Embrace Uncertainty
try to be effective instead of just efficient!

What do you do when "unexpected" things happen? Do you ignore it or do you change your plans accordingly? During the last decade we have seen a big shift in the way knowledge workers are supposed to organize their activities. Slack, agility and effectiveness are typical words used when describing the "new way", while plans, metrics and objectives are typical words used to describe the "old way" of working. In this talk we will describe many of the new concepts and discuss how they can improve the effectiveness of individuals, teams and organizations.

a 45 minute presentation at Cisco Nordic Development Day
March 19 2013
Olve Maudal

(version: 201319031228)

What do you do when starting a new endeavour?

What do you do when starting a new endeavour?

- **analyze** the situation

What do you do when starting a new endeavour?

- **analyze** the situation
- define measurable **objectives**

What do you do when starting a new endeavour?

- **analyze** the situation
- define measurable **objectives**
- create a **plan**

What do you do when starting a new endeavour?

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- define measurable **objectives**
- create a **plan**
- **execute** according to the plan

What do you do when starting a new endeavour?

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routine problem solving

- **analyze** the situation
- define measurable **objectives**
- create a **plan**
- **execute** according to the plan

Knowledge worker

non-routine problem solving

Knowledge worker

non-routine problem solving

- **try** something
- observe and **learn**
- **adjust** behavior
- **repeat** until done

Knowledge worker

non-routine problem solving

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- observe and **learn**
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Knowledge worker

non-routine problem solving

The Agile Manifesto
Systems Thinking vs Reductionism
Effectiveness vs Efficiency
About knowledge work
Modern principles for knowledge workers
Q&A

The Agile Manifesto

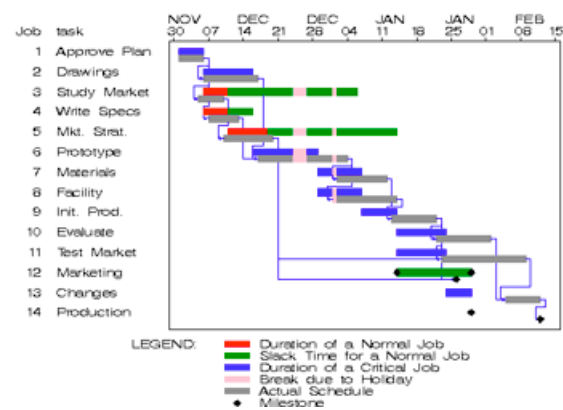There used to be a time, where we believed that anyone could do software development

after all, it was just about programming a computer...

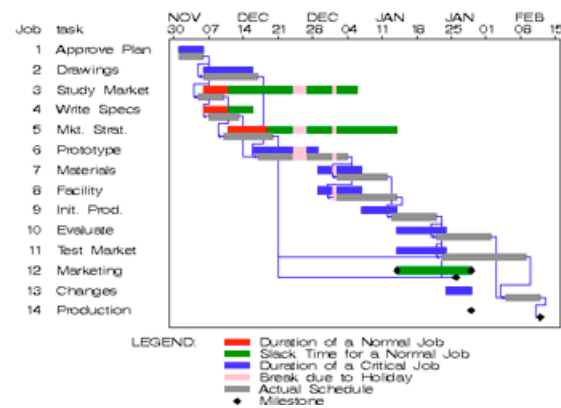1) get some smart people to analyze the problem

1) get some smart people to analyze the problem

Job	task	NOV 30	07	DEC 14	21	DEC 28	04	JAN 11	18	JAN 25	01	FEB 08	15
1	Approve Plan												
2	Drawings												
3	Study Market												
4	Write Specs												
5	Mkt. Strat.												
6	Prototype												
7	Materials												
8	Facility												
9	Init. Prod.												
10	Evaluate												
11	Test Market												
12	Marketing												
13	Changes												
14	Production												

LEGEND:
- Duration of a Normal Job
- Slack Time for a Normal Job
- Duration of a Critical Job
- Break due to Holiday
- Actual Schedule
- Milestone

2) create a plan

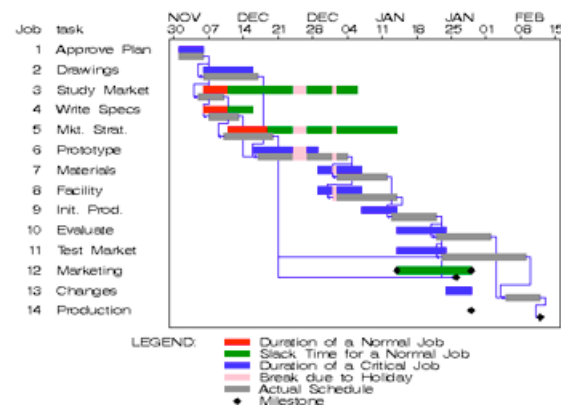1) get some smart people to analyze the problem

2) create a plan

3) find resources

1) get some smart people to analyze the problem

2) create a plan

3) find resources

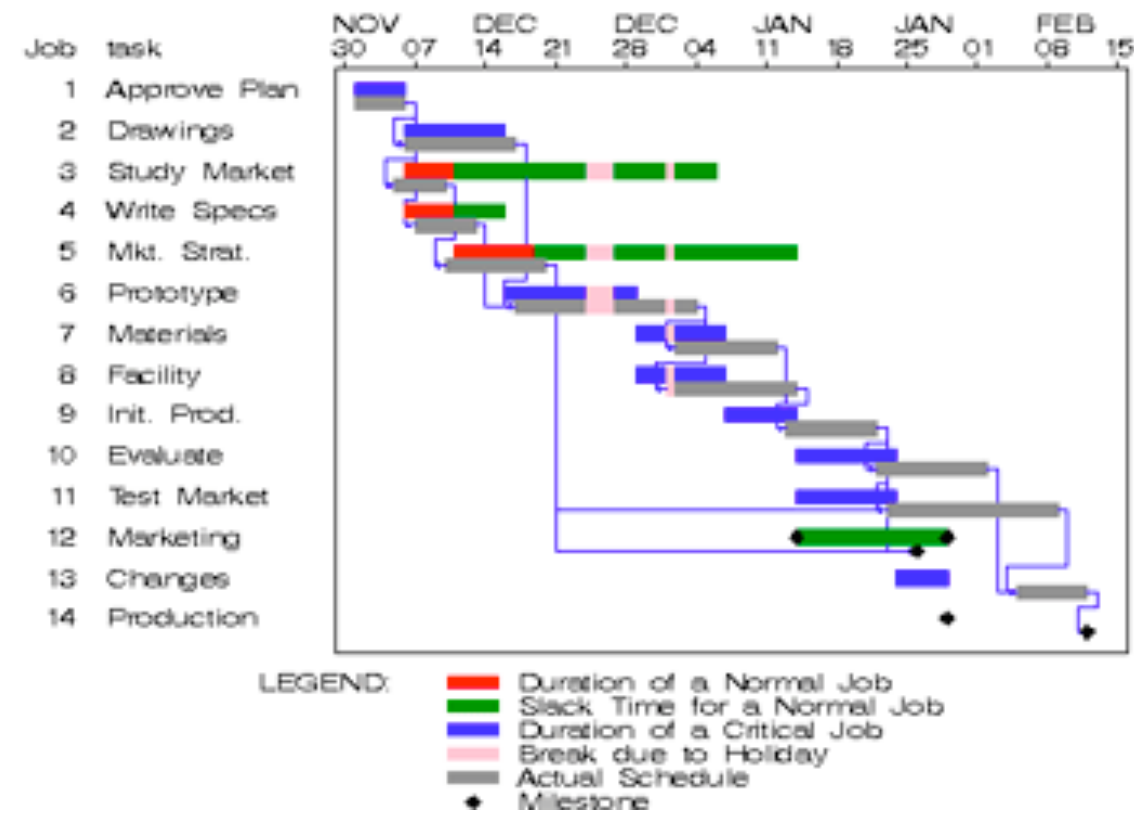4) execute according to the plan

and when the projects failed

the respons was always:

do more up-front analysis

create a more detailed plan

find more resources

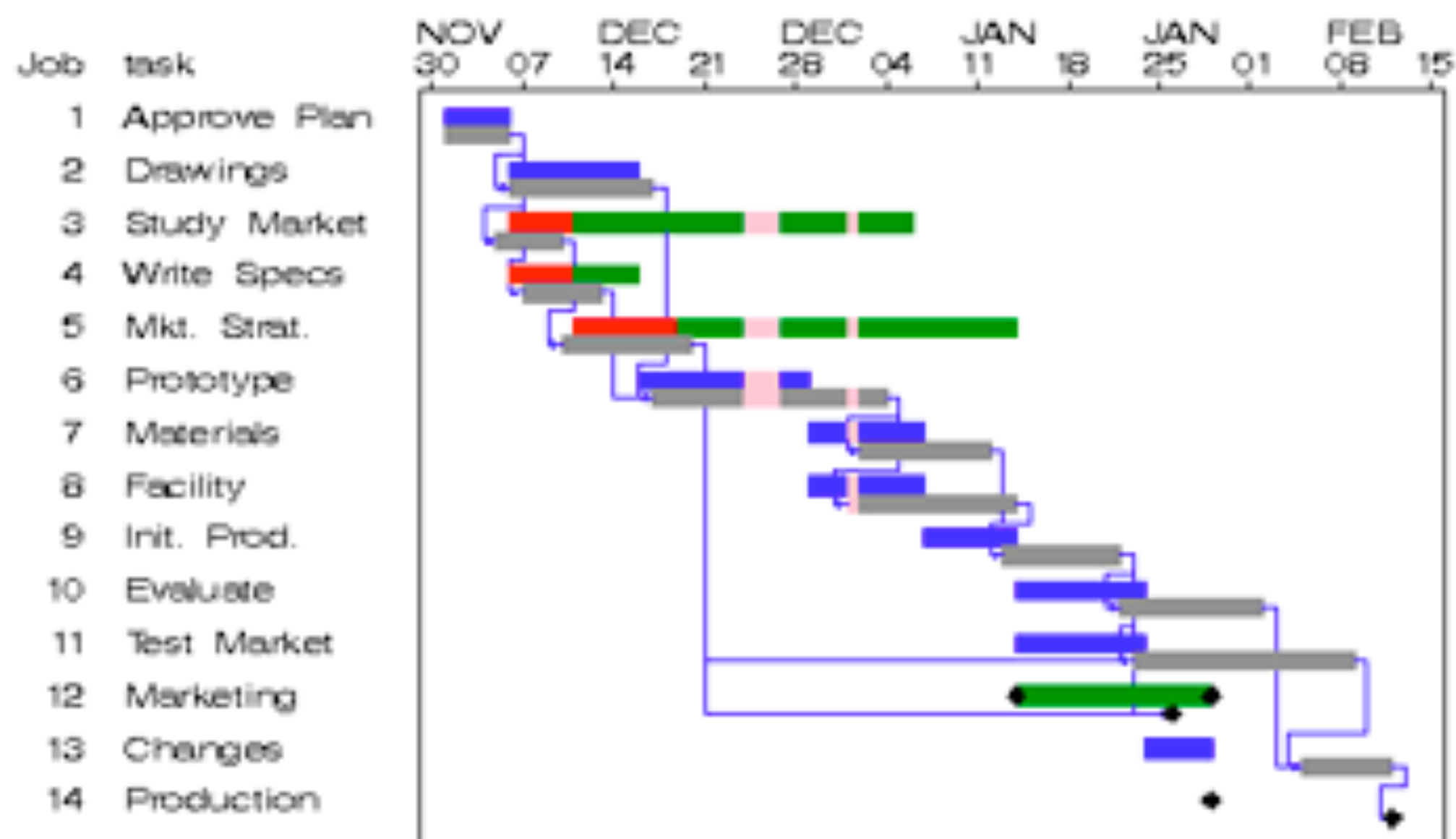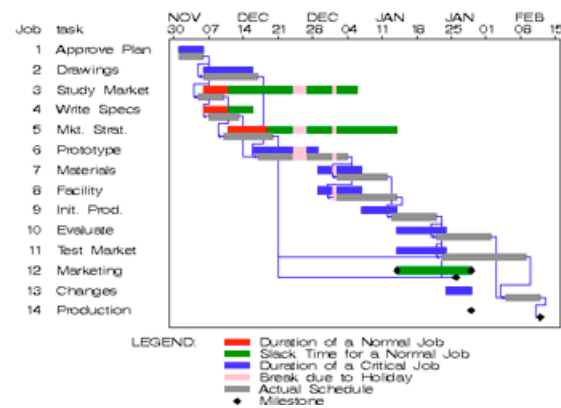and make sure that everyone followed the plan

but the projects still failed

and the respons was, as usual:

		NOV	DEC	DEC	JAN	JAN	FEB
Job	task	30 07	14 21	28 04	11 18	25 01	08 15
1	Approve Plan						
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LEGEND:
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- ◆ Milestone

but of course...

