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Where we are going!

Ivar Jacobson

The Big Picture

This talk is about the kernel and the kernel language.

It draws on my personal experience.

It suggests a goal we need to find.

It shows it can be found.

Reaching the goal, it will have dramatic impact on the whole software community

- the industry,
- the developers,
- the academics,
- the education,
- the methodologists, etc.

> Watts Humphrey:
>
> “This meeting in Zurich is likely to be an historic occasion much like the 1968 NATO session in Garmish.”

Agenda

- On what went well and what went wrong
- Addressing what went wrong
  1. Practices
  2. A new user experience
  3. Practices are not dead, they are enacted
  4. Result
- There must be a kernel
- The Semat kernel: track 3 and 4
- If successful what impact can we expect?
- Wrap up

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What went well and what went wrong

The *perceived* "rise and fall" of RUP

Let's be clear, the "rise and fall" are all about perception

"Good"

- Many proven practices
  - Use-cases (incl test)
  - Iterations
  - Components
  - Architecture
  - Etc.
- Supported UML
  - UML replaced all the hundred modeling languages at the time

"Bad"

- A soup of practices
- Too big
  - People don't read process books
- Hard to extend with agile, CMMI, etc.
- Adoption extremely hard
  - Process savvy
  - Revolutionary
- Gap between what people said they did and what they really did – The Process Gap

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On Processes (or Methods and Methodologies)

Some exaggeration <grin>

- Every process tries to be complete
  - As a consequence every successful process will grow until it dies under its own weight
- Every branded process is just a soup of ideas ”borrowed” from other processes
  - With some new idea(s)
- Every process usually becomes just shelf-ware
  - Law of Nature: People don’t read process books
- The process is out of sync with what the team does…
  - …and the project – process gap get wider and wider
- The project has to adopt an entire process
  - No-one uses an entire process or limits themselves to practices from one process

No wonder people don’t like process

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We looked for fundamental changes.

"Bad"

- A soup of practices
- Too big
  - People don't read process books
- Hard to extend with agile, CMMI, etc.
- Adoption extremely hard
  - Process savvy
  - Revolutionary, not evolutionary
- Gap between what people said they did and what they really did – The Process Gap

Fixing what was "Bad"

- Make practices first class citizens, and process a composition of practices
- Focus on the essentials instead of trying to be complete
- Extensions through practices
- A new user experience with focus on developers, not on process engineers.
- Enact the process

We redesigned RUP as EssUP

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Practices

In the future, an ever present but invisible process

Process becomes second nature

The team's way-of-working is just a composition of Practices

We need a new paradigm

Practice is a First Class Citizen

the unit of adoption, planning and execution of process

From the successes in modern software development

	The Software Engineering Camp	Process Maturity Camp	Agile Methods Camp
Examples:	Unified Process	CMMI, Spice	XP, Scrum

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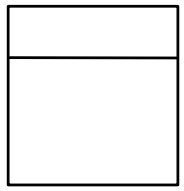
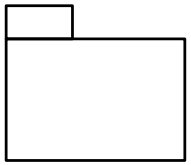
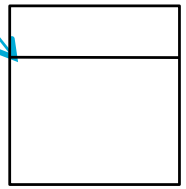
The Paradigm Shift: From ‘Processes’ to ‘Practices’

We have always had practices in a loose meaning

	Before	Now
Process	Process is First Class Citizen	Process is just a composition of practices
Practice	Practices were non-tangible elements They were there but not separable from one another	Practices are First Class Citizens







Class-like elements

- After the paradigm shift you can do all kinds of operations on practices
  - Separate them, compose them, teach them, execute them

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We needed a shared definition of “practice”

Pragmatics

- A practice provides a way to **systematically** address a particular aspect of a process. It is a separate concern of the process.
- There are three kinds of practices (at the least):
  - **Peer** practices
    - A practice has a clear beginning and an end allowing it to be separately applied, examples:
      - Iterative development
      - Use-case driven development
      - Project management à la Scrum
  - **Extension** practices
    - Use cases for SOA
  - **Cross-cutting** practices
    - Team practice incl workshops, self-organizing teams, war room, pair programming, etc.
    - Process improvement for the essentials of CMMI – e.g. metrics.

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A Good Practice is good for the team

- Gives a result of observable value to the customer of the team
  - It is a building block for the team – not necessarily for the process engineers.
    - Not too big – not too small
  - It includes its own verification
  - It is that thing that needs to be made lean
  - It is that thing for which you want to have metrics

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Focus on the Essentials

What is Essential?

- It is the key things to do and the key things to produce
- It is about what is important about these things
- It is less than a few percent of what experts know about these things
  - Law of nature: People don't read process books
- It is the placeholders for conversations
  - Law of nature: People figure out the rest themselves
  - Training helps
- It is the base for extensions

Starting with the essentials makes a practice adoptable.

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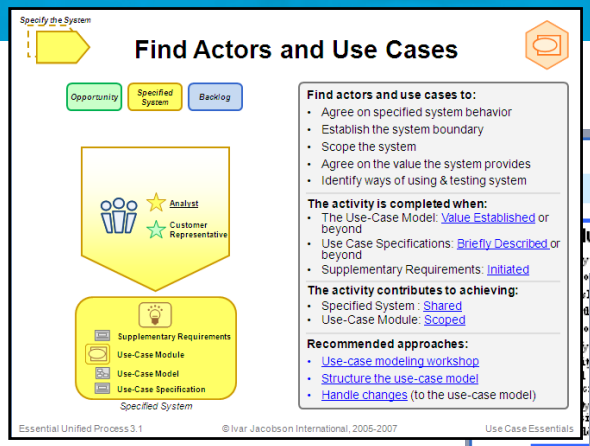
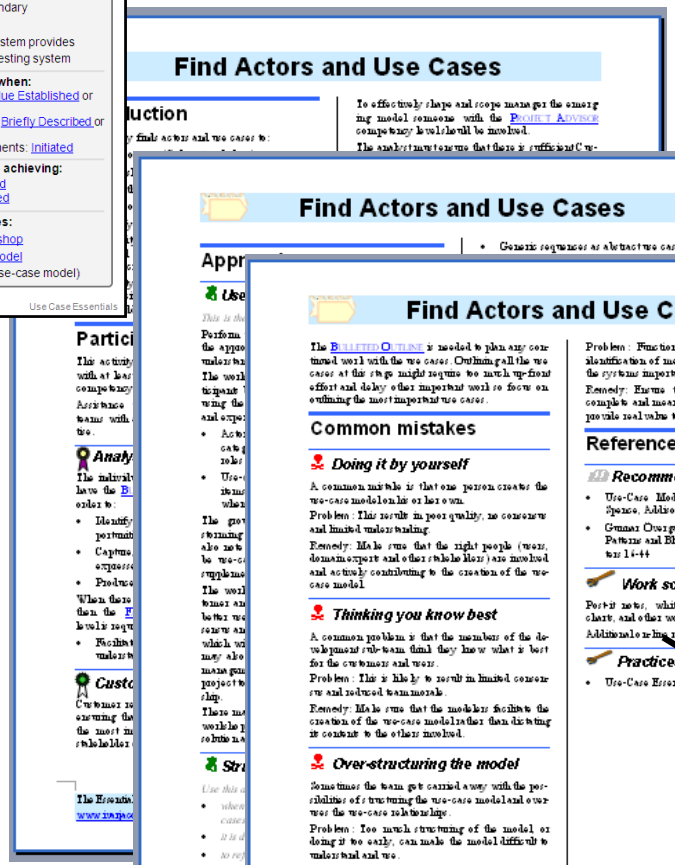
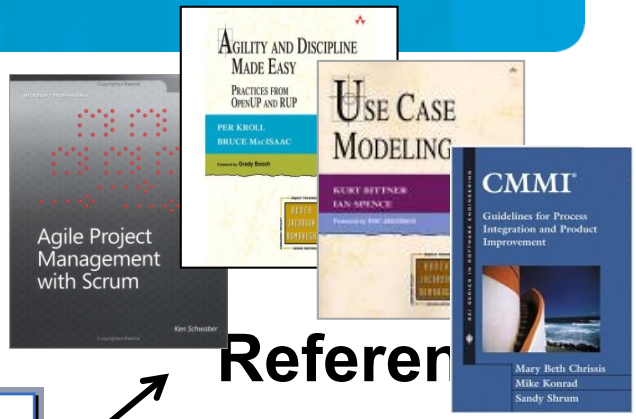
How much do you need in your hands?







