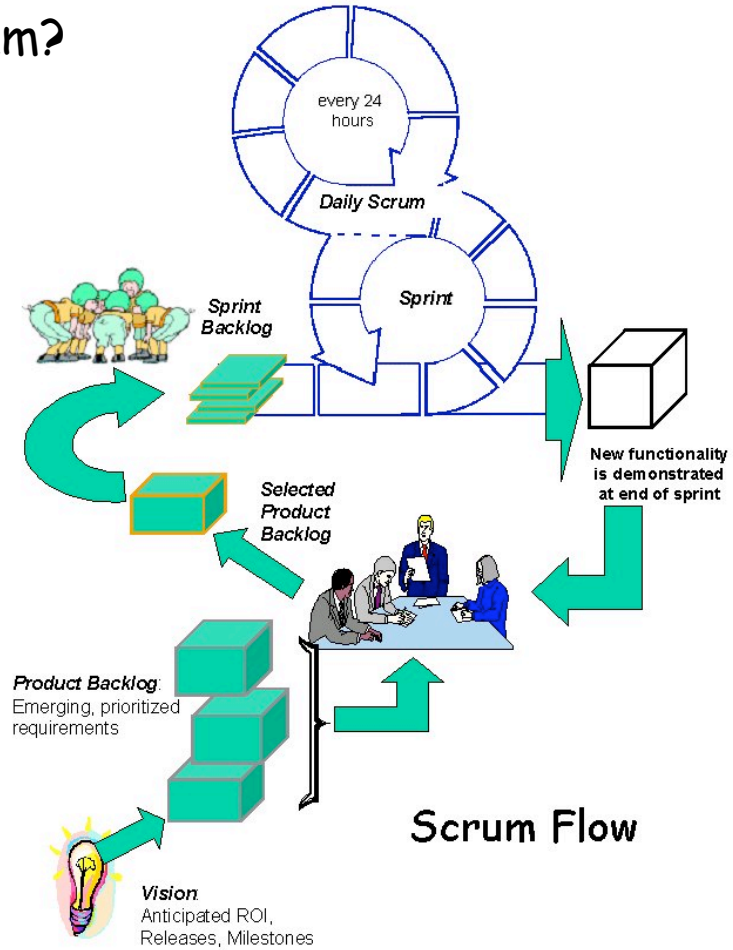
- Team

- Velocity



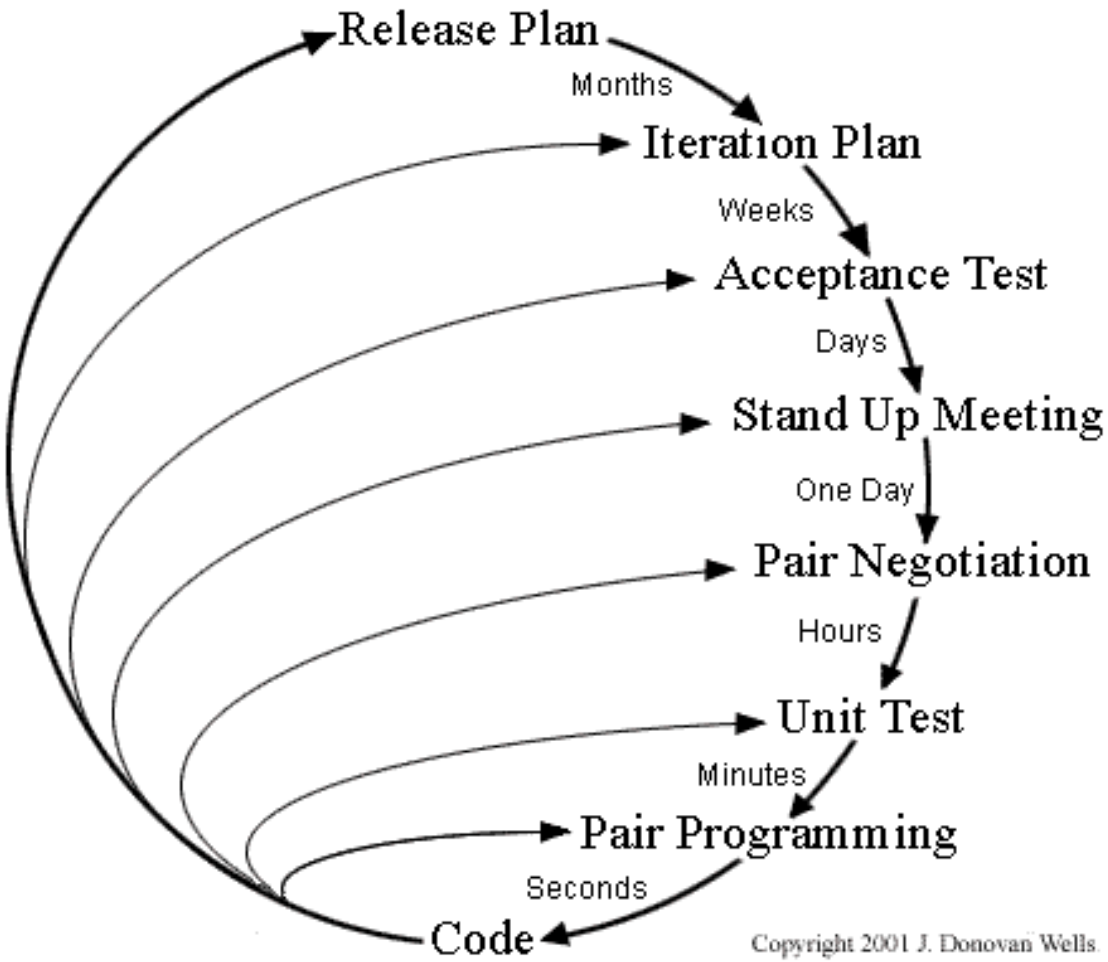
# Inspect and Adapt
# Multiple feedback cycles

Doing ok as a team?

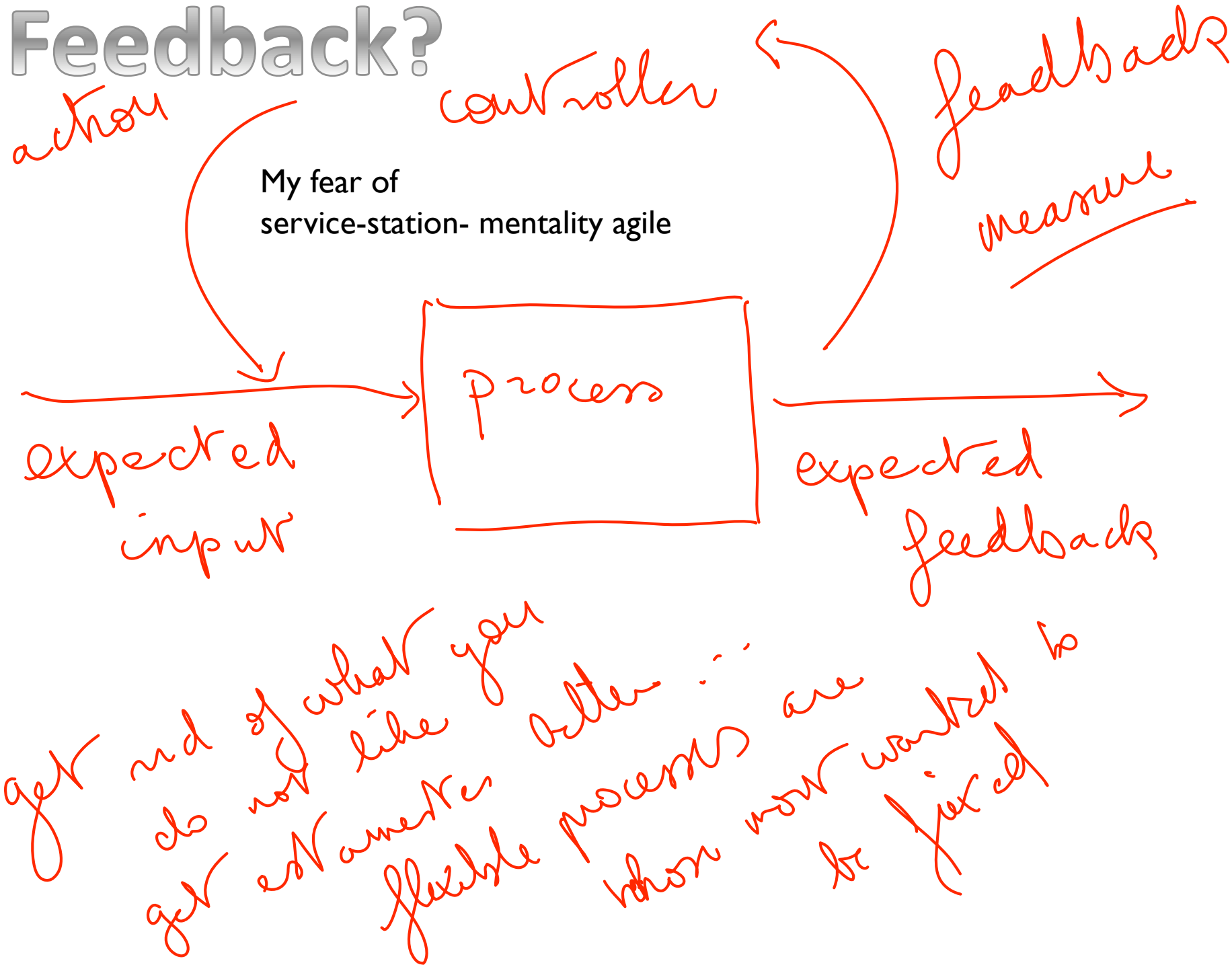



highest value functionality?

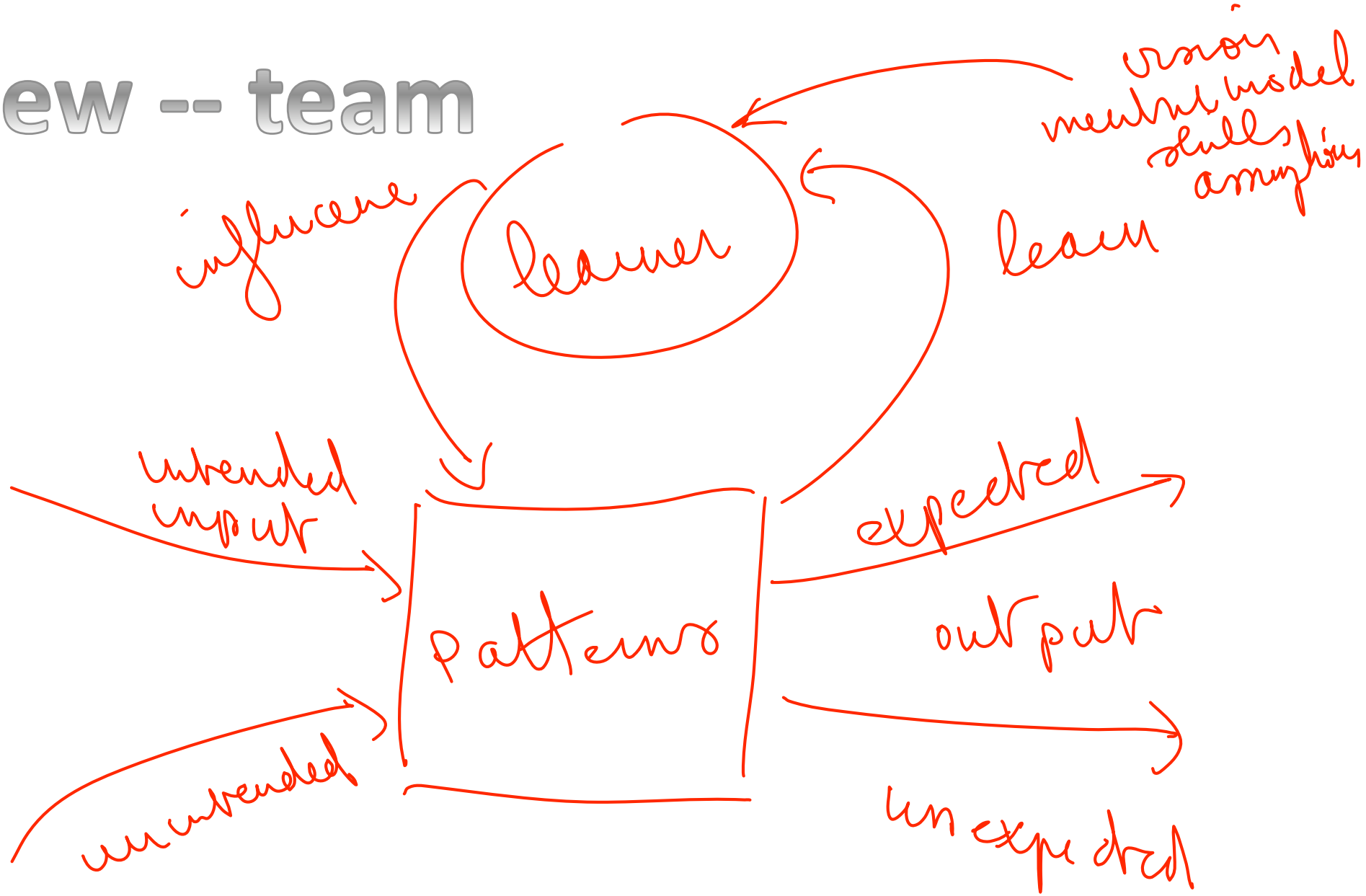
"done" increments of product?


Release Plan
Months
Iteration Plan
Weeks
Acceptance Test
Days
Stand Up Meeting
One Day
Pair Negotiation
Hours
Unit Test
Minutes
Pair Programming
Seconds
Code
Copyright 2001 J. Donovan Wells

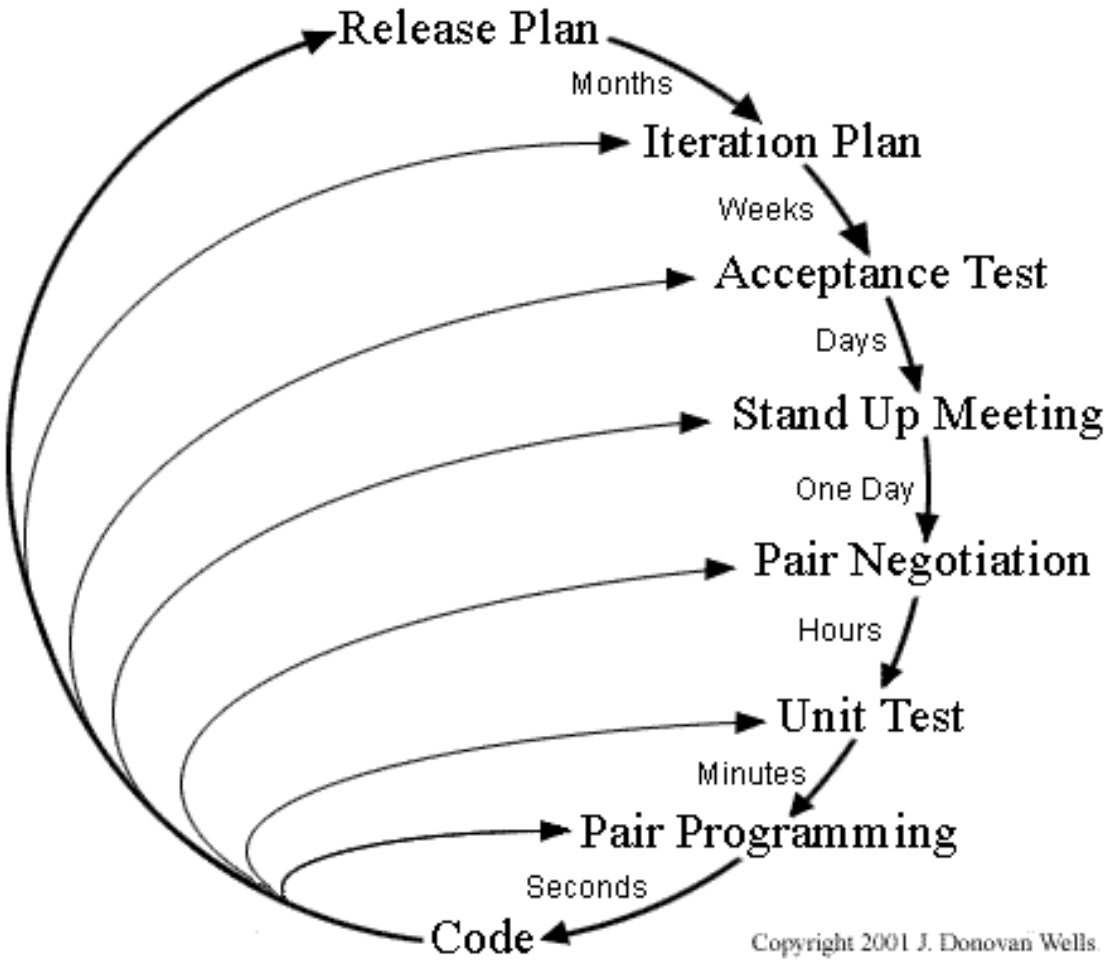
# Feedback?


actor
controller
feedback
measure
My fear of
service-station- mentality agile
process
expected
input
expected
feedback
get rid of what
do not like you
get answers better ...
flexible process are
when now wanted to
be fixed

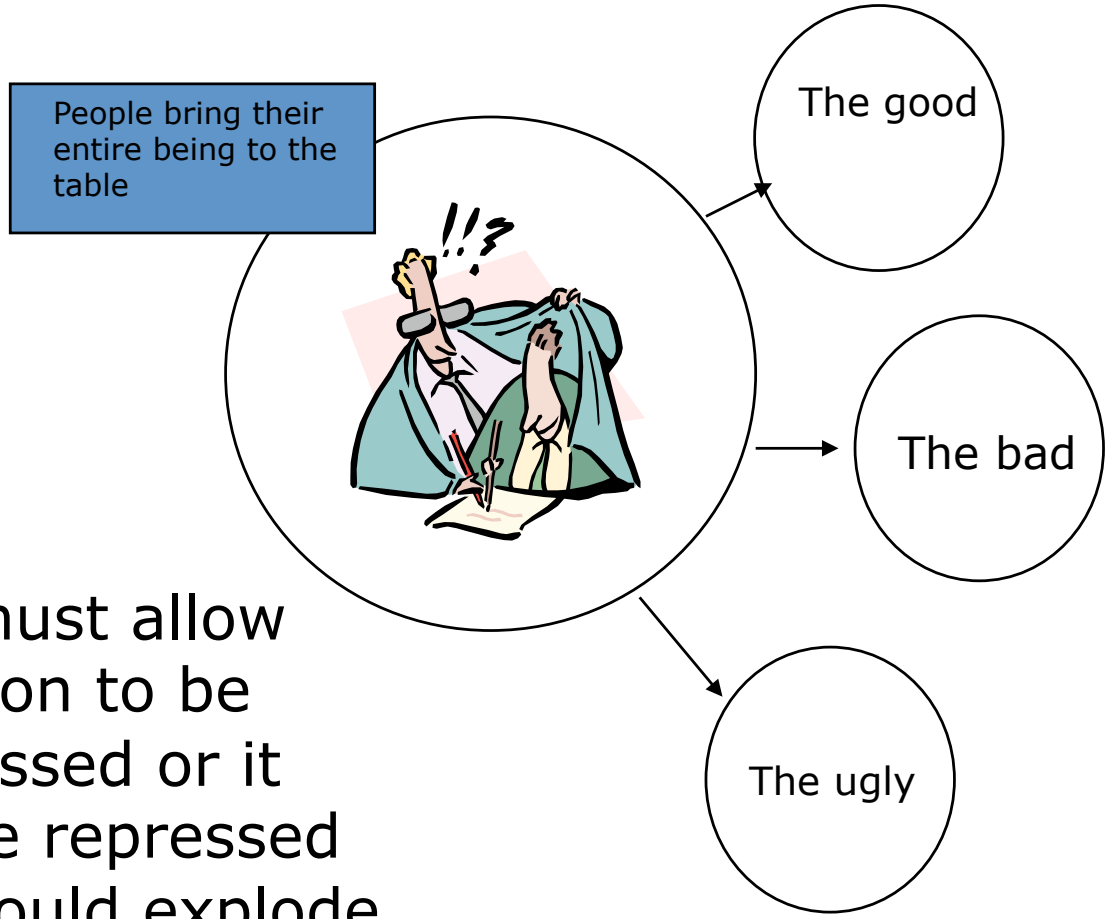
# new -- team


learner
influence
learn
patterns
intended input
unintended
expected output
unexpected

# + Retrospective



# Feelings are Facts




You must allow emotion to be expressed or it will be repressed and could explode later



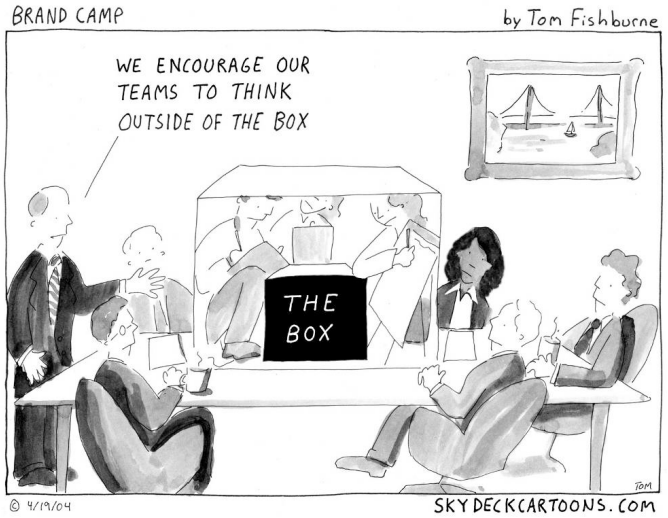
Scrum Master Certification
© Martine Devos 2006

