

The Semantics of Innovation

*Exploring the 'deep nature' of
innovation*

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This talk objective

Clarify what is innovation...

What is the 'take home' message? I anticipate:

Good News and Bad News...

From Roman trireme ...

(Good news may turn bad ...)

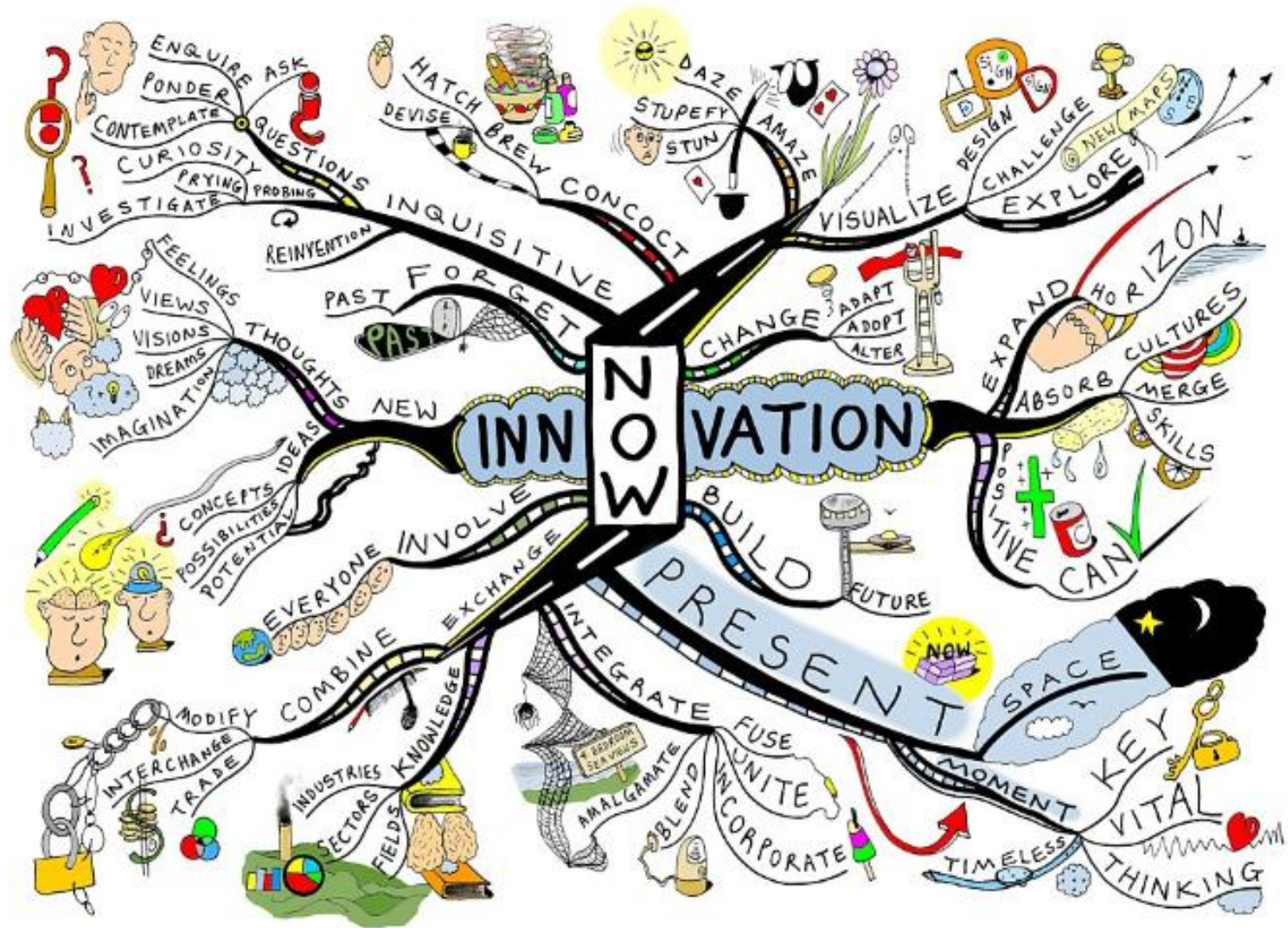
To Enterprise Innovation ...

(Bad news: it's a very complex subject,

Good news: next slide will clarify it ...)



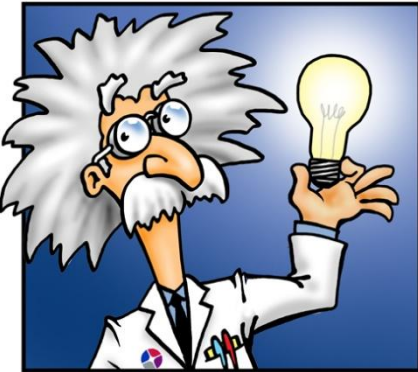
A clear picture of Innovation



Talk Summary

- **Motivating section**
 - What is innovation and why we need?
 - The nature of innovation: a first intuition
- **What is Innovation**
 - Towards a deep and **formal** understanding
- **What digital technology can do for it**
 - Innovation is a **human** centric endeavour
 - **Technology** can consistently support
 - From ERP to EIP: **Enterprise Innovation Planning** systems
 - A concrete example: the European Project **BIVÉE**
- **Conclusions**

What is the nature of Innovation?



Is innovation an *Art*?

Is it a *Practice*?

is it an *Engineering Discipline*?

is it a *Business* opportunity?

Do we need innovation?

Obvious answer ... YES!

BUT ...