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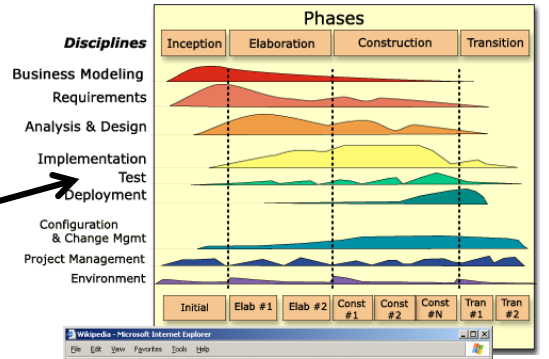

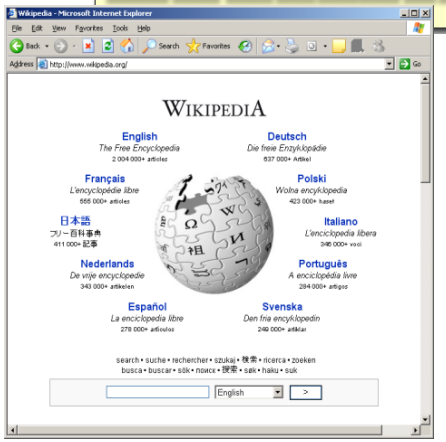

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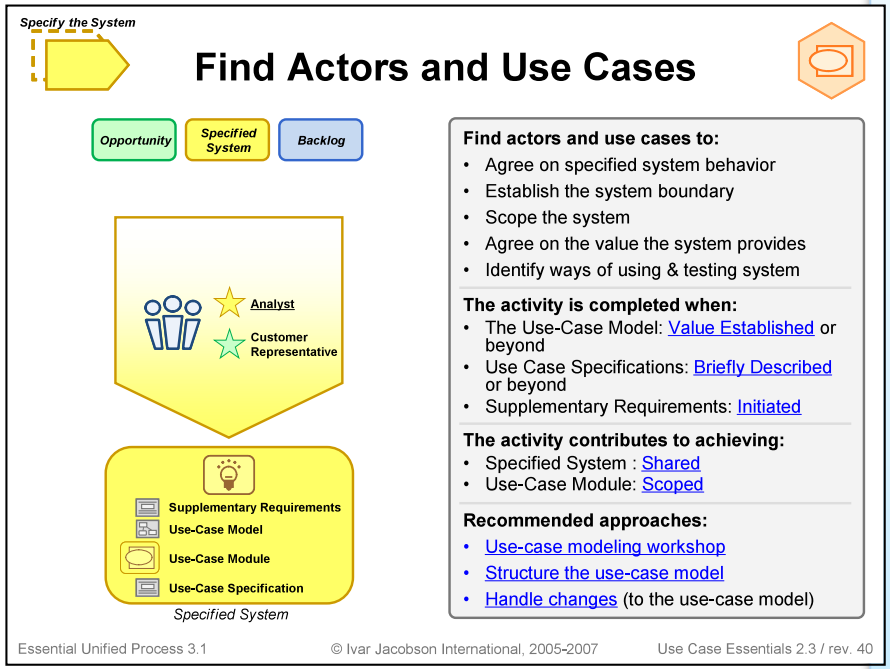
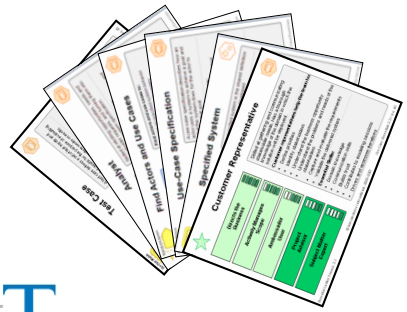
Why Cards?

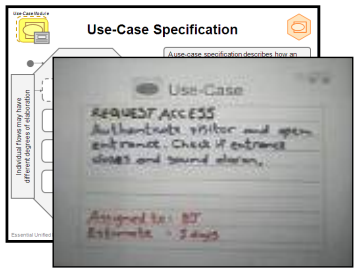


- Cards are tactile
- Cards are simple and visual
- Cards use conversational and personalized style
- Cards are not prescriptive so they get the learner to think more deeply
- Cards get…and keep…the readers attention
- Cards promote agility
- They can be written on to make minor adjustments to the practice on the fly

- A practice is a set of cards



- A team works on a set of instance cards



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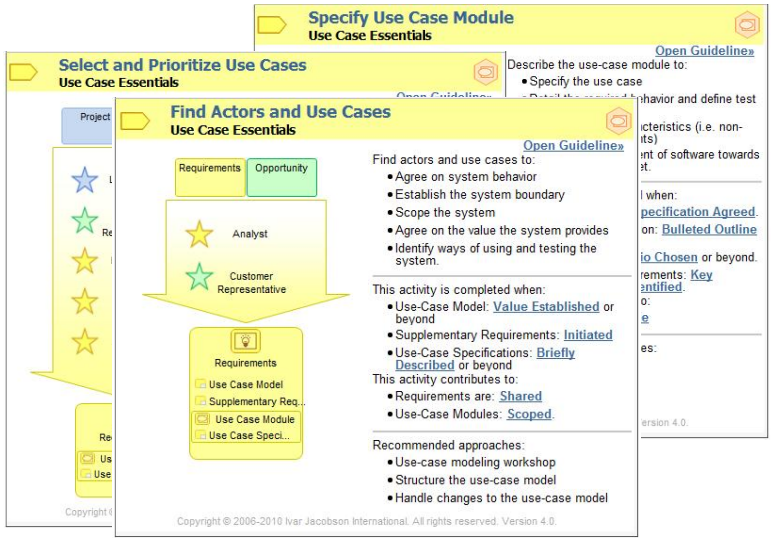
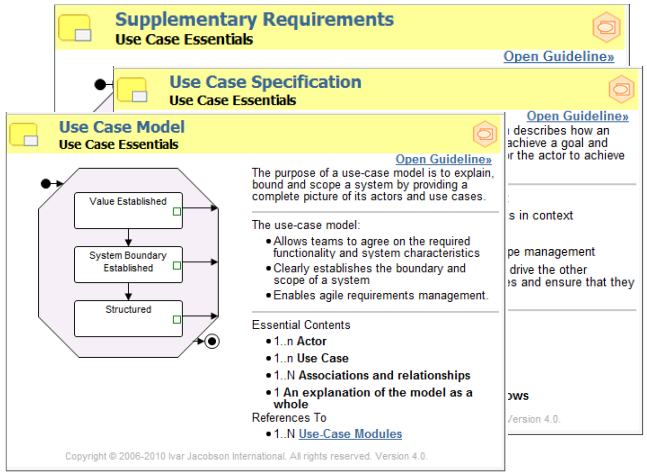
Practices are enacted