# Either/Or to Both/And

# There/Then/Them

# Here/Now/Us

# Nanny → …



# Change models

# Hole in the floor model

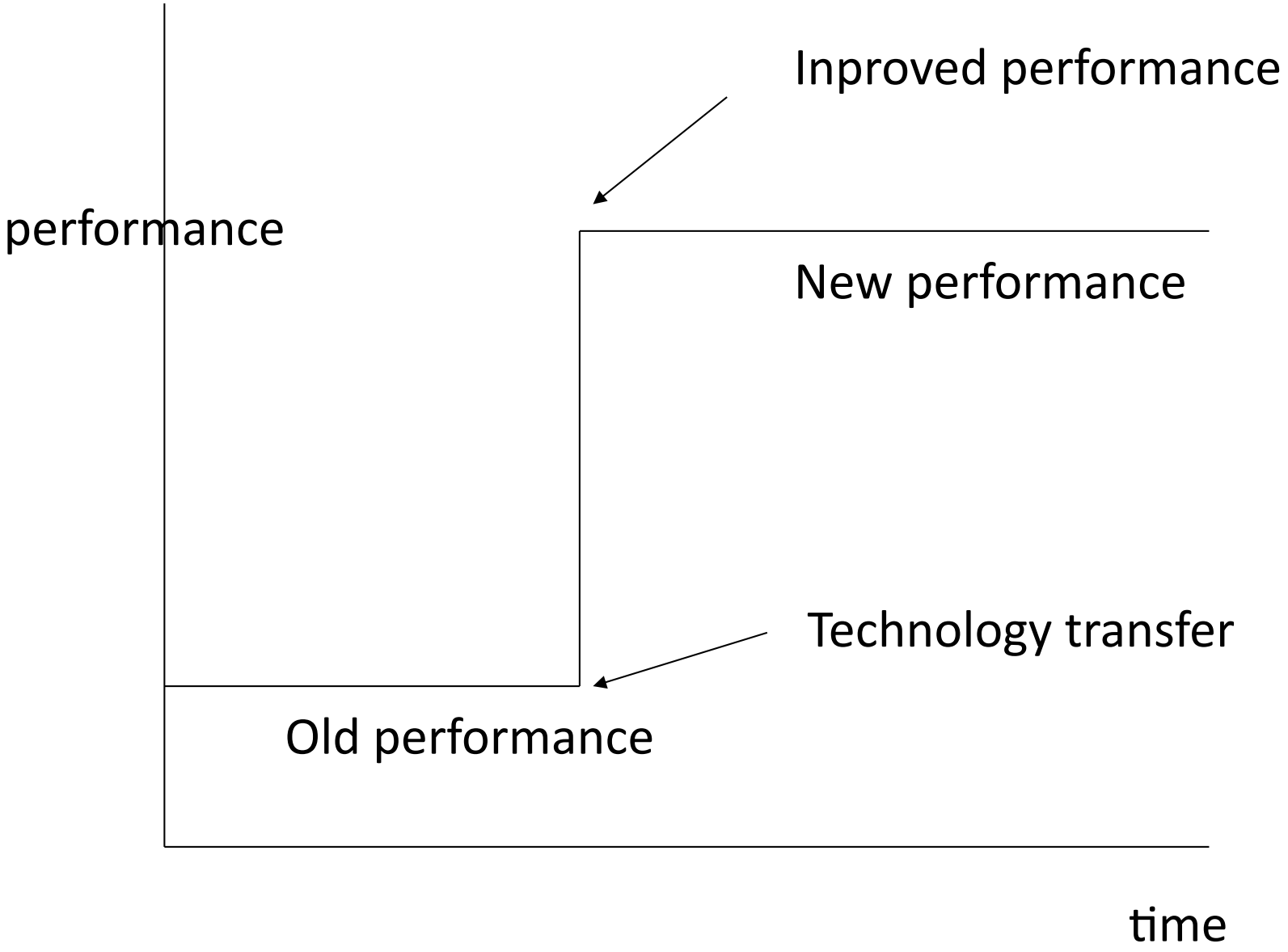
- Assumptions
  - There are superior and inferior people
  - All design comes from above, from the superior people
  - There is no possibility of useful feedback from the inferior people
  - No change is dropped through the hole until it is perfect
  - The is no human contact needed
  - Sophistication in chance means carefully drilled holes, such as position papers, lecture presentations, course material, help systems and methodologies

# Hole in the floor - model

- Working upstairs the engineers develop the perfect system
- Change plan consists of drilling a hole in the floor
- … and the workers use it happily ever after – there is instant diffusion

- The only thing that can possibly obstruct the change plans is lack of understanding
- If the they not understand, repeat, or speak louder

# Hole in the floor – model



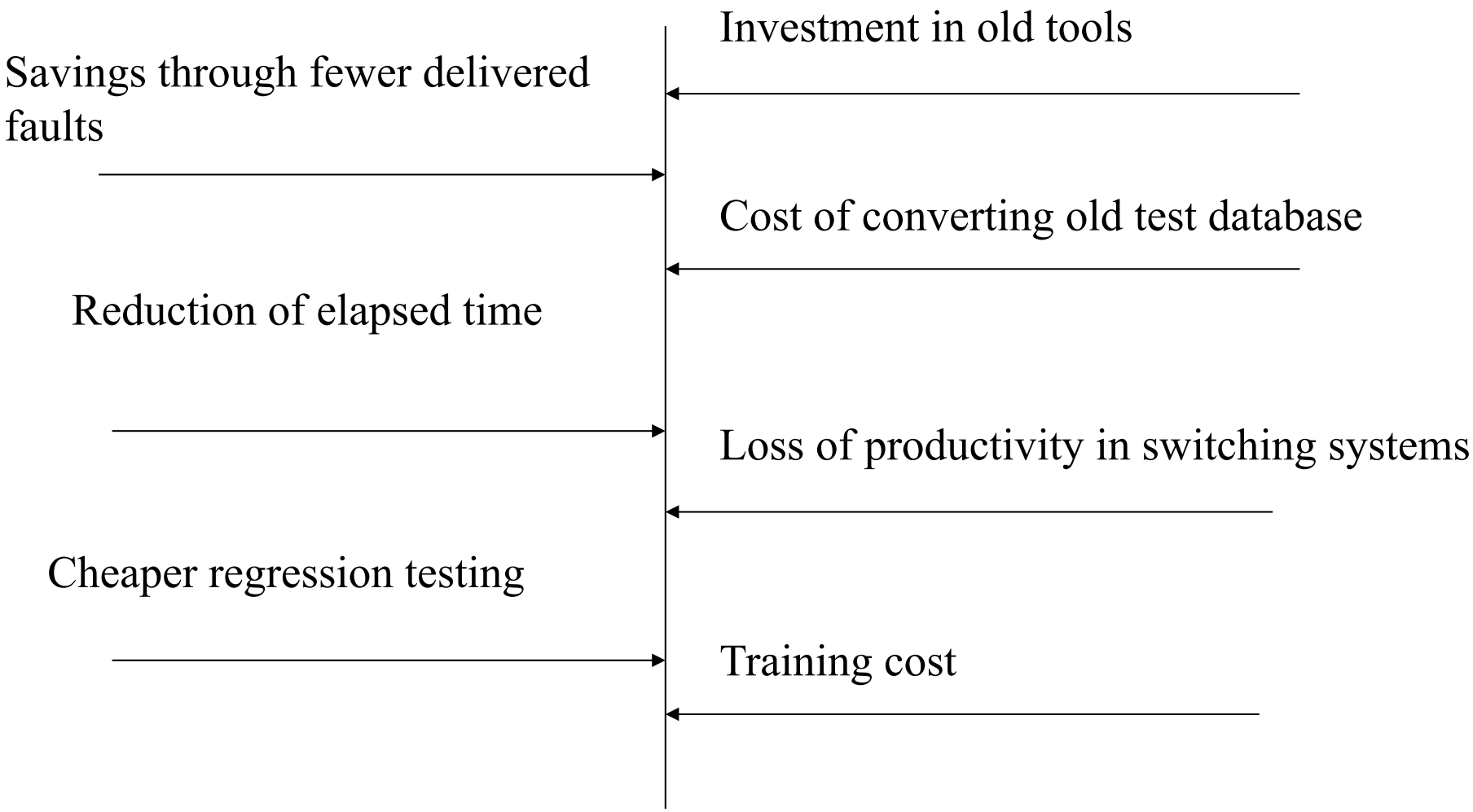
# The Newtonian model

- The bigger the system you want to change, the harder you must push
- The faster the change you want, the harder you must push
- To change in a certain direction, you must push in that direction

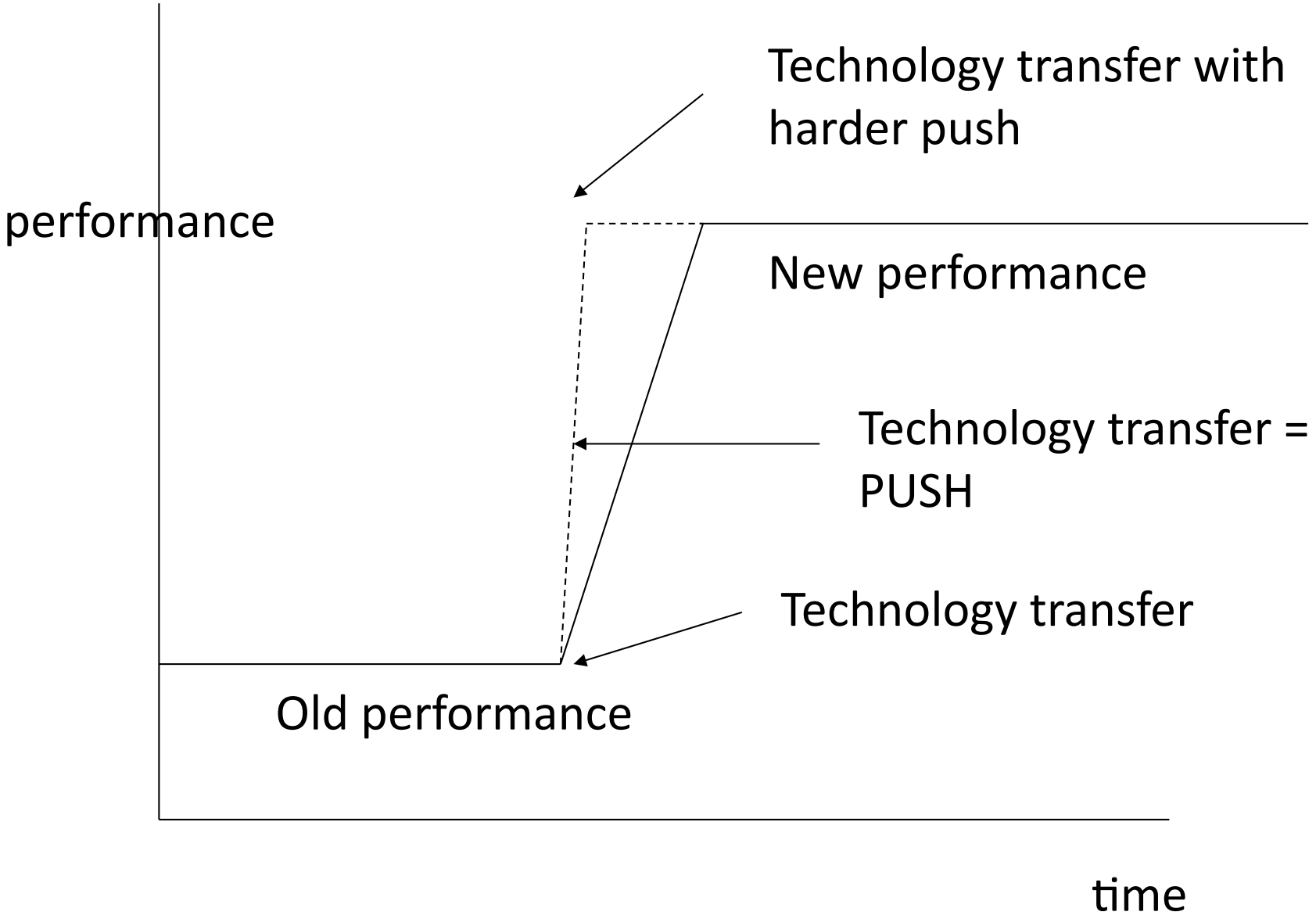
- … but push works both ways

- Reactions
  - When you push in one direction, people may move in the opposite direction
  - You you push harder, people may move less easily
  - When you push in one direction, people may move in a totally unexpected direction
  - When you push less, people may move more easily
  - When you push too fast, they may shatter

# Force field analysis



# Hole in the floor – model

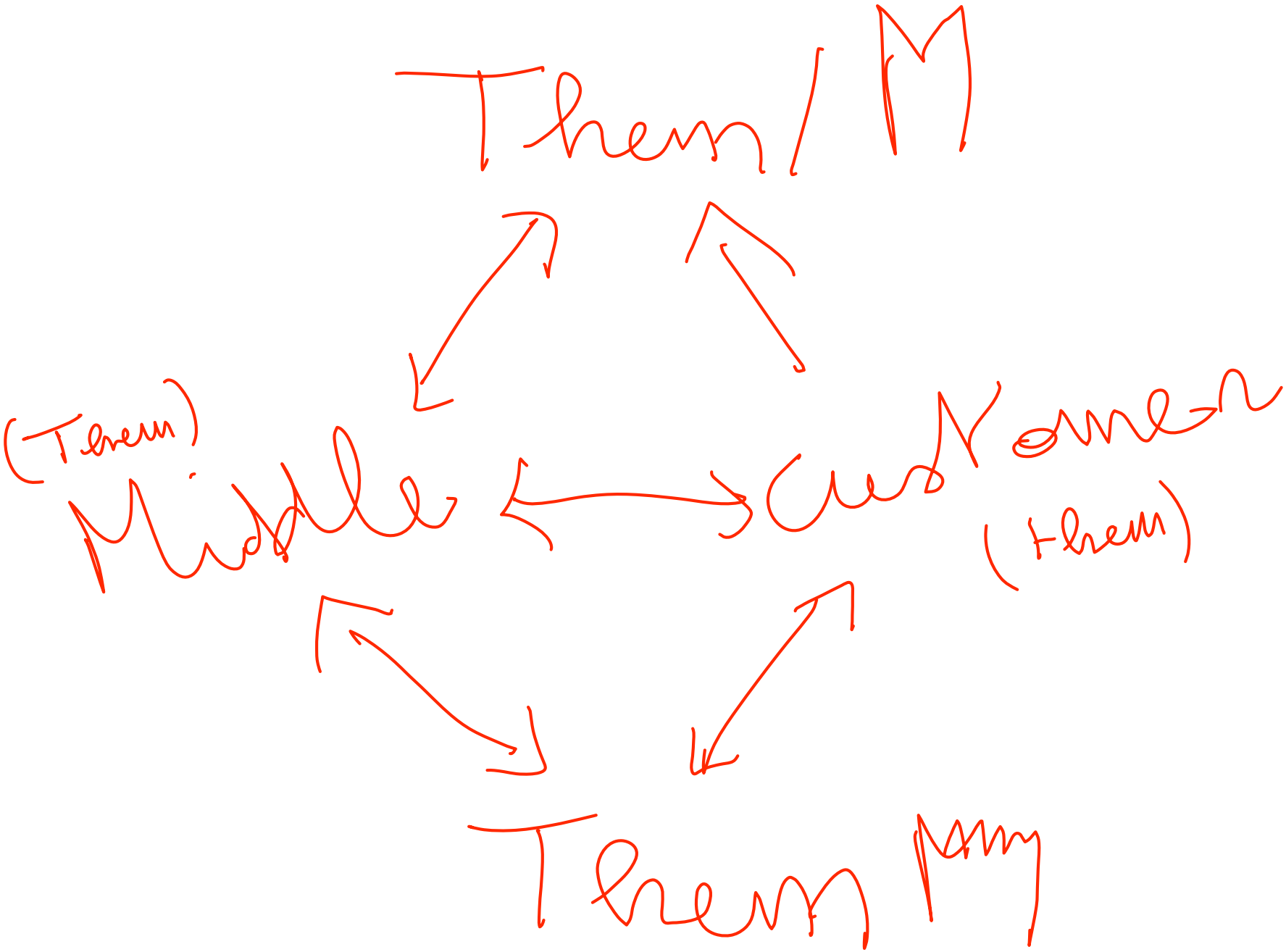


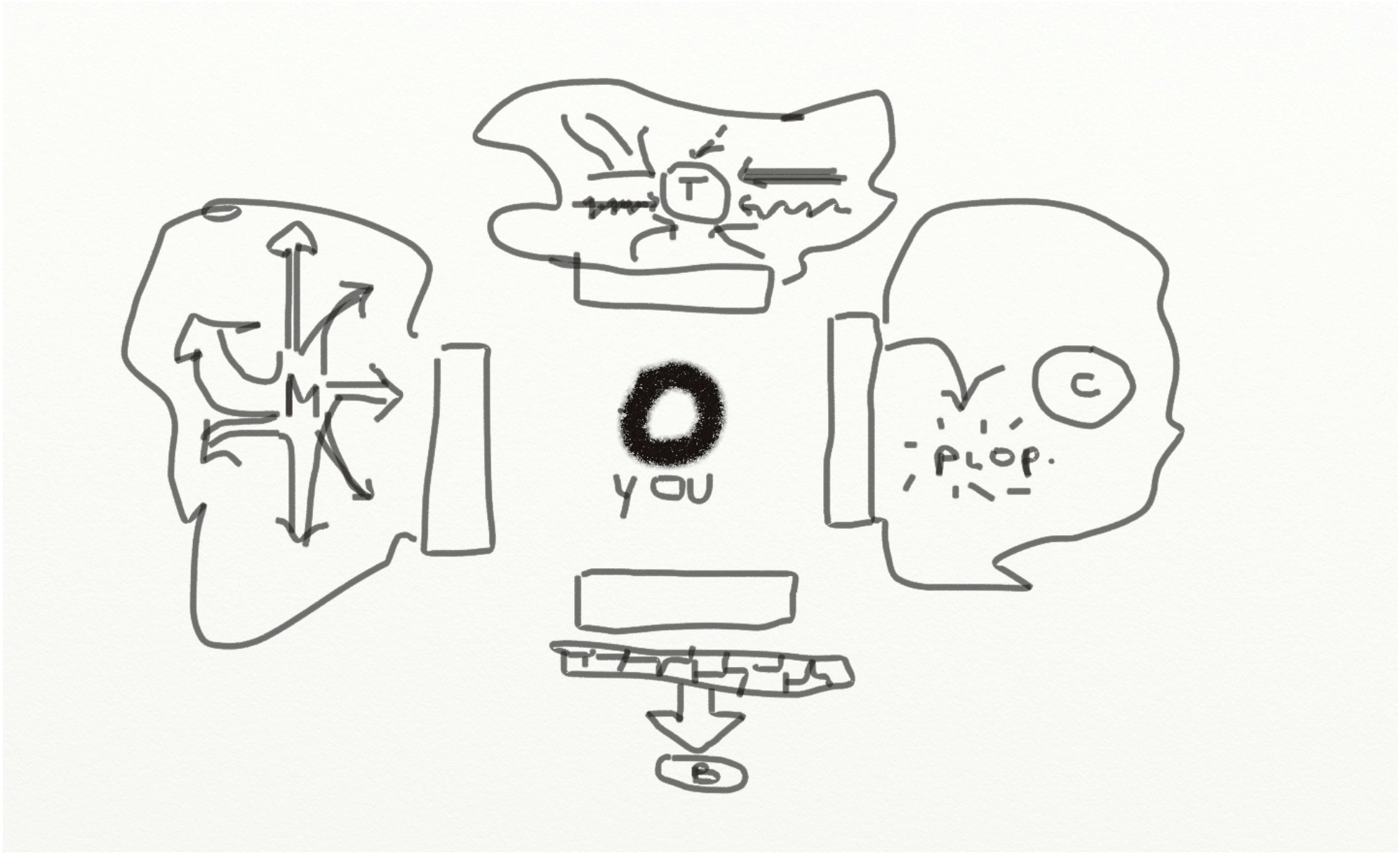
# Accounting and technology

- Accounting measure by consumption
  - They know the price of everything and the value of nothing (Oscar Wilde)
  - Managing organization (pattern 2)
- Technology managers manage by production
  - Variable or Steering (level 3)