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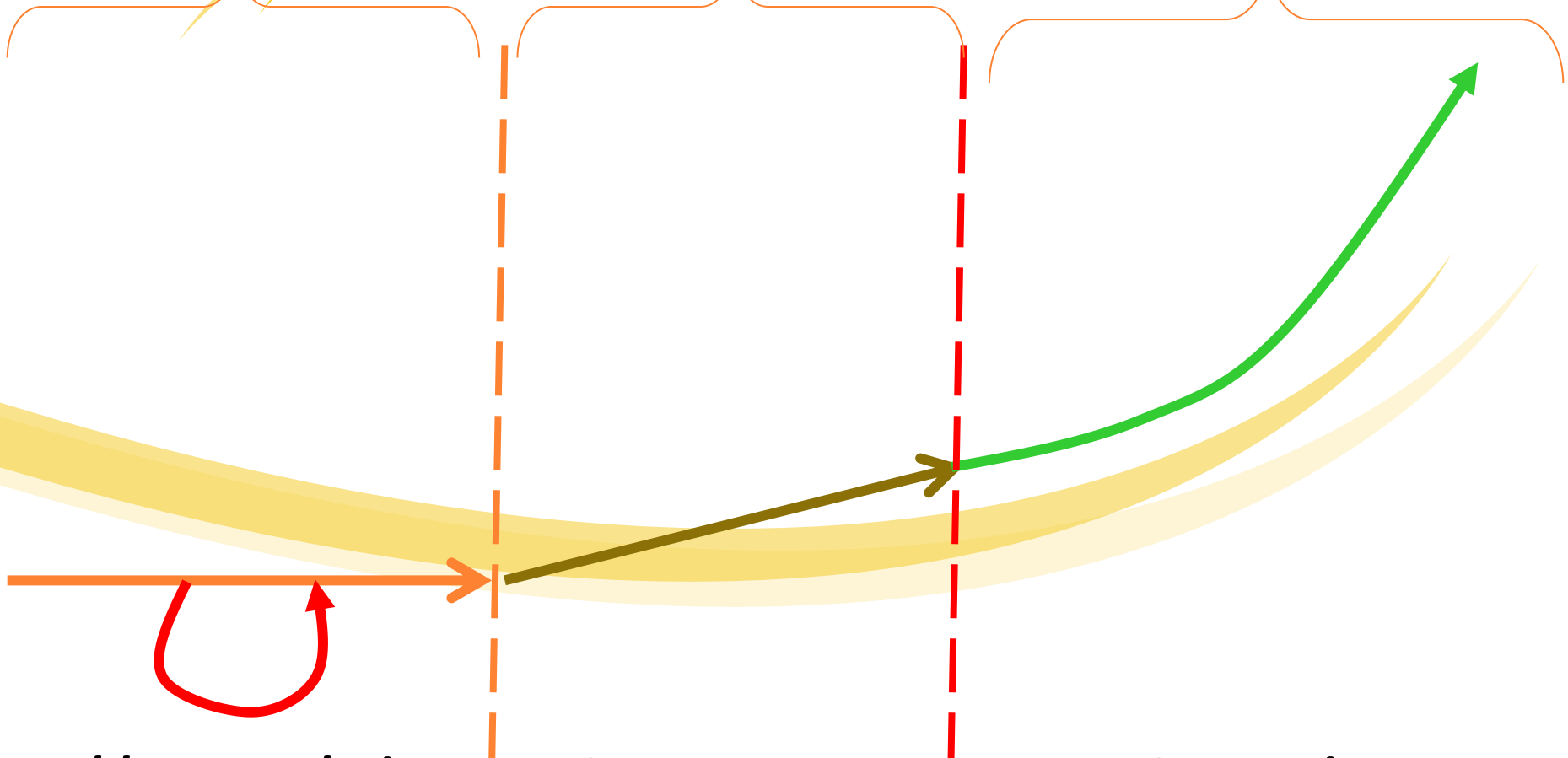
“Your proposal is innovative. Unfortunately, we won’t be able to use it because we’ve never tried something like this before.”

Survival Threshold

Dying Business

Business as usual

Winning Business



Problem Resolution

Improvement

Innovation

What are the drivers?

For a successful Innovation, what really counts?