Set Up
Your Goals

Get Help
To Reach
Your Goals





Things to do

Things to produce

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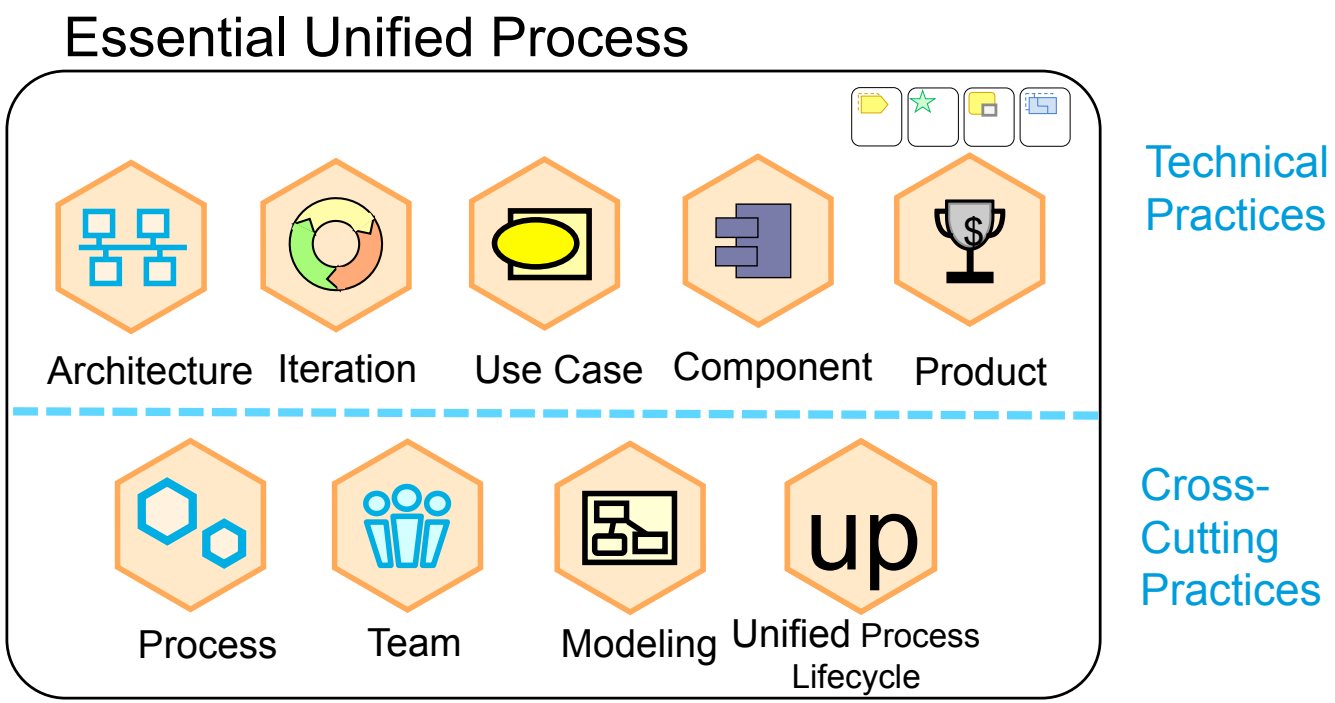
Thus we fixed what didn't work

Fixing what was "Bad"

- Make practices first class citizens
- Focus on the essentials
- Extensions through practices
- A new user experience with focus on developers
- Enact the process to close the gap



Great, but now more became evident!

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Hypothesis harvested from the fixing-the-problem work

- All methods comprise of a set of things that are always there - documented or not.
- We called this set the Kernel.
- Every method can then be described as a set of composed practices using the kernel.

There is a kernel!
Many different methods can be built out of this same kernel.

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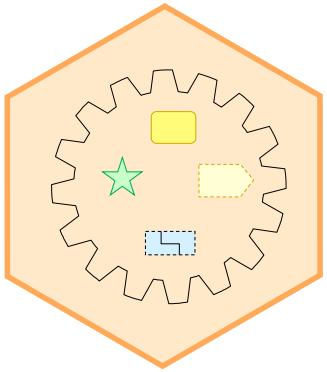
To verify the hypothesis we started all over

- We called our initiative EssWork (moving beyond EssUP)
- The Kernel we harvested is very small, extracted from a large number of methods
- It contains empty slots for things that every process have
  - Slots for
    - Competencies, such as analyst, developer, tester
    - Things to work with, such as backlog, implementation, executable system
    - Things to do, such as implement the system, test the system
- The Kernel is practice and of course method agnostic.



