

The Future of Software Engineering as seen with SEMAT Glasses

Ivar Jacobson



Yesterday
and to most people also
Today

We all became Agile

Big branded methods getting
out of fashion

'Engineers' -> Craftsmen

Dave Thomas: The word 'agile'
... is effectively meaningless

Challenges to ensure you
have the best method

Challenges with methods
being passive (just books)

Acknowledging the poor state of art of SE
Resulting in the SEMAT-Call for Action

We learnt from books? Here some Rational books



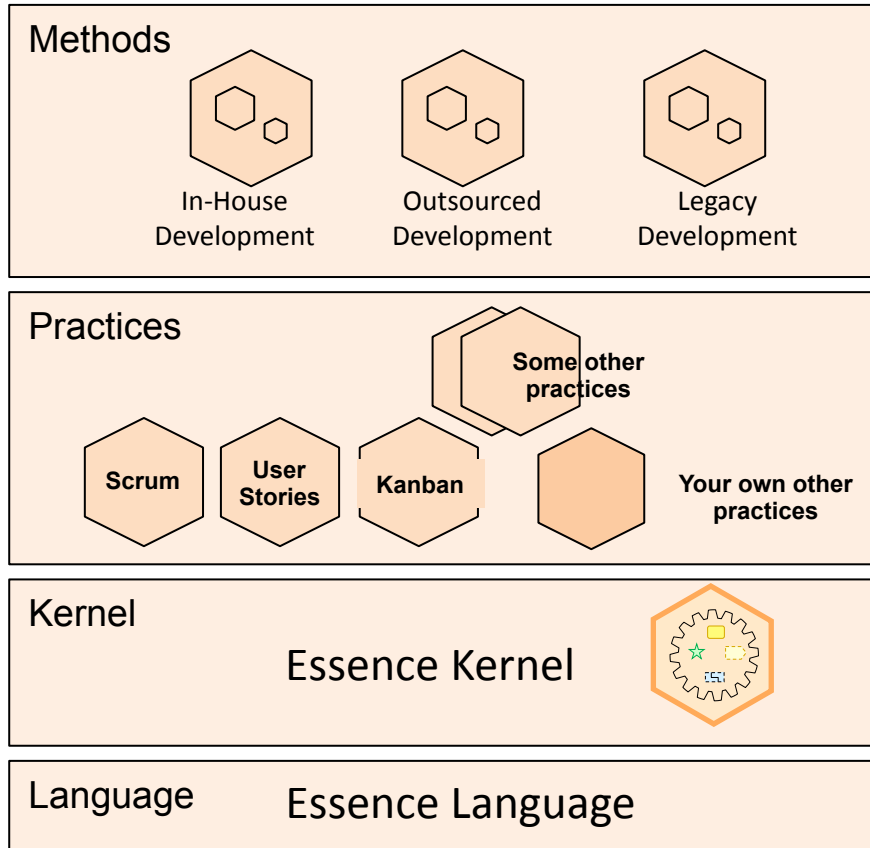
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The New Method Architecture