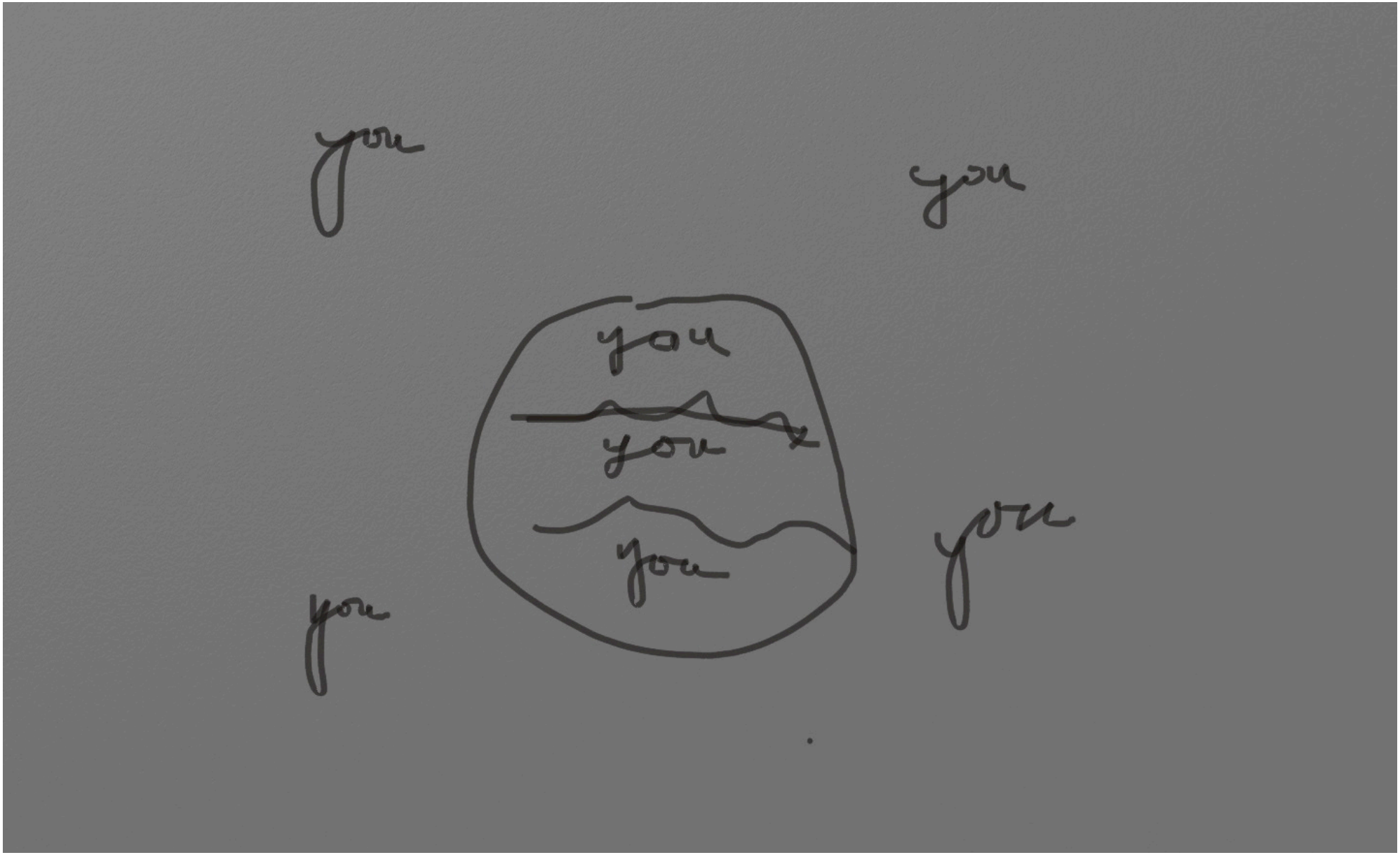
# Espoused theory and theory in use

- Espoused theory – “what happens behind stretched goals is employee achievement”
- Theory is use = “keep them under my control”
- With Report?
- In order to achieve an (level 5) anticipating culture this difference needs to be exposed
  - Fill out N summary reports in advance for N possible actions
  - Present one of the N reports and ask “what will you do if you get this report?” – repeat for each report
  - If the manager is not prepared to say “discontinue” it is not a true review (similar Accept)


Them / M
(Them)
Middle
Customer
(+them)
Them My


T
M
C
YOU
PLOP
B

- And it is about You and Me -- you and me as a top, you and me as a bottom, you and me as a middle, you and me as a customers, and the part you and me play in the organization


you
you
you
you
you
you
you

# Internal warfare

- We can misunderstand one another's worlds; we can misinterpret one another's behavior; we can see malice, insensitivity, and incompetence behind one another's actions; we can see ourselves as the well-intentioned, blameless, helpless victims of other people and circumstances; we can act accordingly and go to war with one another

# Understanding and accommodation

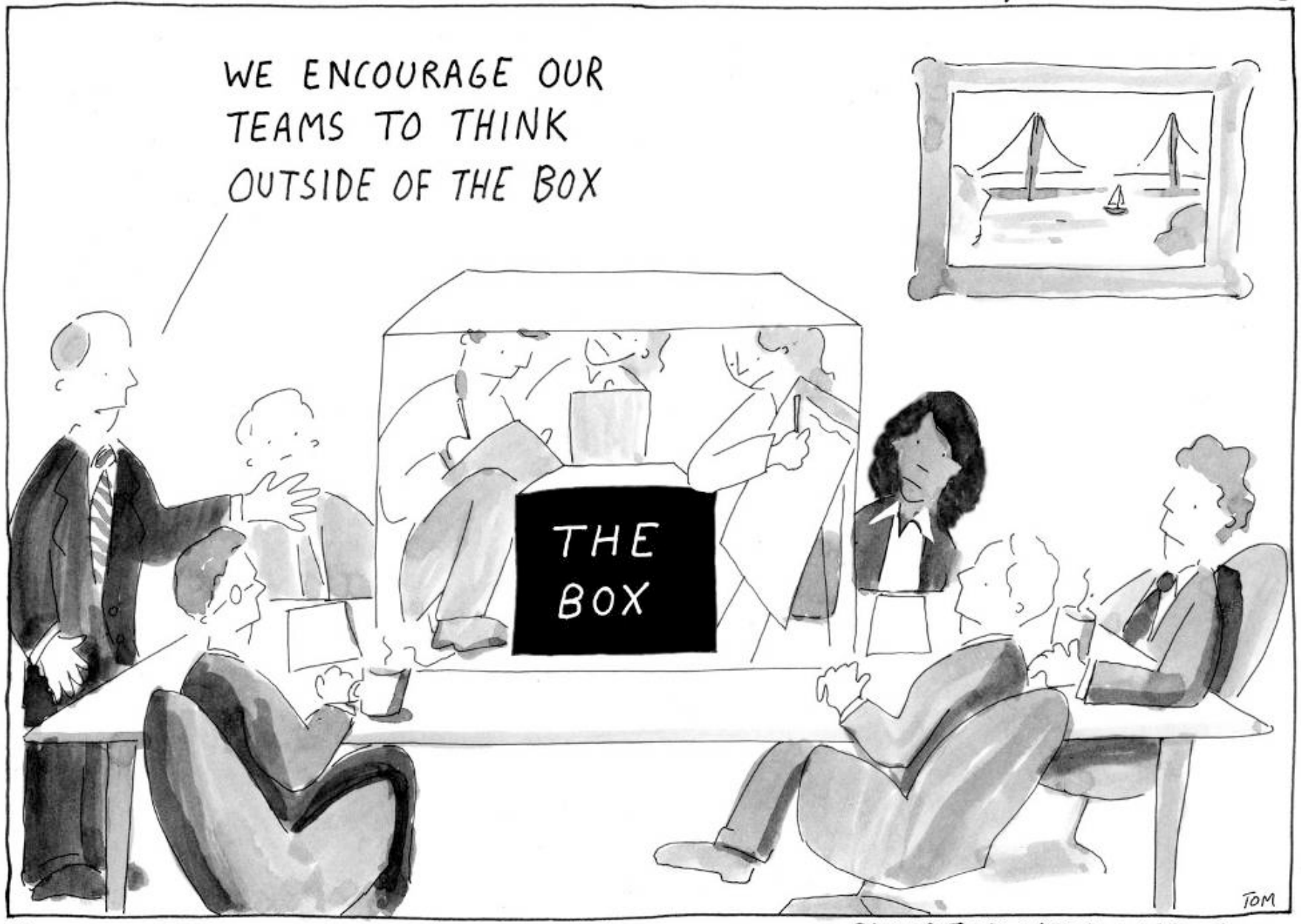
- We can see into, comprehend, accept and adjust to one another's worlds; we can accommodate to others, acting in ways that make it possible, easy even, for them to do what we need them to do in order for us to move ahead with our work; we can see the "stuff" that comes to us from others as the behavior of people struggling to cope with and survive in the unique conditions of their worlds; we can choose not to get hooked on that stuff; we can stay in the center ring and not get drawn into the drama of the side show; we can accomplish our goals by easing the conditions of others

# Transformation

- We can refuse to accept and accommodate the familiar reality; we can say NO to the predictable responses to the common conditions of organization life; we can create new responses and new, more powerful realities in which as tops we are not burdened, as bottoms we are not oppressed, as middles we are not torn, and as customers we are not screwed. We become central to creating what our organizational life will be.

BRAND CAMP

by Tom Fishburne



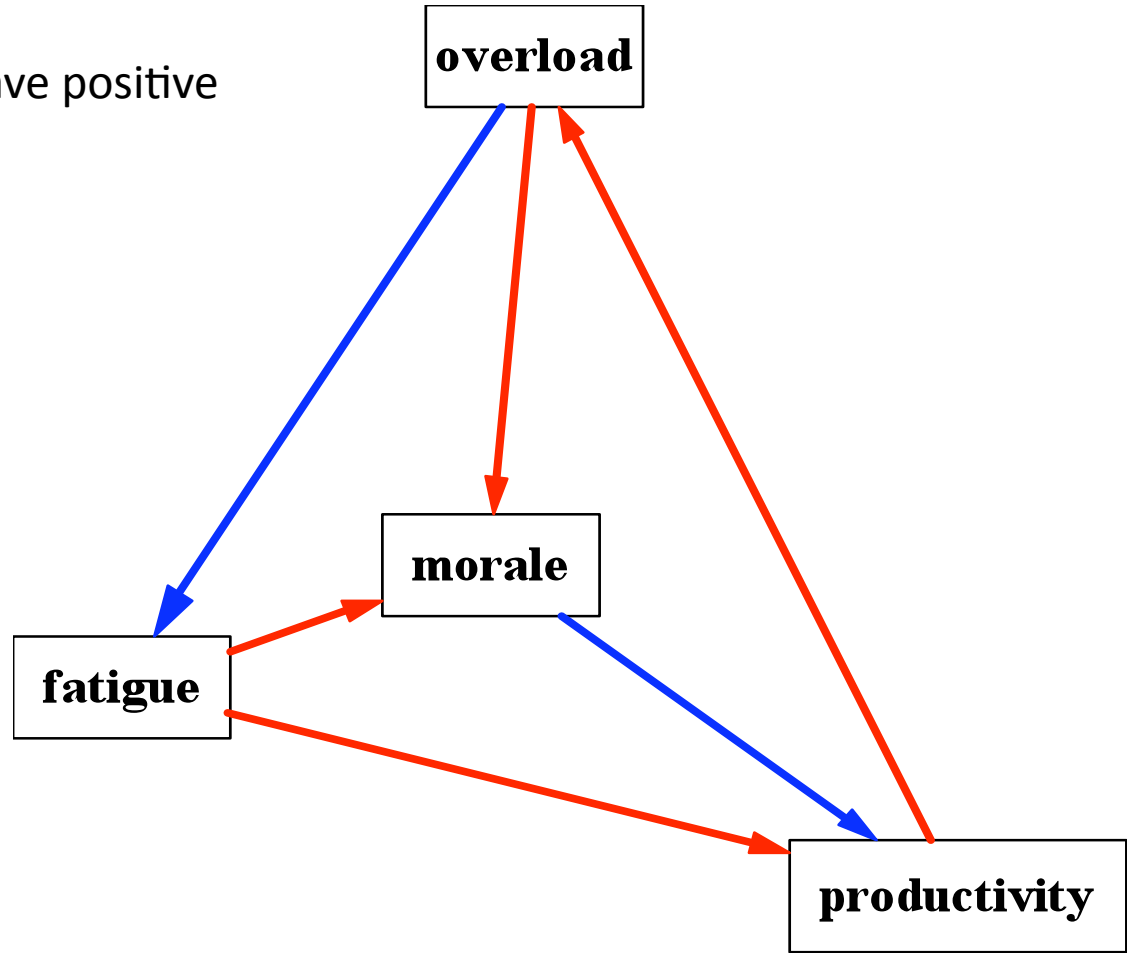



SKYDECKCARTOONS.COM

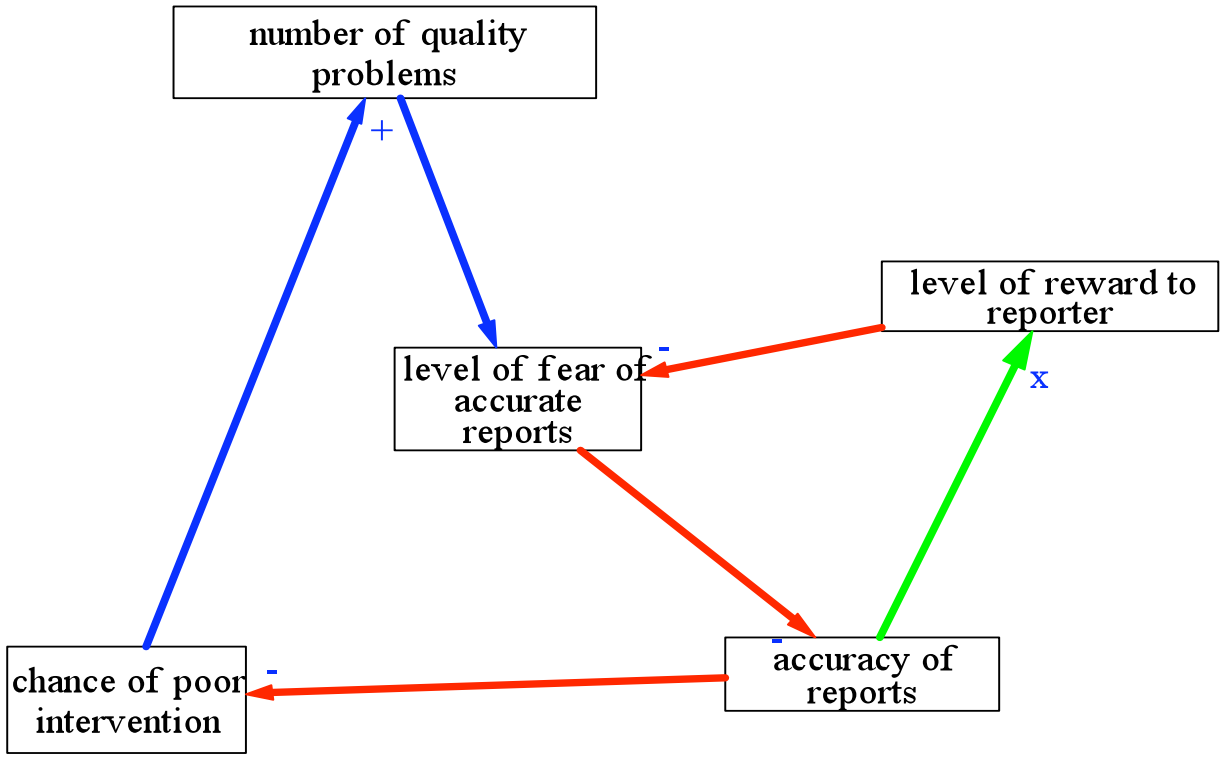
# Connect the system with more of it itself (Wheatley)

# Chronic overload is self-perpetuating

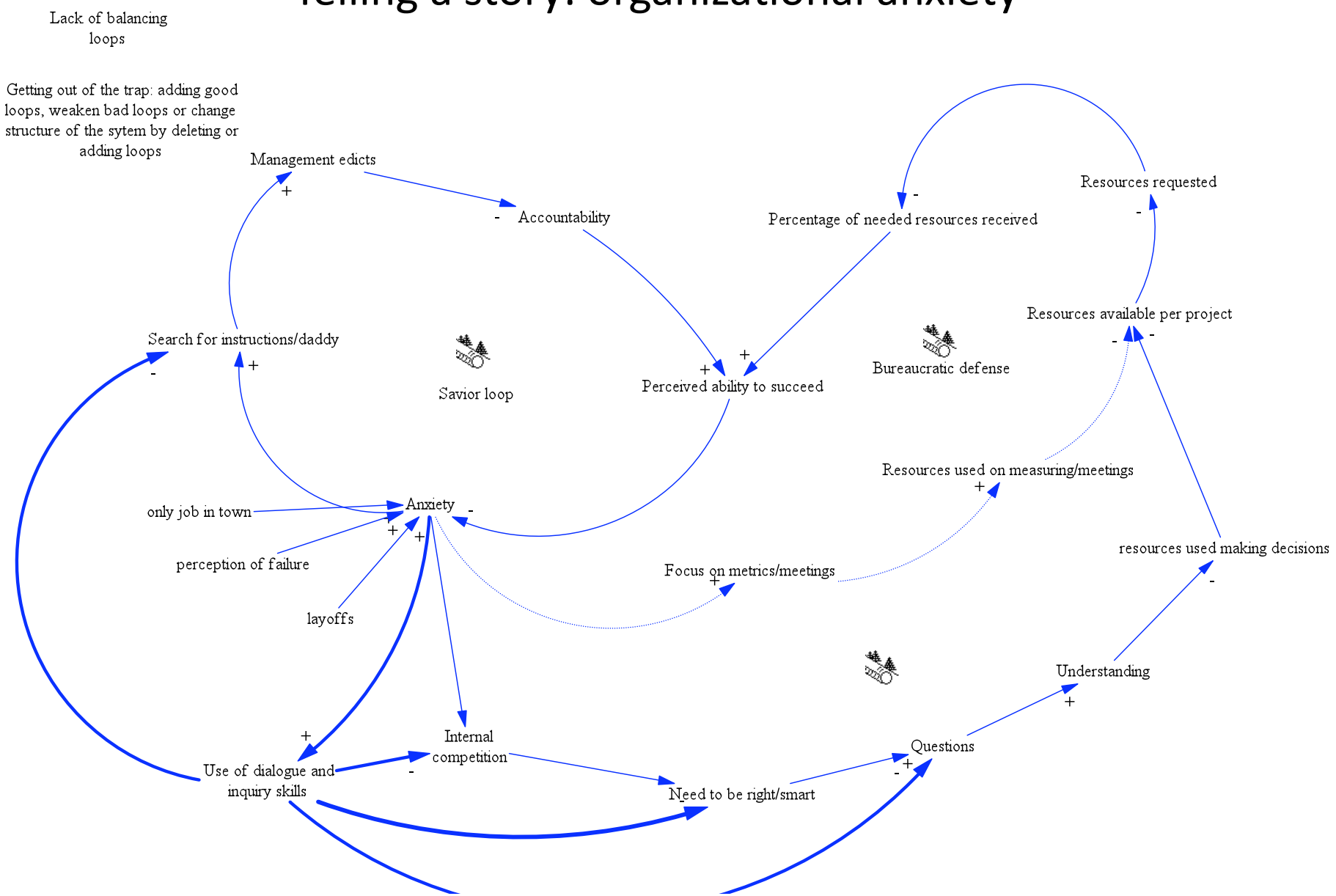
Early intervention can have positive snowball