Kernel

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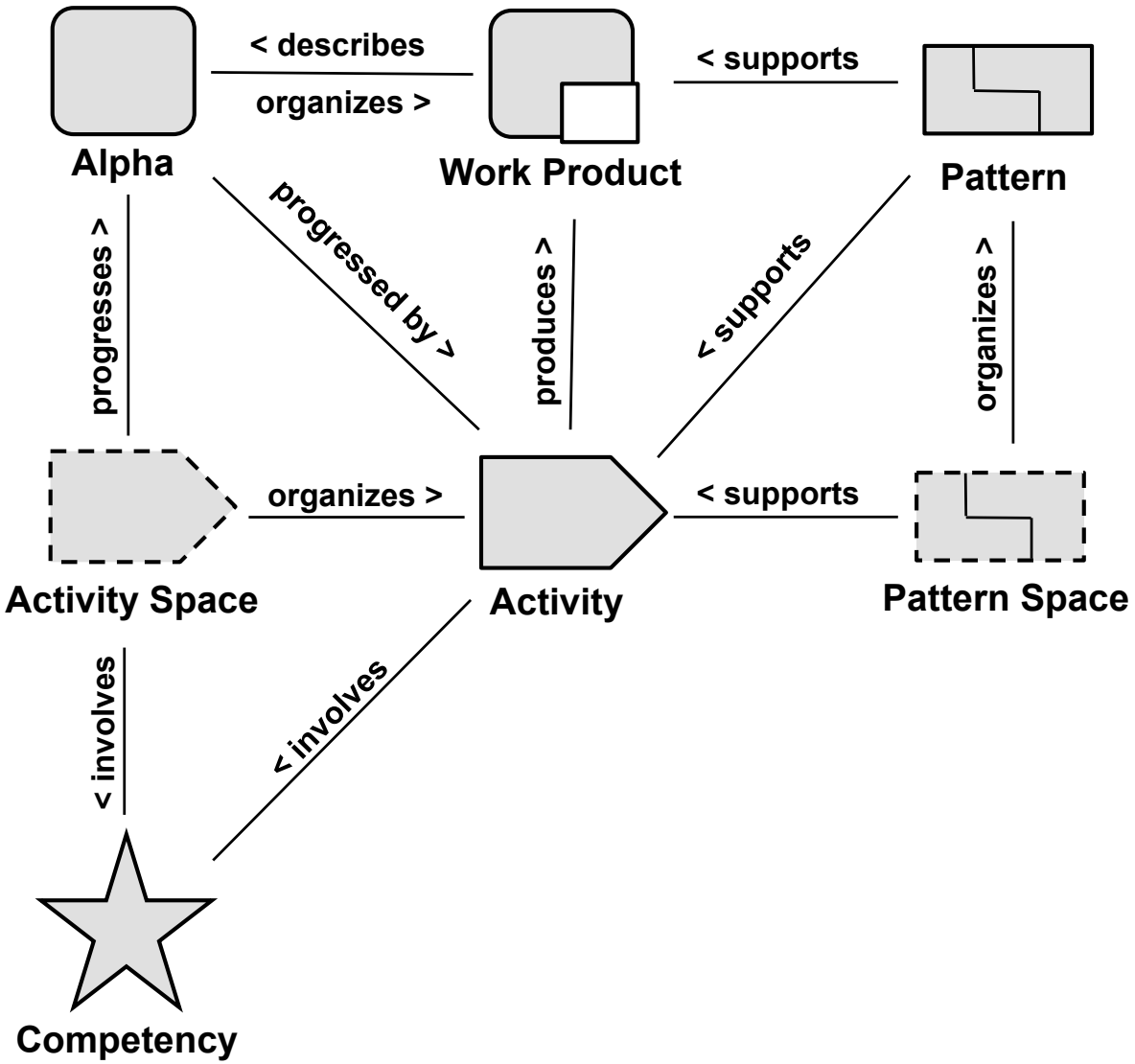
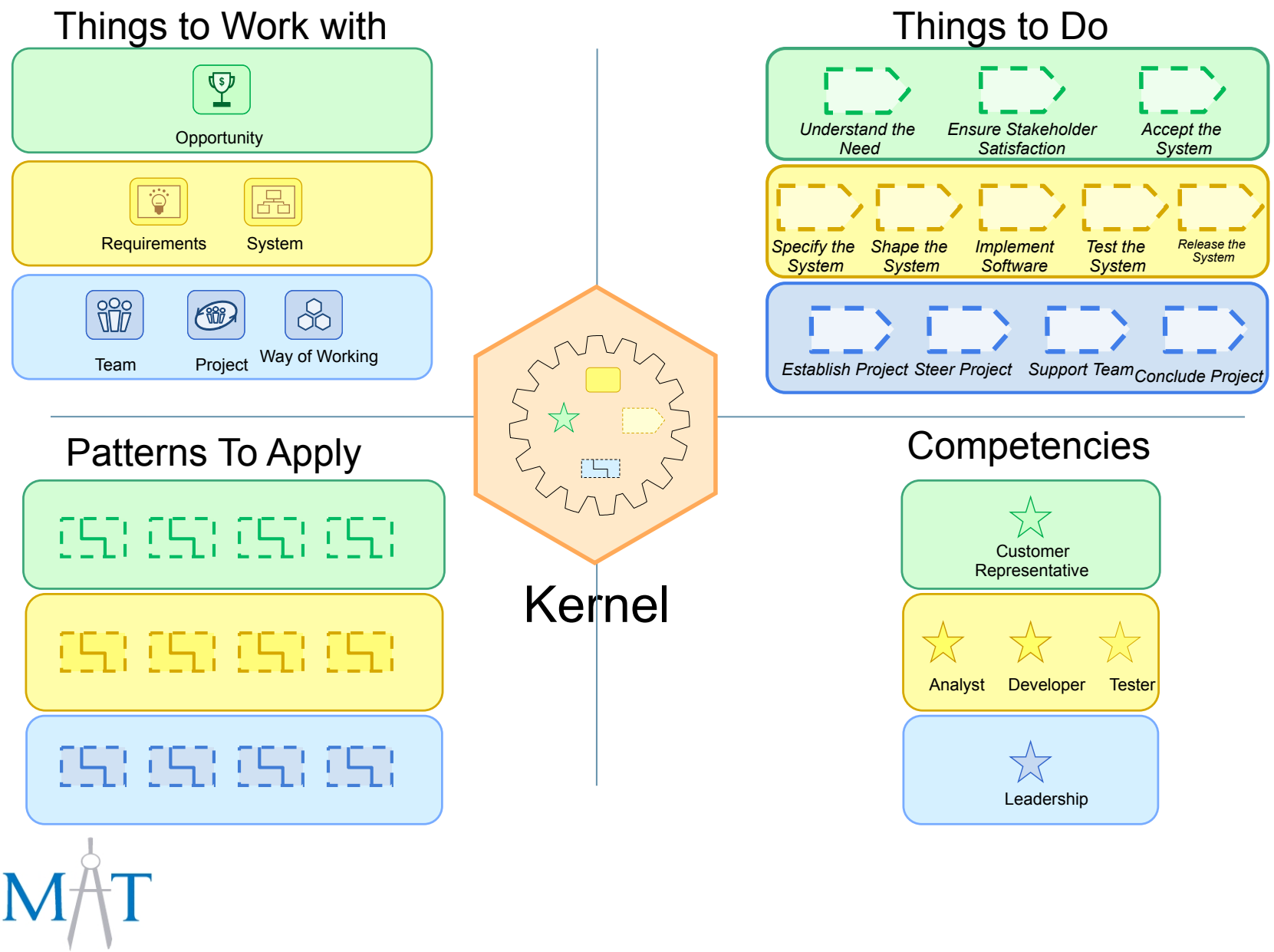
The Kernel includes a Meta-Model - an implied language