Dark ages of software development (early 80's to late 90's)

1) get some smart people to analyze the problem

2) create a plan

3) find resources

4) execute according to the plan

We had only discovered a fancy way of playing the "scabby queen" game, also known as the "Old Maid" or "Svarte Per", always try to "save your ass" by delegating responsibility to someone else.
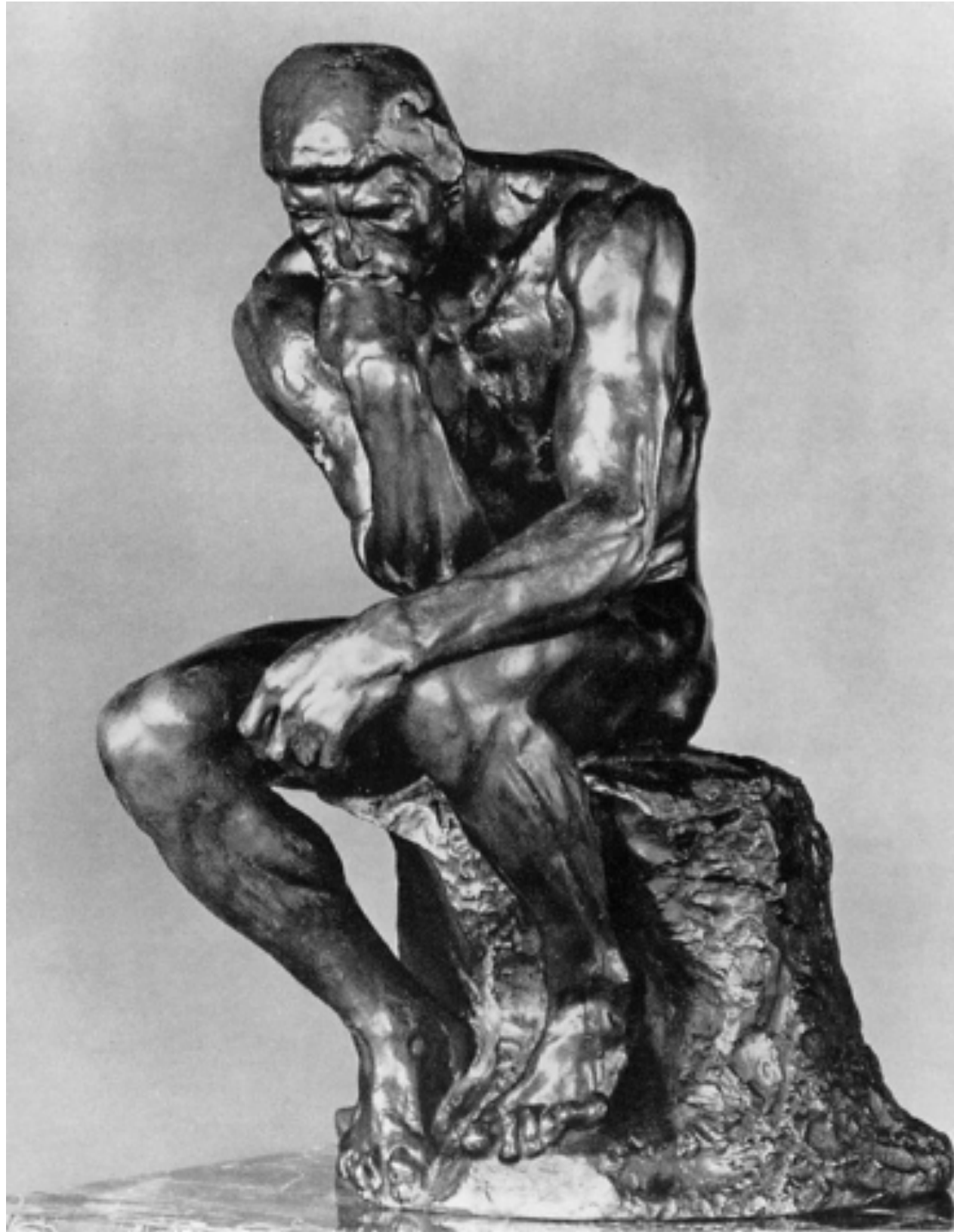
The Agile Manifesto (2001)

Manifesto for Agile Software Development

We are uncovering better ways of developing
software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on
the right, we value the items on the left more.

Kent Beck	James Grenning	Robert C. Martin
Mike Beedle	Jim Highsmith	Steve Mellor
Arie van Bennekum	Andrew Hunt	Ken Schwaber
Alistair Cockburn	Ron Jeffries	Jeff Sutherland
Ward Cunningham	Jon Kern	Dave Thomas
Martin Fowler	Brian Marick	

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
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Individuals and interactions over **processes and tools**
Working software over **comprehensive documentation**
Customer collaboration over **contract negotiation**
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Individuals and interactions over processes and tools
Working software over comprehensive documentation
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Individuals and interactions over processes and tools
Working solutions over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

Individuals and interactions over processes and tools
Working solutions over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

The agile manifesto started a huge awakening process in the software industry...

(picture from the 1990 film Awakenings)

but we also see that similar realization is reaching
other disciplines now.

(picture from the 1990 film Awakenings)

processes and tools
comprehensive documentation
contract negotiation
following a plan

Individuals and interactions
Working solutions
Customer collaboration
Responding to change

Individuals and interactions
Working solutions
Customer collaboration
Responding to change

Systems Thinking vs Reductionism

Reductionism is a philosophical position that a complex system is nothing but the sum of its parts, and that an account of it can be reduced to accounts of individual constituents.
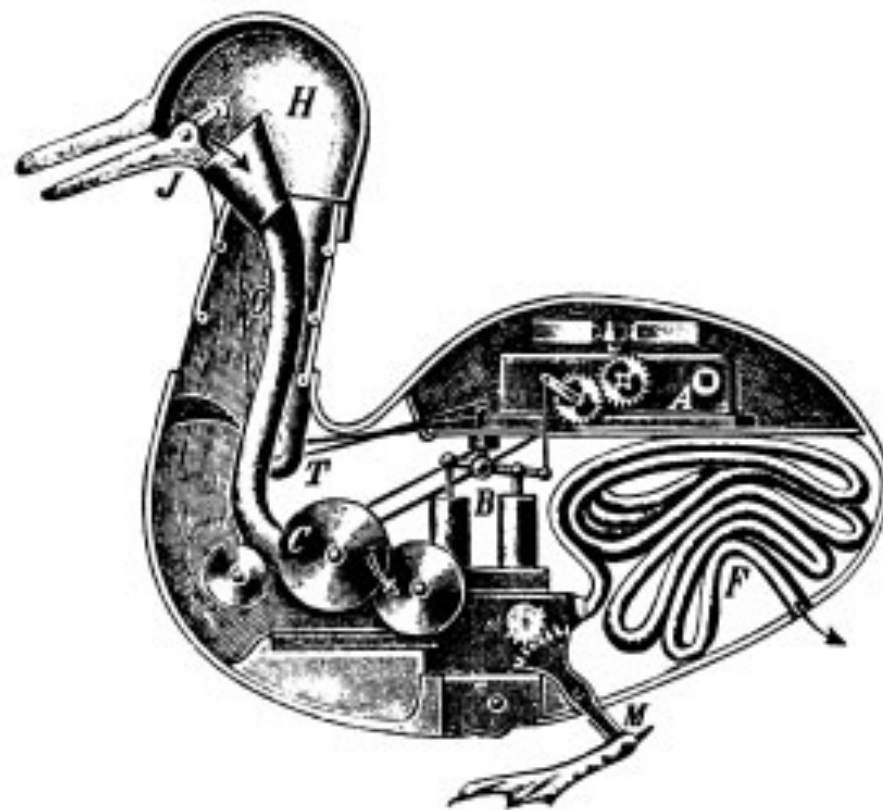
Divide and Conquer

Systems thinking is the process of understanding how things influence one another within a whole

Reductionism   vs   Systems thinking

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Reductionism   vs   Systems thinking

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Systems thinking is the process of understanding how things influence one another within a whole

(aka, Taylorism vs Demingism)

Frederick Winslow Taylor (1856-1915)

W. Edwards Deming (1900-1993)

(W. Edwards Deming 1900-1993)

(W. Edwards Deming 1900-1993)

"The striking thing one first notices in the main lobby [in Toyotas HQ] is larger than life pictures of three individuals. One is of Toyota's founder, another of the same size is of Toyota's current chairman, and a third, much larger picture, is of W. Edwards Deming.