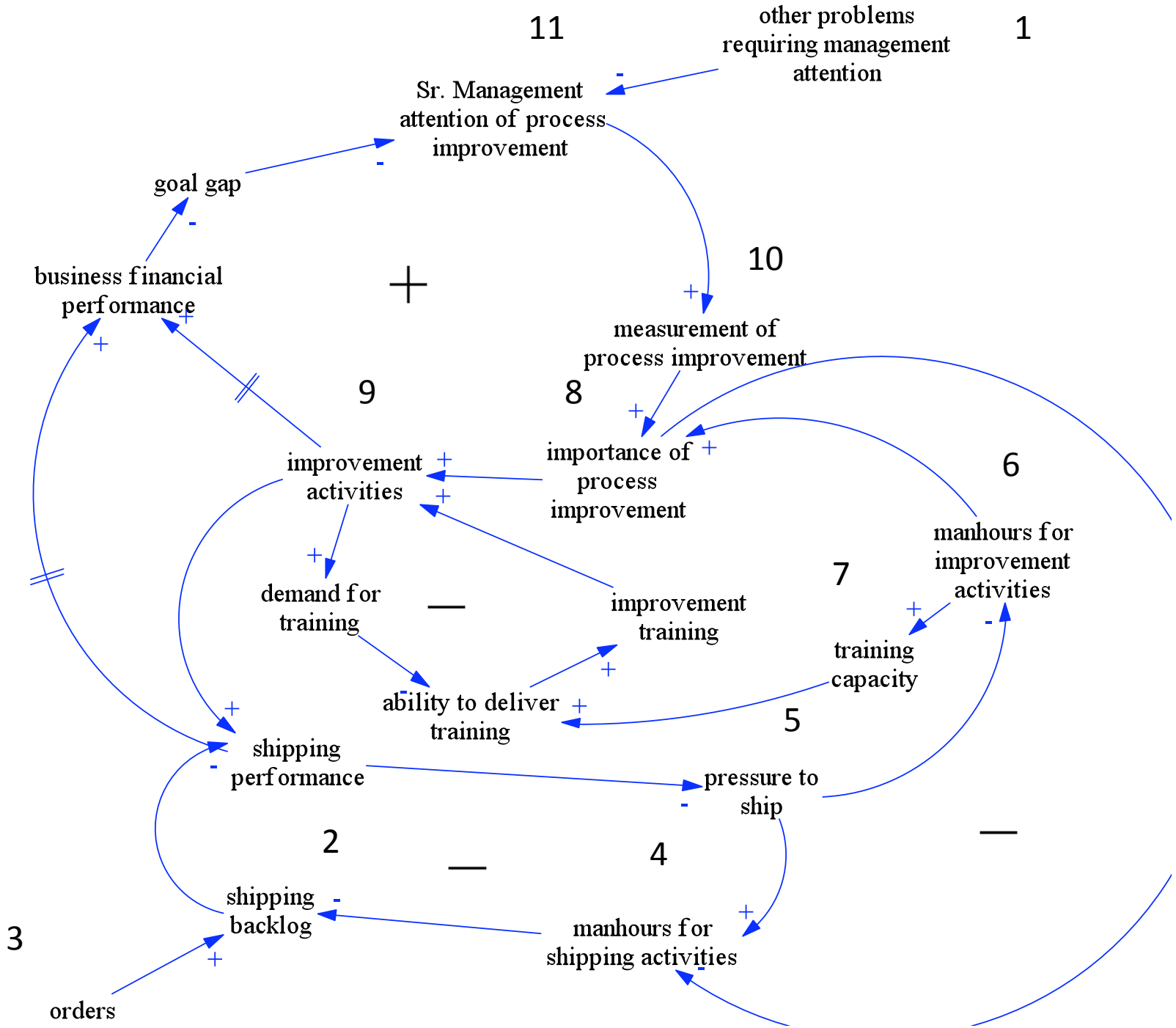


# Look for stabilizing feedback loops



# Telling a story: organizational anxiety



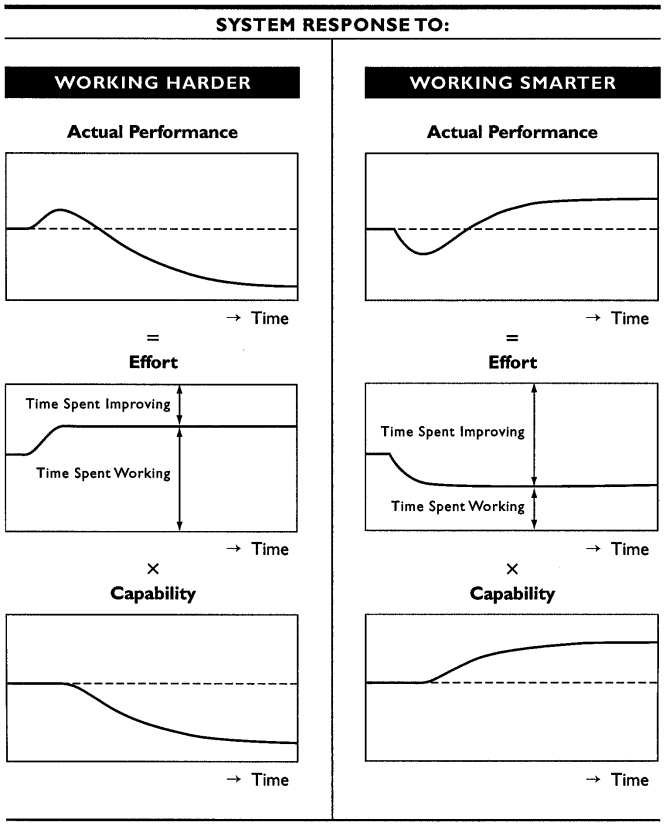

11
other problems requiring management attention
1
Sr. Management attention of process improvement
goal gap
business financial performance
10
measurement of process improvement
9
8
improvement activities
importance of process improvement
6
manhours for improvement activities
7
demand for training
improvement training
training capacity
ability to deliver training
5
shipping performance
pressure to ship
2
4
shipping backlog
manhours for shipping activities
3
orders

# Nobody gets credit for fixing problems that never happened

- Creating and sustaining process improvement

Nobody Ever Gets Credit for Fixing Problems that Never Happened

**FIGURE 6.** Simulations of the Working Harder and Working Smarter Strategies



# Systems thinking – an inherent assumption: we create our own "worst nightmares"

- We have a tendency, under time pressure, to apply overdoses of established measures.
- We have an inability to think in terms of nonlinear networks of causation rather than in terms of chains of causation – and properly assess side-effects and repercussions of our behavior
- We find an inadequate understanding of exponential development, an inability to see that a process that develops exponentially will, once it has begun, race to conclusion with incredible speed.

- The tendency of a group of experts to reinforce one another's conviction that they are doing everything right, the tendency to let pressure to confirm suppress self-criticism (group-think)

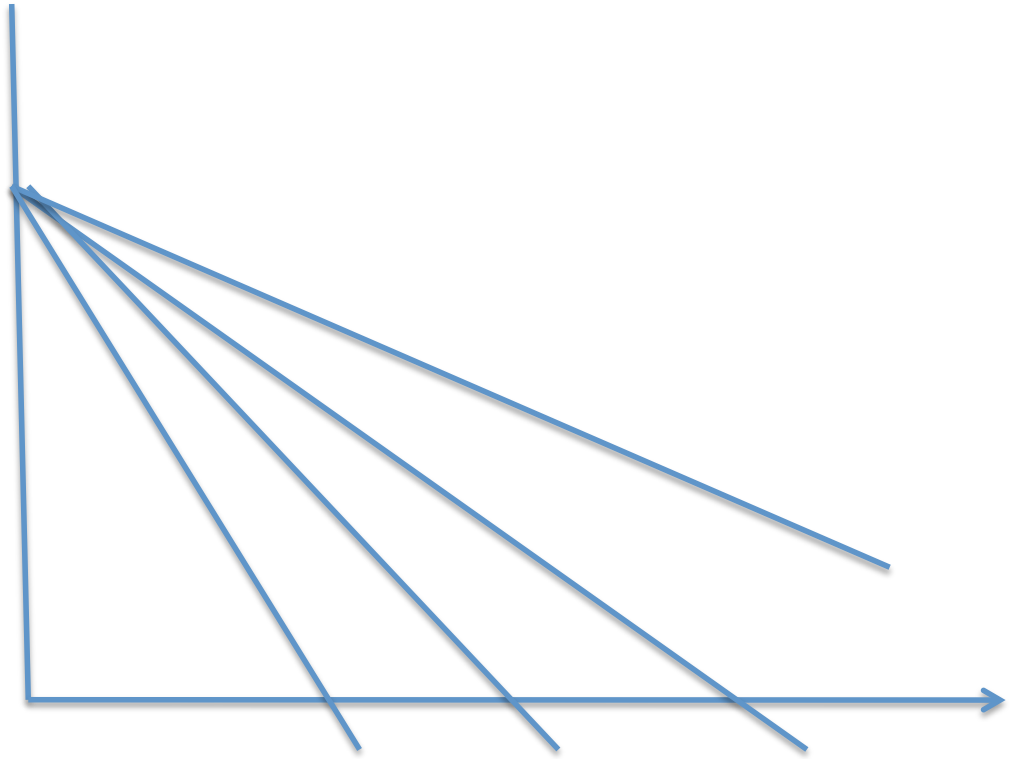
# A case study

Based on Sterman:

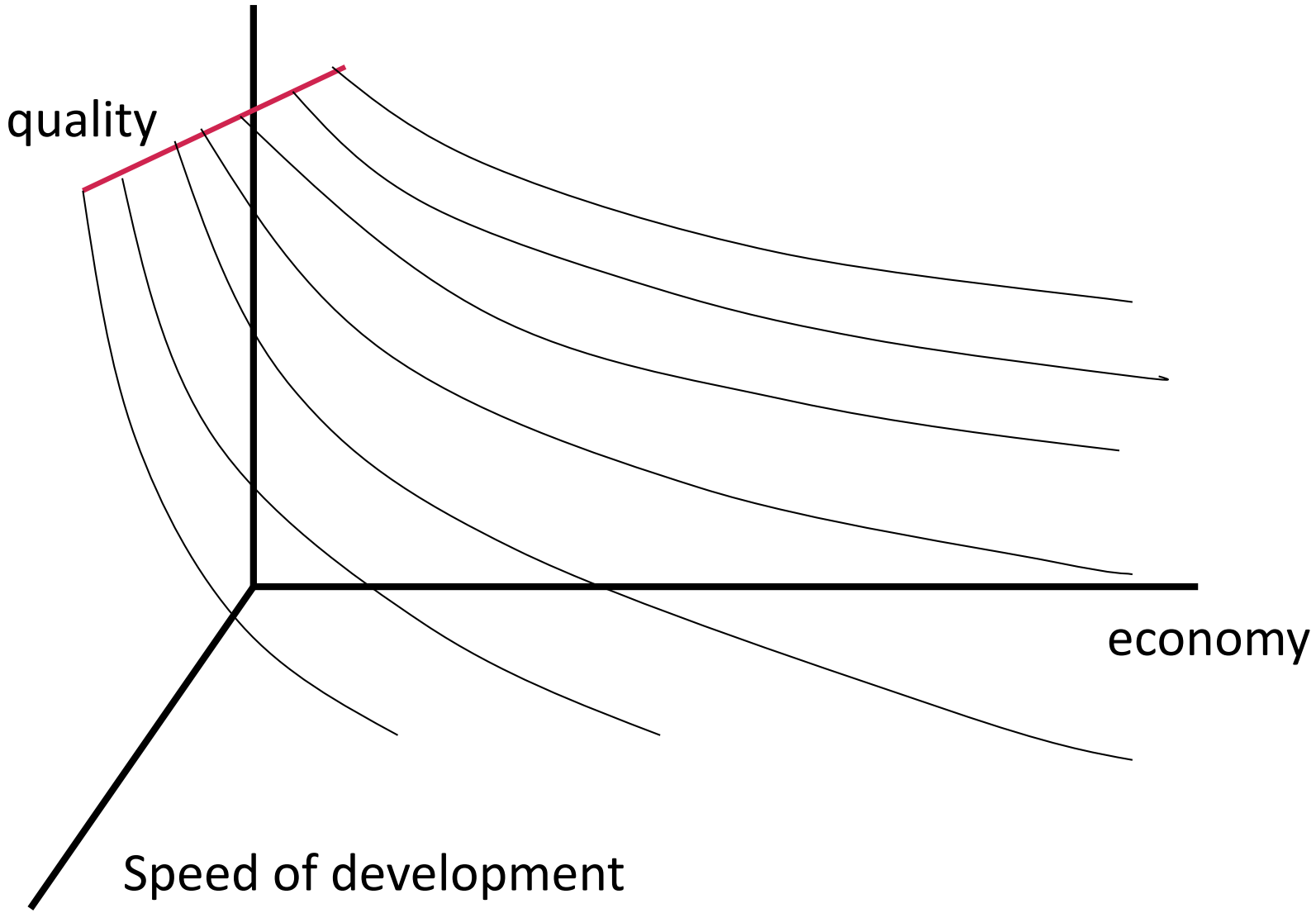
Nobody ever gets credit for fixing problems that never happened

## Technical debt

And fundamental attribution error



# Indifference curves



# Our own role in it

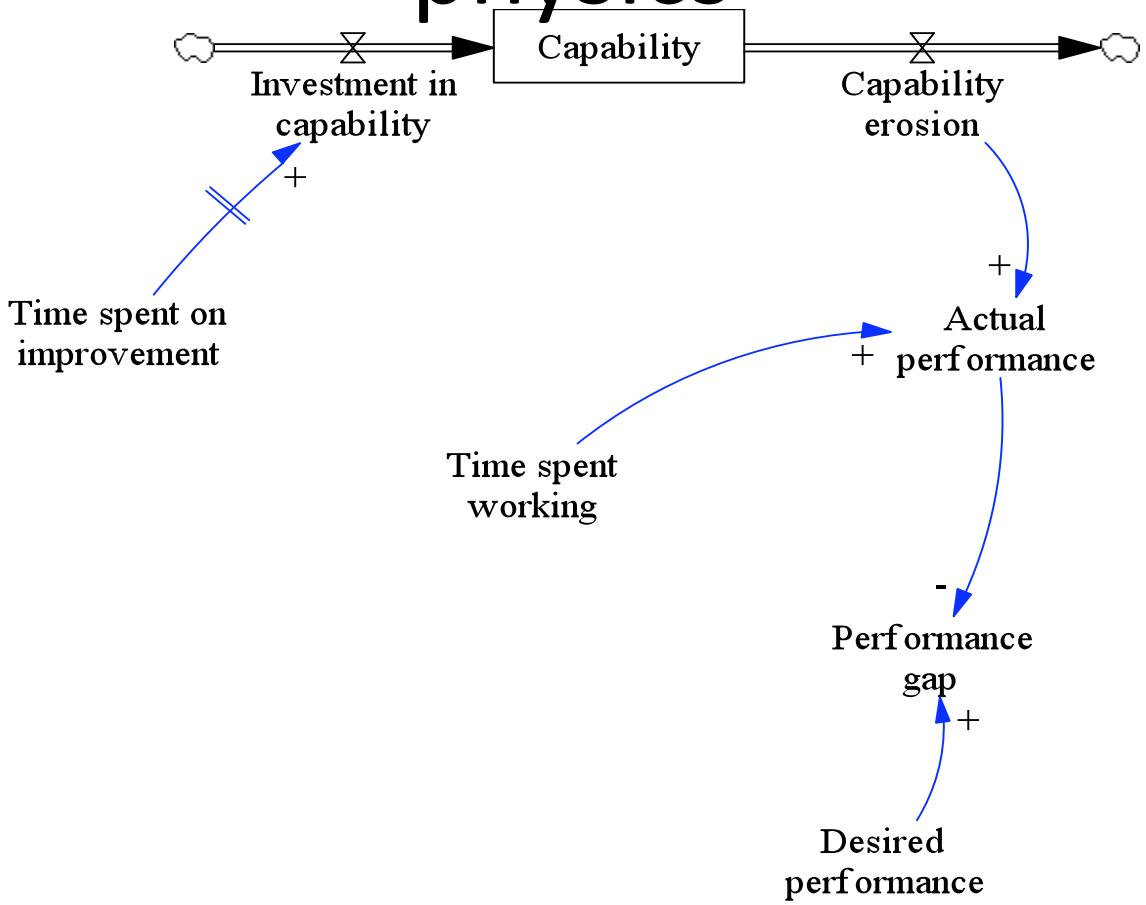
Need it faster, pressure, shortcuts

Fundamental attribution error – if they can do it now, they can do more in the future

Fundamental attribution error – it's the stupid managers

- Is it?
- Who is taking the shortcuts

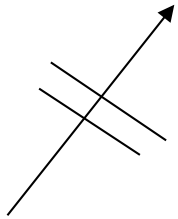
# Capability development – the "physics"



- Arrows indicate the direction of the causality
- + (or S) means when variable A changes, variable B changes in the same direction
- - (or O) means when variable A changes, variable B changes in the opposite direction

| capabilities |
|---|

A “stock” – an asset that accumulates over time



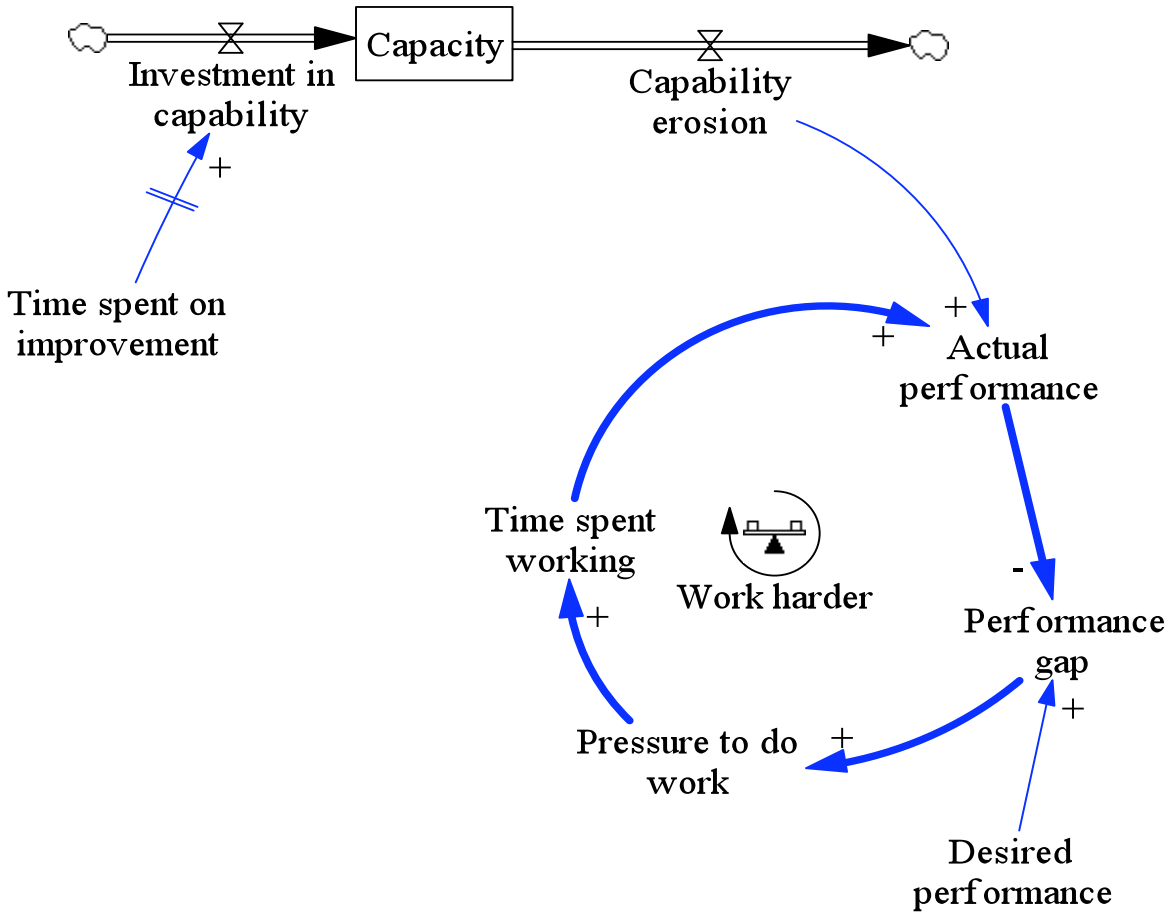
Delay -- While yielding more permanent gain,
Time spent on improvements does not
Immediately improve performance

# The “physics” of process improvement

- The actual performance of any process depends on two factors:
  - The amount of time spent working
  - The capability of the process used to do that work

  For example: labor hours/day and productivity
- Performance can be improved by dedicating additional effort to either work or improvement
  - Results differ
    - Time spent improving process yields more enduring change – for all subsequent work
    - 20% overtime in boosting work may yield 20% output increase, but only for the duration of overtime
- No improvement in capacity lasts for ever: machines wear out, processes go out of control, design becomes obsolete…
- People compare their goal with actual performance – and search for ways to decrease the performance gap

