SEMAT

THE SMARTER WAY

The Semat Initiative

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IVAR JACOBSON INTERNATIONAL

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The Semat initiative

www.semat.org

Founded by the Troika in
Sep 2009:

Ivar Jacobson
Bertrand Meyer
Richard Soley

As an Industry

Everyone of us knows how to develop our software,

but as an industry we don't know it

We don't have a widely accepted foundation

Who said that? ☺

…we look like a fashion industry

Software Development is driven by fashions and fads

- Fifteen years ago it was all about OO
- Ten years ago it was about components, UML, Unified Process
- Five years ago it was about RUP and CMMI
- A few years ago it was about XP
- Last year it was about Scrum
- Now it is about Lean or Kanban

All good, but none has all you need!

A CASE FOR ACTION STATEMENT

- Software engineering is gravely hampered today by immature practices. Specific problems include:
  - The prevalence of fads more typical of fashion industry than of an engineering discipline.
  - The lack of a sound, widely accepted theoretical basis.
  - The huge number of methods and method variants, with differences little understood and artificially magnified.
  - The lack of credible experimental evaluation and validation.
  - The split between industry practice and academic research.

This is not smart!

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This is not smart!

CASE FOR ACTION STATEMENT cont'd

- We support a process to refound software engineering based on a solid theory, proven principles and best practices that:
  - Include a kernel of widely-agreed elements, extensible for specific uses
  - Addresses both technology and people issues
  - Are supported by industry, academia, researchers and users
  - Support extension in the face of changing requirements and technology

This is smart!

Signatories as of June 30, 2010

For current list, please see www.semat.org

- Pekka Abrahamsson,
- Scott Ambler,
- Victor Basili,
- Jean Bézivin,
- Dines Bjorner,
- Barry Boehm,
- Alan W. Brown,
- Larry Constantine,
- Steve Cook,
- Bill Curtis,
- Donald Firesmith,
- Erich Gamma,
- Carlo Ghezzi,
- Tom Gilb,
- Ellen Gottesdiener,
- Sam Guckenheimer,
- Robert Grass,
- David Harel
- Brian Henderson-Sellers,
- Watts Humphrey,
- Martin Griss,
- Capers Jones,
- **Ivar Jacobson**,
- Philippe Kruchten,
- Robert Martin,
- Stephen Mellor,
- **Bertrand Meyer**,
- James Odell,
- Meilir Page-Jones,
- Dieter Rombach,
- Ken Schwaber,
- Alec Sharp,
- **Richard Soley.**
- Andrey Terekhov
- Ed Yourdon

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Agile,
Iterative,
RUP,
Computer
science,
Metrics,
CMMI,
Etc.

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Corporate Signatories as of May 9, 2010

- ABB
- Ericsson
- Fujitsu UK
- IBM
- Microsoft, Spain
- SAAB
- Samsung SDS
- Software Engineering Center - Korea
- Telecom Italia
- City of Toronto, Ontario
- Wellpoint

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Some challenges addressed by SEMAT

Industry

Big companies have many processes. Challenges:
-Reuse practices
-Reuse training
-“Reuse” of people
-Evolutionary improvement is hard

Developers

Want to become experts. Challenges:
-Their skills are not easily transferable to a new product.
-Their career path follows a zig-zag track from hype to hype.

Academics

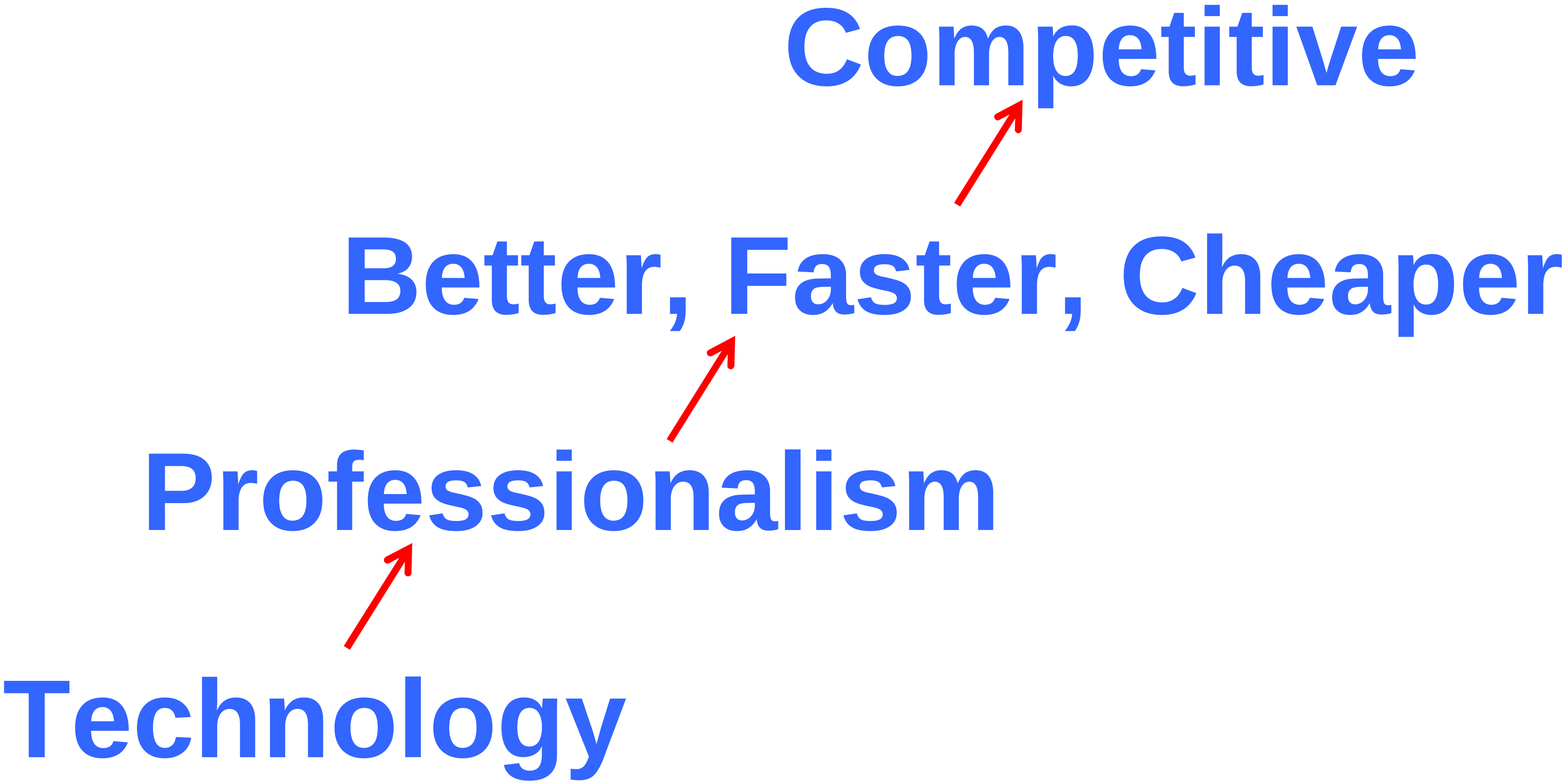
Asked to educate and research. Challenges:
-The Gap between research and industry
-No widely accepted theory
-Teaching instances of methods doesn’t create generalists

Methodologists

Every method is a soup of practices. Challenges:
-Have to reinvent the wheel

SEMAT will have significant impact on the software community.