"Dr. Deming: The American Who Taught the Japanese About Quality"
(Aquayo, 1991)
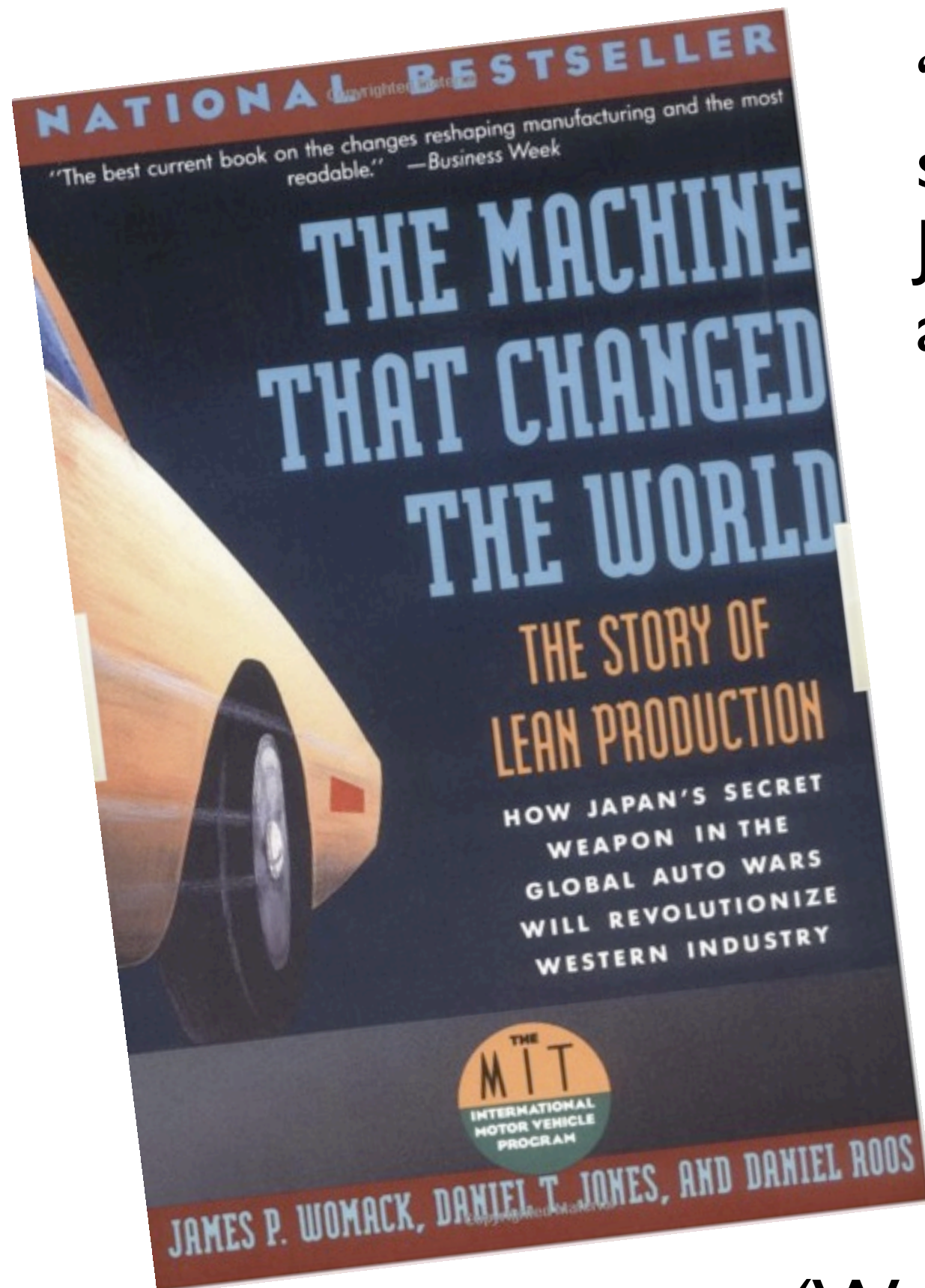
"Japanese companies are sweeping the world, and the Japanese auto industry soars above the competition."

(Womack, Jones, Roos, 1990)

(Demingism)

(Taylorism)

Systems thinking is the process of understanding how things influence one another within a whole

Reductionism is a philosophical position that a complex system is nothing but the sum of its parts, and that an account of it can be reduced to accounts of individual constituents.

Demings fourteen key principles for management

Create constancy of purpose toward improvement of product and service, with the aim to become competitive and stay in business, and to provide jobs.

Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.

Cease dependence on inspection to achieve quality. Eliminate the need for massive inspection by building quality into the product in the first place.

End the practice of awarding business on the basis of price tag. Instead, minimize total cost. **Move towards a single supplier** for any one item, on a long-term relationship of loyalty and trust.

Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

Institute **training** on the job.

Institute leadership (see Point 12 and Ch. 8 of "Out of the Crisis"). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

Drive out fear, so that everyone may work effectively for the company. (See Ch. 3 of "Out of the Crisis")

Break down barriers between departments. **People in research, design, sales, and production must work as a team**, to foresee problems of production and in use that may be encountered with the product or service.

Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.

a. **Eliminate work standards** (quotas) on the factory floor. Substitute leadership.
b. **Eliminate management by objective**. Eliminate management by numbers, numerical goals. Substitute leadership.

a. **Remove barriers that rob the hourly worker of his right to pride of workmanship**. The responsibility of supervisors must be changed from sheer numbers to quality.
b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, inter alia," abolishment of the annual or merit rating and of management by objective (See Ch. 3 of "Out of the Crisis").

Institute a vigorous program of education and self-improvement.

Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

A subset of Systems Thinking by Deming:

- Cease dependence on inspection to achieve quality
- Move towards single suppliers and establish long-term relationships
- Drive out fear
- Break down barriers between departments
- Eliminate work standards
- Eliminate management by objective
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Effectiveness vs Efficiency

The washing machine analogy

The washing machine analogy

The washing machine analogy

100% full = high efficiency, very low effectiveness
50% full = high effectiveness, moderate efficiency

Introduce slack to become more effective!

Introduce slack to become more effective!

Introduce slack to become more effective!

The more difficult tasks you need to solve, the more slack you need

Effectiveness

Efficiency

Effectiveness

Efficiency

Effectiveness

Efficiency

Effectiveness

Efficiency

Effectiveness

Efficiency

About knowledge work

Few high tech projects are like running
down on a paved road where you can see the ...

... goal in the end of the road.

Most projects are more like...

extreme orienteering

in impossible terrain

with a group of people

in the dark
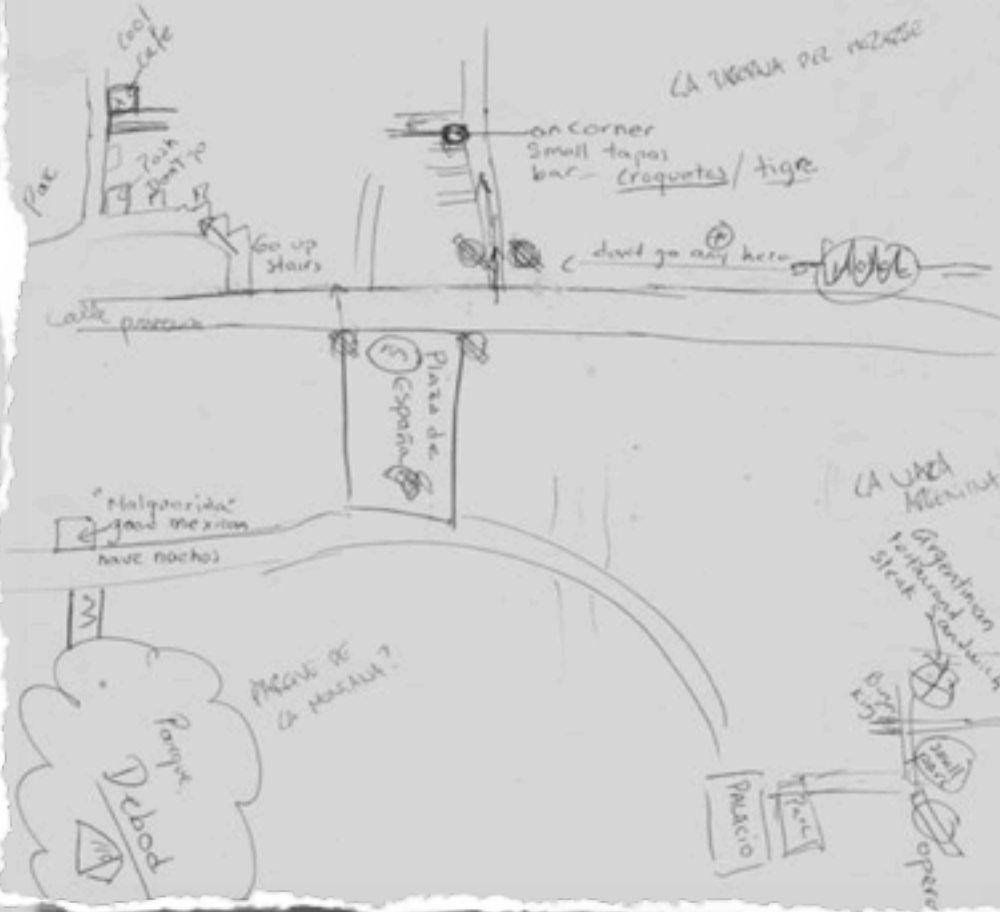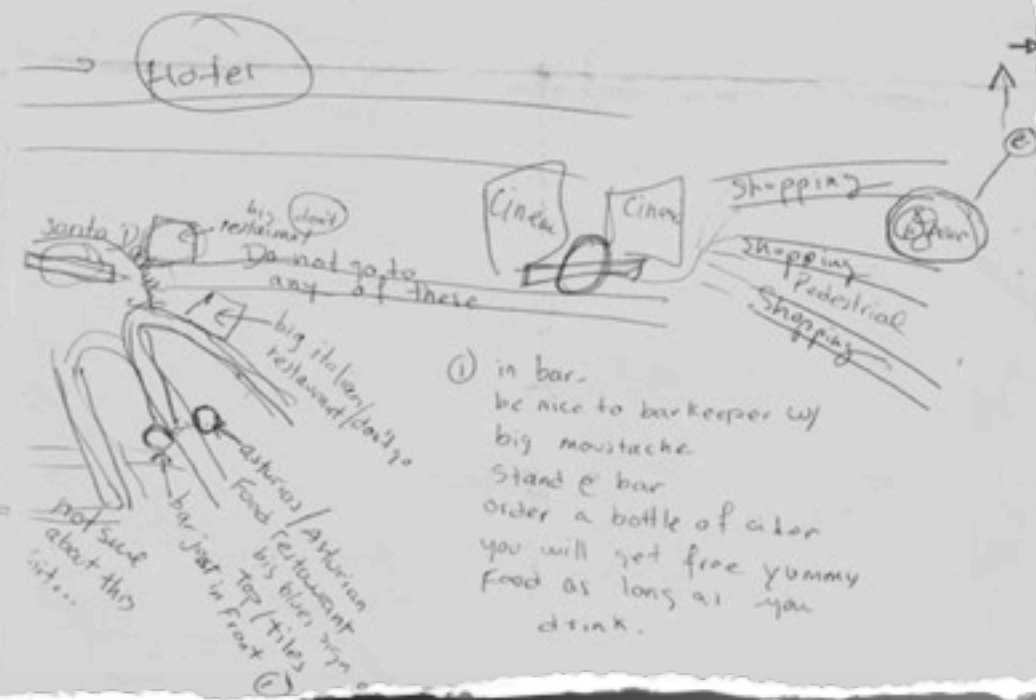
with only a sketchy map as guidance

Modern principles for knowledge workers

Embrace chaos

Embrace chaos

Break the rules

Break the rules

Break the rules

prepare to die!