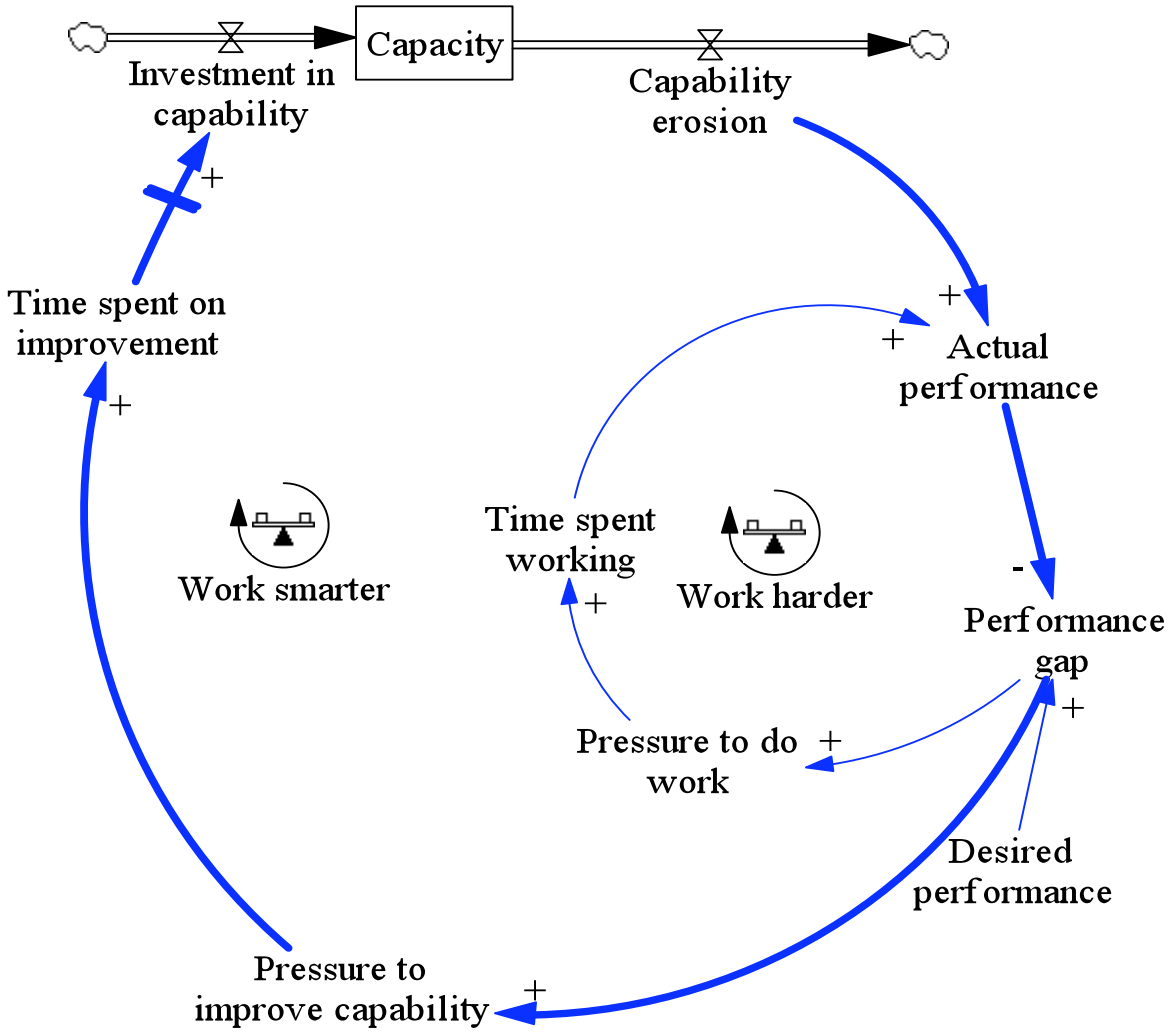
# Work Harder Balancing Loop



# Work Harder “balancing loop”

- To decrease the performance gap there are two basic options
- Option one: increase the amount of time people spend working
- Work Harder – is a balancing loop:
  - Managers facing a performance gap are under pressure
  - They pressure people to spend more time and energy doing work
  - An increase in work increases performance and closes the performance gap
- It is called a Balancing Feedback Loop, because it constantly works to balance desired and actual performance
- *Pressure to do work includes*
  - *Telling people to work harder, do overtime, setting more aggressive targets, imposing severe penalties*
  - *And more subtle: more frequent performance reviews*
  - *More frequent status-reports*

# Work Smarter Balancing Loop

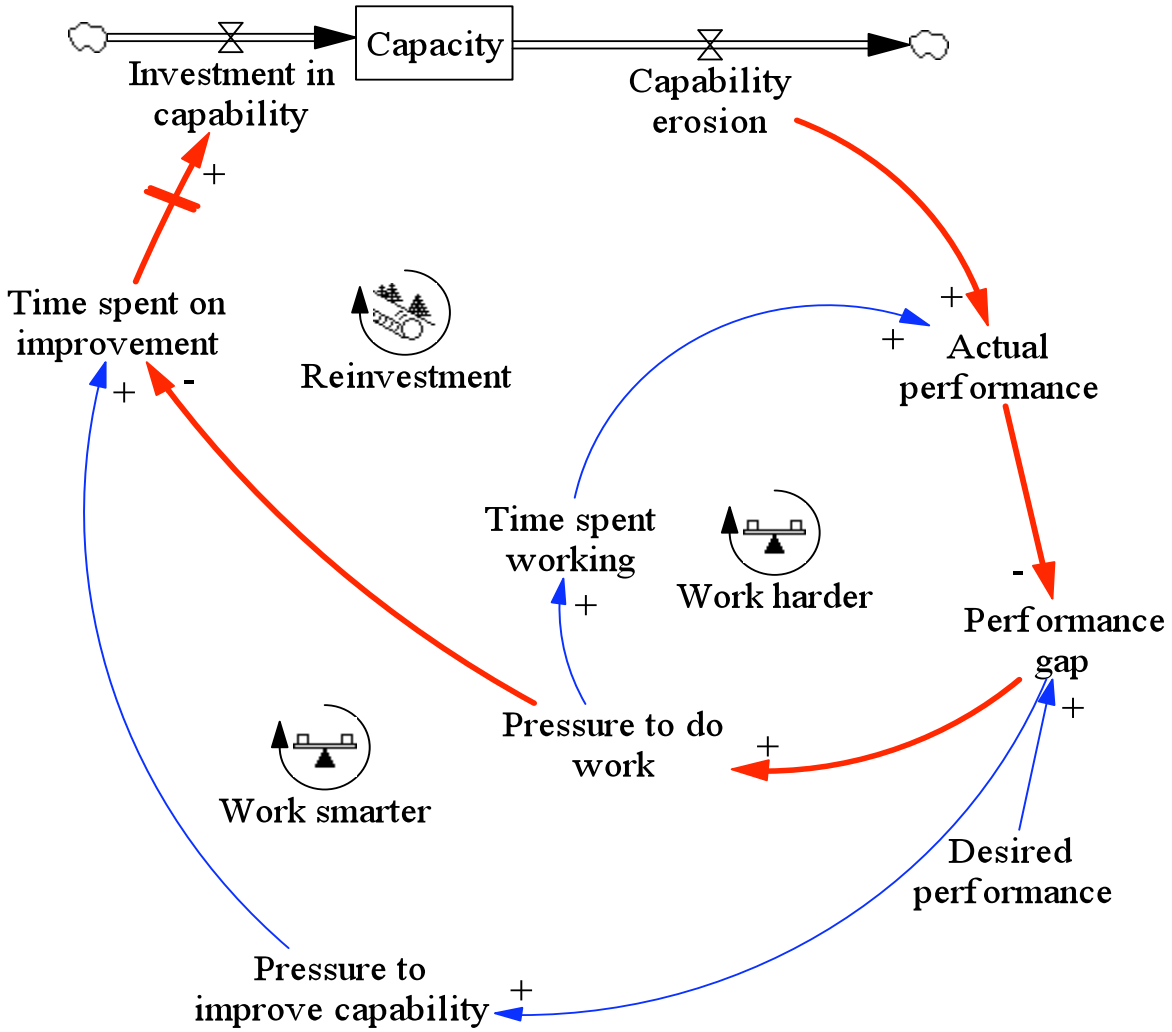


# Work Smarter “balancing loop”

- A second option to close the performance gap is to improve the capability of the process
- In this Work Smarter balancing loop, managers respond to performance shortfall by increasing the pressure to improve capability
  - *Encourage launch of improvement programs, experimentation, research, invest in training …*
- If successful, these investments will, with time, yield improvements in process capability, and close the performance gap
- Work smarter improves future productivity, but with a delay – and investments can be risky (not always addressing root cause of the problem…) – they do little to solve the problem ‘right now’

- Thus managers frequently use Work Harder at the expense of long term improvements – pushing overtime, dropping training and improvement programs
- Working harder becomes routine

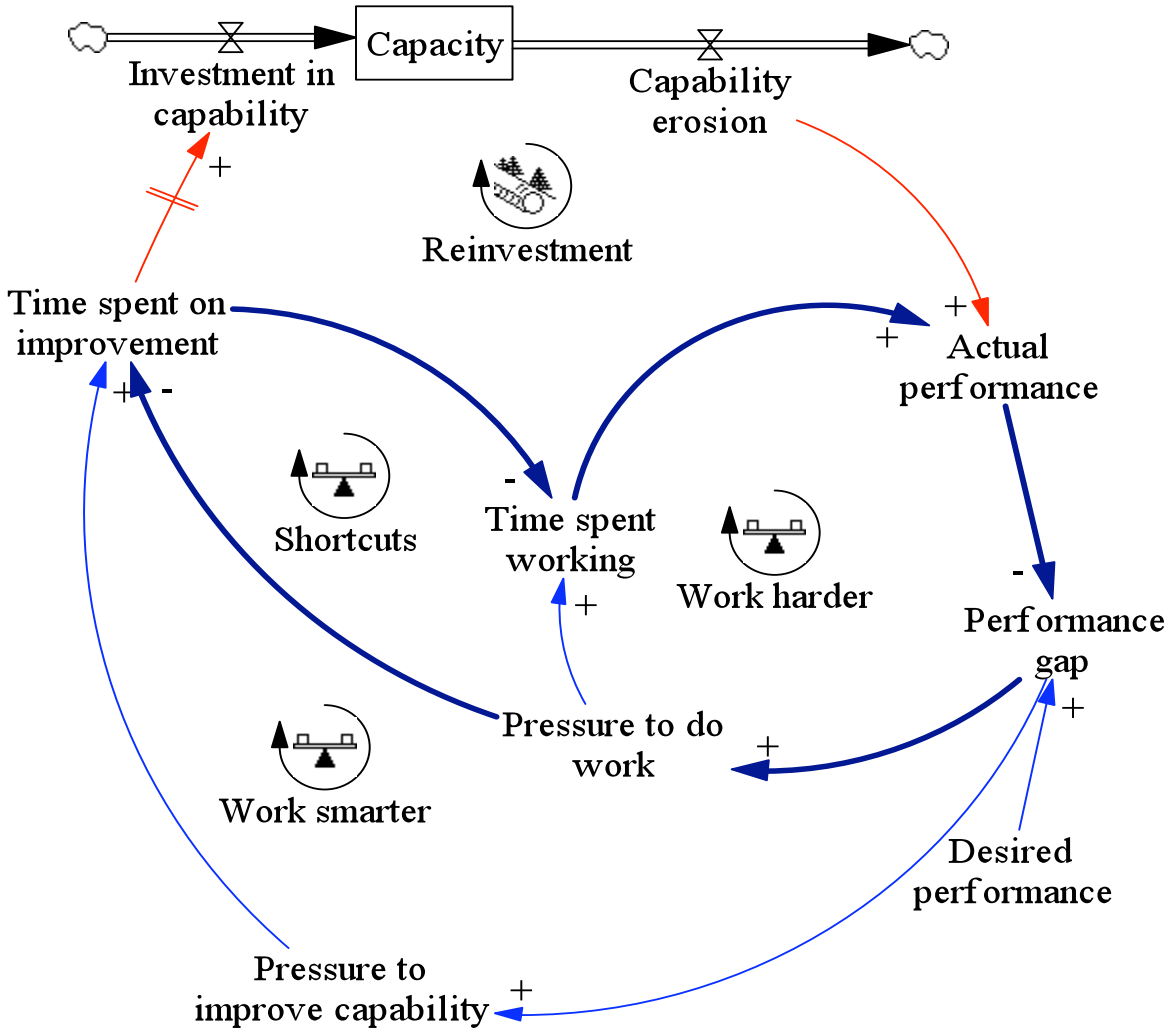
# Reinvestment Reinforcing Loop



# Reinvestment “Reinforcing Loop”

- Work Harder and Work Smarter are connected
- Companies rarely have excess resources
- Increasing the pressure to work leads people to spend less time on non-work related activities
  - *breaks, family,… putting in unpaid overtime*
- But there is a limit to long hours; if the performance gap continues to rise, workers have no choice but to reduce time spent on improvements
  - *Training, PLE, design … and cut corners*
- The reinvestment loop is a positive feedback loop that tends to reinforce whatever behavior that currently dominates
  - *If an organization successfully improves, its process capacity will rise, creating a virtuous cycle with workers having even more time to improve*
  - *If workers are short of time they will cut corners and capability begins to decay, growing the performance gap in a vicious cycle*

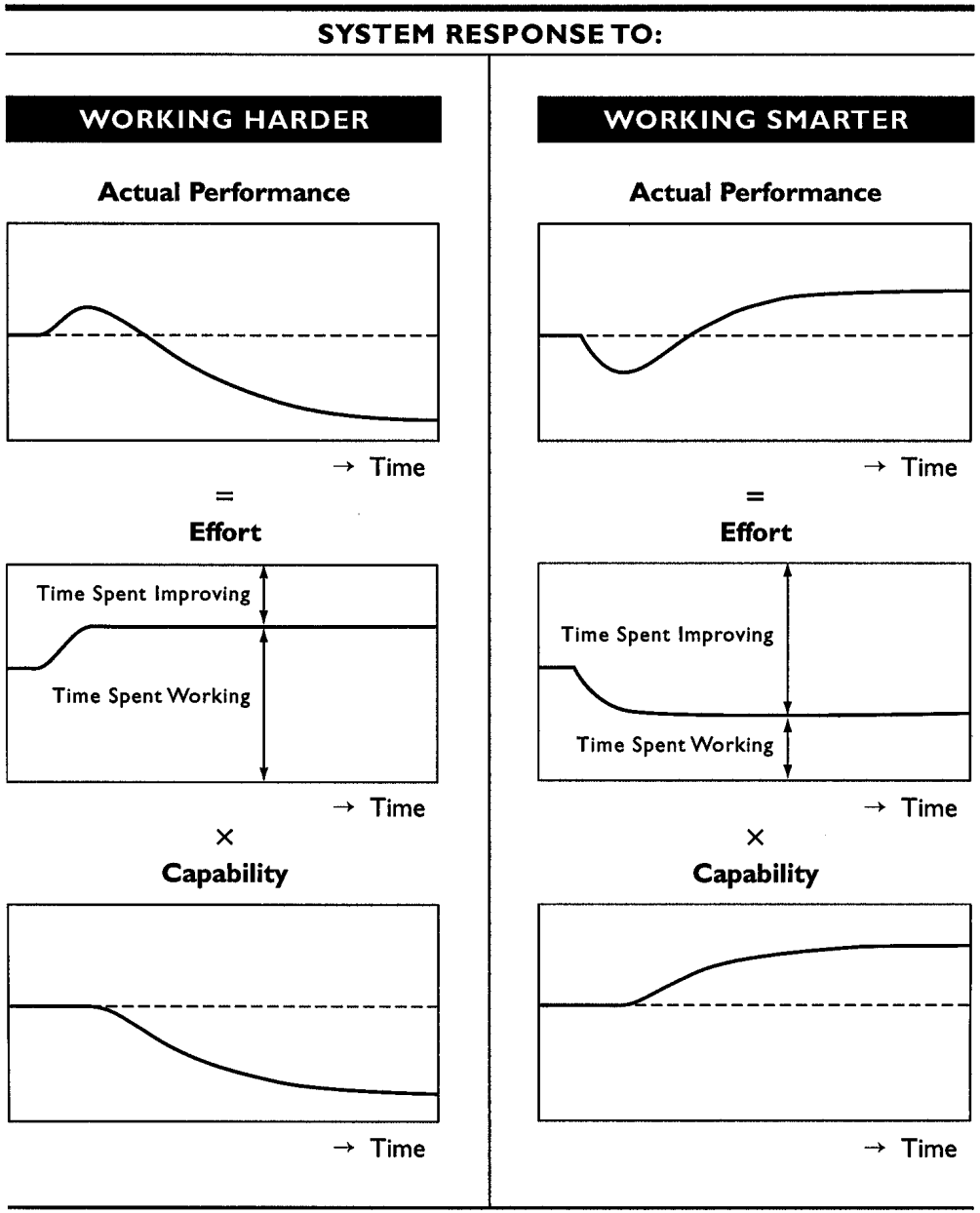
# Shortcuts Balancing Loop



# Shortcuts and capability trap

- When improvement programs yield their first results, often companies are tempted into downsizing – draining away resources from improvement, so ending up in the vicious cycle
- Reinvestment cycle typically works in the vicious direction
- Cutting investments erodes capability and hurts performance
  - But capability does not drop right away; it takes time for capacity to depreciate
  - Decision to skimp on improvement boosts time available to work now
- Short cuts are tempting because of the delay in consequent decline – there is a “grace” period
- BUT the shortcut loop is effective ONLY because the capability does not change immediately

**FIGURE 6.** Simulations of the Working Harder and Working Smarter Strategies



# Better-before-worse
# Worse-before-better

- The benefit of working harder is short lived
- Working harder creates a Better-before-worse situation
- Investing in improvements takes time and creates Worse-before-better – reducing output in the short run
- Increasing time spent in improvement reduces output in the short run. Eventually capability rises more than enough to offset the drop in work effort and performance is permanently higher

# Capability trap

- Interaction between Shortcuts and Reinforcing reinvestment loops creates the ‘Capability trap’.
- In need of a performance boost, we can get it by shortcuts BUT we soon fall short of our objectives and need more shift towards working harder
- Pressure for people to work harder, forces organizations into the capability trap with ever-increasing effort required to maintain performance

# Faulty attributions

- Faced with inadequate performance, we often misattribute.
- We look for cause and effect close to each other (time and space), assume one event has a single cause and underestimate time delays
- The worker is close in time and space to production of defects – so we conclude inadequate worker effort or insufficient discipline
- Having made that attribution it makes sense to increase pressure
- This has two effects:
  - Worker effort immediately rises
  - They do the highly visible
  - In order to reach targets they eventually have to use shortcuts
  - …

# Self confirming attribution error

- The bias towards blaming people forces us into the capability trap
- Managers cannot observe all the activities of workers; they cannot see how much is due to increased effort and how much is due to cutting back on training, design,…
  - Suppose a gap that requires 6 more hours per week; workers cut down on breaks… but eventually have to use shortcuts
- Because managers do not observe that, they overestimate the impact of the get-tough-policy – and see short term improvements as evidence of their suspicion
- The cycle drives the organization in still higher levels of pressure and fewer resources for improvement
- It changes the mental model towards "poor attitude" problems, and may hit beyond one company… towards the economy and "move the lazy engineer's jobs abroad"

# “Conspiracy of silence” (Argyris)

- Workers often unwittingly conspire in strengthening managers’ attributions
- Faced with pressure (and fear) they are reluctant to tell managers they cannot meet objectives
- They use shortcuts, BUT for managers, unaware of the shortcuts, output appears to rise without requiring sacrifices
- When managers eventually discover the shortcuts, their view of workers as untrustworthy is confirmed
- They are “forced” to monitor more closely, using more time
  - “until you reach the target I want an hourly progress meeting”
- What starts as erroneous attribution about skills, effort and character of workers eventually becomes true
- Manager’s worst fears are realized as a consequence of their action

# The structure of the system

- Consistent with the theory, we should NOT attribute the problems to unskilled, ill-intentioned management
- Rather the structure of the system inadvertently leads talented managers into the capability trap
- Faced with double bind of aggressive performance targets workers cut corners
- Management discovers the shortcuts and do not trust the workers anymore – and step into closer monitoring
- Workers hide problems – “never reveal a problem until you have a solution”
- The capability trap gets embedded into incentives, and corporate culture – solving problems is more visible than avoiding them!
- Stereotypes and conflicts not only hurt organizational performance but damage society – ‘problem with western culture’

# So what can be done?

- Successful improvement must include a significant shift in mental models of those leading and participating in improvement models
- The cycle has to be broken – once the cycle of self-confirming attributions is broken, any number of process improvement tools and methods can work
- Breaking the cycle is not easy
- It involves dialogue, genuine involvement of all levels
- Techniques to visualize feedback and “side-effects” can help, as well as simulations and games that help experience structural effects (the ‘Beergame’, …)

# Simple tools and techniques

# Circles (Indian)

- Quick, Usable, Extendable solution (Weinberg)

- Hacker
  - Responsible for solving the immediate problem, constrained by the guardian and the healer
- Healer
  - Responsible for amending the process to prevent further occurrences, or to be prepared to handle them better, constrained by the guardian and the hacker
- Guardian
  - Responsible for seeing that no harm comes to the product (aided by the hacker) or process (aided by the healer) as a side effect of hacking or healing