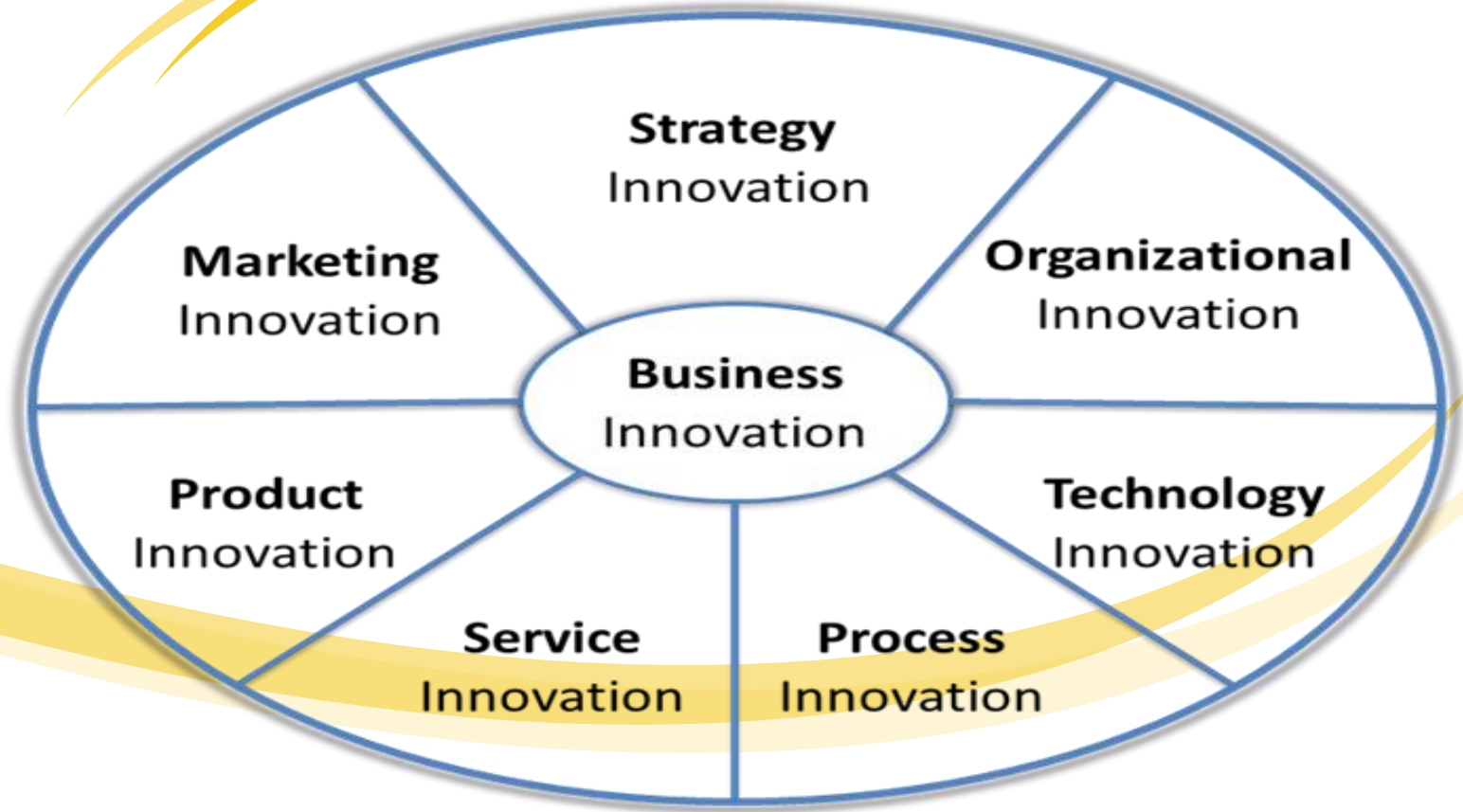
The **fantasy** and the creativity?

A solid **market** research?

The numbers of a **Feasibility** Study?

Remember: 90% of 'good' ideas are abandoned or fail (EC statistics on project proposals)

What are the Innovation targets?



(Source: BIVEE Deliverable D2.1)

Then ... Let's go deeper!

According to Wikipedia:

“**Innovation** is a new **idea**, device or process. Innovation can be viewed as the **application** of better solutions that meet new requirements, inarticulated needs, or existing market needs.”

Do you agree?

Not ME!!!

(it misses the point ...)

Let's ask Humphrey ...

It's a serious *KM* affair, baby!

... But what's *innovation*, after all?



Two Enterprise Knowledge Spaces

Value Production Space: the target of innovation

- Where value is actually produced
- Where innovation will concretely take place,
- While innovating, business and value production should not be affected
- After innovation is achieved, business should improve in a measurable way

Enterprise Innovation Space

- Where transformation is conceived

Enterprise Innovation Space

The space where

- **Innovation needs** / ideas are captured and elaborated
- Experts are able to evaluate the chances of **success**
- **Cost/Benefits** models are put in place
- **Risk** assessment and contingency plans are established

Ok, fine ... But ***WHAT IS INNOVATION?***

Ok, let' try to be more precise ...

What do you have on the table?

- ***Value Production Space***, where added value is created
- ***Enterprise Innovation Space***, where new solutions are created to improve the value production

Therefore: **EIS** needs to specify the concrete impact on **VPS**... Otherwise we are doing philosophy!

Here is why I do disagree with Wikipedia ...

Innovation is ...

“**Creativity**, invention that becomes a concrete engineering / business / market practice, i.e., a viable solution capable of **changing** for better the Value Production Space performance.”

To transform creativity into business we need **solid knowledge**, good practices and dedicated team work, all the above supported by advanced ICT platforms and tools.

Innovation is ...

A process (is it a process?), articulated by three main events

- 1. Innovation Trigger:** when an innovation opportunity / need arises
- 2. Innovation specification:** when all the details of the new solution are defined
- 3. Innovation implementation:** when the innovation is transferred into the VPS

In essence

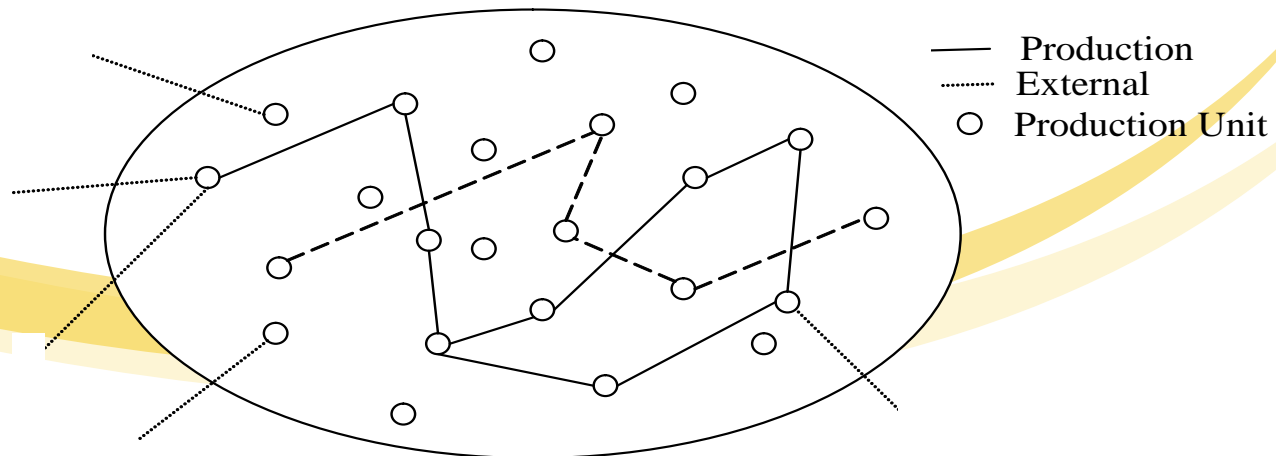
Innovation is a virtuous transformation of the VPS

Value Production Space (VPS)

In: materials, resources, competences

Out: produced goods and/or services

Effects: Increased creation of value (hopefully)



production space is not a closed territory

Innovation as Transformation

- The VPS is already a space where transformations take place
- So, Innovation is a Meta-Transformation (MT)
- A transformation of a transformation in formal terms is a *Functional*.

$$MT : VPS \rightarrow VPS$$

So far so good, but ...