Method Architecture



Analysts



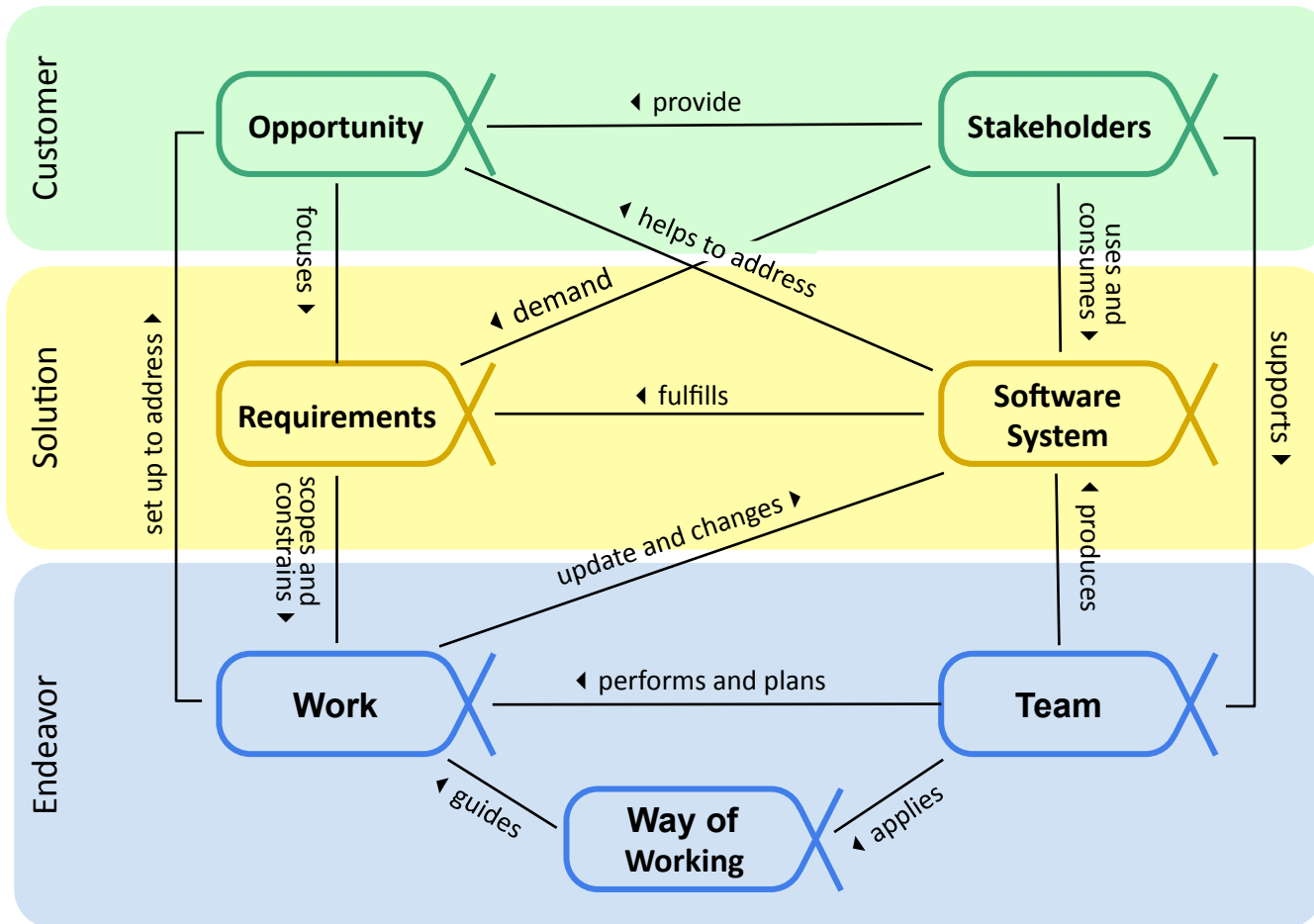
Developers



Testers

Process engineers are secondary

Essence defining the Common Ground



Today



We got Essence – a common ground of software engineering

Methods focused on the essence expressed through superlight user experience

Craftsmen & Engineers
No polarized view

For all of us: developers, executives, teachers, researchers

Comparing Methods by comparing Practices

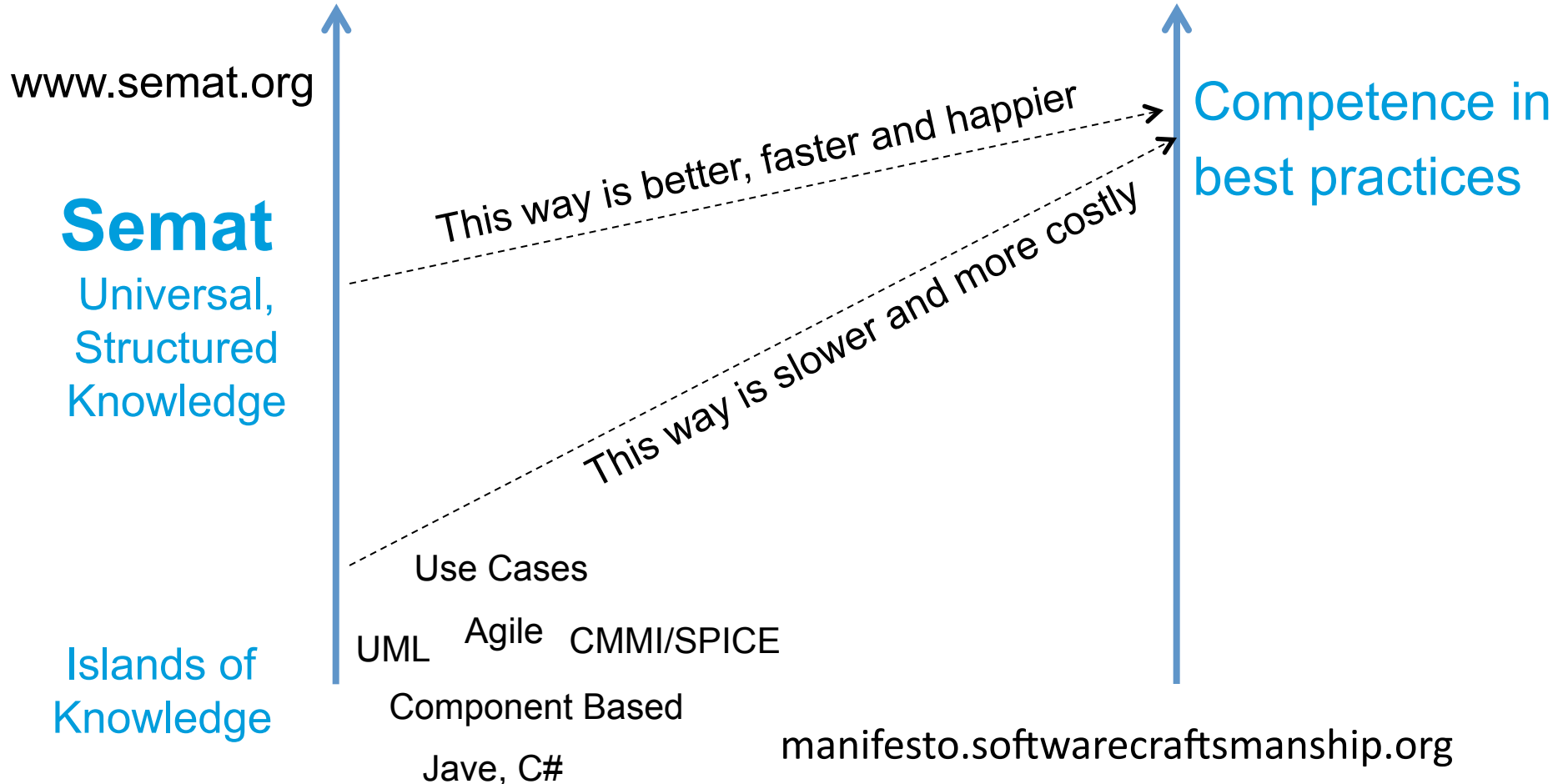
Methods are active supporting the team in doing (not just reading)

We have the Whats of SE
Now we need the Hows

Good Knowledge Base Promotes Professionalism

Knowledge

Professionalism



A detailed image of the USS Enterprise (NCC-1701-A) from Star Trek: Enterprise. The ship is shown from a side-on perspective, flying towards the right. It has a dark grey hull with "U.S.S. ENTERPRISE" and "NCC-1701-A" visible on its side. The ship's saucer section is prominent, and the nacelle is glowing with a bright blue light. The background features a large planet with a ring system, a smaller planet, and a bright star in the lower left corner. The overall scene is set in a deep blue space with numerous stars.

Tomorrow

We will get Practice Libraries

Tools of many kinds:
Essence tools, practice specific tools

100s of composable Practices

Expert Systems/Intelligent
agents

**Practices are First-Class
citizens, Methods are just
compositions of Practices**

**Methods are active
supporting the team in
doing (not just in reading)**

Now we are getting the Hows

Tomorrow

Bill Gates: The Road Ahead

Newsweek December 19, 2005:
"How 'intelligent agents' and mind-mappers are taking our information democracy to the next stage."