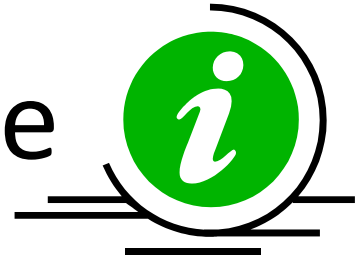
Target

Estimate

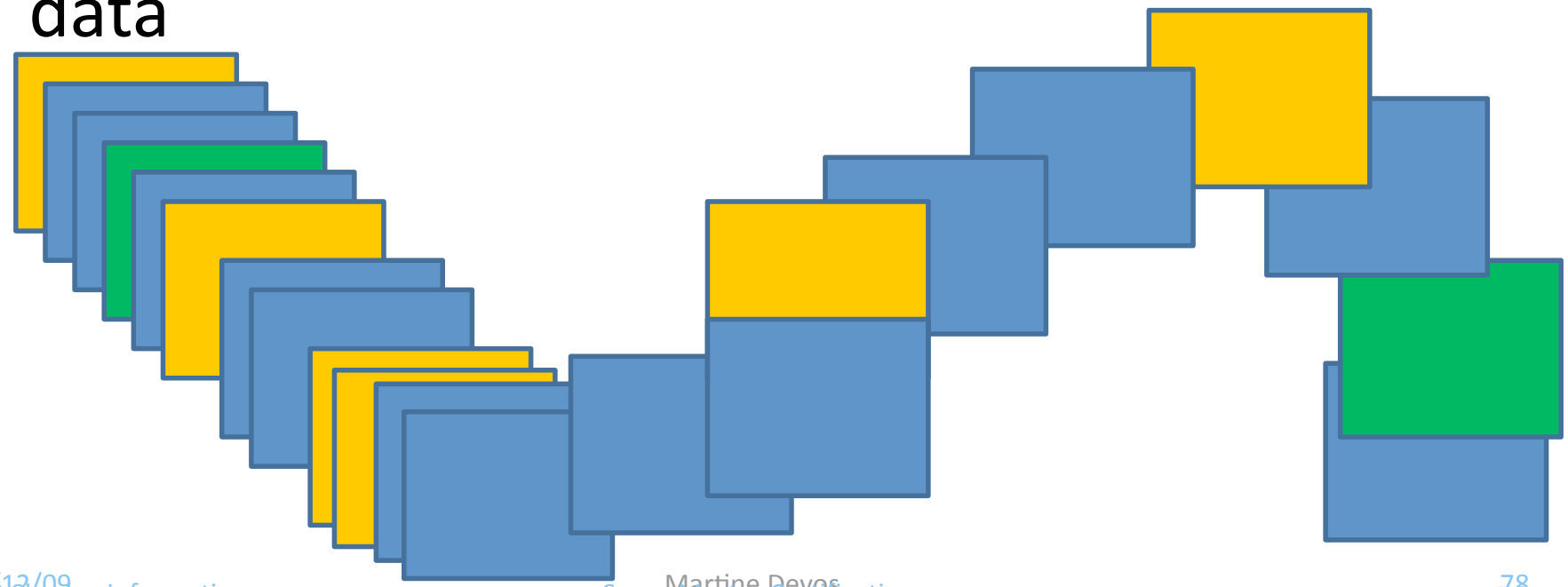
Commitment

# Before the Green Tee and after

# Keeping track of waste

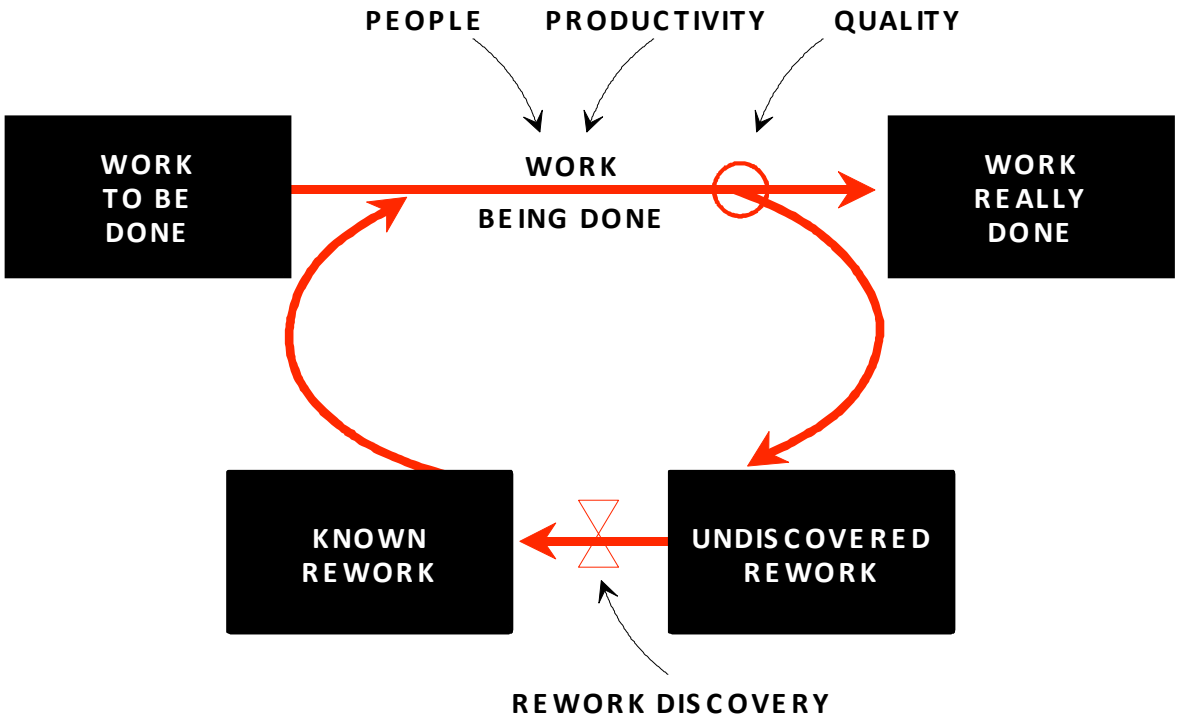


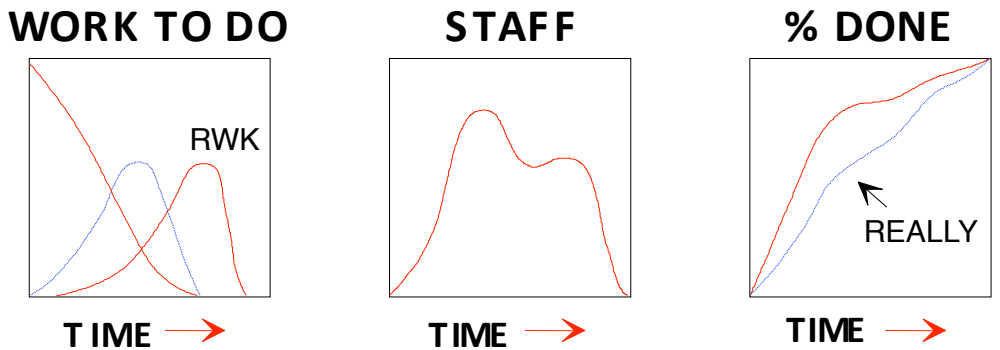
- Waste snake
- Keep track of where we spend our time
- It is easier to convince management if we have data



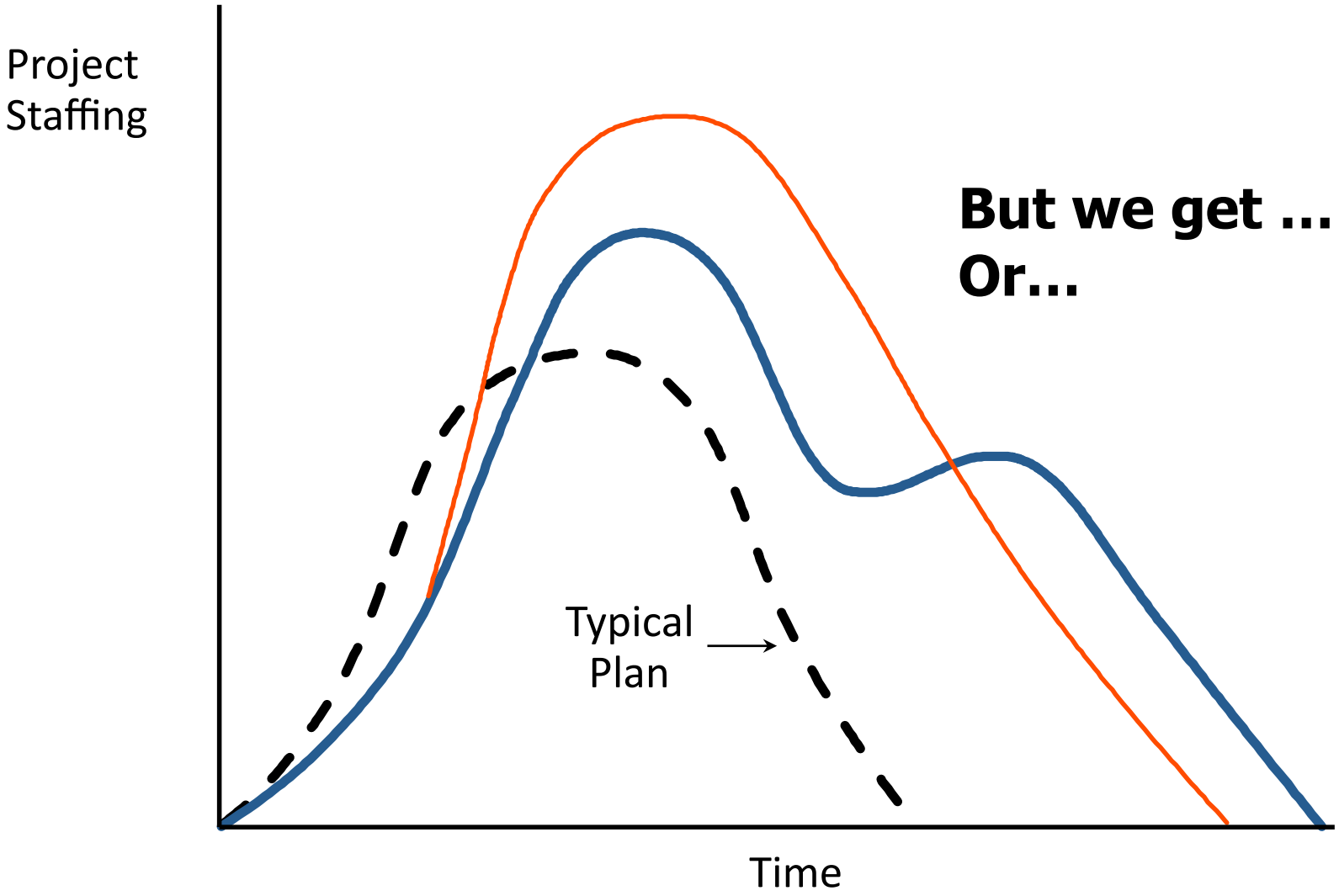
# A Tool: Focused Conversation

- A focused conversation uses questions at four levels:
  - Objective questions
    - Questions about facts and external reality
  - Reflective questions – feelings are facts
    - Questions to call forth immediate personal reactions to the data, an internal response, sometimes emotions or feelings, hidden images and associated facts – when we encounter an external reality (data/objective) we experience an internal response
  - Interpretive questions -- priorities
    - Questions to draw out meaning, values, significance, and implications
  - Decision questions
    - Questions to elicit resolution, bring the conversation to a close, and enable the group to make a resolve for the future
- Focused conversation provides a tool for pooling ideas, sharing wisdom, cracking open new solutions

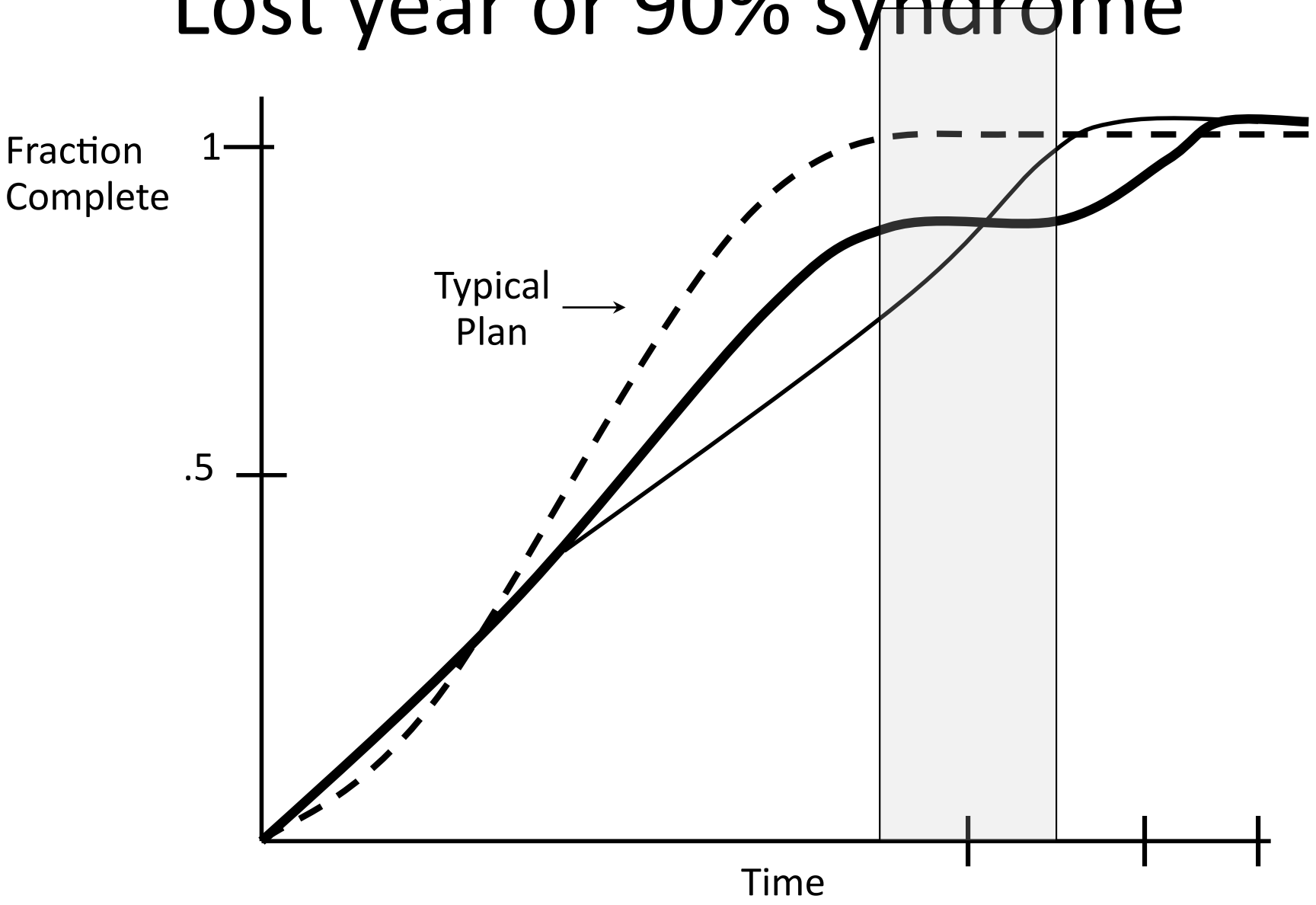

PEOPLE
PRODUCTIVITY
QUALITY
WORK TO BE DONE
WORK
BEING DONE
WORK REALLY DONE
KNOWN REWORK
UNDISCOVERED REWORK
REWORK DISCOVERY


WORK TO DO
RWK
TIME
STAFF
TIME
% DONE
REALLY
TIME

# Behavior Modes on a Project



# Lost year or 90% syndrome



# Engineering and development work done and effort

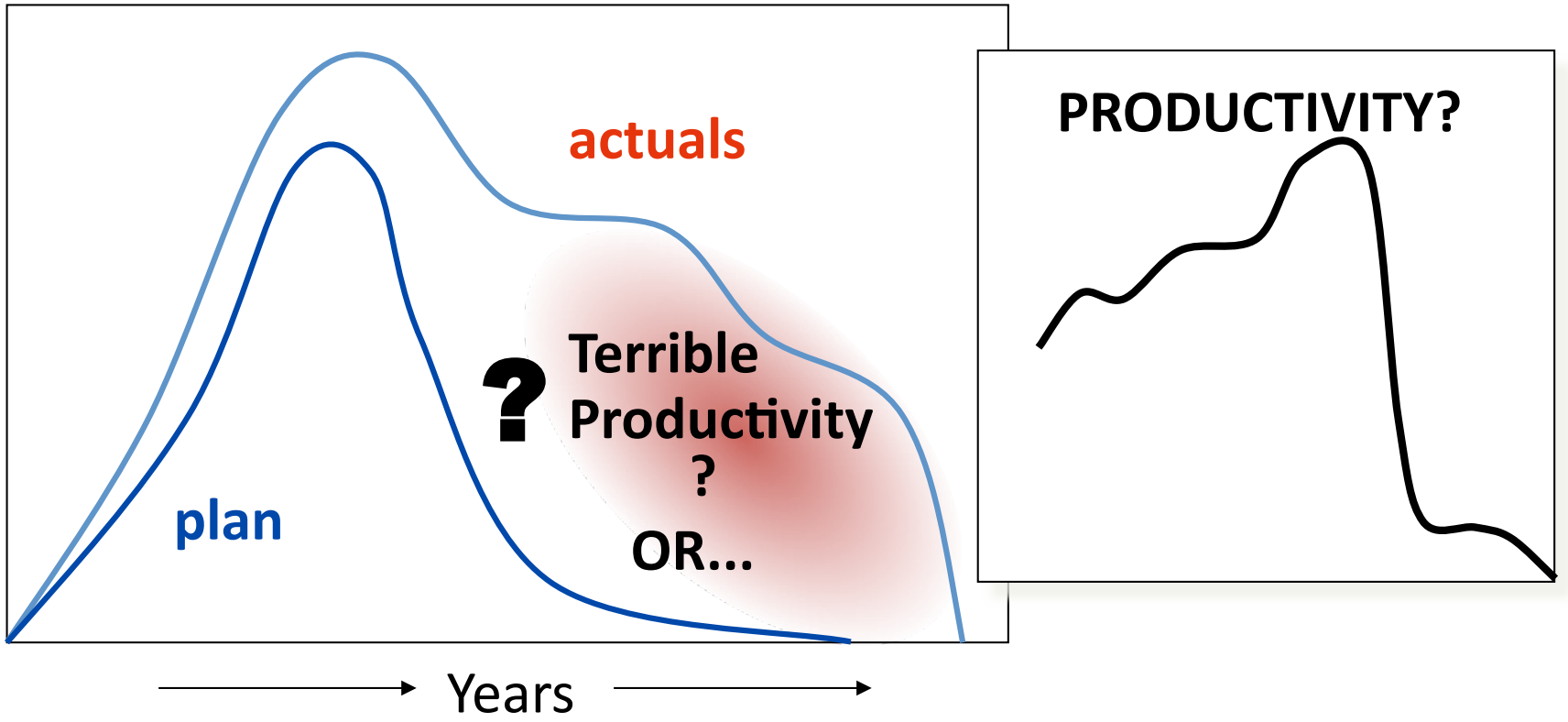
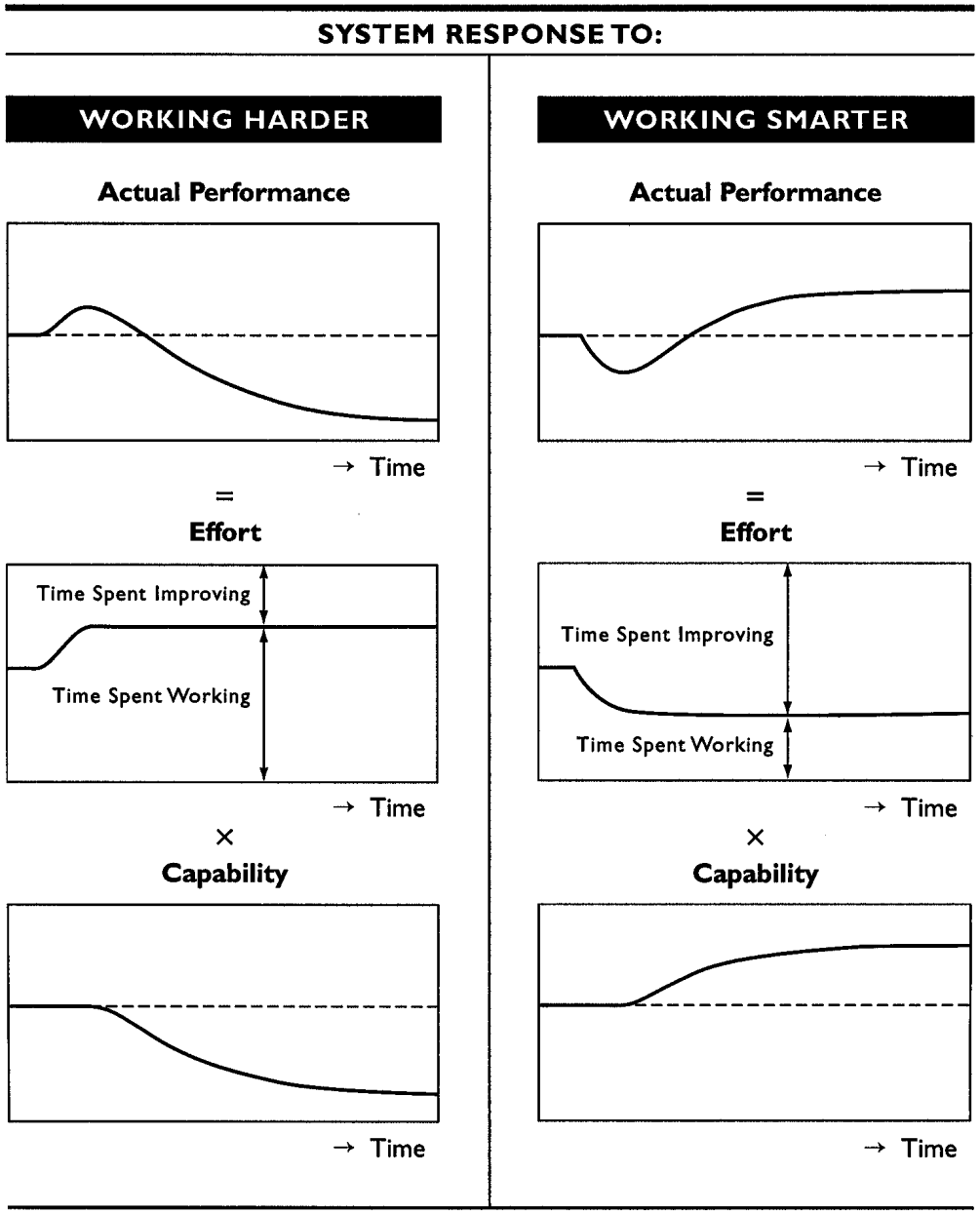
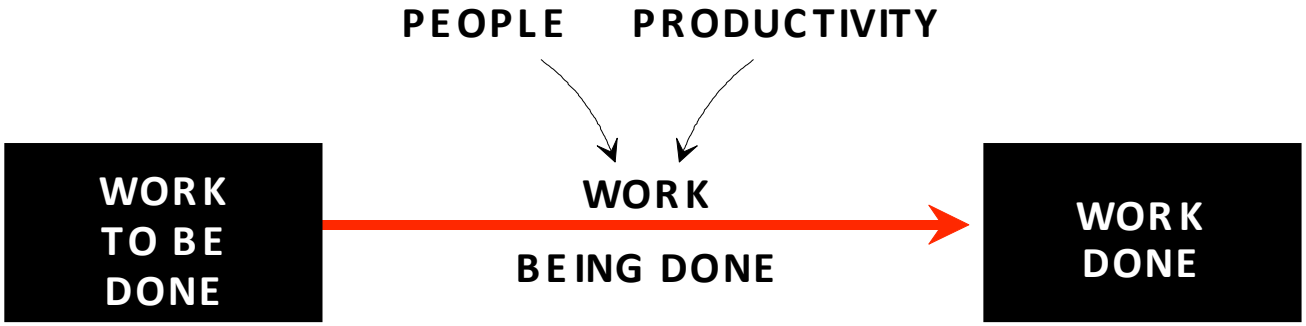
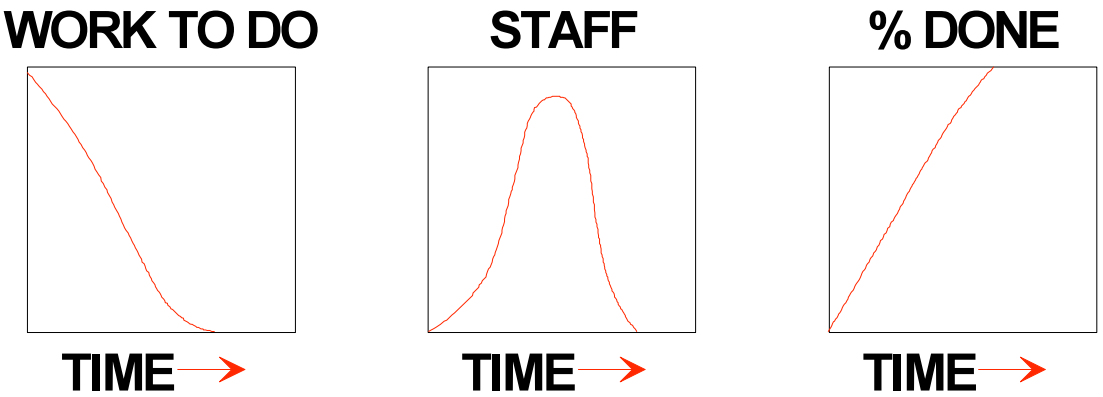