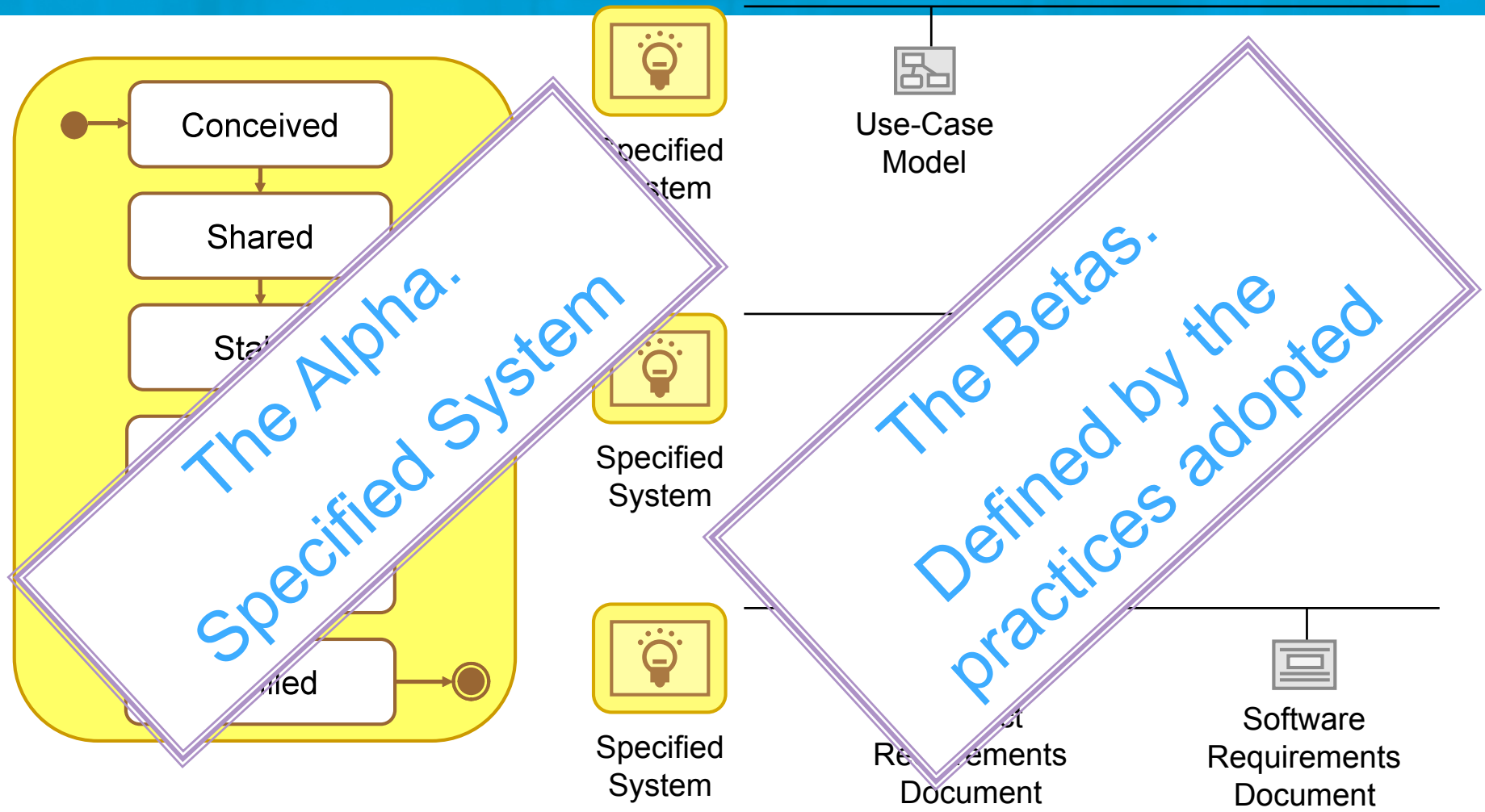


The EssWork Kernel

- contains empty slots for things that every process have



Practices put the meat (*Betas*) on the bones (*Alphas*)



For example there are many ways to specify the system.

Practice Development with

Comparing Alphas and Work Products

Alphas:

- The most important things that all software projects have whether they exist
- Intangible
- The things whose progress we want to understand, monitor, direct and control
- Alphas have progress states
- State progression means progression towards release

Work products:

- Used to record information ***about*** alphas
- Used to understand and assess the alphas
- Can be physical documents, electronic files, models, databases, .xml ....
- State progression generally represents more information or detail

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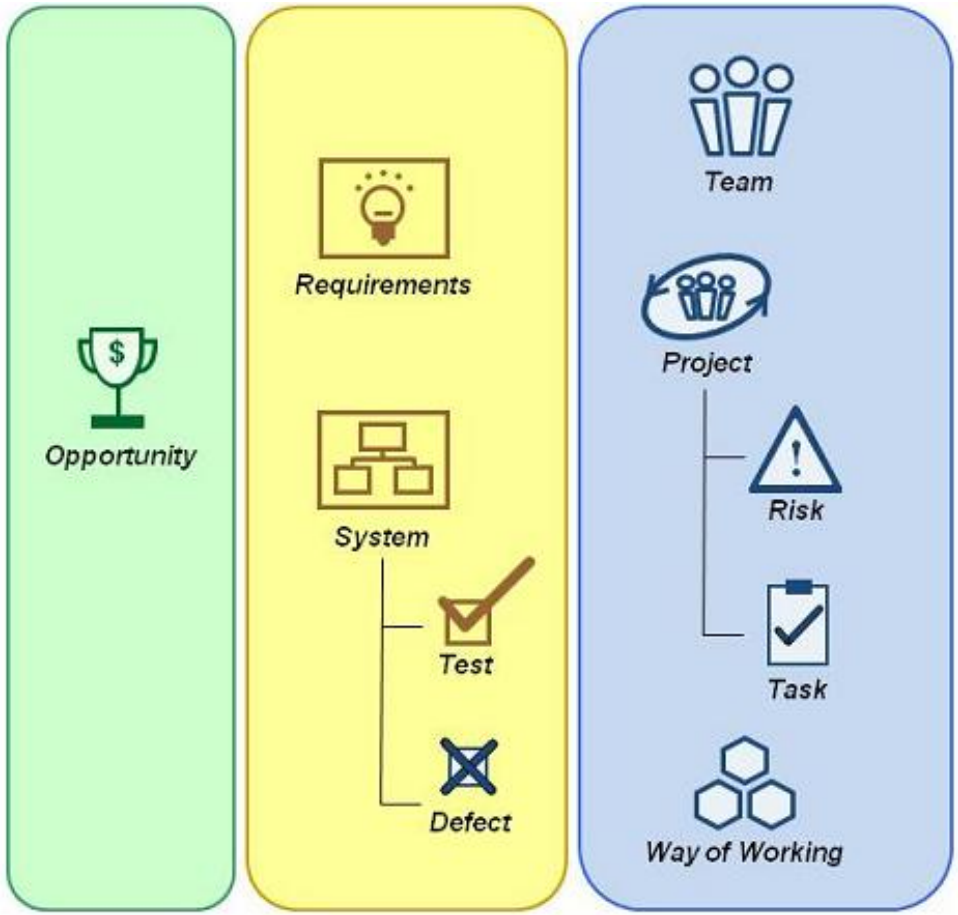
Things to Work with: Alphas and Work Products

These are the alphas:



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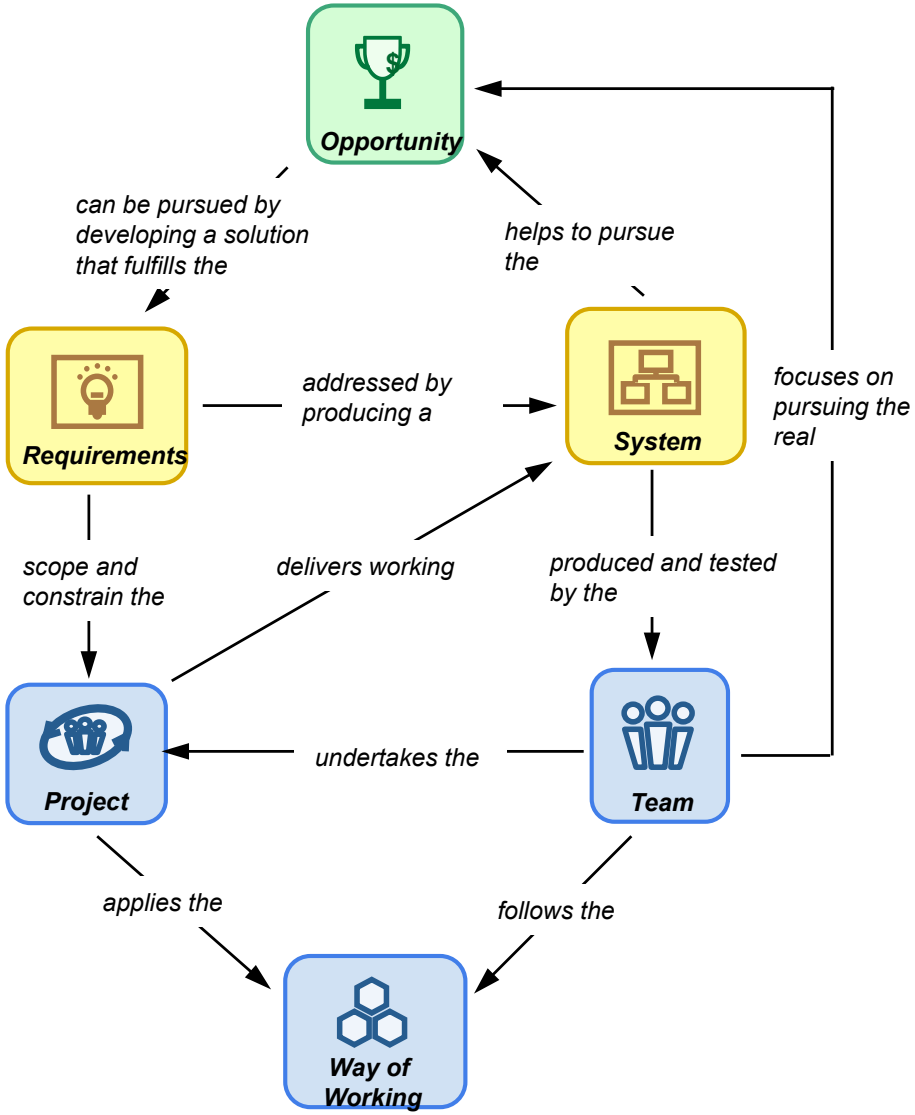
Alpha Relationships