IT'S HAPPENING:
Smarter software
is turning mere data
into real knowledge

Bill Gates
The Road Ahead
How 'intelligent agents' and mind-mappers are taking our information democracy to the next stage.

IT'S HARD TO SAY EXACTLY WHEN IT HAPPENED, BUT AT SOME point in the last 20 years the word "knowledge" became an adjective. An intellectual property became increasingly important to businesses, and personal computers started appearing on every desktop; employees morphed into knowledge workers; companies began to focus on knowledge management and key information was stored in knowledge bases connected—in theory—via knowledge networks.

IT'S HAPPENING:
Smarter software is turning mere data into real knowledge

The result was the knowledge economy, a phenomenon that has transformed the business of business and helped create emerging economies in respectably. For this is only the beginning. Most of the "knowledge" on which the knowledge economy is built is actually just information—data, facts and basic human intelligence. Knowledge itself is more profound. As management guru Peter Drucker once put it, "Knowledge is information combined with experience, wisdom, interpretation and reflection." If the knowledge derived from information that gives you a competitive edge.

Most of us now live in an "information democracy"—if you have access to a PC and the Internet, you can tap into almost all the information that is publicly available worldwide. Web-based software and Web services can help track, store and filter the information in ways that were impossible only a decade ago. But while we've gone a long way toward optimizing how we use information, we haven't put about the same on the knowledge.