**FIGURE 6.** Simulations of the Working Harder and Working Smarter Strategies



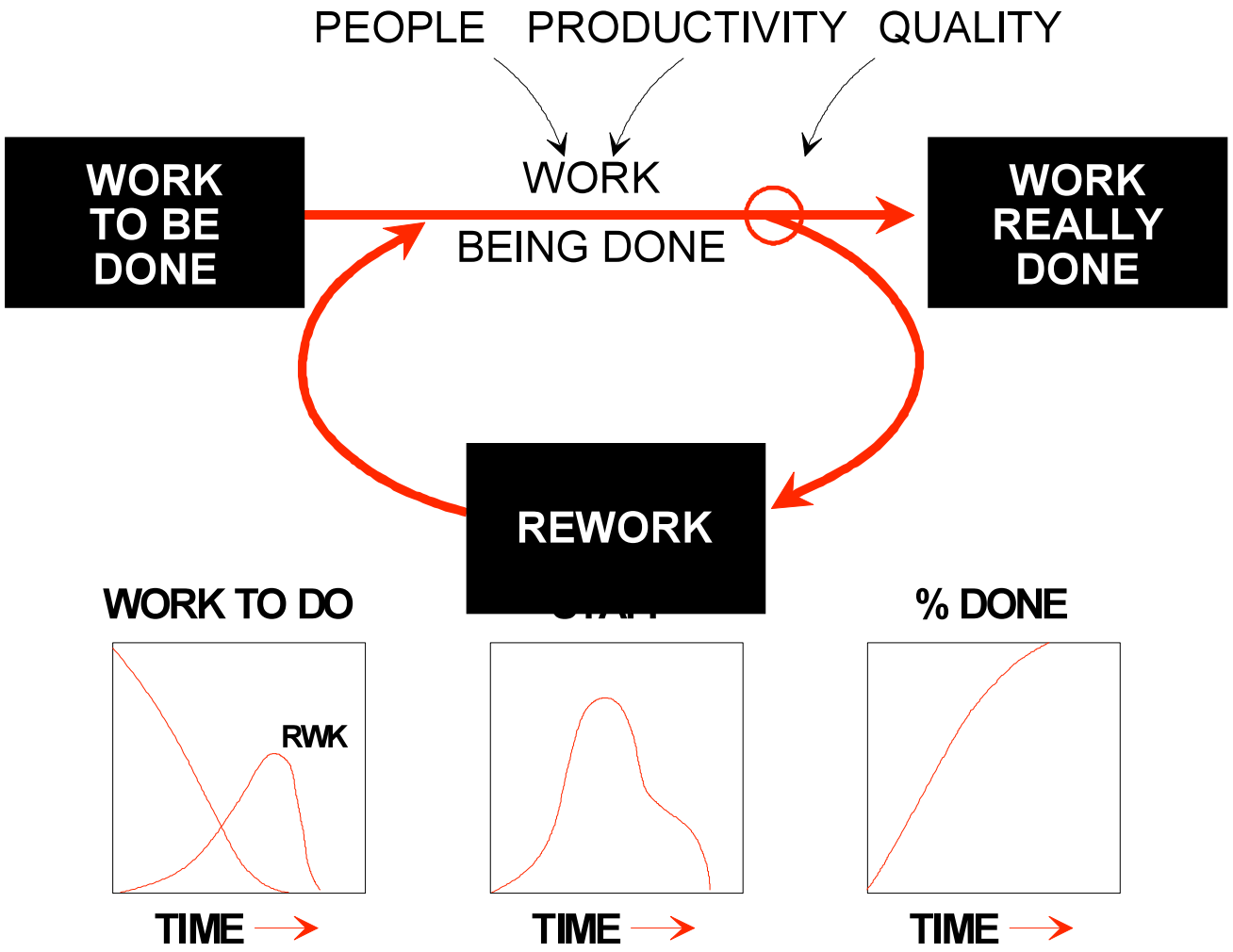
# Traditional View of a Project



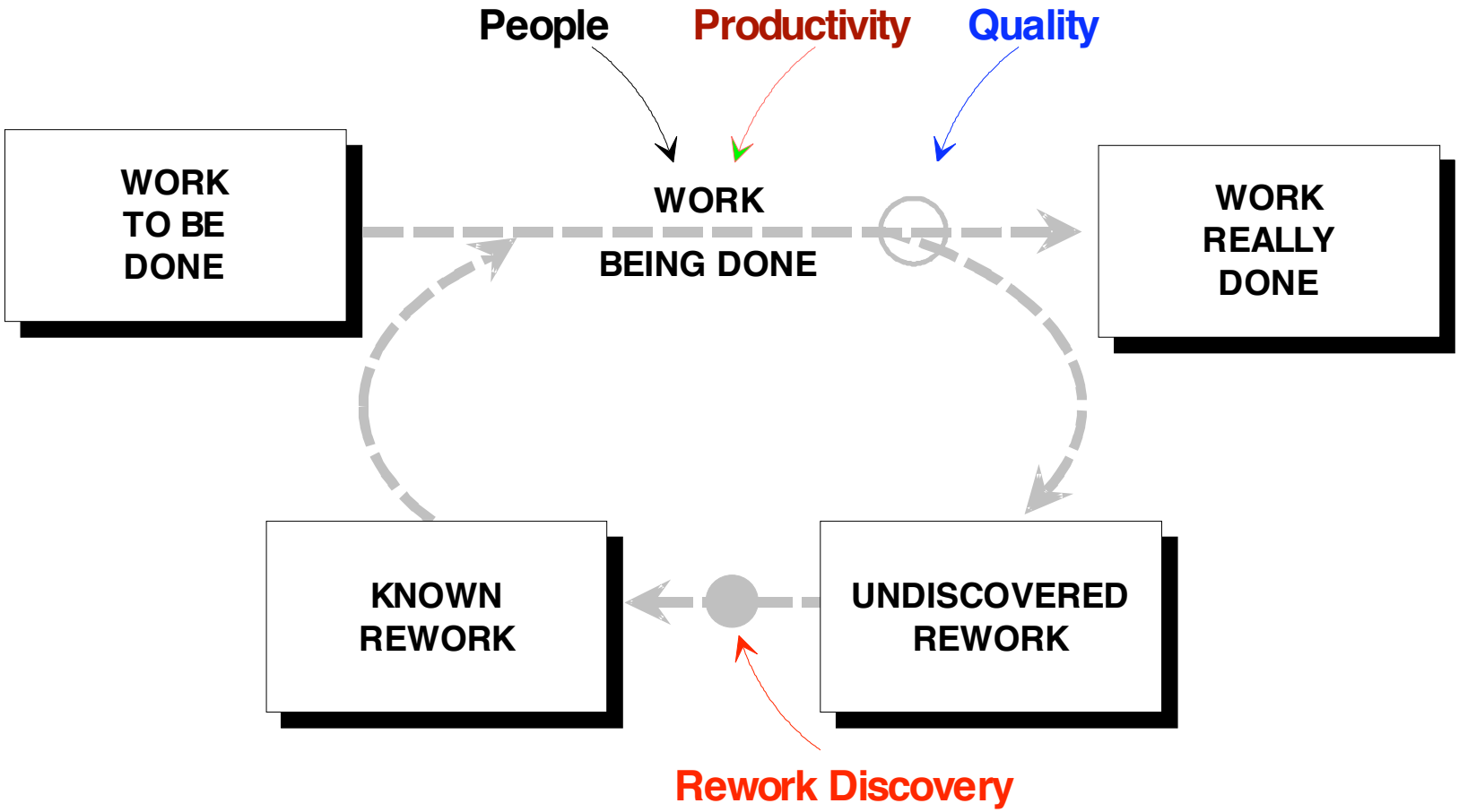

**Source: Lyneis – Project dynamics course material**

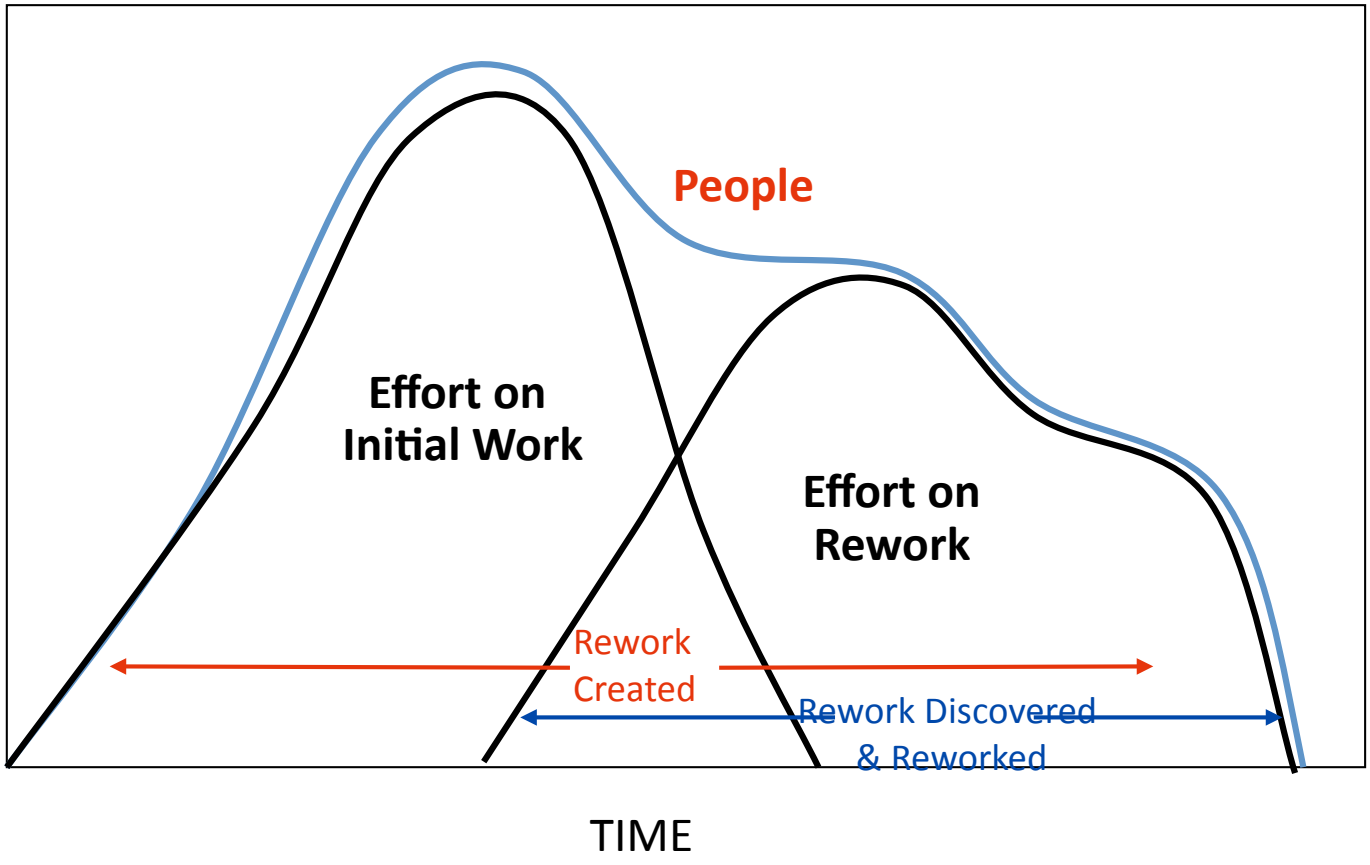
# …Failure to consider rework




**Source: Lyneis – Project dynamics**

# Key to project dynamics: rework cycle




People
Effort on
Initial Work
Effort on
Rework
Rework
Created
Rework Discovered
& Reworked
TIME

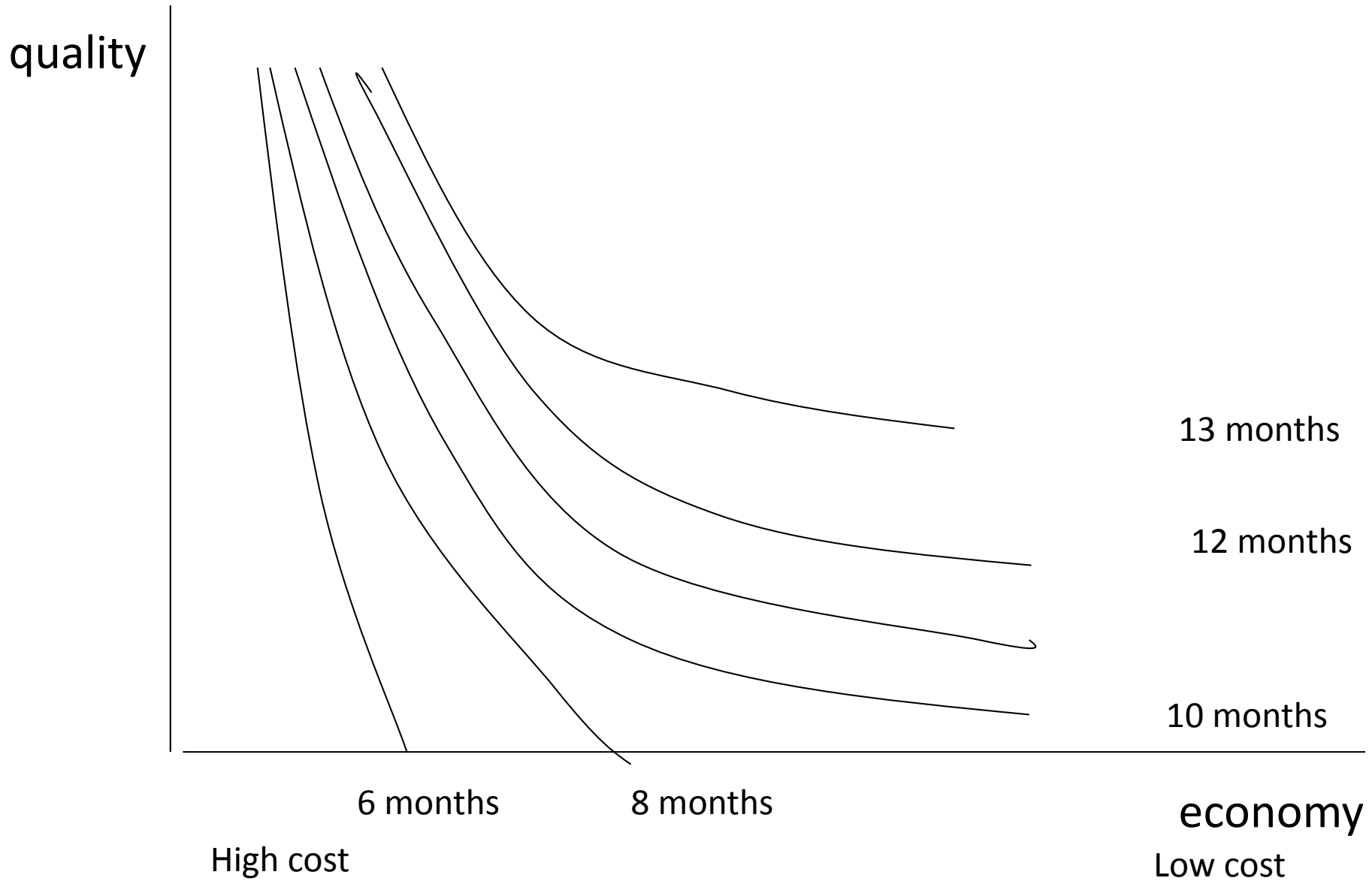
# Better-before-worse
# Worse-before-better

- The benefit of working harder is short lived
- Working harder creates a Better-before-worse situation
- Investing in improvements takes time and creates Worse-before-better – reducing output in the short run
- Increasing time spent in improvement reduces output in the short run.  Eventually capability rises more than enough to offset the drop in work effort and performance is permanently higher

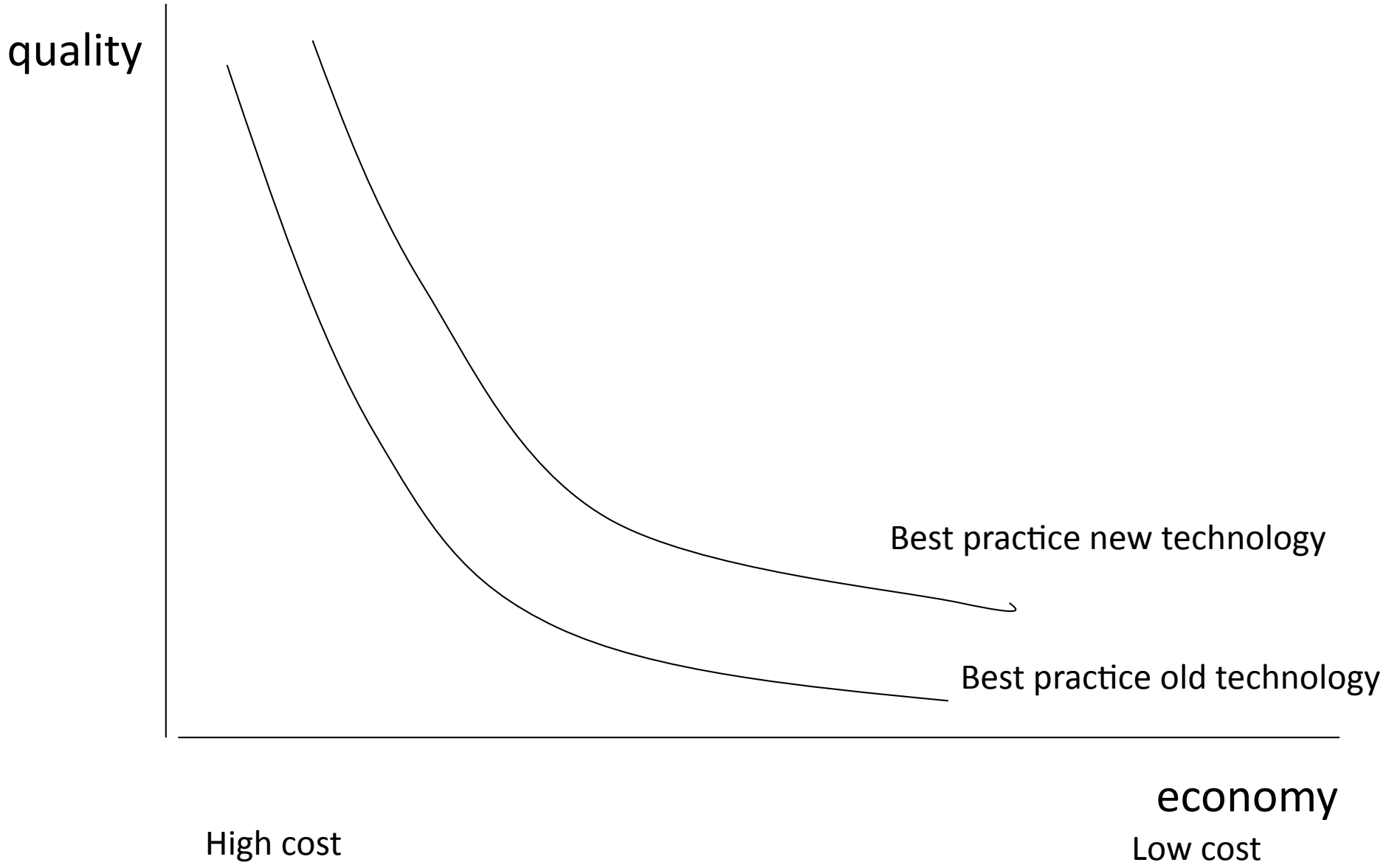
# The structure of the system

- Consistent with the theory, we should NOT attribute the problems to unskilled, ill-intentioned management
- Rather the structure of the system inadvertently leads talented managers into the capability trap
- Faced with double bind of aggressive performance targets workers cut corners
- Management discovers the shortcuts and do not trust the workers anymore – and step into closer monitoring
- Workers hide problems – “never reveal a problem until you have a solution”
- The capability trap gets embedded into incentives, and corporate culture – solving problems is more visible than avoiding them!
- Stereotypes and conflicts not only hurt organizational performance but damage society – ‘problem with western culture’