The path to success



Competitive

Better, Faster, Cheaper

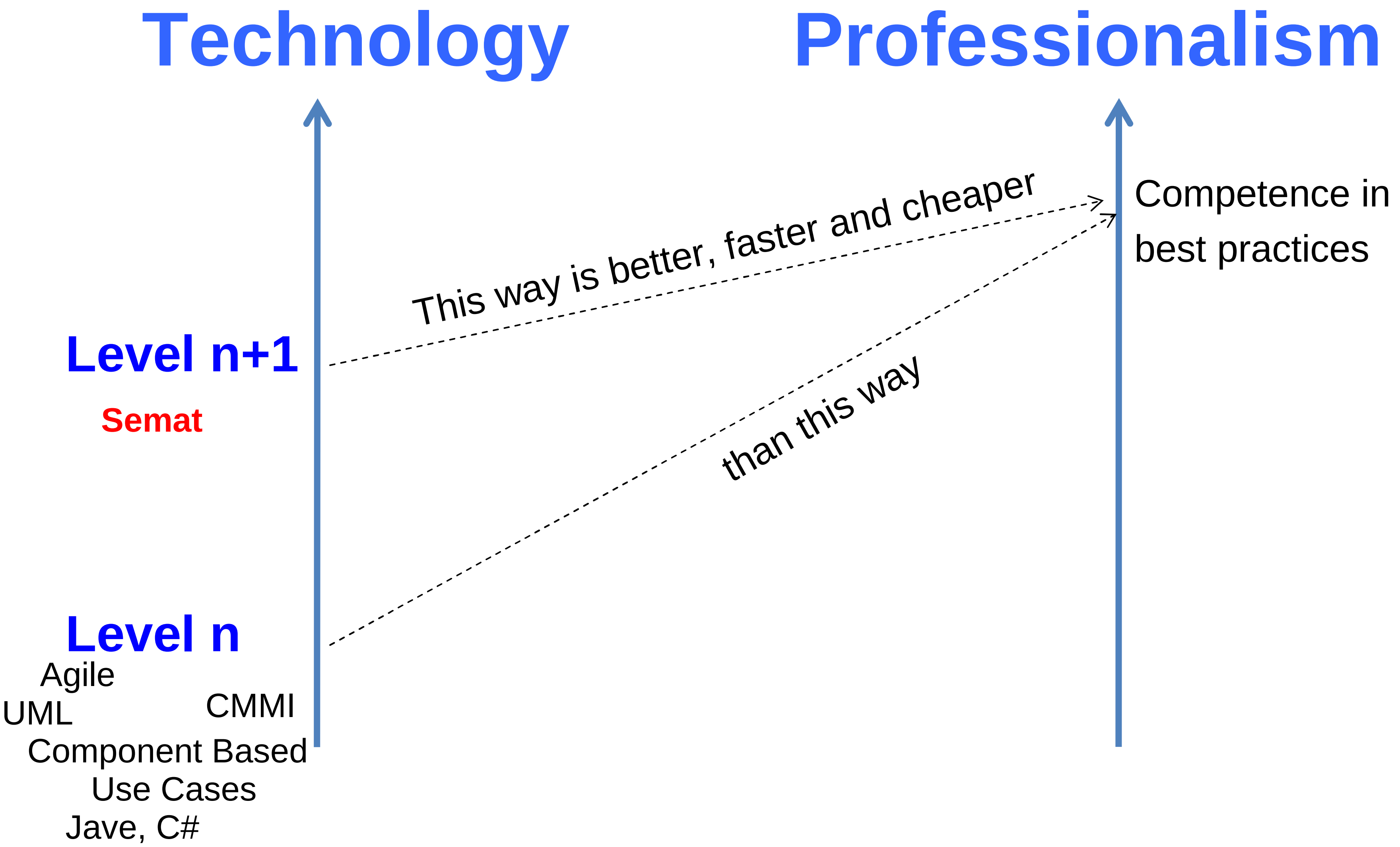
Professionalism

Technology

How will Semat help?

- Semat is smart way to organize knowledge about software development practices that allow you to
  1. Reuse practices within a company, compare practices, compose practices into methods
  2. Systematically change an existing method in small manageable steps, independent on which this method is
  3. Focus your development resources on creative solutions instead of reinventing the wheel.
  4. Raise the competence level in software development for the whole software community by learning software engineering at its roots instead of learning by examples only
  5. Become more professional in what software development really is and to effectively learn about more advanced techniques than just basics. For example really understanding SOA, EA, PLA and not just application development
  6. Get your research useful to the industry and not just give you an academic title