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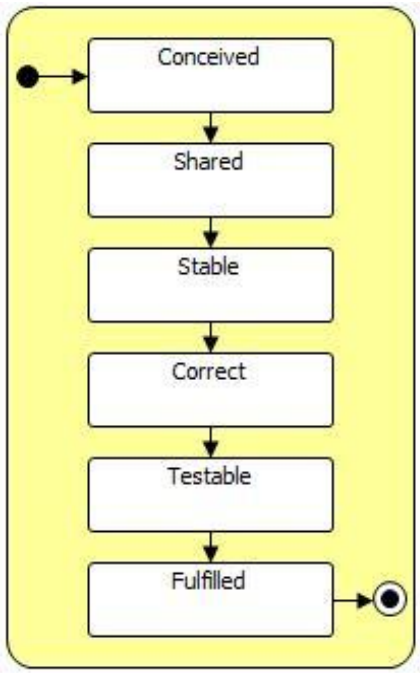
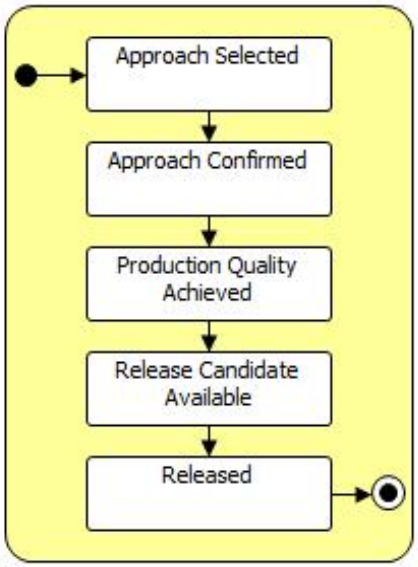
Alpha States



Requirements states



System states

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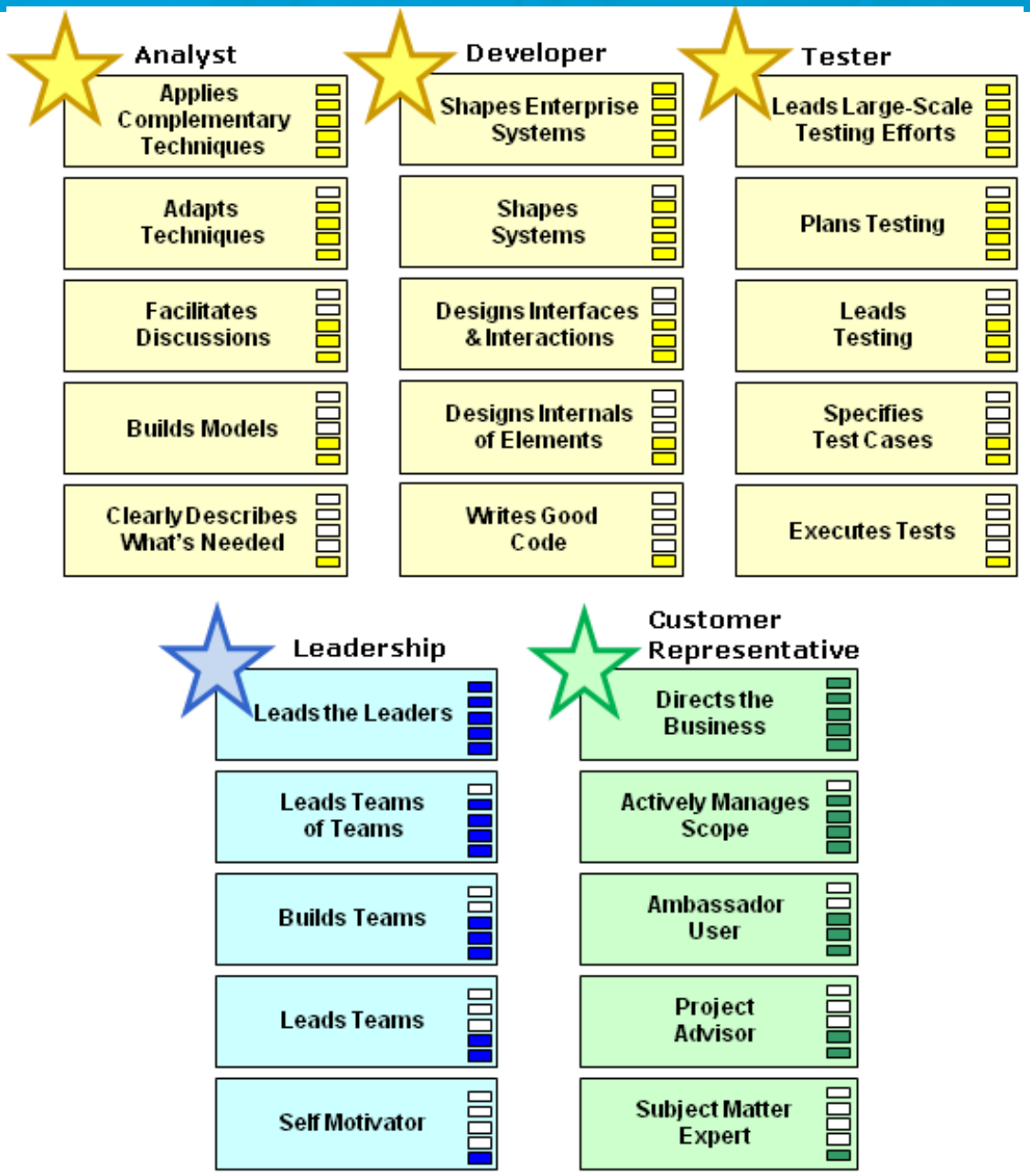
Competency Levels