Focus on communication (over documentation)

Focus on communication (over documentation)
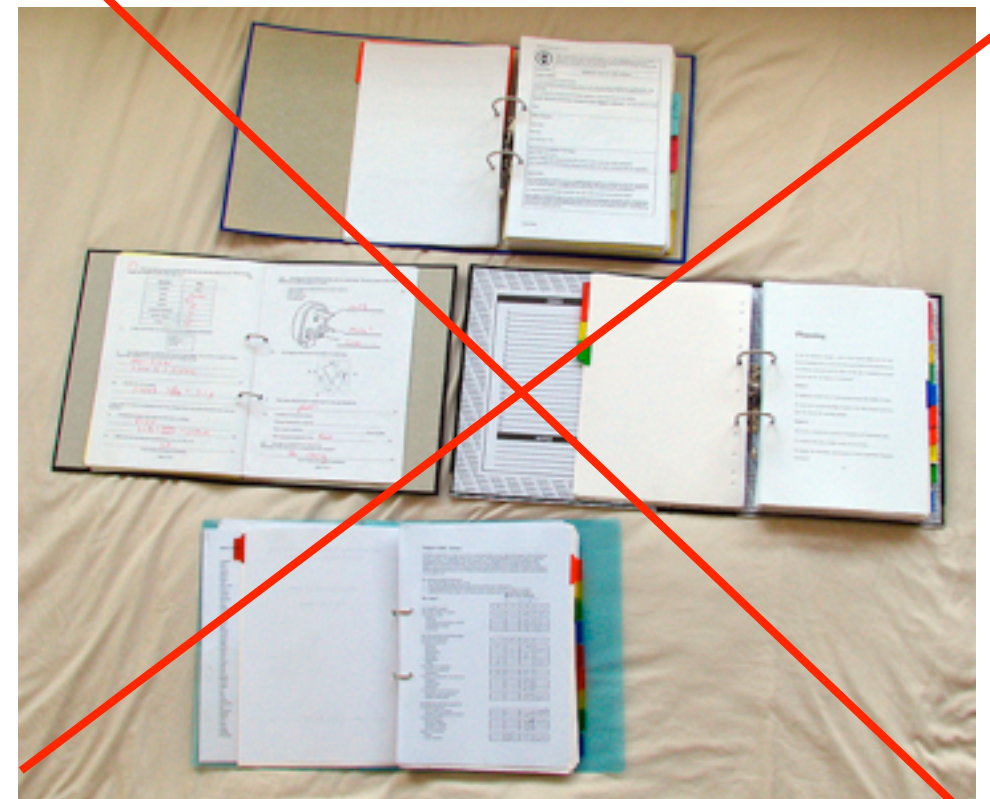
Introduce slack

Introduce slack

*If your company's goal is to become fast, responsive, and agile, more efficiency is not the answer--you need more **slack**. (Tom DeMarco)*

Constrained innovation

Constrained innovation

Reward courage (and failures) to amplify learning

Reward courage (and failures) to amplify learning

Reward courage (and failures) to amplify learning

Focus on the whole product

Focus on the whole product

system thinking   vs   reductionism

Delay decisions (and do continuous planning)

Delay decisions (and do continuous planning)

Plans are of little importance, but planning is essential – Winston Churchill
Plans are nothing; planning is everything. – Dwight D. Eisenhower
No battle plan survives contact with the enemy. – Helmuth von Moltke the Elder

Delay decisions (and do continuous planning)

Plans are of little importance, but planning is essential – Winston Churchill
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Everyone has a plan 'till they get punched in the mouth. – Mike Tyson

Aim for approximately right rather than accurately wrong

Aim for approximately right rather than accurately wrong

Aim for approximately right rather than accurately wrong

Timing is everything

Timing is everything
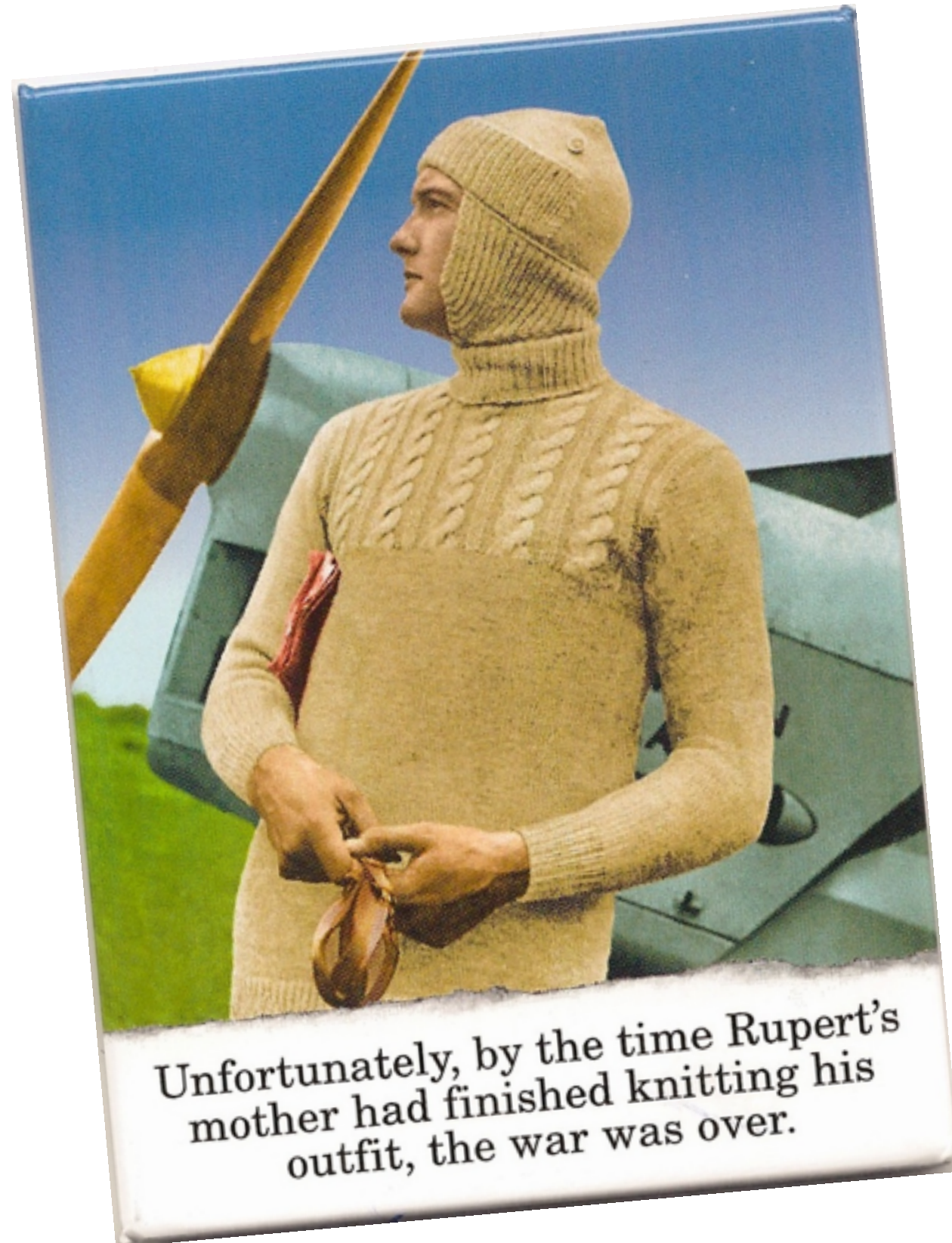
Unfortunately, by the time Rupert's mother had finished knitting his outfit, the war was over.

Summary

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Embrace uncertainty
by responding to change over
following a plan

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Amplify learning by accepting
failures and rewarding
courage

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Embrace uncertainty
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Amplify learning by accepting
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Focus on effectivenes, by
introducing slack in the
system

Q&A

Plans

Commitments

Efficiency

Objectives

Documentation

Inspection

Procedures

Planning

Collaboration

Effectiveness

Direction

Communication

Reflection

Principles

The new new product development game

The new new product development game

Stop running the relay race and take up rugby

Hirotaka Takeuchi and Ikujiro Nonaka

In today's fast-paced, fiercely competitive world of commercial new product development, speed and flexibility are essential. Companies are increasingly realizing that the old, sequential approach to developing new products simply won't get the job done. Instead, companies in Japan and the United States are using a holistic method—as in rugby, the ball gets passed within the team as it moves as a unit up the field.

This holistic approach has six characteristics: built-in instability, self-organizing project teams, overlapping development phases, "multilearning," subtle control, and organizational transfer of learning. The six pieces fit together like a jigsaw puzzle, forming a fast and flexible process for new product development. Just as important, the new approach can act as a change agent: it is a vehicle for introducing creative, market-driven ideas and processes into an old, rigid organization.

Mr. Takeuchi is an associate professor and Mr. Nonaka, a professor at Hitotsubashi University in Japan. Mr. Takeuchi's research has focused on marketing and global competition. Mr. Nonaka has published widely in Japan on organizations, strategy, and marketing.

The rules of the game in new product development are changing. Many companies have discovered that it takes more than the accepted basics of high quality, low cost, and differentiation to excel in today's competitive market. It also takes speed and flexibility.

This change is reflected in the emphasis companies are placing on new products as a source of new sales and profits. At 3M, for example, products less than five years old account for 25% of sales. A 1981 survey of 700 U.S. companies indicated that new products would account for one-third of all profits in the 1980s, an increase from one-fifth in the 1970s.[1]

This new emphasis on speed and flexibility calls for a different approach for managing new product development. The traditional sequential or "relay race" approach to product development—exemplified by the National Aeronautics and Space Administration's phased program planning (PPP) system—may conflict with the goals of maximum speed and flexibility. Instead, a holistic or "rugby" approach—where a team tries to go the distance as a unit, passing the ball back and forth—may better serve today's competitive requirements.