- *Doman* and *Range* are not fully known, and
- **How to map** the partially known reality (AS-IS) to the new reality (TO-BE) is also scarcely known

In summary:

- we need to built a *Transformation* starting from a partial knowledge of the territory we are operating on ...

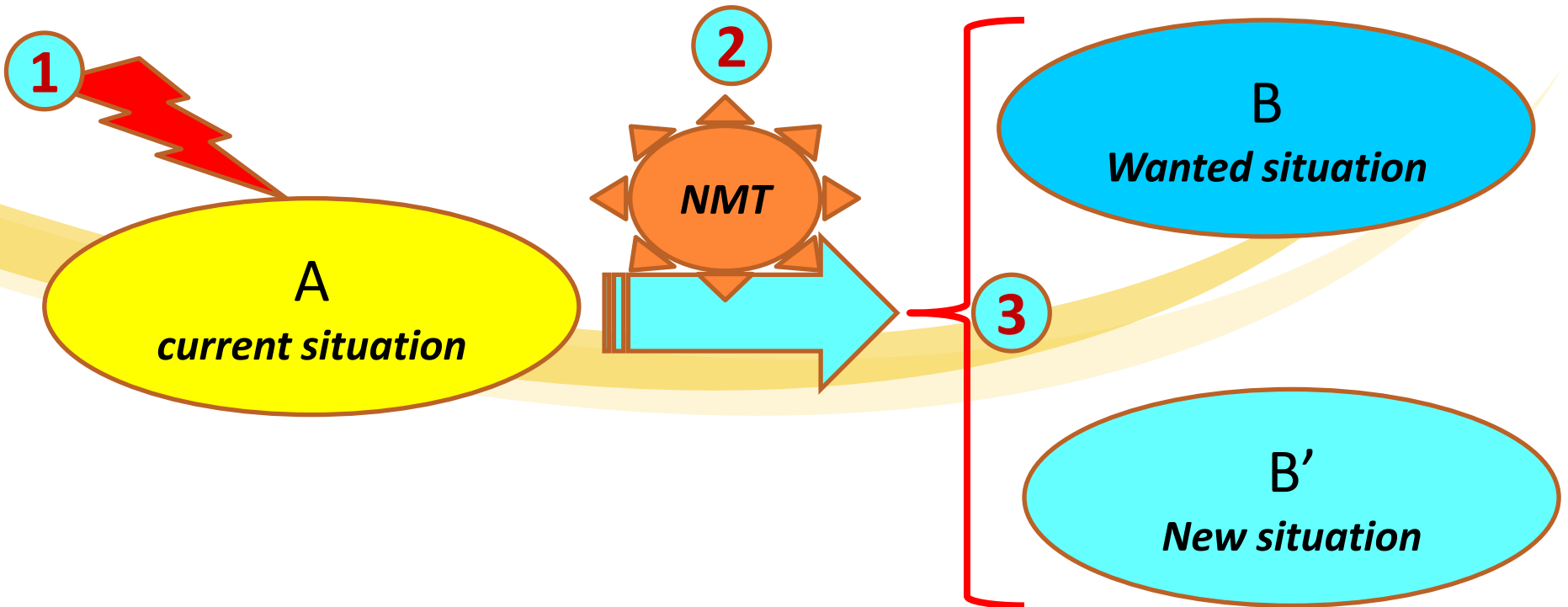
Then, the **core of Innovation** is a:

Non-deterministic Meta-Transformation: NMT

Innovation: the global picture

Innovation =

1. InnoTrigger + 2.NMT + 3.Active Changes



1. Innovation Triggers

Start from: need, opportunity, intuition, ...

- (i) **push-mode** and technology driven, when the innovation is generated on the supply side;
- (ii) **pull-mode** and customer driven, when the innovation is requested by the demand side;
- (iii) **co-creation**, when all the stakeholders cooperate together to generate product or process innovation.

What are Innovation sources?