Technology helps become professional



Technology

Professionalism

Competence in best practices

This way is better, faster and cheaper

than this way

Level n+1

Semat

Level n

Agile

UML

CMMI

Component Based

Use Cases

Jave, C#

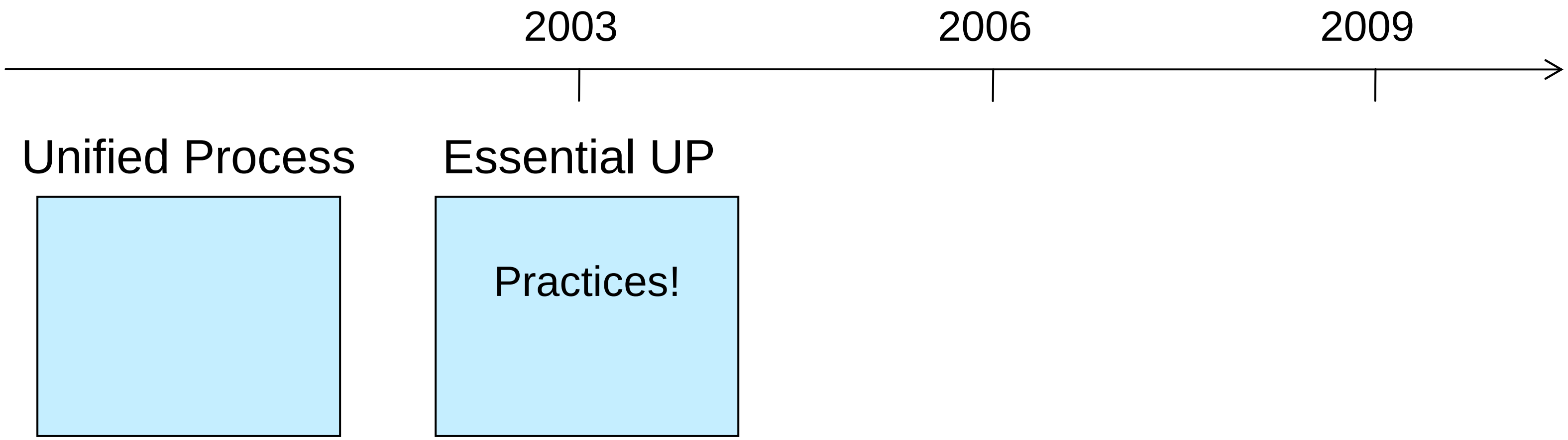
Semat is not

- A new Unified Method
- It doesn’t compete with any method -- agile or not
    - It is inclusive of all practices, both good and bad
- It doesn’t compete with SWEBOK, SPEM, OPF, EPF, …

- Semat is instead about finding what we all agree is common in software engineering and use this commonality to explain what is different between different methods, practices, etc.

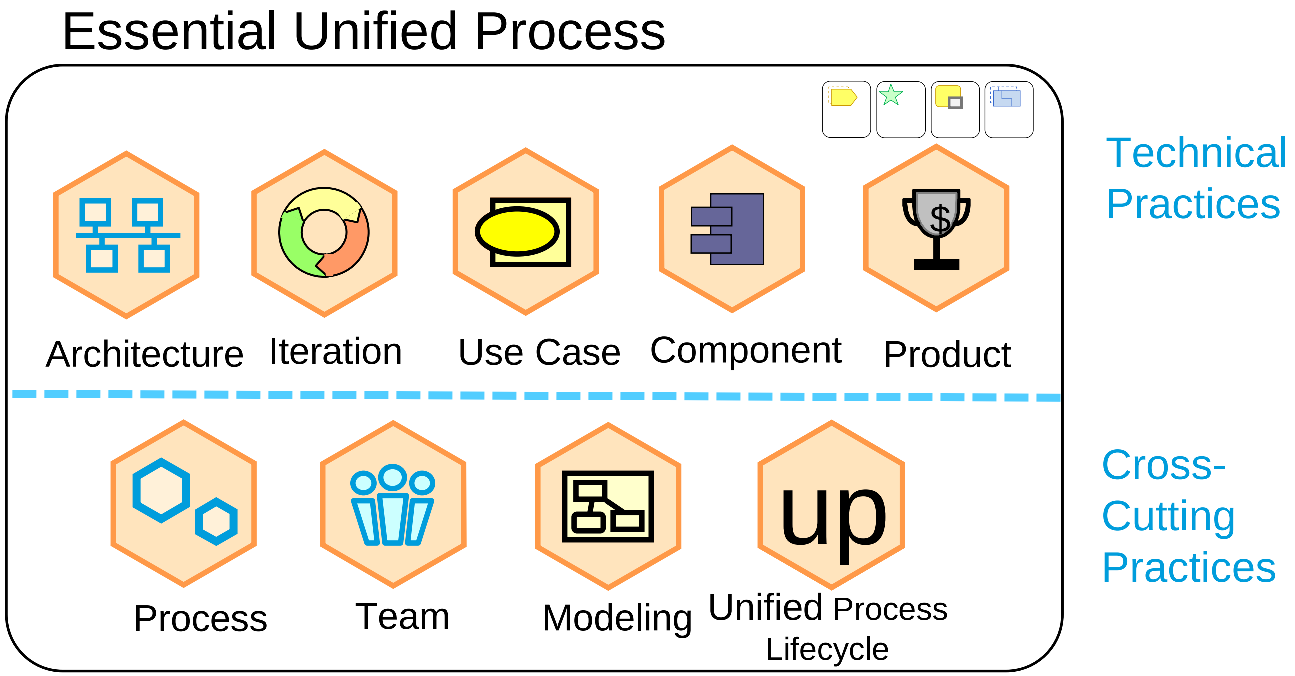
Path to SEMAT (personal)

- Following experience-based evolution:



All methods are compositions of practices

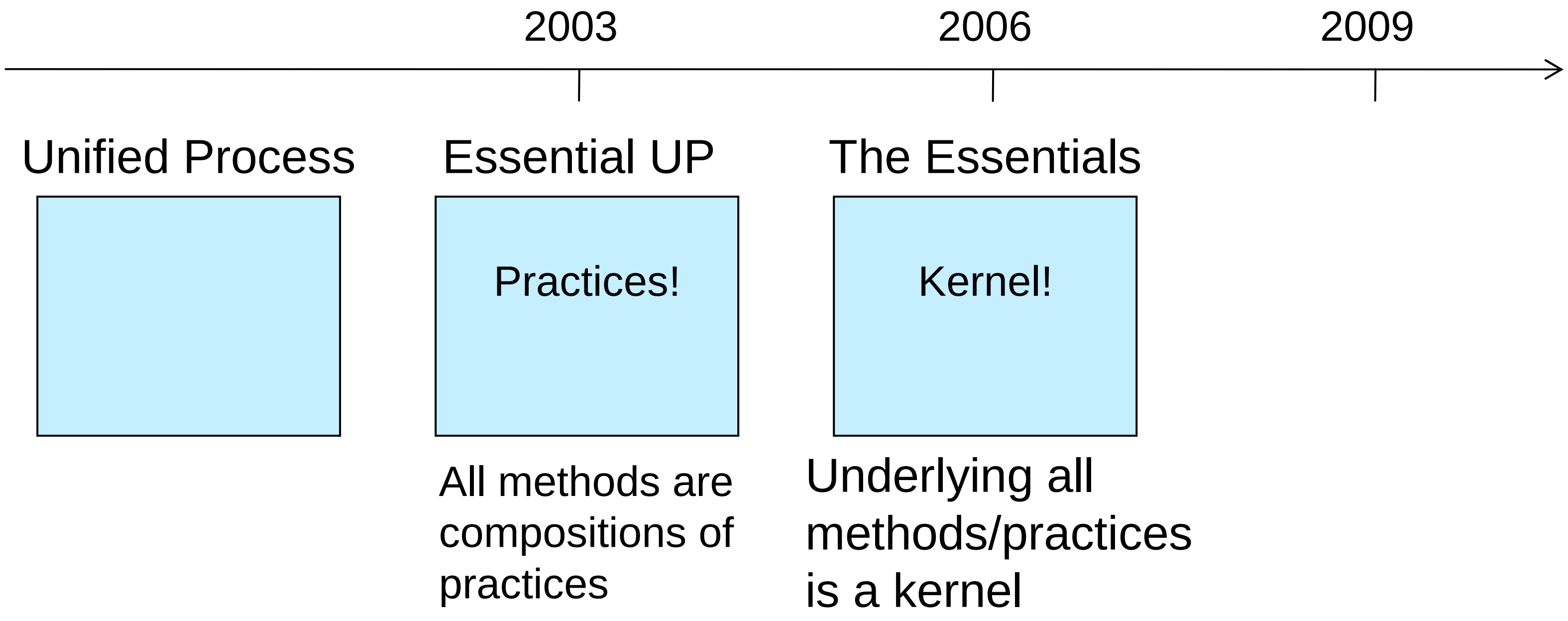
From the Unified Process to the Essential Unified Process