Under the old approach, a product development process moved like a relay race, with one group of functional specialists passing the baton to the next group. The project went sequentially from phase to phase: concept development, feasibility testing, product design, development process, pilot produc-
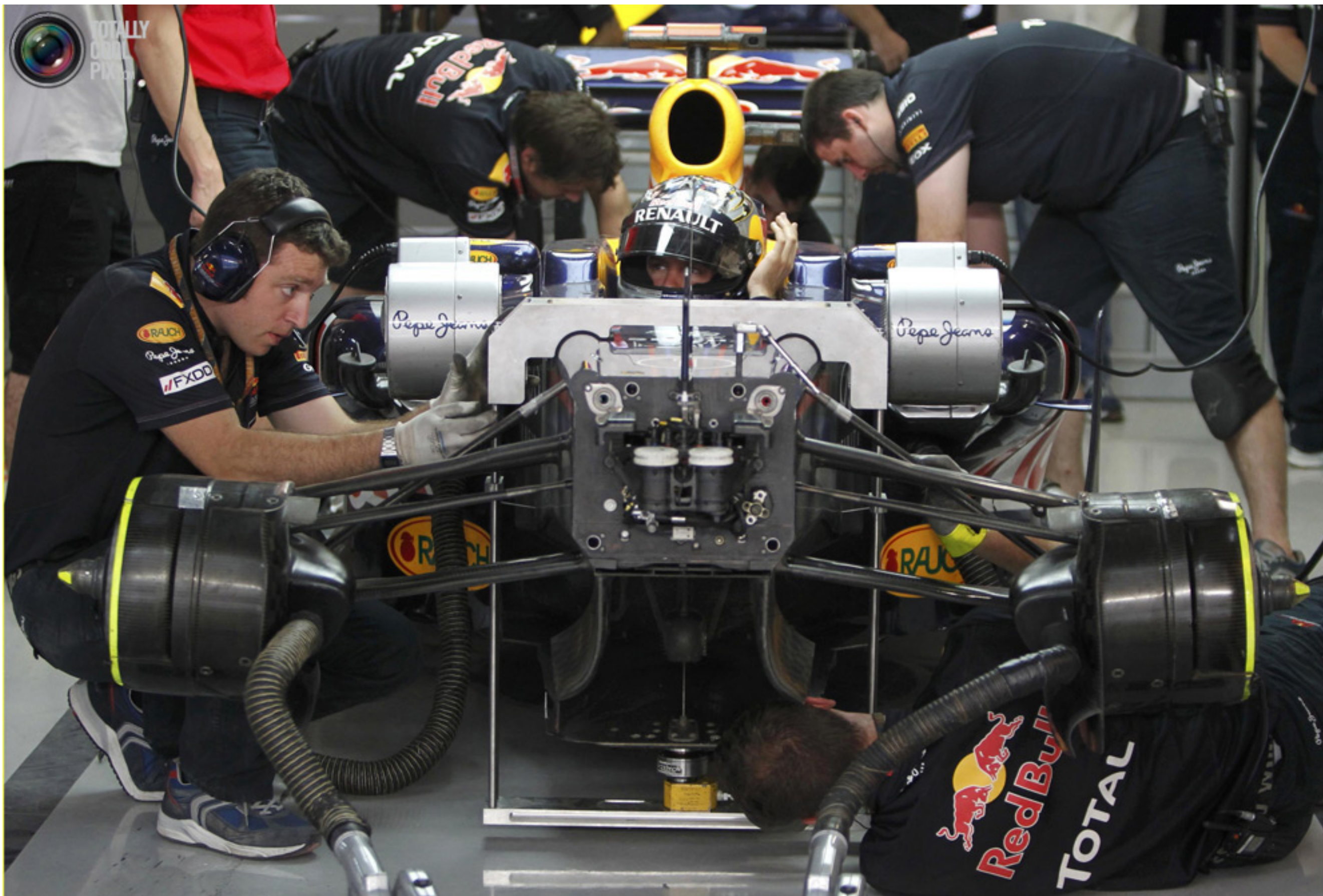
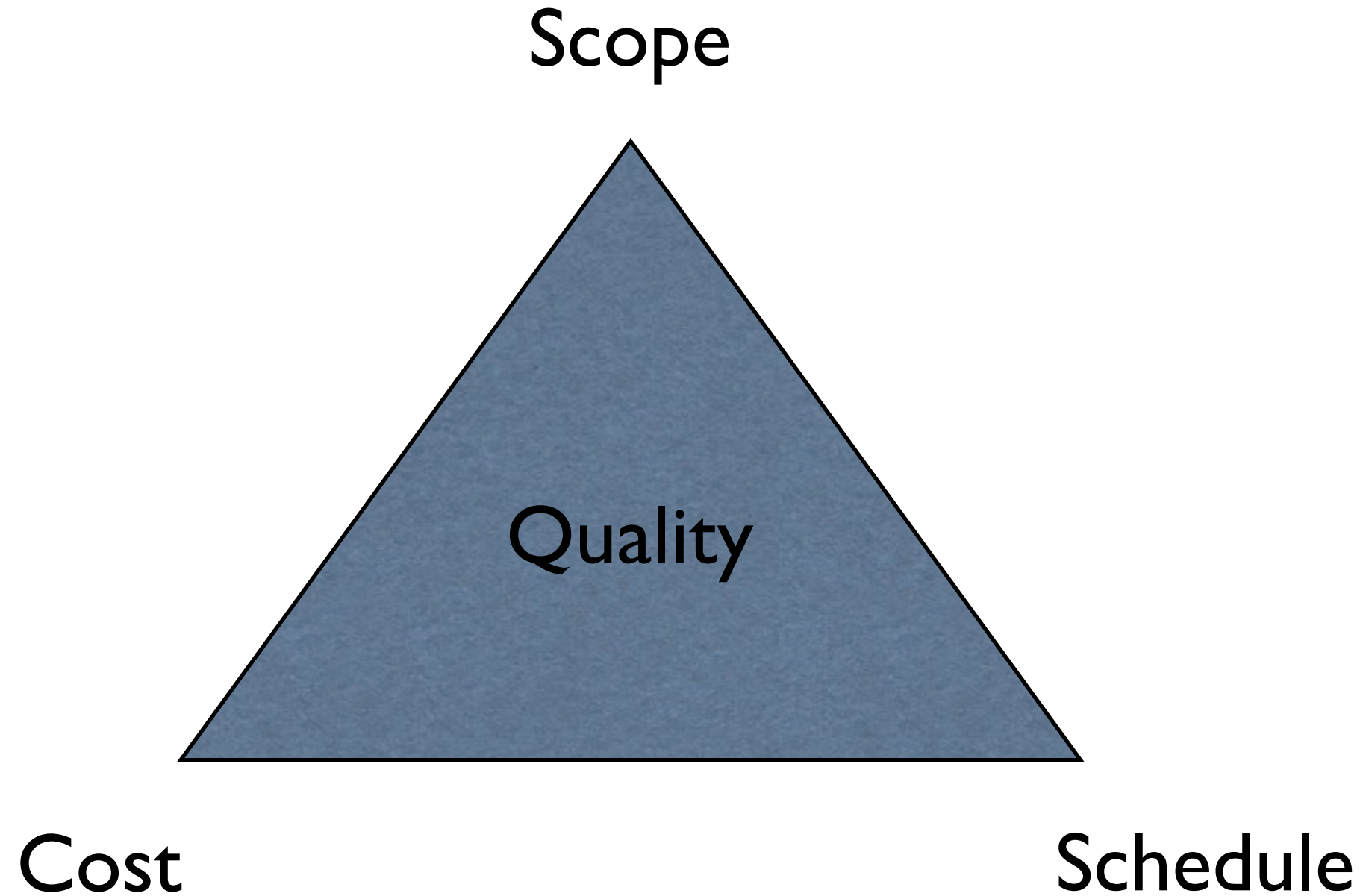**Harvard Business Review**

SPLITTING
BACKBONE
SWIFT & COMPANY

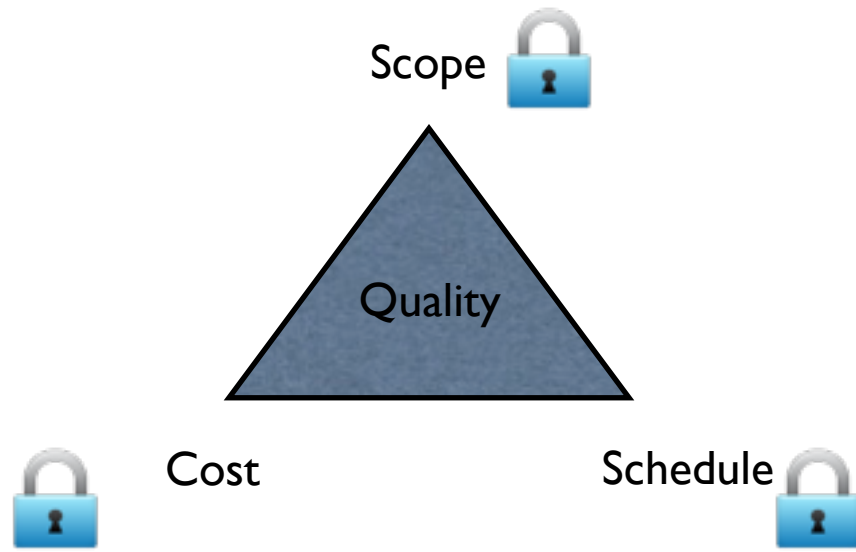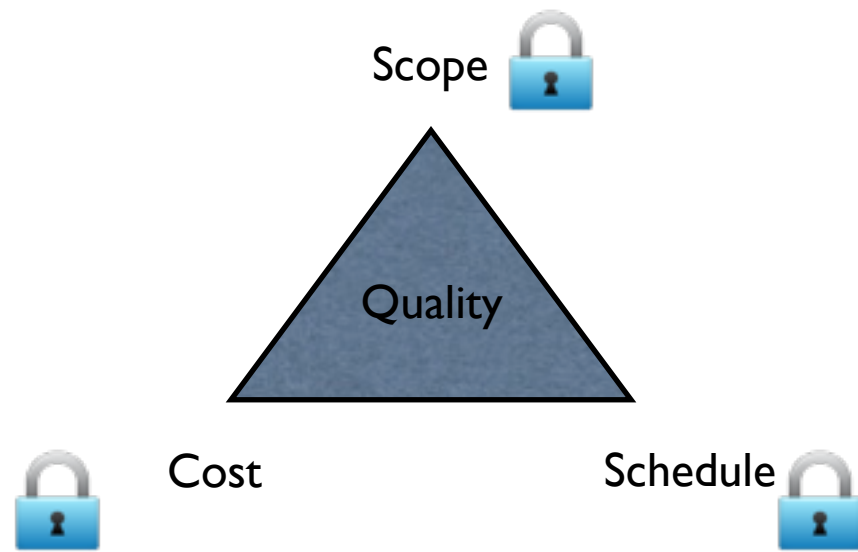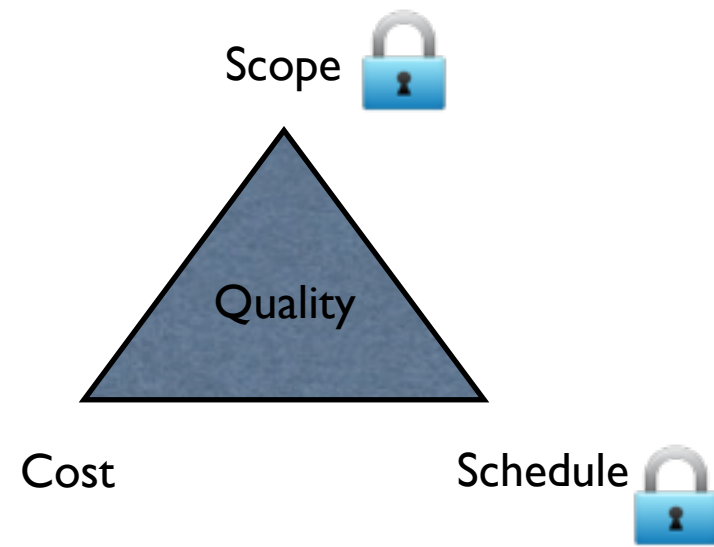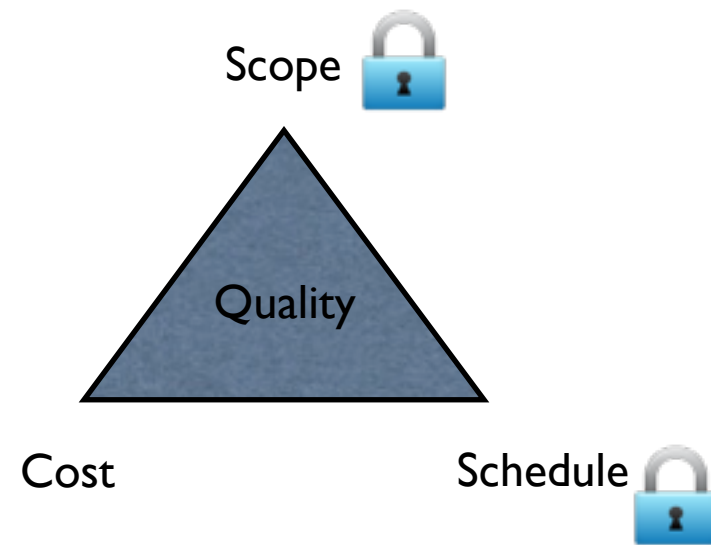265 Splitting backbones and final inspection — hogs ready for cooler, Swift & Co., Chicago, U.S.A. Copyright 1906 by H. C. White Co.

"Fast, Good, Cheap. Pick two!"

Scope

Quality

Cost   Schedule

Scope 🔒

Quality

Cost 🔒

Schedule 🔒

Scope 🔒

Quality

Cost   Schedule 🔒

Scope 🔒

Quality

🔒 Resources   Schedule

Scope 🔒

Quality

🔒 Resources

Schedule

Unfortunately, by the time Rupert's mother had finished knitting his outfit, the war was over.