This is a vast growth opportunity, and it's surprisingly unglamorous. While information means on the face, knowledge is much "stickier"—harder to communicate, more subjective, less easy to define. For instance, the knowledge you accumulate throughout your career—the "tacit" knowledge, which is that the "explicit" knowledge found in, say, manuals or text books—defines your value to the organization you work for. Your ability to combine it with the knowledge of co-workers, partners and customers can make the difference between success and failure—for you and your employer. Yet today, even having an arsenal of knowledge within a company or profession can be daunting.

But as software gets smarter, it's starting to help those synthesize and manage knowledge, too. Some of this technology is deceptively simple. Software, such as our own OneNote, helps people take and organize their typed and sketched notes using a "pen and paper" approach that is more abstract than text-based word processors. On another level, there's also a new generation of "mind-mapping" software that also can act as a digital "think tank" to help connect and synthesize ideas and data—and

obviously create new knowledge. Researchers like ours are developing technology that can automatically "track" your working flow, making suggestions about related subjects or files, knowledgely, even if the software makes a bad guess, it can still be valuable in helping you move ideas. Computer scientists are also making progress against a long-held dream of "intelligent agents" that anticipate your needs and proactively join in your behavior that's relevant to the work you're doing. Experimental programs like ours are learning to capture and use your ideas against common-sense logic, spotting flaws in hypotheses and acting as "virtual subject experts" to help guide your thinking.

These technologies promise corollaries—literally, the "jumping to gether" of knowledge from different disciplines. They help people combine their own ideas with at least some existing knowledge that more efficiently than was previously possible. But they also have a key problem on which how to succeed at the most: ideas that are being generated around the world.

Today's smart engines are good at finding hidden patterns in an ocean of data, and even at finding answers to simple questions. The next step is better recognizing regions and causal links in the big picture and assess the value of all that information, and to help those that have our minds data with meaning and context. Some of it is tedious tasks: the technologies that make it possible already exist.

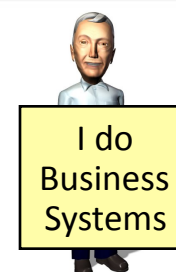
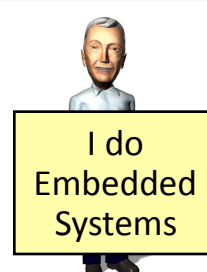
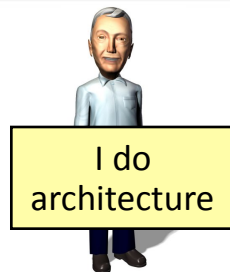
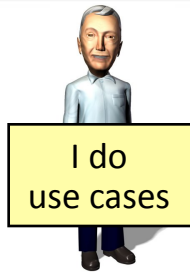
The power they hold is held in a program, because that's how it's stored. It's how it's stored that the value of a network is roughly equal to the square of the number of people using it. "My World's Law" applies equally to knowledge: being able to tap into the world's ideas and thinking on a daily basis is now more than a wish for information will revolutionize business, science and education. It will literally revolutionize how we think—and help to finally realize the potential of a truly global knowledge economy.

Talk
...an survey on the knowledge economy in the January 2006 Special Report at: Newsweek.com

...is the chairman of Microsoft.

24 NEWSWEEK DECEMBER 19, 2005 www.newsweek.com

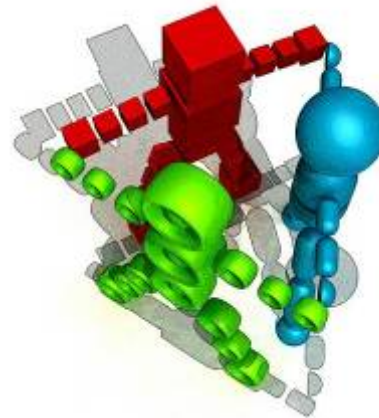
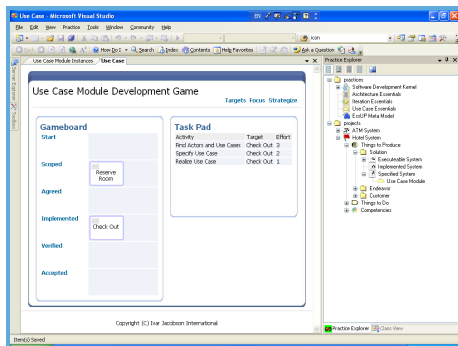
Smart Practices are intelligent agents for software development



- Virtual Pair
- Programmers
 - Analysts
 - Designer
 - Tester
 - Project Managers

Active Guidance

provides expert advice just when needed



Active Review

monitors status, progress and quality (individual/mgmt)

Active Automation
delegates mundane tasks

What is in it for the developers?