Great, but now more became evident!
There is a kernel!
Many different methods can be built on top of this same kernel.

Path to SEMAT (personal)

- Following experience-based evolution:



2003

2006

2009

Unified Process

Essential UP

Practices!

All methods are compositions of practices

The Essentials

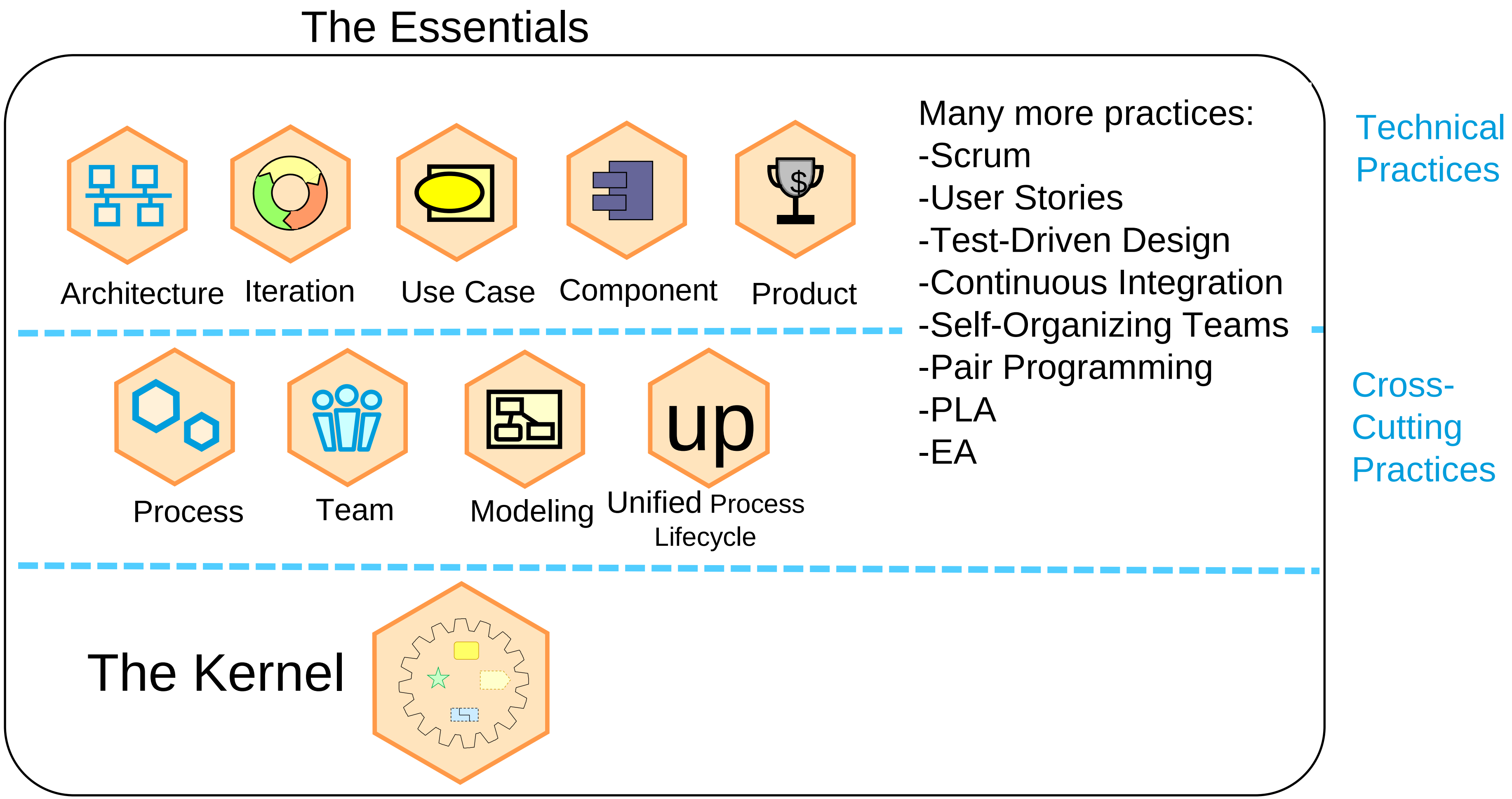
Kernel!

Underlying all methods/practices is a kernel

Michelangelo (attributed) “I am freeing the statue from the block”.

Paraphrasing him: “We are freeing the kernel from the methods”.

From the Essential Unified Process to The Essentials



The Essentials

Architecture

Iteration

Use Case

Component

Product

Process

Team

Modeling

Unified Process Lifecycle

The Kernel

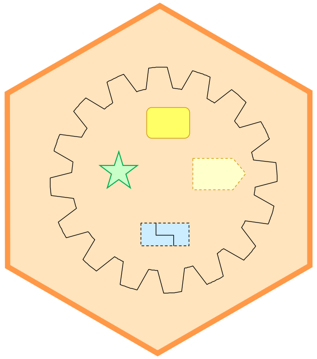
Many more practices:
- Scrum
- User Stories
- Test-Driven Design
- Continuous Integration
- Self-Organizing Teams
- Pair Programming
- PLA
- EA

Technical Practices

Cross-Cutting Practices

What is in the Kernel

- The Kernel we harvested is very small, extracted from a large number of methods
- The Kernel is practice and method agnostic.