Scope

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Resources   Schedule
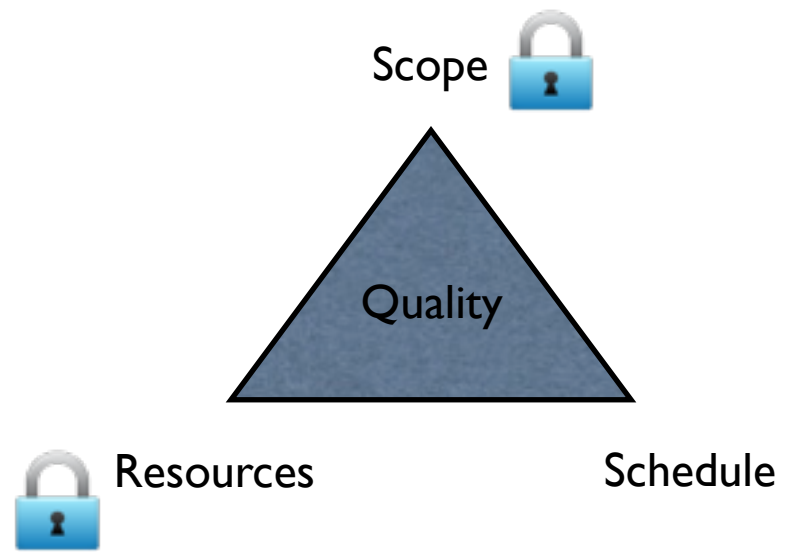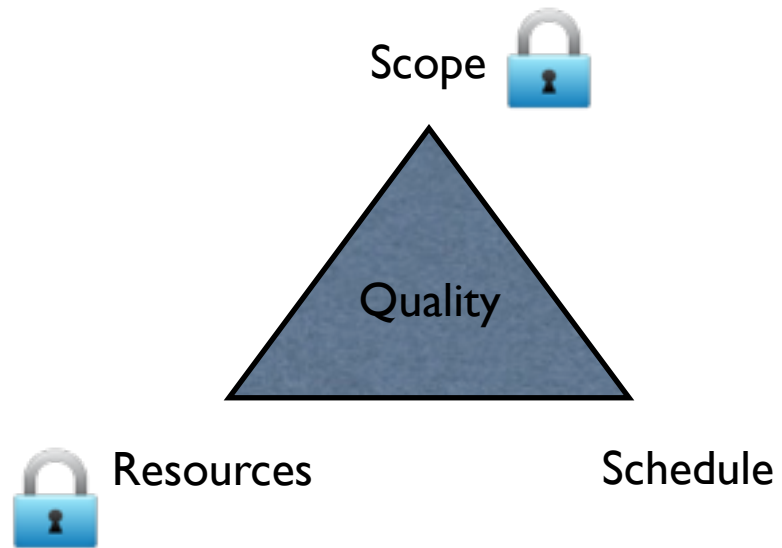
Scope

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Schedule 🔒
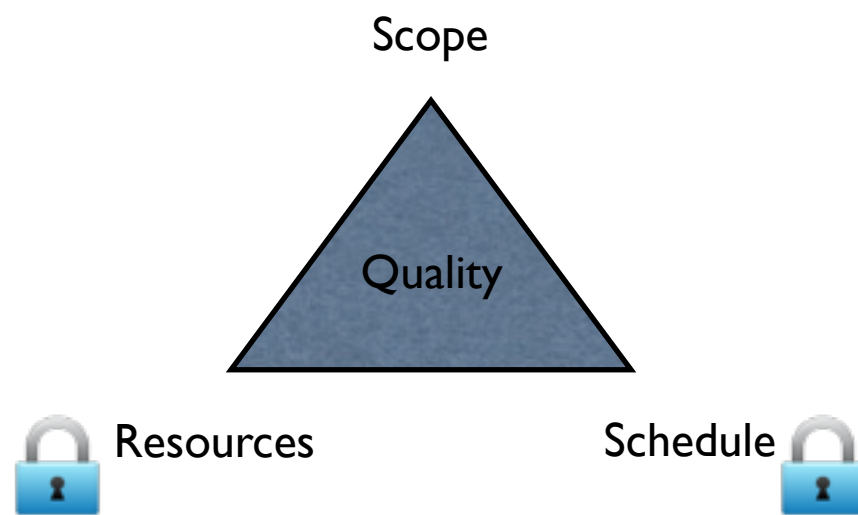
IBM 5150 PC with IBM 5151 monitor

Theory X - employees are inherently lazy and will avoid work if they can and that they inherently dislike work.

Theory Y - employees may be ambitious and self-motivated and exercise self-control. It is believed that employees enjoy their mental and physical work duties.

Seven Lean Principles

- Eliminate Waste
- Amplify Learning
- Decide as Late as Possible
- Deliver as Fast as Possible
- Empower the Team
- Build Integrity In
- See The Whole

(Poppendieck, 2003)