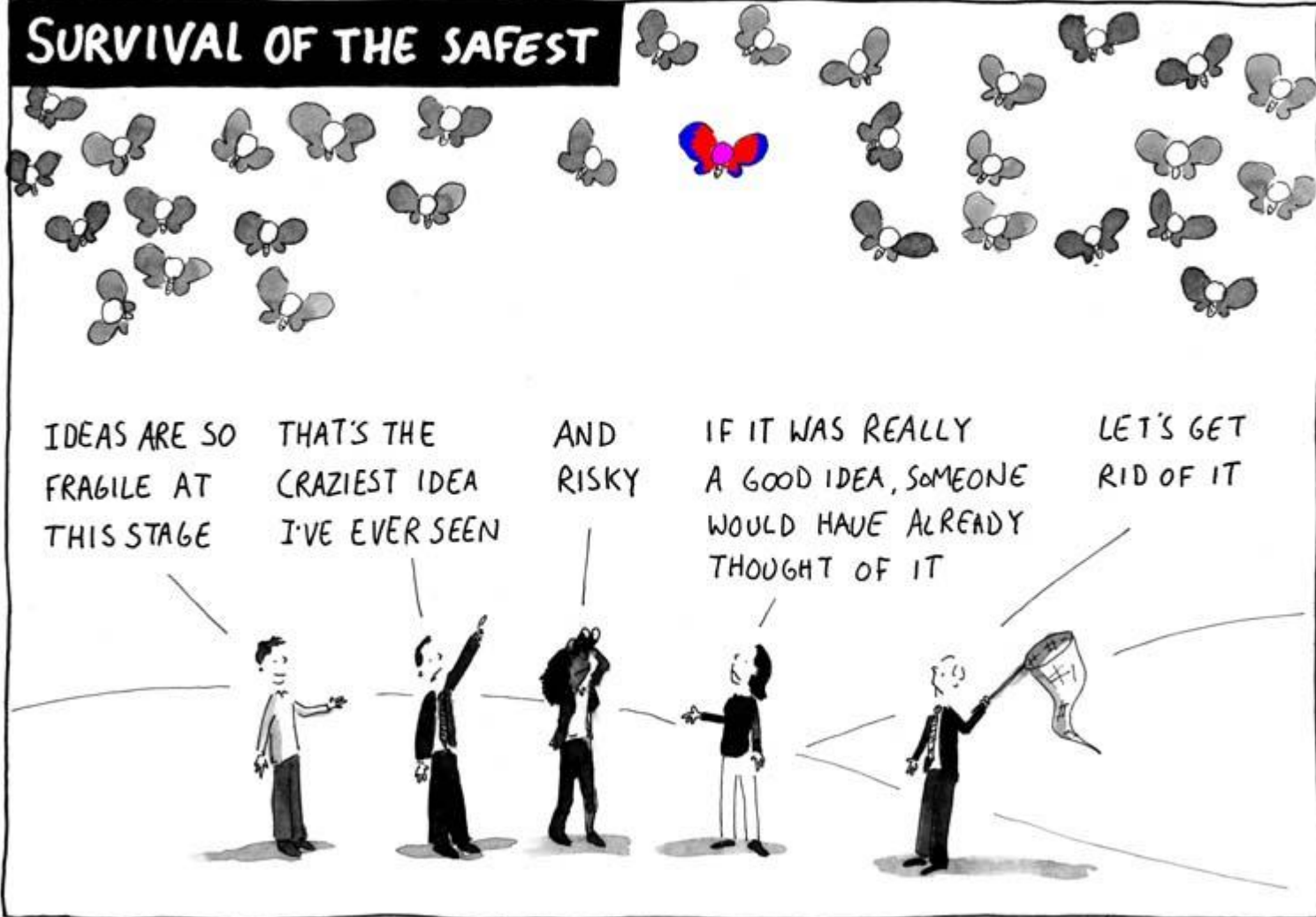
- The creative genius?
- User driven innovation?
- The nurturing context?
- The technology breakthrough?
- Cross-fertilization between sectors?
- Crowdsourcing?

Nurture Ideas!

BRAND CAMP

by Tom Fishburne

SURVIVAL OF THE SAFEST



IDEAS ARE SO
FRAGILE AT
THIS STAGE

THAT'S THE
CRAZIEST IDEA
I'VE EVER SEEN

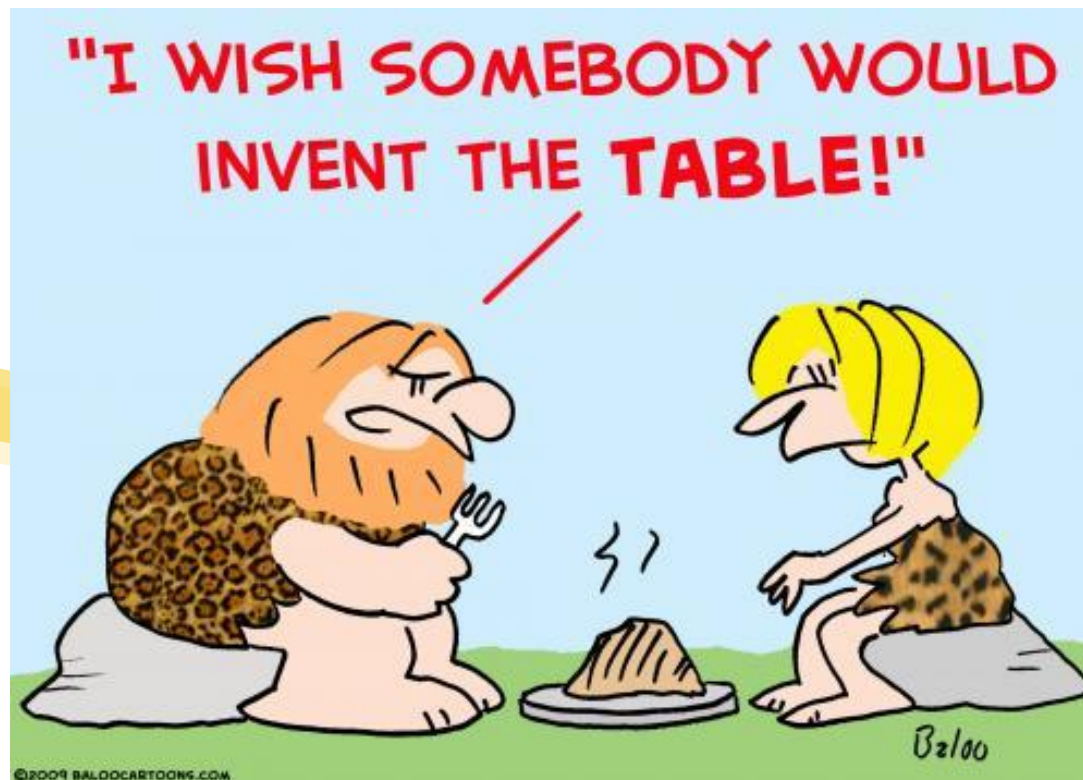
AND
RISKY

IF IT WAS REALLY
A GOOD IDEA, SOMEONE
WOULD HAVE ALREADY
THOUGHT OF IT

LET'S GET
RID OF IT

Pull-mode Innovation

We listened to users and we understand what they need ...