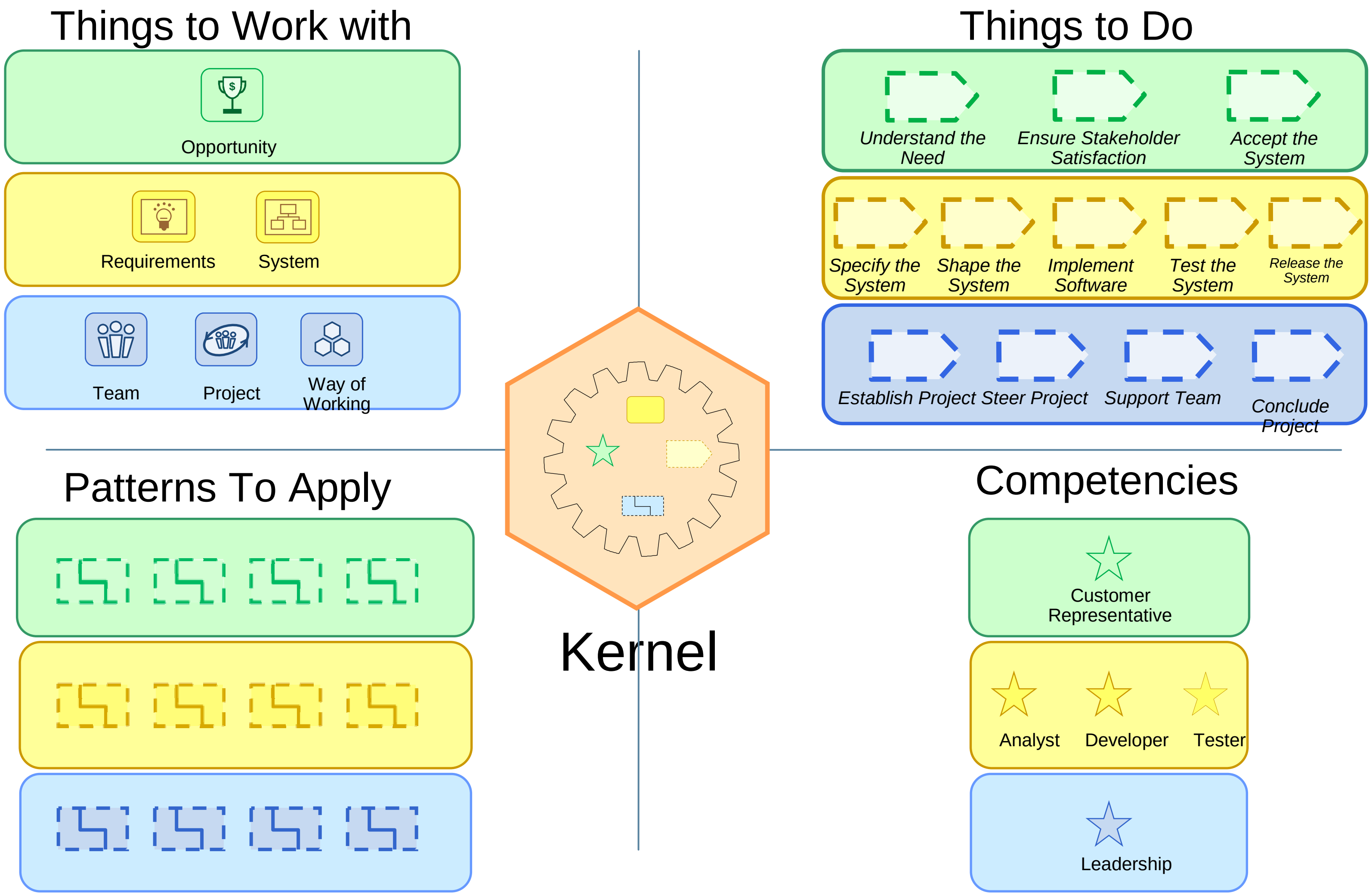


Kernel

The Kernel includes the essence of software engineering

The EssWork Kernel

- contains empty slots for things that every process have



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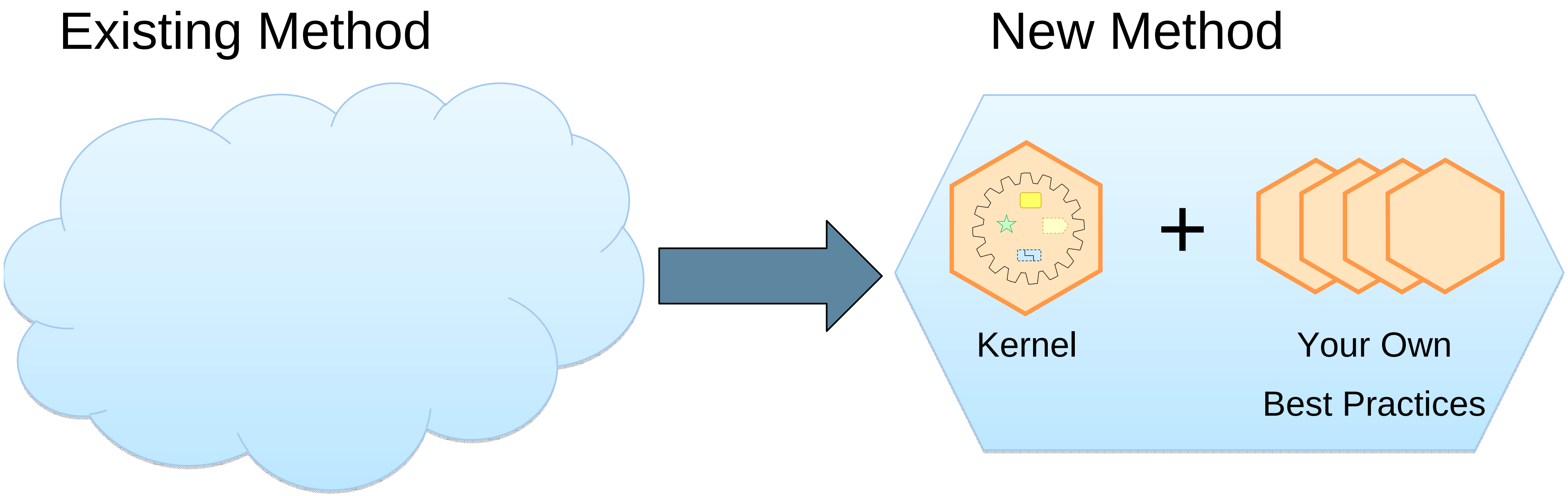
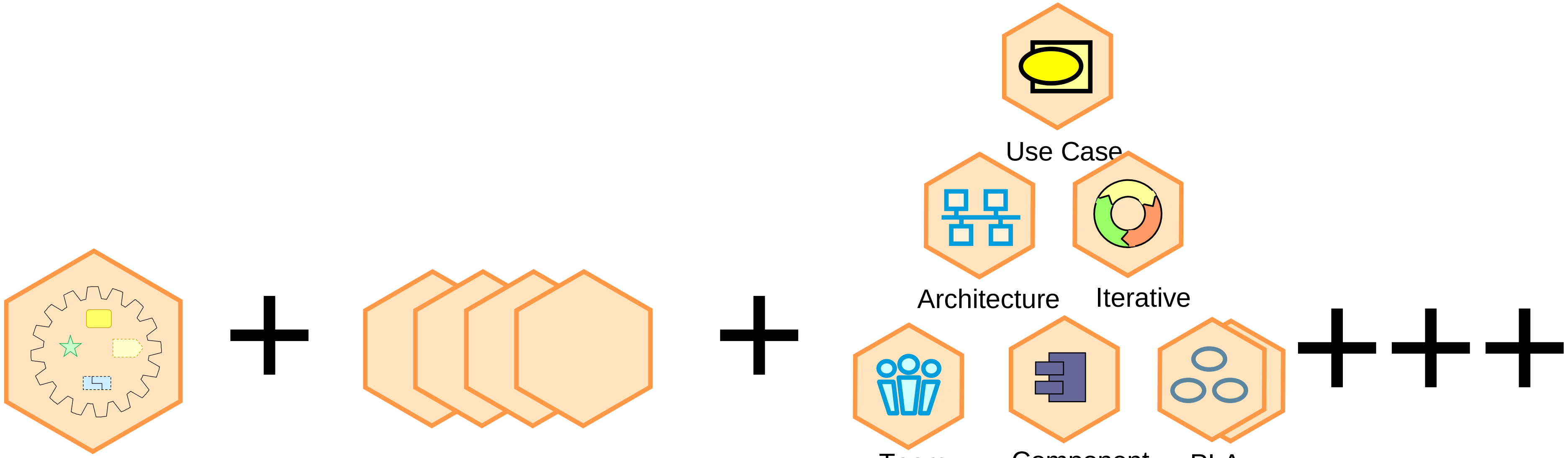
Method evolution