The Toyota Production System

Divide and Conquer

THE MAGIC ROUNDABOUT

Ring road
Cirencester
A 4289

(M4)
Marlborough
Burford
Oxford

Town
centre

H A&E

A 4312
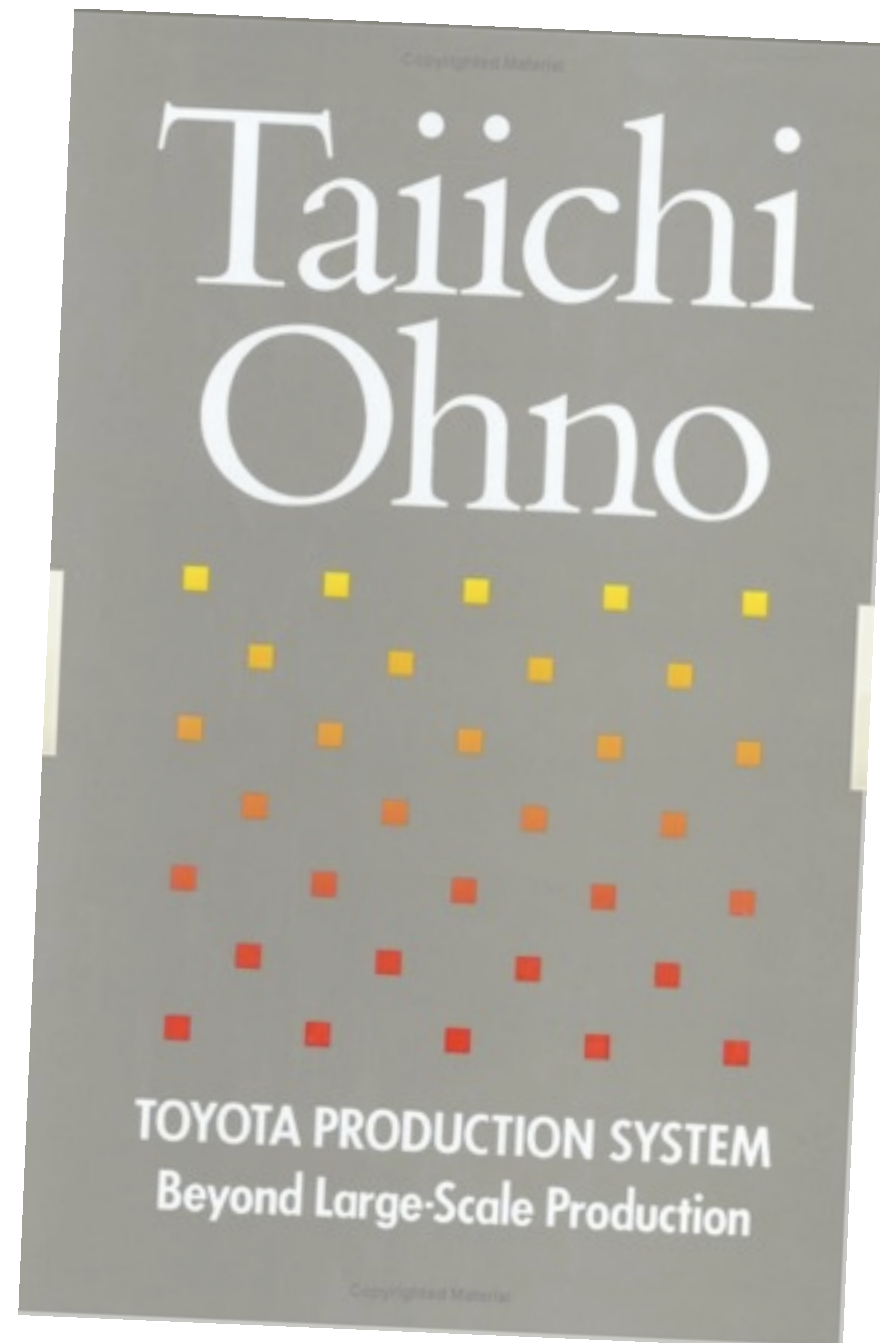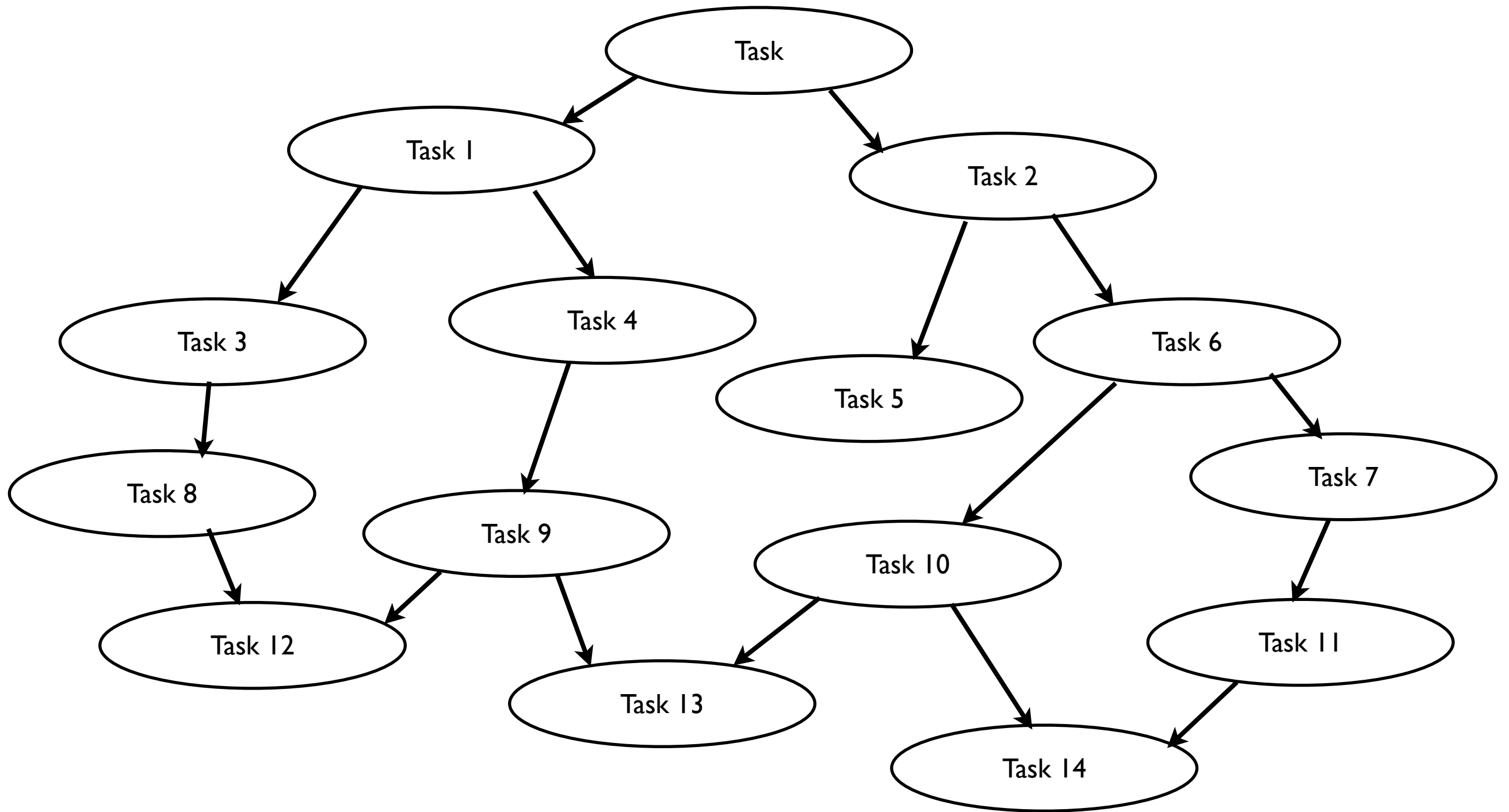
Some thoughts about systems thinking
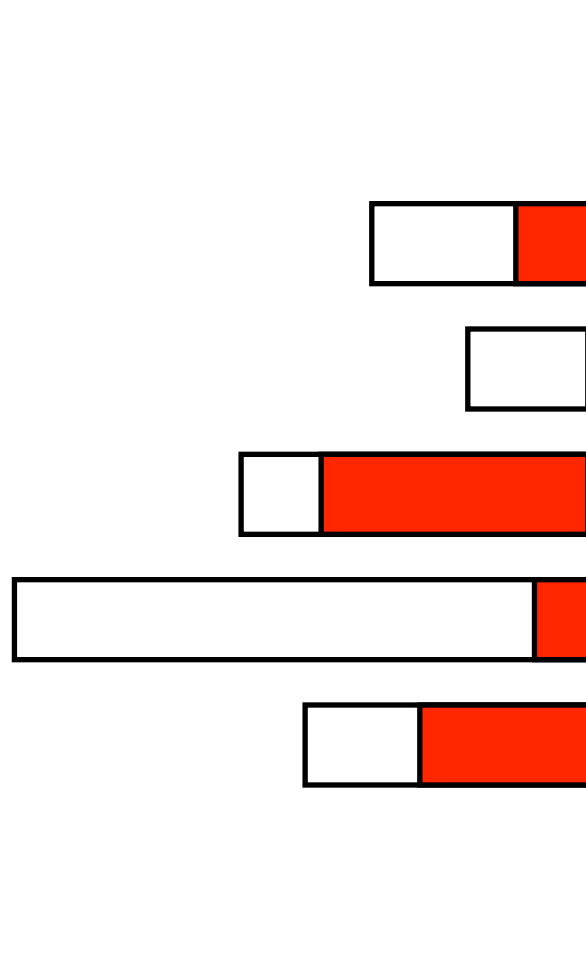
everything has a negative component ...
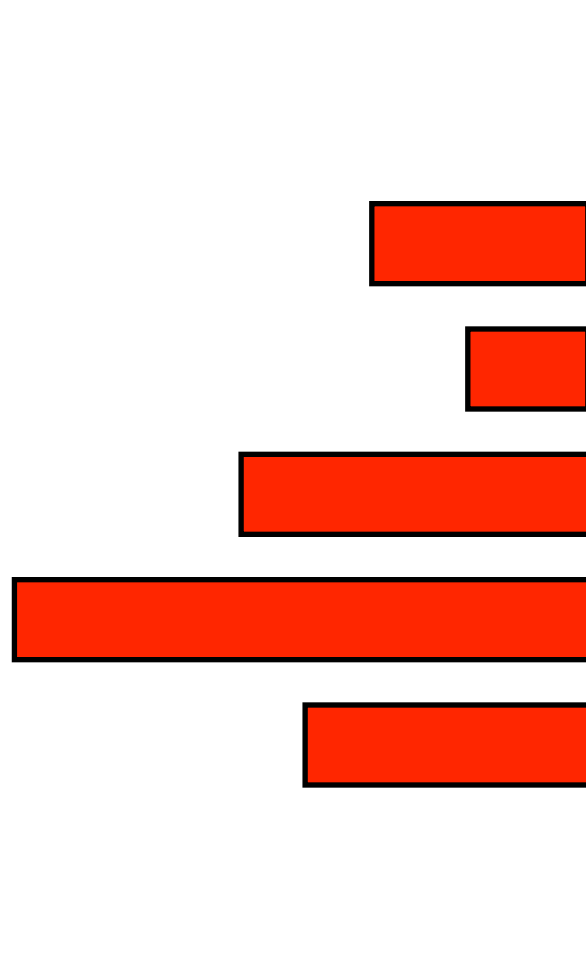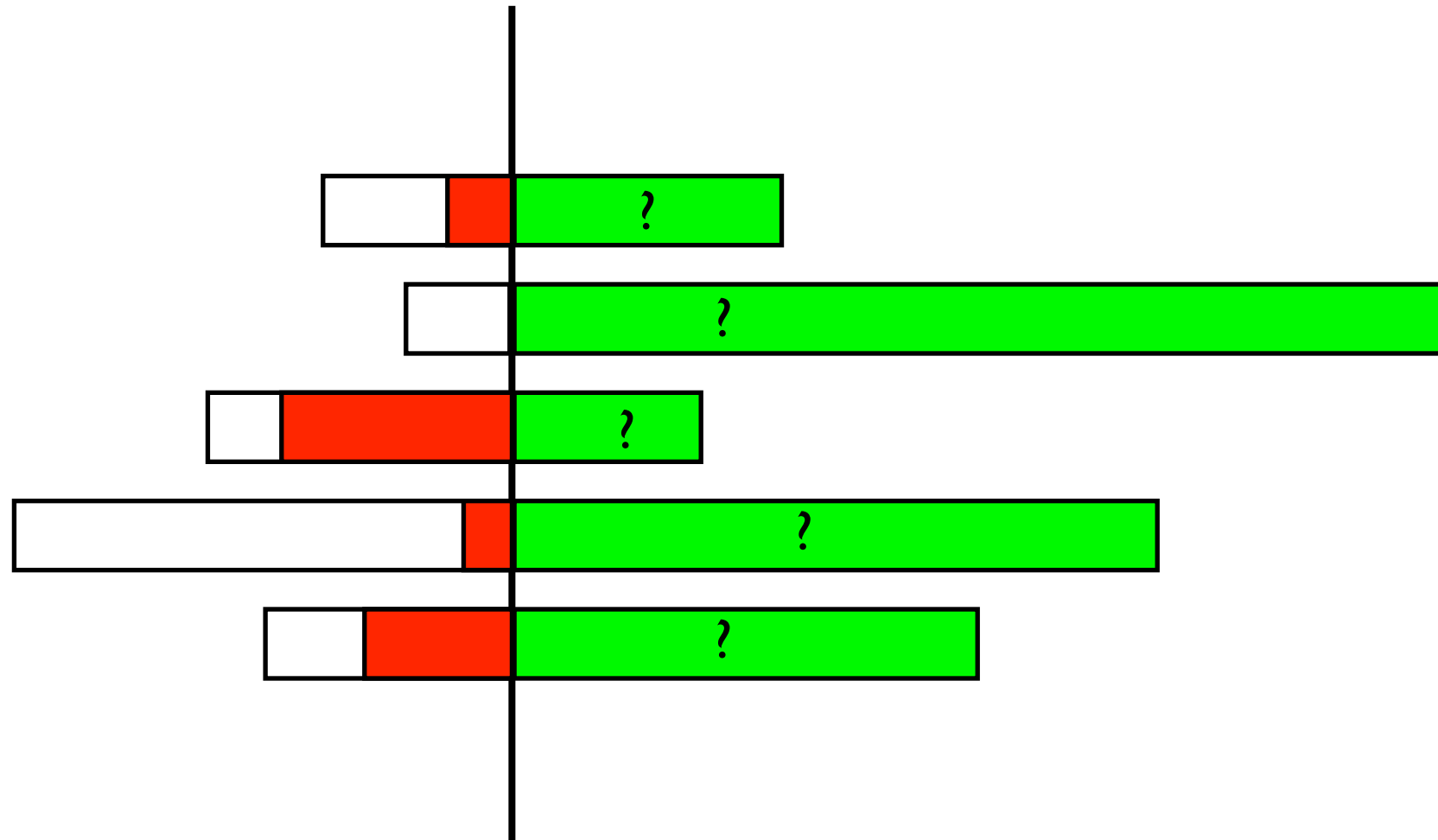
... as well as a positive component
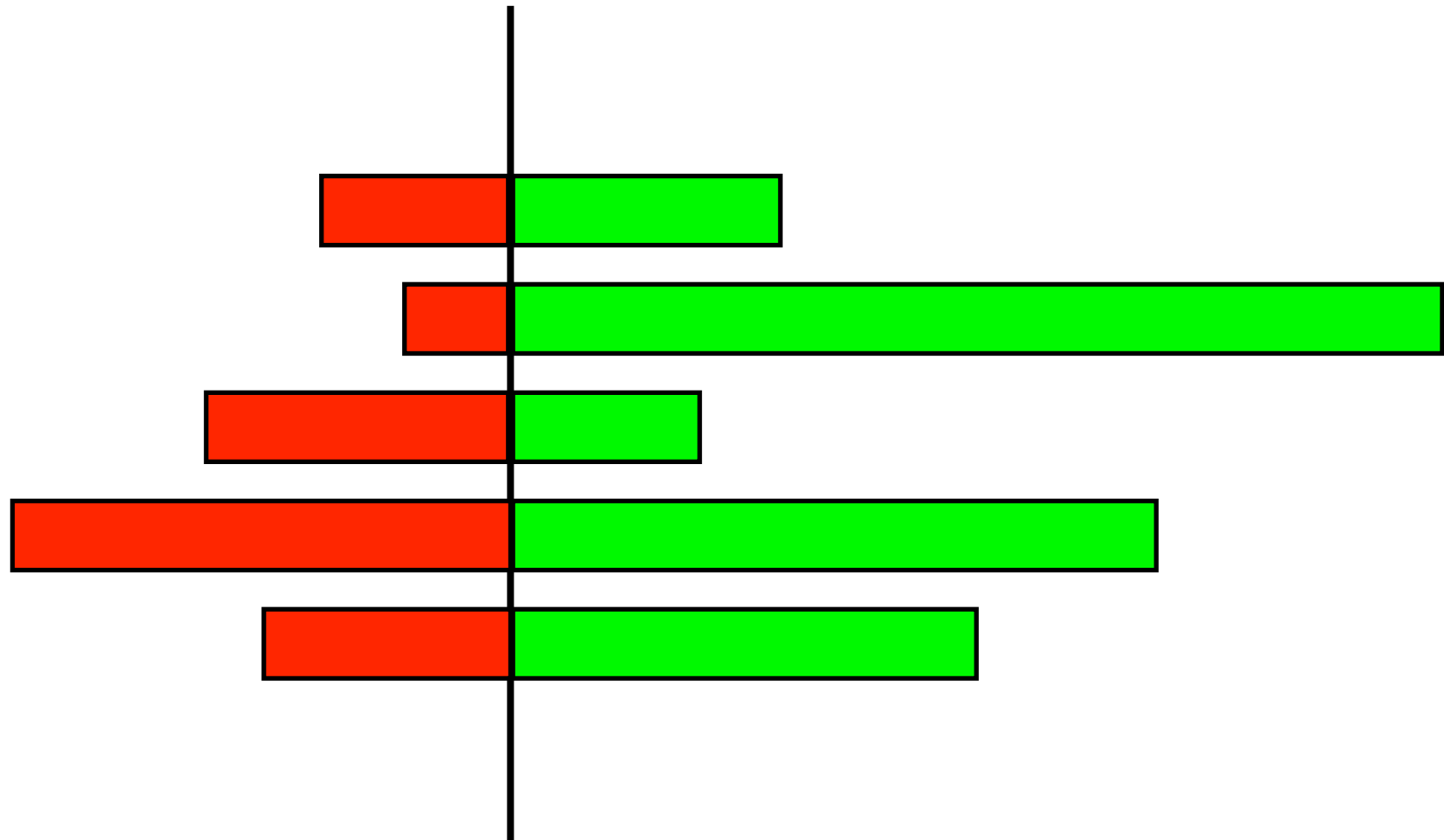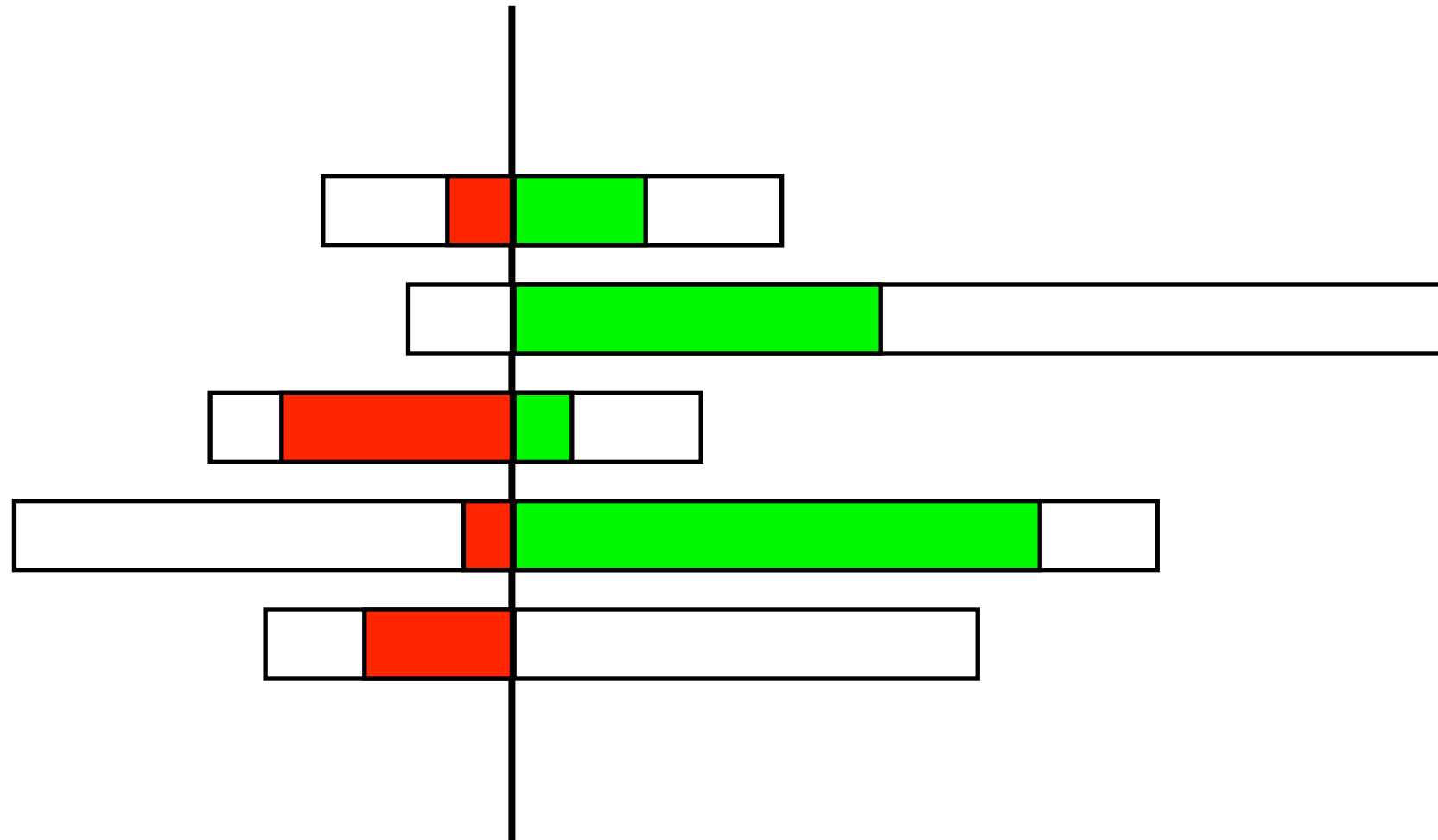
so if you want to improve something...
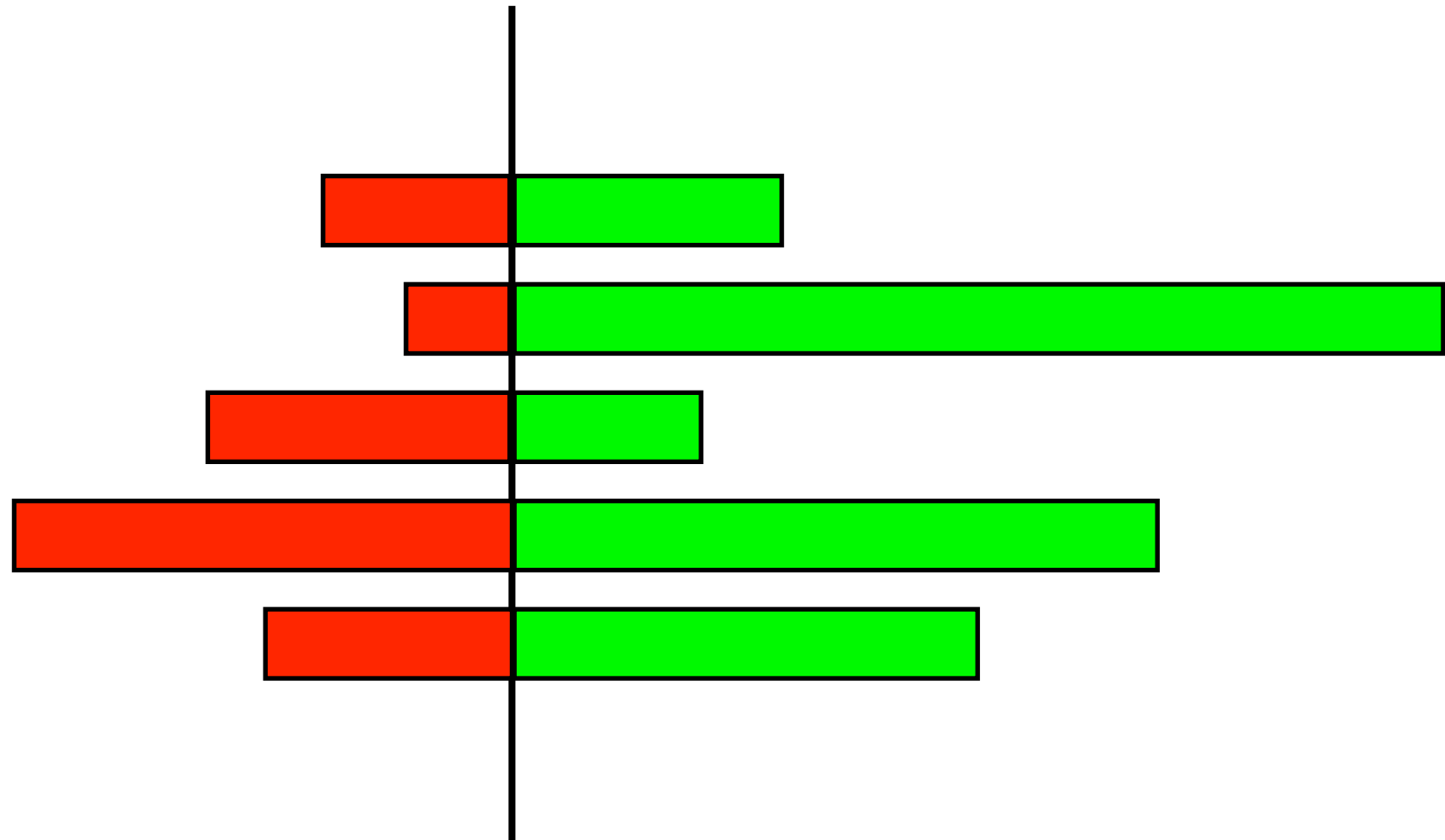
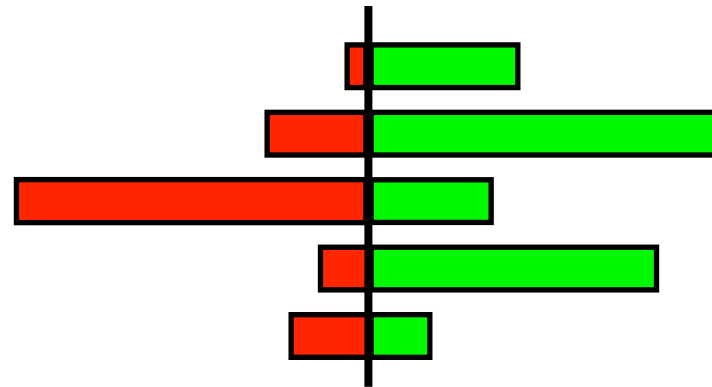... do **<u>not</u>** try to fix the negative stuff ...