User-driven Innovation ...

BRAND CAMP

by Tom Fishburne



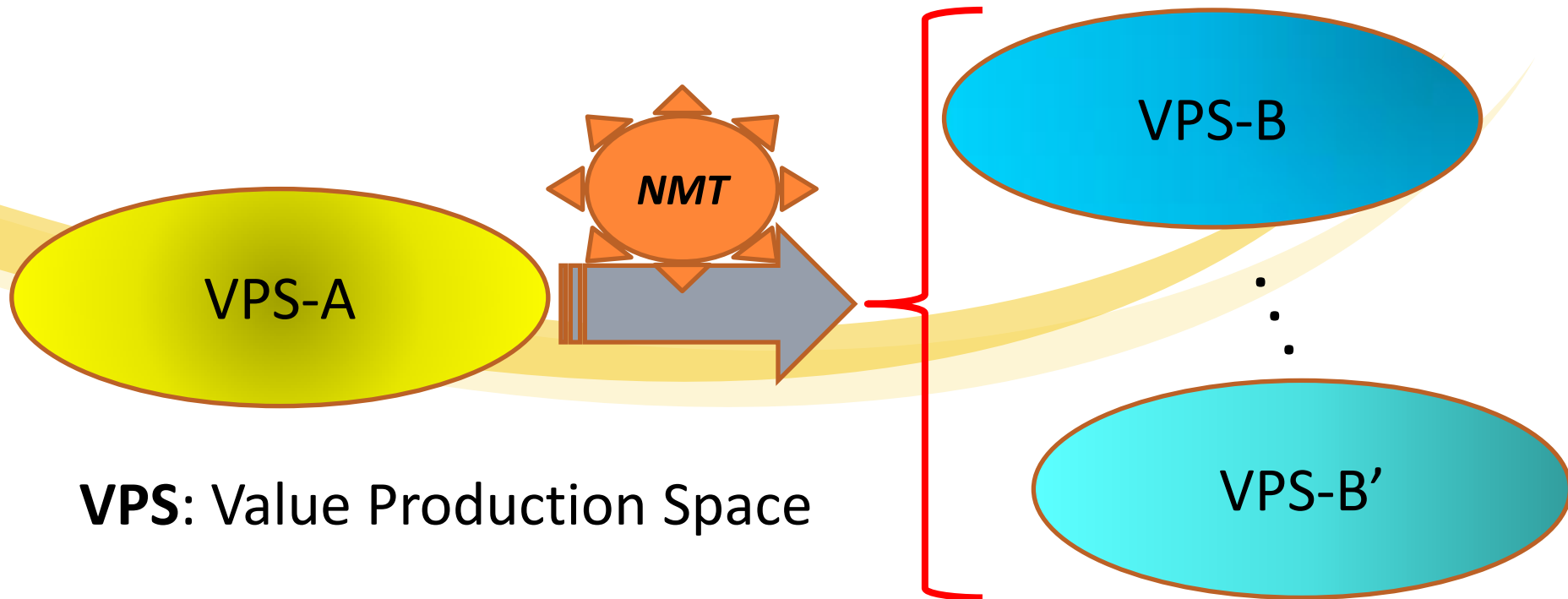
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2. Non-deterministic Meta-Transformation

Based on Functional Theory

- A theory on the transformation of functions



VPS: Value Production Space

Defining *NMT*

Challenges:

- We need to define the *NMT* representing the core of the Innovation Project

But ...

- We need to identify Domain and Range

Domain: what is the current situation? The AS-IS Value Production Space?

Range: what is the objective? And, how we need to change the VPS to achieve it?

Non-determinism: since we CANNOT specify everything,

- how to proceed?
- ... wait and see the BIVEE proposal.

3.Change Management

When we move from theory to real world...

- Is the VPS and the enterprises ready for a change
- How much such a change will cost (Gap Analysis)
- Can we evaluate costs and benefits
- Did we consider the possible failures
- Is there a Risk Management program?
- Are there Contingency Plans (... You can die of innovation!)

Change Management

*Innovation means to rethink
the reality we used to know,
and then change it dynamically*



Resistance to Change



"Your proposal is innovative but I'm afraid I can't use it. I'm comfortable with the current failing procedures."

Managing the Risks

Observing, Measuring, Understanding, Assessing, Replanning



Supporting Technologies

Theory is good for ... publishing papers!

- But in the enterprise we need concrete solutions
- Today enterprises need to focus on continuous Open Innovation
- From ERP to Enterprise Innovation Planning systems
- An example:

The **BIVÉE** Project

*Business Innovation in Virtual Enterprise
Environments*

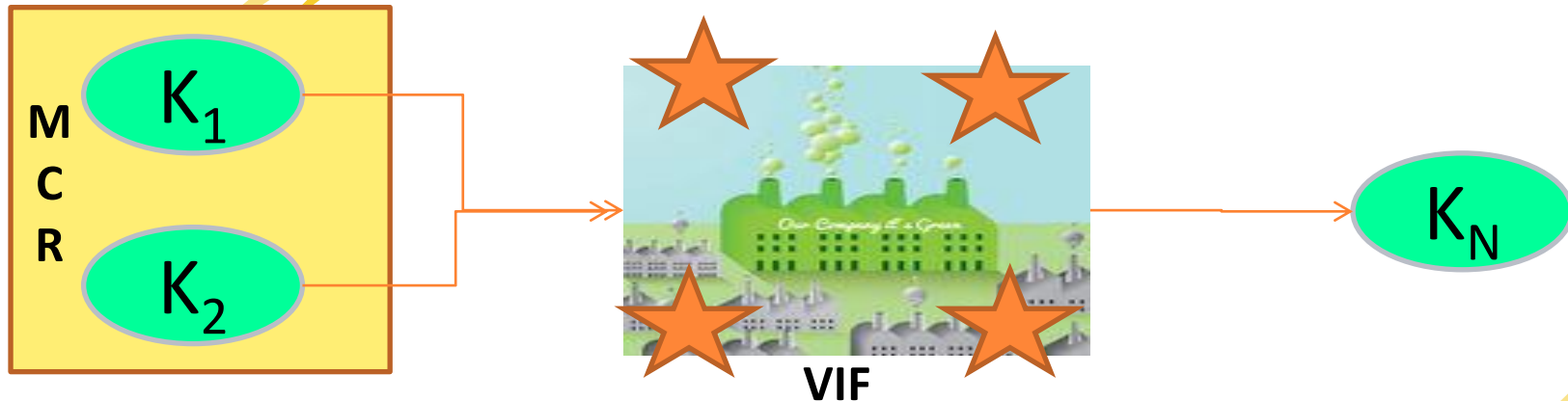
BIVEE in a nutshell

- **BIVEE - Business Innovation in Virtual Enterprise Environments, FoF - FP7 (bivee.eu)**

Mission:

- to address **the full lifecycle** of the ‘inventive enterprise’ that spans **from creativity** and idea generation **to engineering of new businesses**,
- The approach is aimed at putting **people in the center**, with their creativity and competencies,
- providing a **nurturing environment** where open thinking and free interaction is more important than formal processes and stringent control (without relaxing on effective monitoring and performance evaluation).

Innovation as a Knowledge Factory



- **Innovation** as an iterative, continuous venture
- Take existing knowledge about VPS (managed by the ***Mission Control Room***), then connect, fertilise,
- Produce new knowledge, in the ***Virtual Innovation Factory***, according to **4 Waves**: Creativity, Feasibility, Prototyping, Engineering

BIVEE: the Big Picture



**Mission
Control
Room**



**Virtual
Innovation
Factory**

Front-End

**Production
Innovation
Knowledge
Repository**

Middle-Tier

**Production
Monitoring
System**

**Innovation
Monitoring
System**

Raw Data Management

Back-end

**PRODUCTION
SPACE**

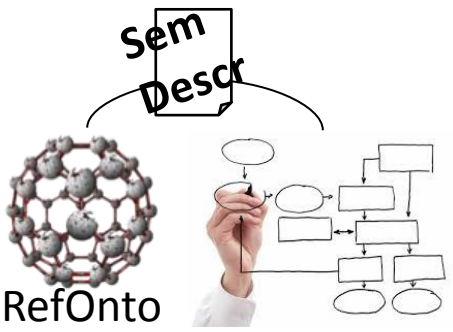


**INNOVATION
SPACE**



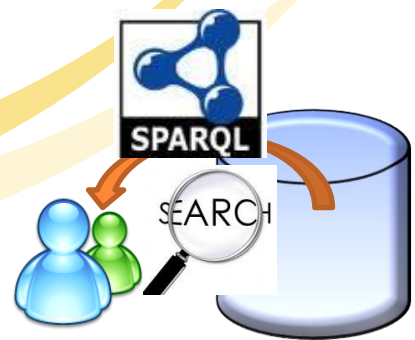
PIKR Facilities

■ Collaborative Ontology Engineering



■ Semantic annotation (tagging) of enterprise resources

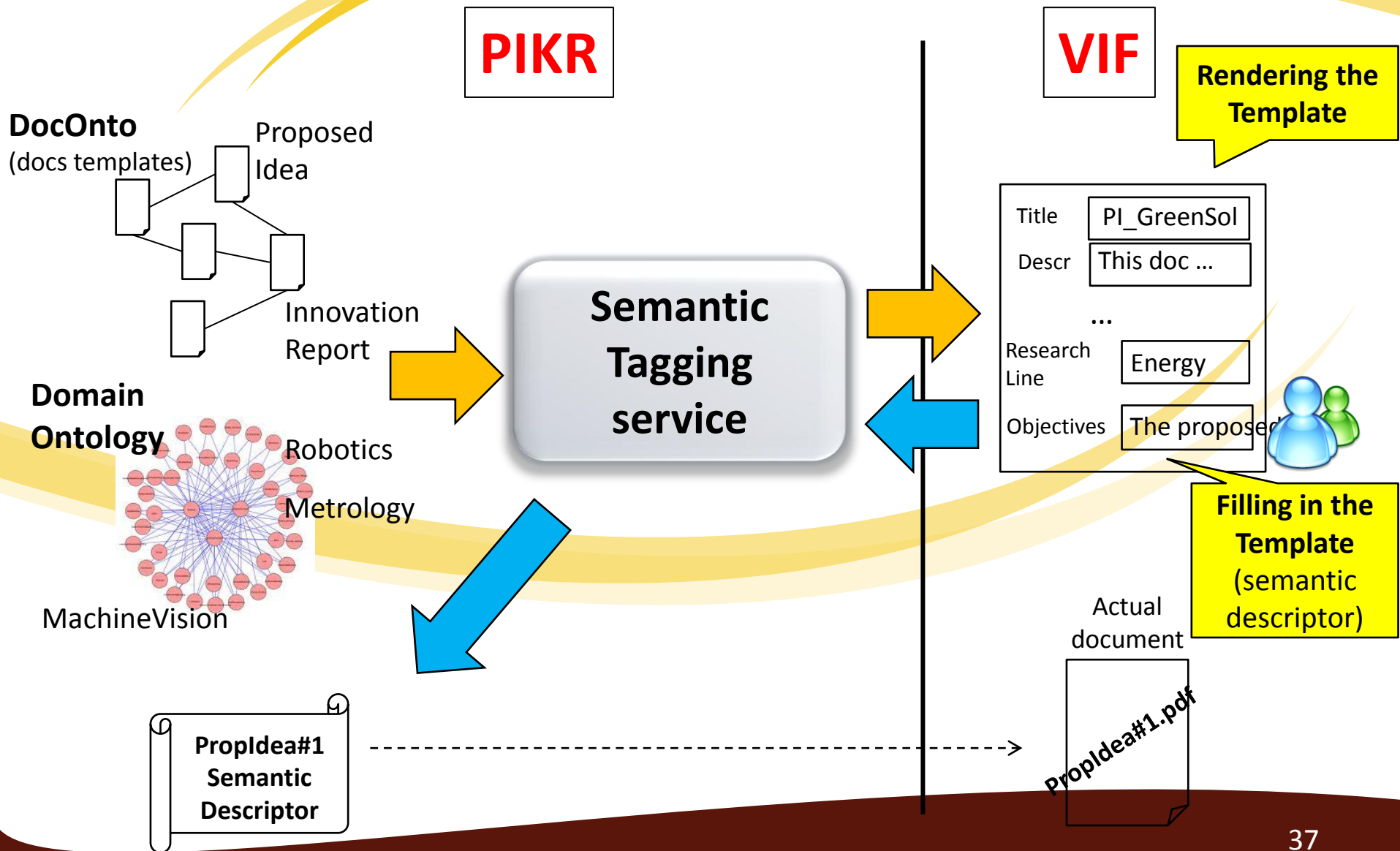
■ Semantic search and query to access available knowledge