Change starts by harvesting your best practices from your own method



You get a method structured for the future

Improve your method by adding other, proven practices



Kernel

Your Own

Best Practices

Other Practices

From Many Sources

OK, there is a kernel!
Maybe there are many?
But none is widely-accepted!
That needs to be changed!

Path to SEMAT (personal)

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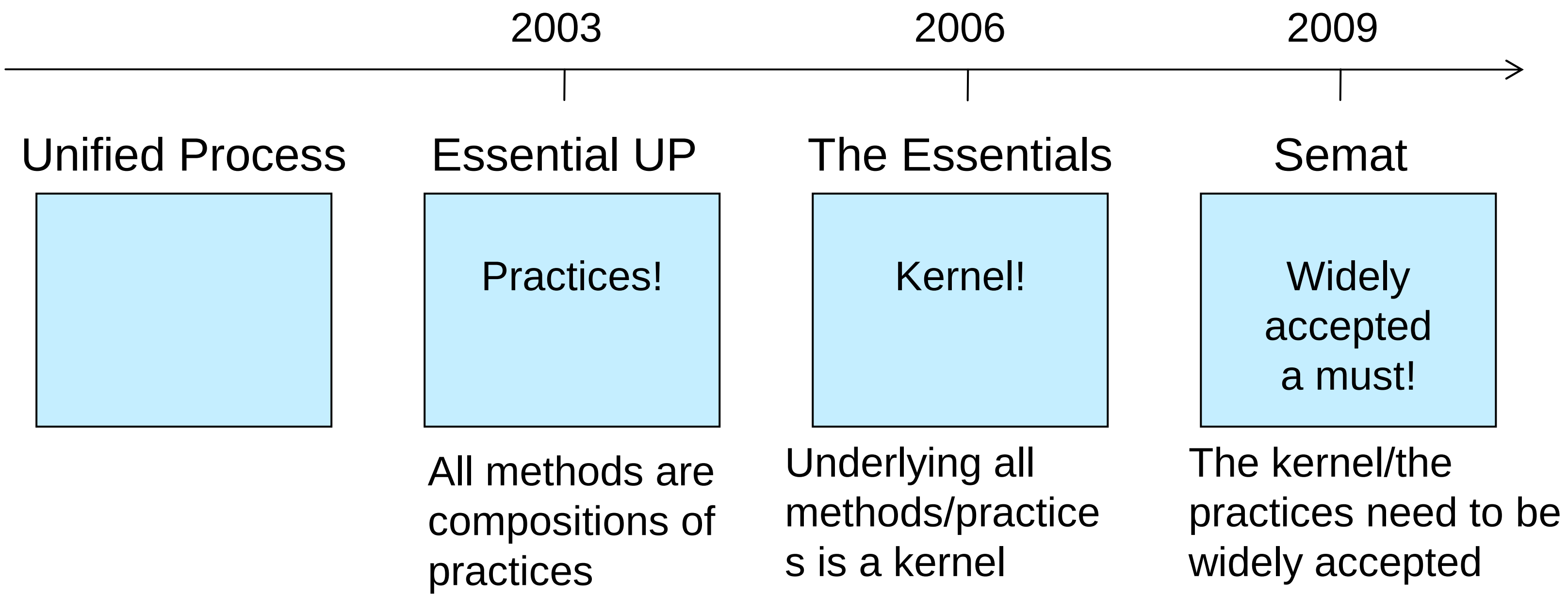


2003 · 2006 · 2009

Unified Process

Essential UP: Practices!

All methods are compositions of practices

The Essentials: Kernel!