What is in it for the teachers?

What is in it for the executives?

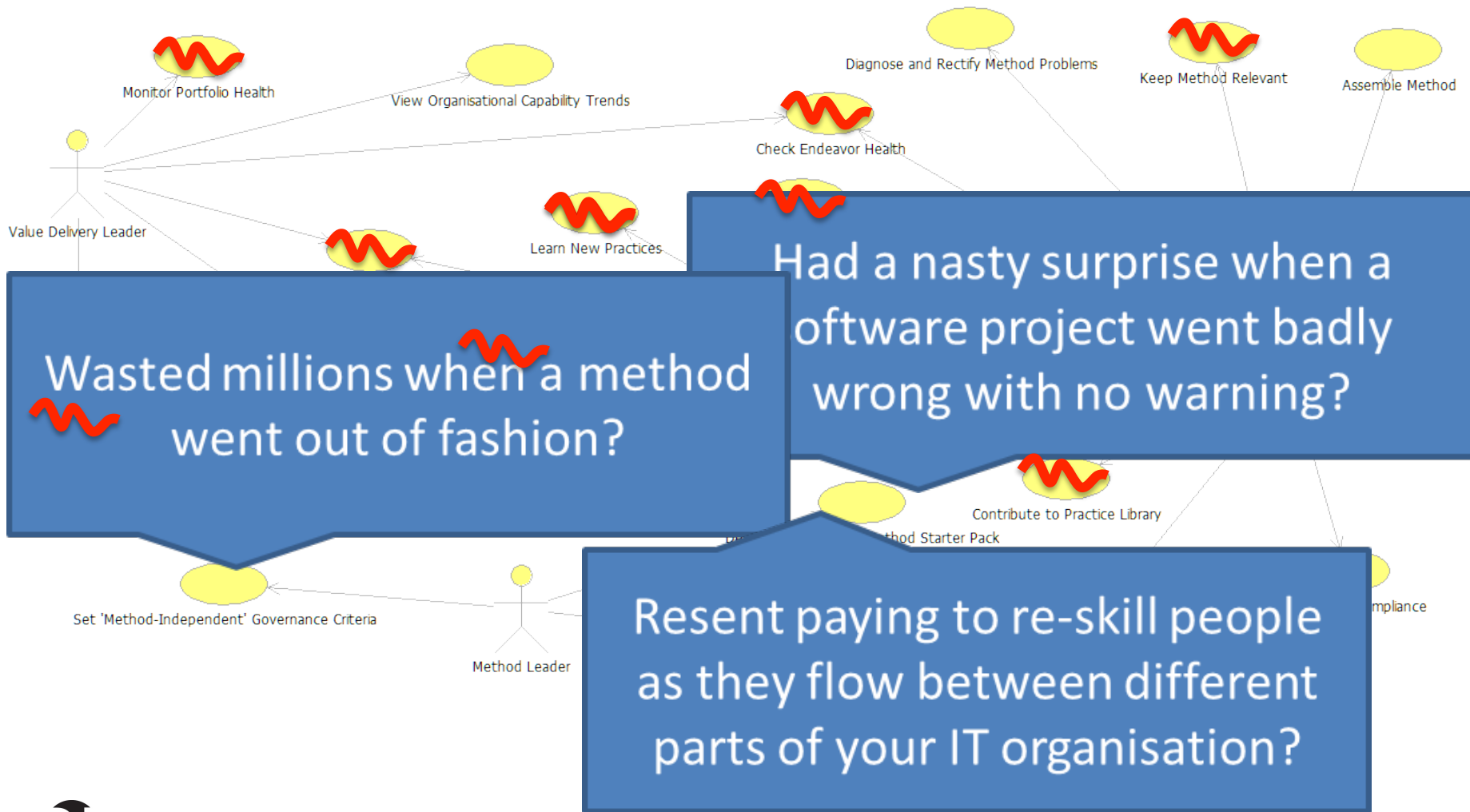
What is in it for the researchers?

**Agile – from Craft to
Engineering**

**Software companies need
many practices – powered
by Essence**

**We have refounded Software Engineering
--What's next?**

Pain to Essence Value Mapping



System engineering

Generic endeavors

Project/Business engineering

Innovation practices getting more important than development practices

Industry adoption

Academic adoption

More on Tomorrow

We have made a paradigm shift!

Summary

- Watts Humphrey said ahead of the first SEMAT meeting in Zurich, March 2010, when he said: “This meeting in Zurich is likely to be a historic occasions much like the 1968 NATO session in Garmish.”