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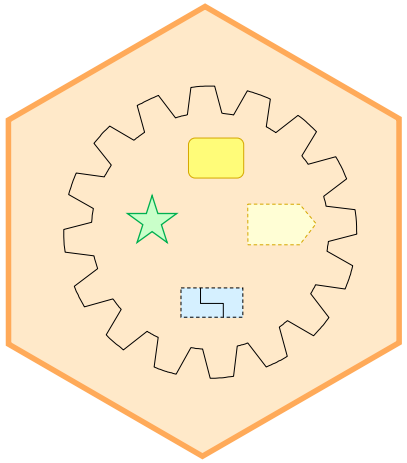
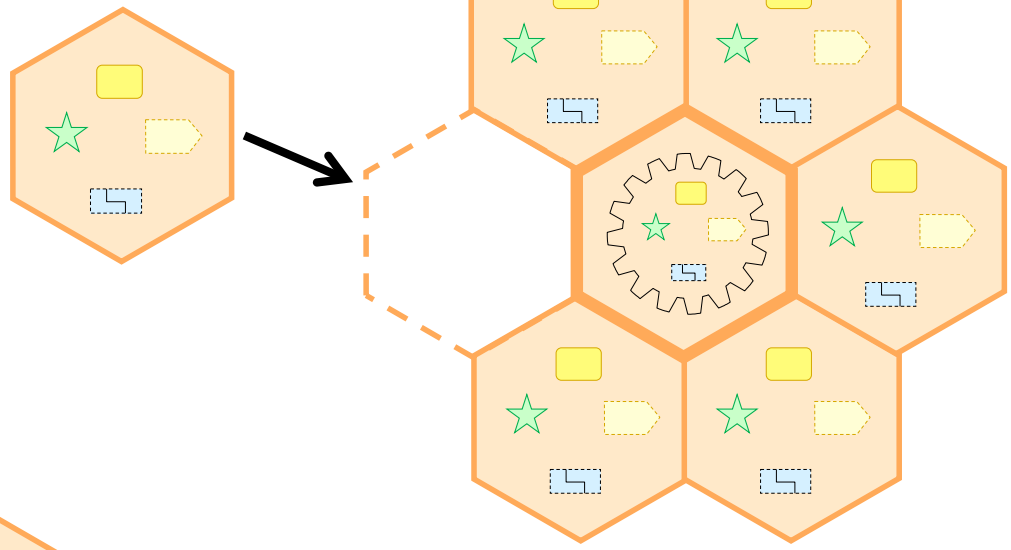
Using the kernel

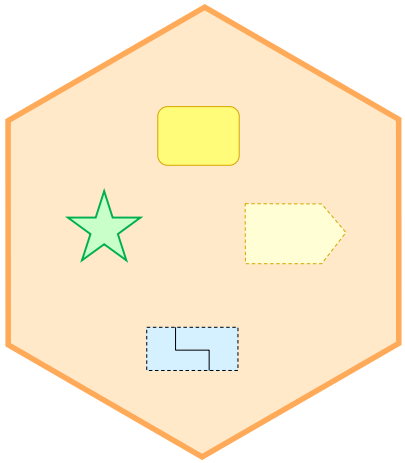


Kernel

The kernel defines an “empty process”

Practices “slot” into the common kernel.





Practice

Each practice contains practice-specifics to add to the kernel.

Way of Working

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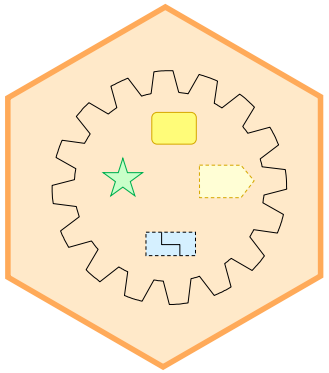
Change starts by harvesting your best practices from your own method



Kernel

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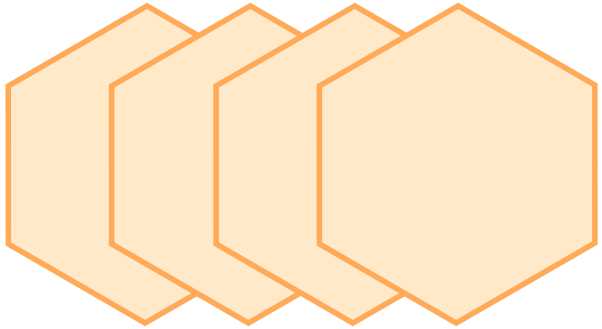

Your Own

Best Practices

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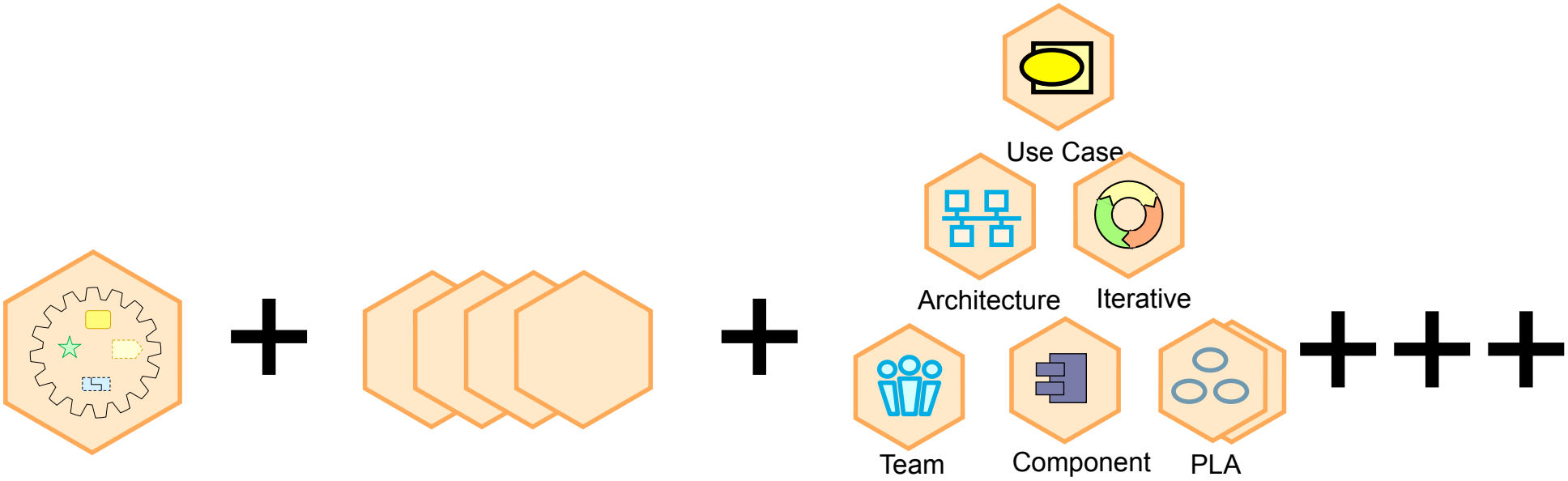
Improve your method by adding other, proven practices



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!