Underlying all methods/practices is a kernel

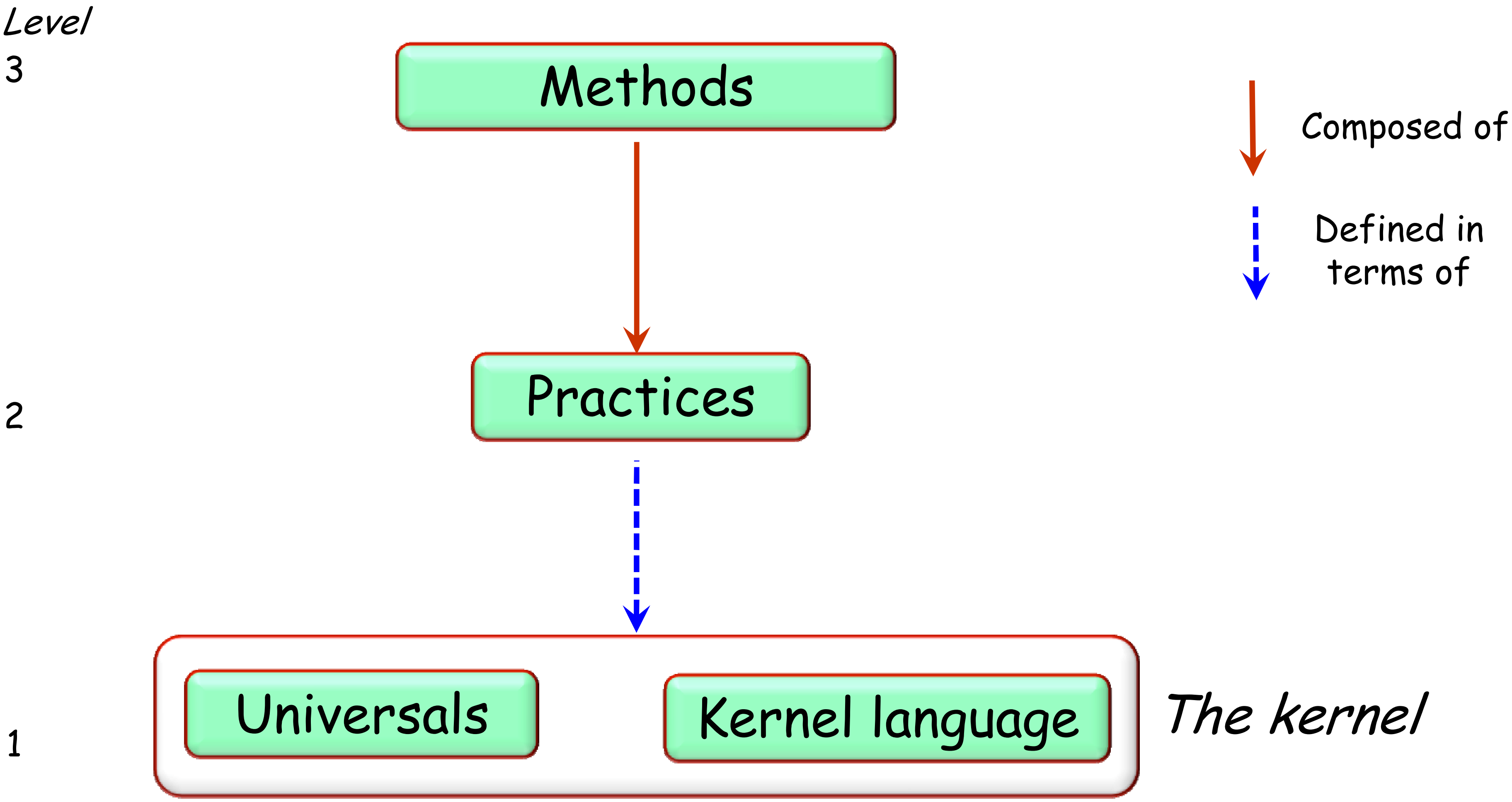
Semat: Widely accepted a must!

The kernel/the practices need to be widely accepted

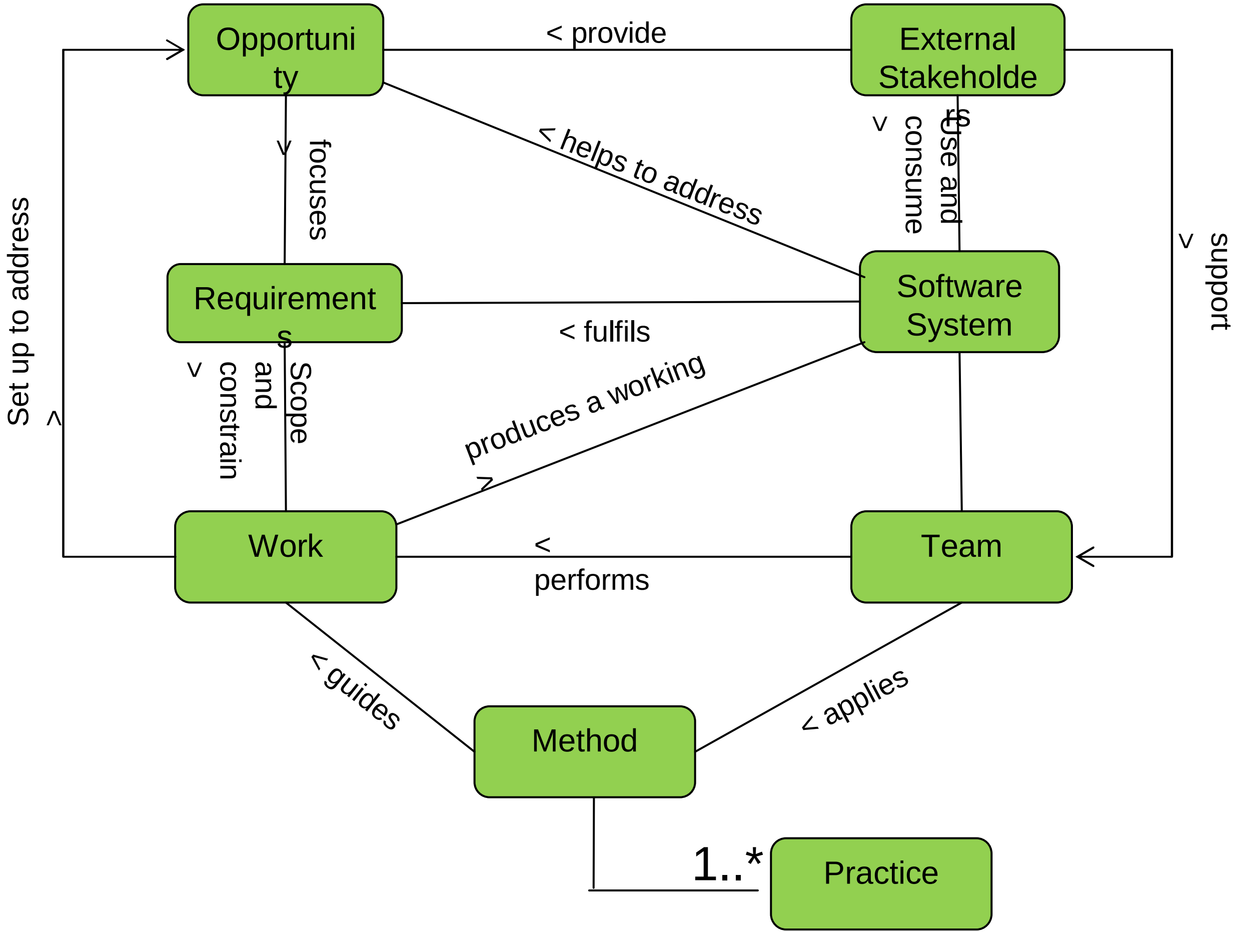
Michelangelo (attributed) “I am freeing the statue from the block”.