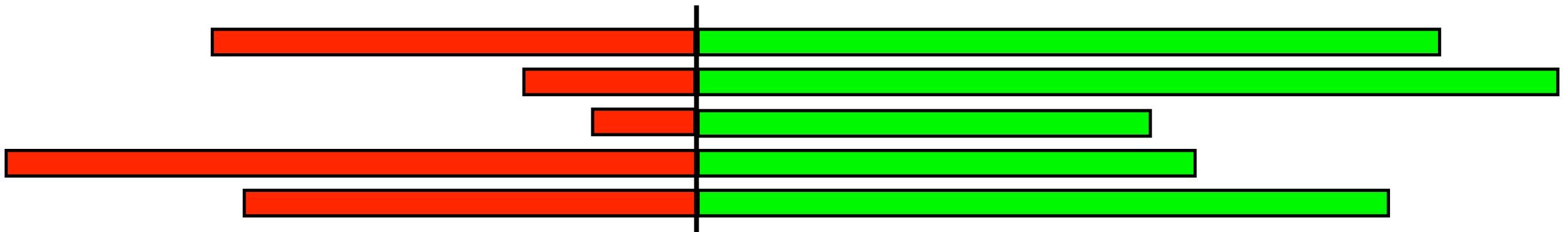# ... without considering how it will affect the positive component

because you might end up by reducing the positive component by even more

good organizations often have a profile like this

great organizations usually have profiles that looks like this

"Managing your problems can only make you good, whereas building your opportunities is the only way to become great." (Good to Great, Collins, 2001)

The more you tighten your grip, Tarkin, the more star systems will slip through your fingers.

(Princess Leia)