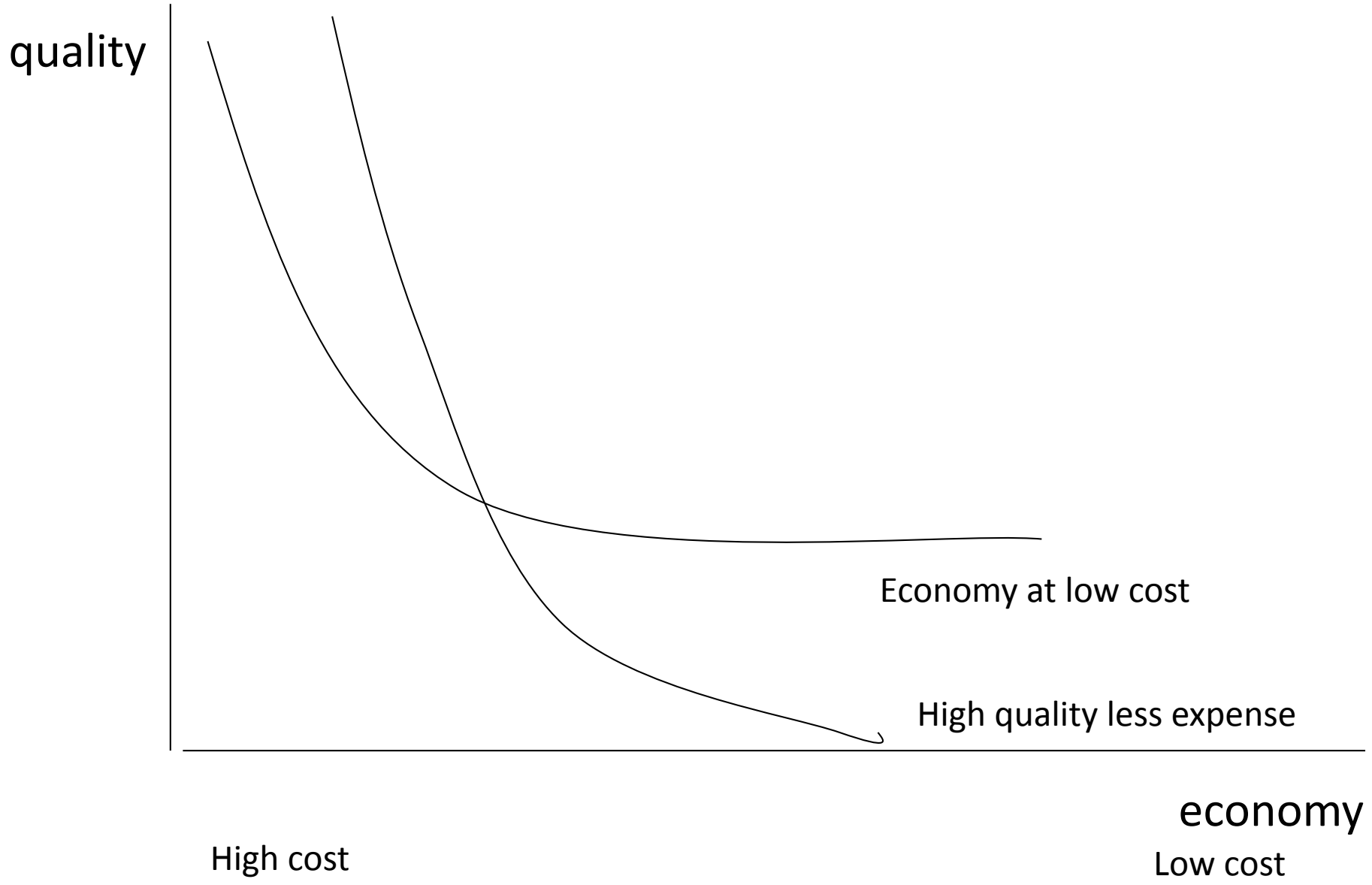
# Trade-offs among quality, economy and speed



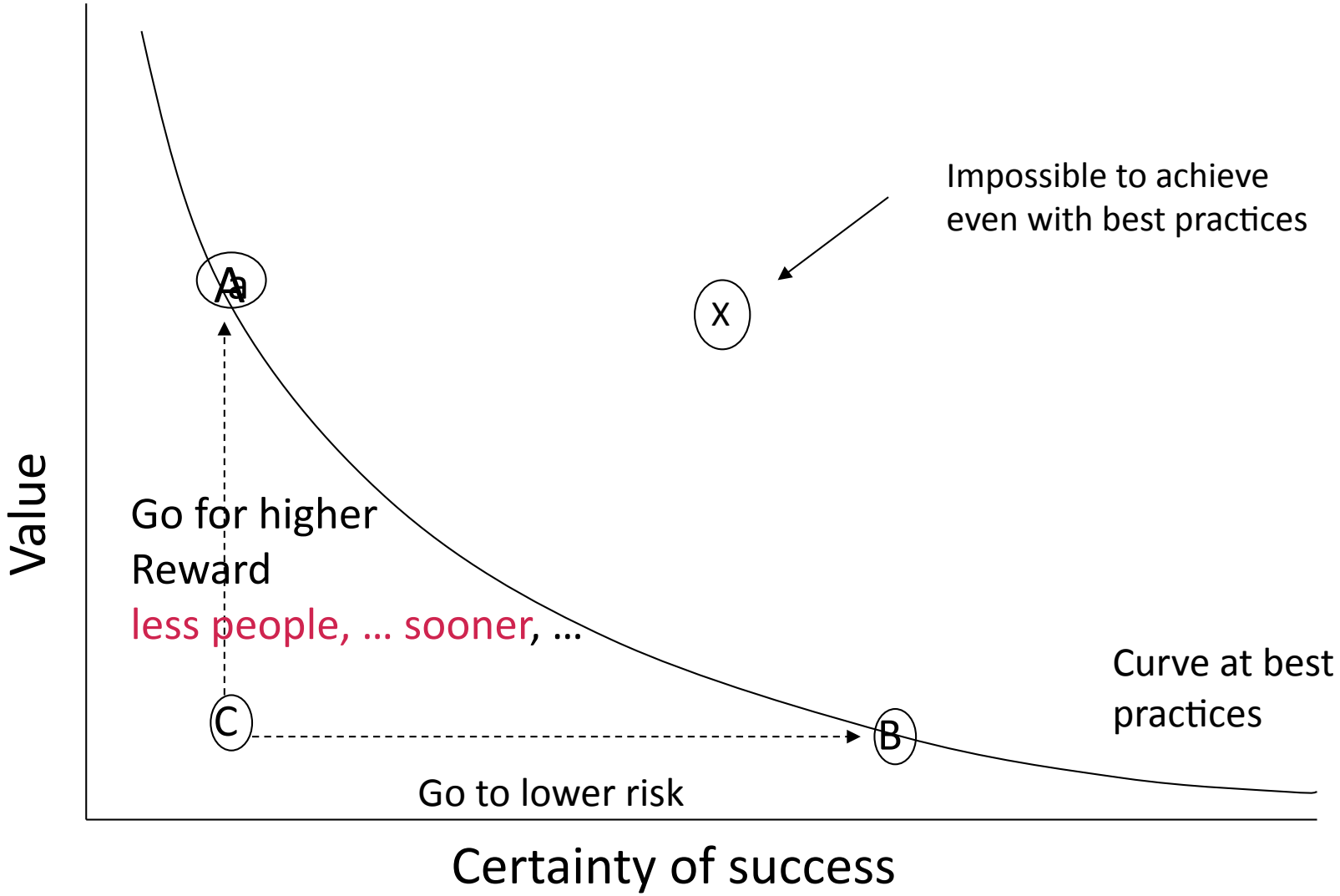
# Old and new technology



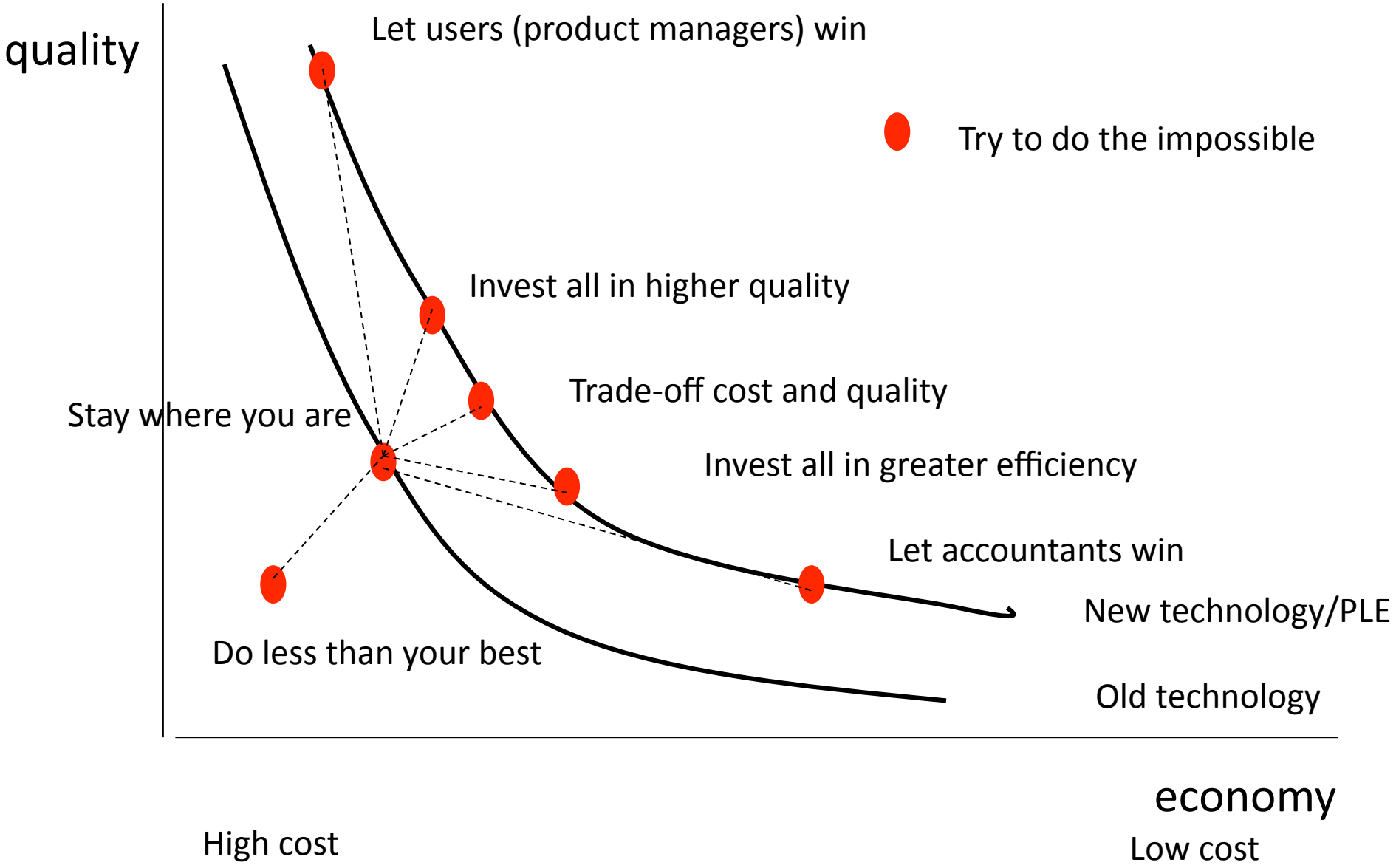
# Economy systems at low cost -- A
# High quality at less expense -- B



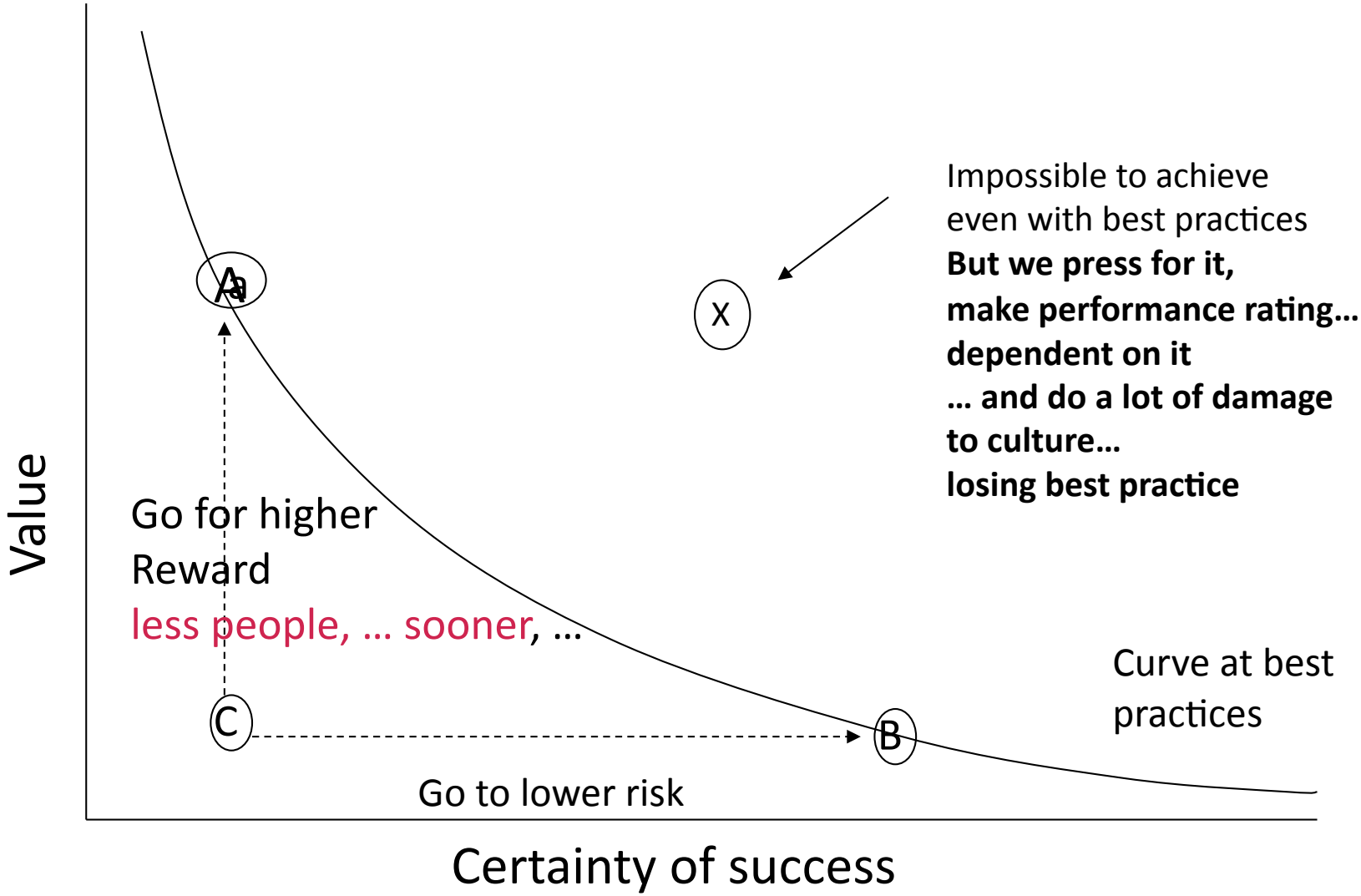
# Risk and reward



# Engineering management action; after choosing technology there are choices to be made



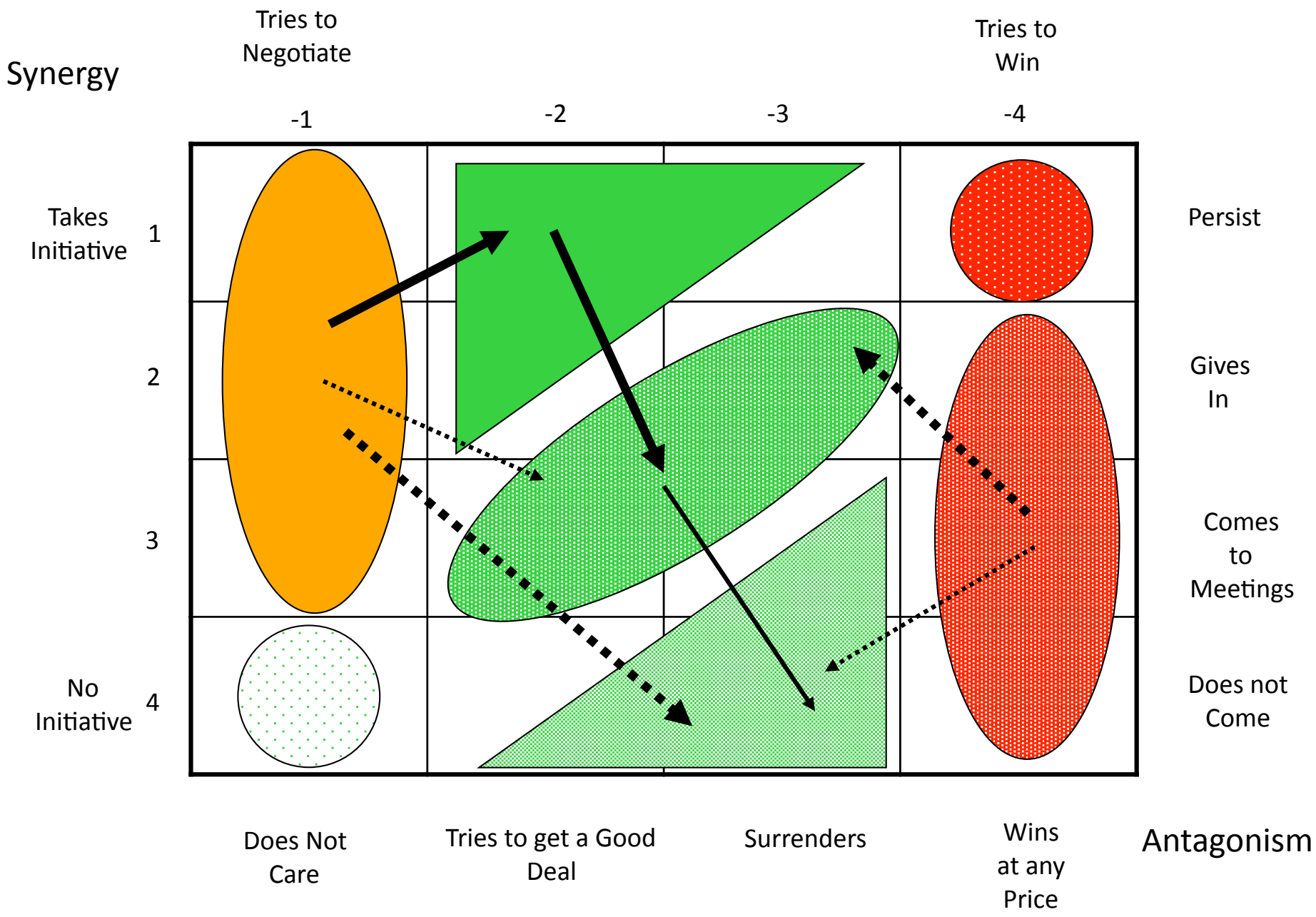
# Risk and reward and management faults



# New Age?

- *Does Senge think his movement is New Age?*
- *Asked directly, he replies: "The term carries a lot of baggage, but yes, Deming always talked about a new economic age. That was his term, and he said that the principles by which success is going to be determined in this new economy will be different. So it's New Age.*

- *Sustainable Software Development*
- *Sustainable Development*


Synergy
Tries to Negotiate
Tries to Win
-1
-2
-3
-4
Takes Initiative
1
2
3
4
No Initiative
Persist
Gives In
Comes to Meetings
Does not Come
Does Not Care
Tries to get a Good Deal
Surrenders
Wins at any Price
Antagonism

Hypotheses testing