Paraphrasing him: “We are freeing the kernel from the methods”.

The Envisioned Kernel



The universals identified so far…The number is still growing!



The universals are the essential elements

in software engineering

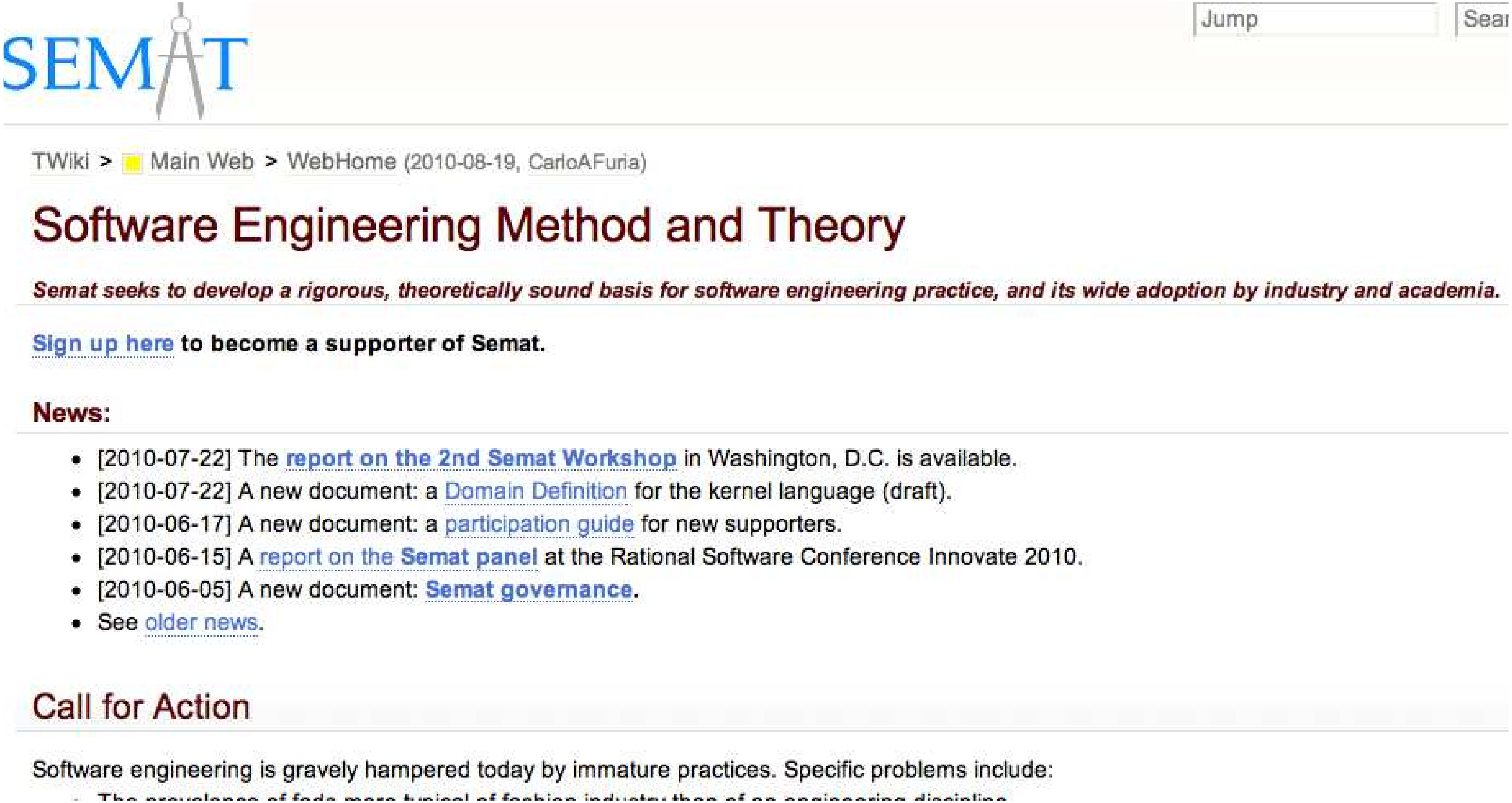
The Semat solution in a nutshell

1. A method is a composition of practices as opposed to an interconnection of process component (discipline, or similar).
   - Practices give value one by one, they are what users want to make lean, they provide interesting measures, all of which is the critical differentiator.
2. All methods have something in common - a common ground or a kernel. The kernel consists of two things: the universals, and the kernel language
3. The primary users of methods and practices are project participants (developers, testers, project leads, etc.).
   - Process engineers are secondary.
4. Methods need theory – our work must stand on a solid theoretical basis.
   - Methods being composed of practices, practices being described in terms of universals and elements such as activities and work products; all formalized into a language is the beginning of such a theory.
   - Individual practices being supported by theories take our work across the whole research in software engineering.

Semat China Chapter

- Please contact professor Zhong Chen, director at School of Software and Microelectronics, Peking University
- Chen Zhong chen@ss.pku.edu.cn
- www.semat.org
- Become a supporter

Become a supporter



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TWiki > Main Web > WebHome (2010-08-19, CarloAFuria)

Software Engineering Method and Theory

Semat seeks to develop a rigorous, theoretically sound basis for software engineering practice, and its wide adoption by industry and academia.

Sign up here to become a supporter of Semat.

News:

- [2010-07-22] The **report on the 2nd Semat Workshop** in Washington, D.C. is available.
- [2010-07-22] A new document: a Domain Definition for the kernel language (draft).
- [2010-06-17] A new document: a participation guide for new supporters.
- [2010-06-15] A report on the **Semat panel** at the Rational Software Conference Innovate 2010.
- [2010-06-05] A new document: **Semat governance**.
- See older news.

Call for Action

Software engineering is gravely hampered today by immature practices. Specific problems include:

- The prevalence of fads more typical of fashion industry than of an engineering discipline

Thank You

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