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CASE FOR ACTION 2nd part

- 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

The Kernel ≈ The Kernel Language + The Universals

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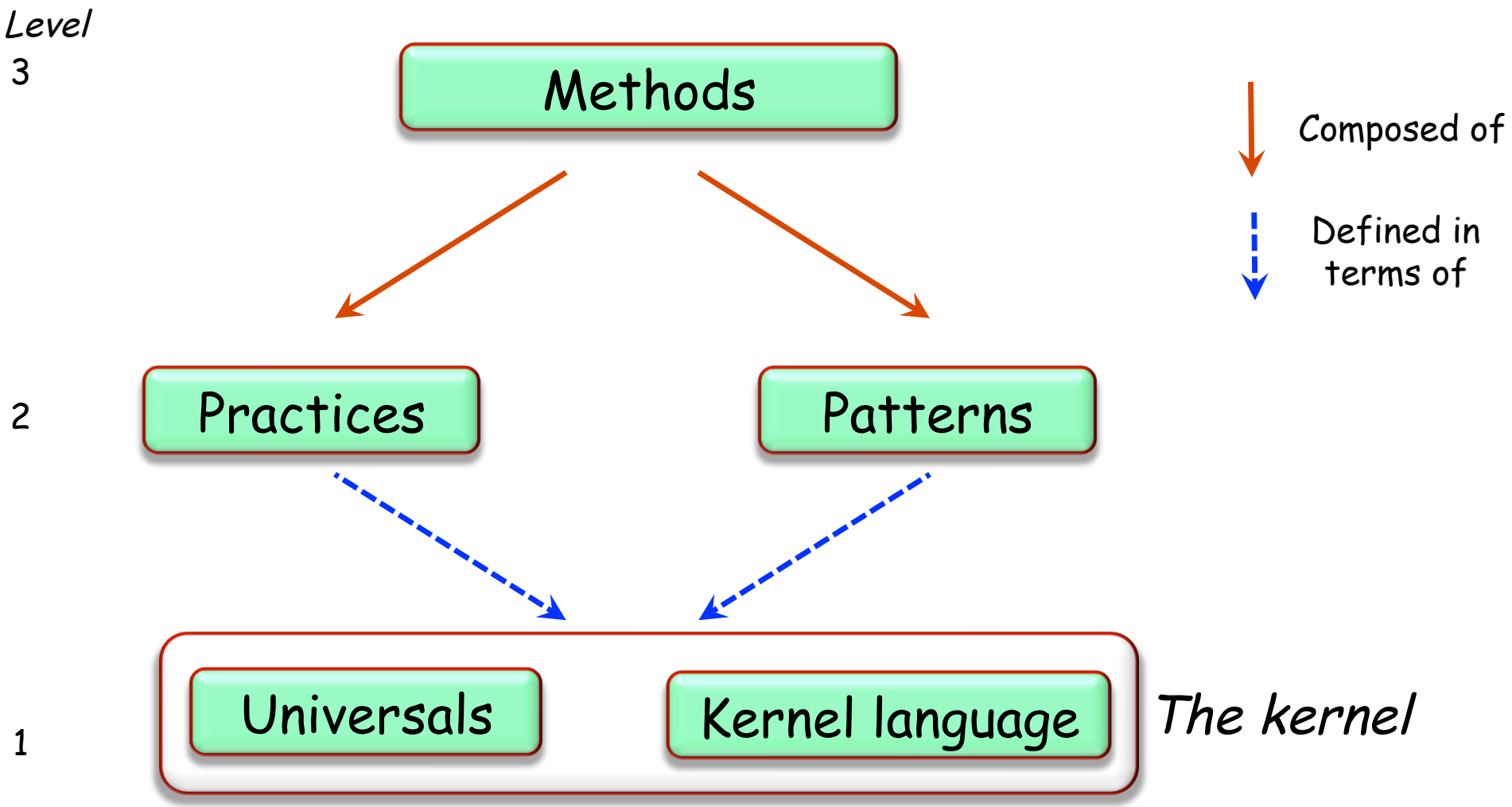
The Envisioned Kernel



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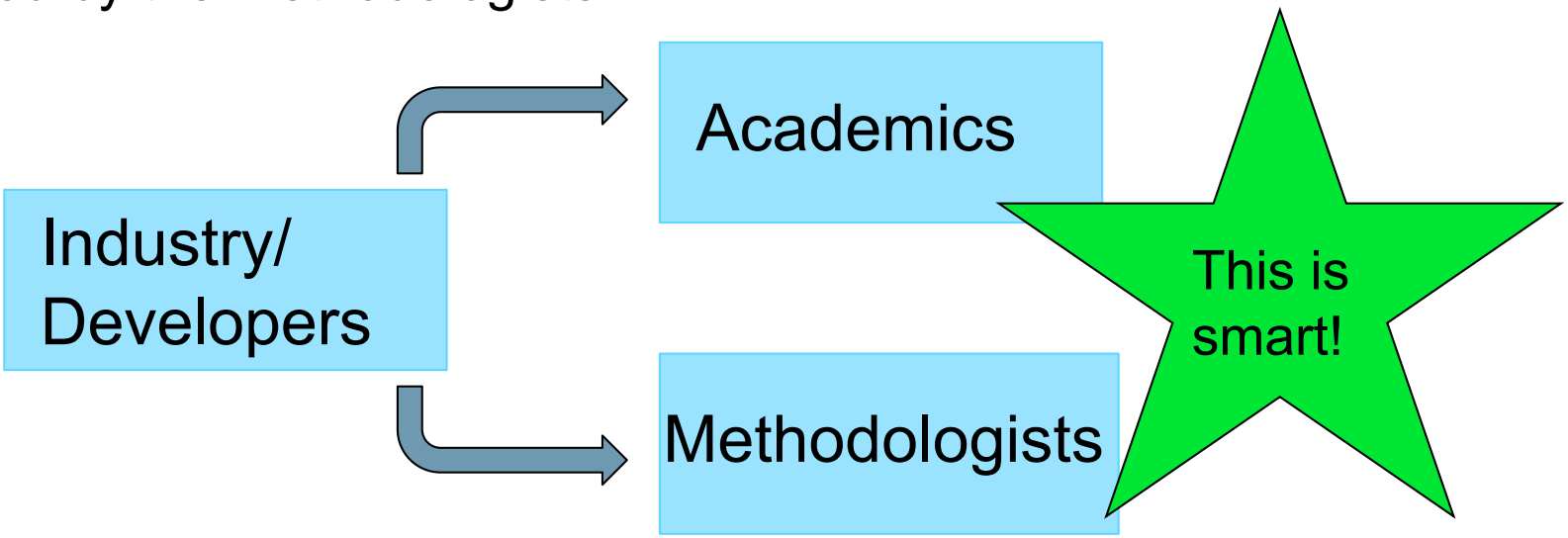
A recipe for success

Our work needs to be

- driven from the demands of the industry/developer community, and
- enabled and formulated by the research community, and
- popularized by the methodologists.



We need a theoretical basis that is widely shared and supported, one that crosses the boundaries between the different software development camps.

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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 can have significant impact on the software community.

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Final Words

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Questions

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Thank You

ivar@ivarjacobson.com

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The Universals

Kernel properties

- Concise.
- Scalable.
- Extensible.
- Measurable.
- Formally specified.
- Broad practice coverage.
- Broad lifecycle coverage.
- Broad technology coverage.

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The Universals

Criteria for inclusion

- Universal
- Significant
- Relevant
- Defined precisely
- Actionable
- Assessable
- Comprehensive.

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- Let's now start to talk about the **Universals which belongs to track 3:Which are the universal alphas?The very root has n top alphas. In our case (EssWork) they are:- Opportunity, (which is an intangible but onto which we can attach a business case work product, a budget, and lots of other stuff)- Requirement (which are what you call Intent which I like). Here you can attach reqt spec, use case model, but all these are practice specific- System. Here you can attach design model, use case realizations, code, deployment model, ...all are practice specific- Project. There is always a project. Here you can attach project plan, iteration plan, backlog...practice specific stuff- Team. There is always a team. Here you can have sub-alphas such as team members etc.- Way of working. Another word for method/process, whatever. Here you can attach descriptions describing your way of working. In EssWork this is done by attaching a number of practice descriptions.All these are top alphas. Sub-alphas are always practice-specific. For instance, if you**

- Some questions I have got:What is Guidance? I think it is a work product attached to the alpha Way-of-working?Tool. We probably need a new language construct ToolHuman operator. We have an alpha called Team and it has sub-alphas Team_member. If this is not enough we may have to add a new language construct Worker.Automatic operator. Could be Worker with the attribute Automatic.Language. Is this a new language construct, or a Tool? Program. This is a work product attached to the System alpha or to sub-alphas of the System alpha.

The Kernel Language

- The **kernel language contains constructs that we need to define in track 4, such as :- Method/methodology/process or as I prefer to call them: Way-of-working- Practice - Pattern and KindofPattern- Alpha and sub-alpha- Work product- Competency- Activity and KindofActivity**

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