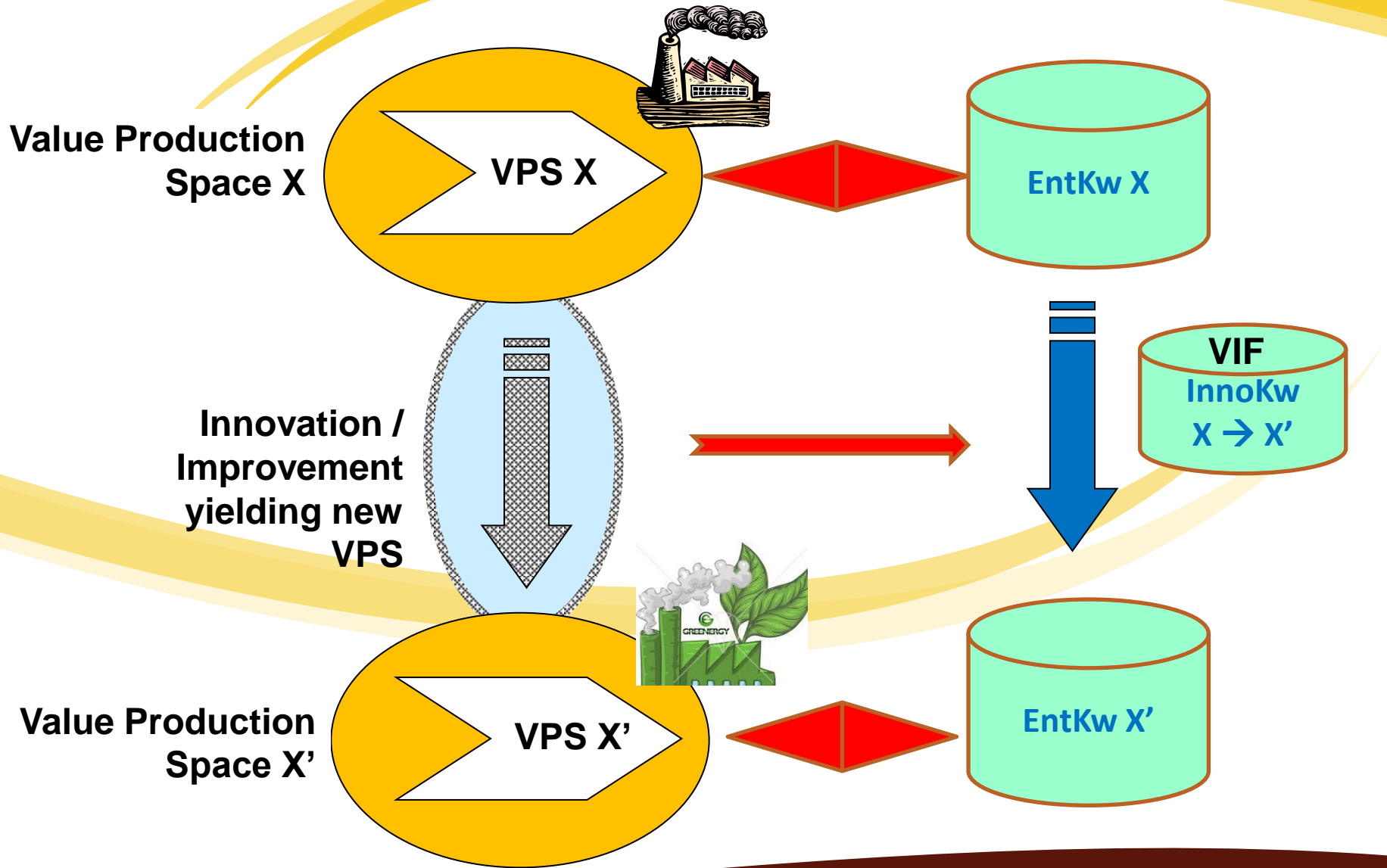
■ Semantic social networking and crowd-sourcing



Semantic Annotation of documents



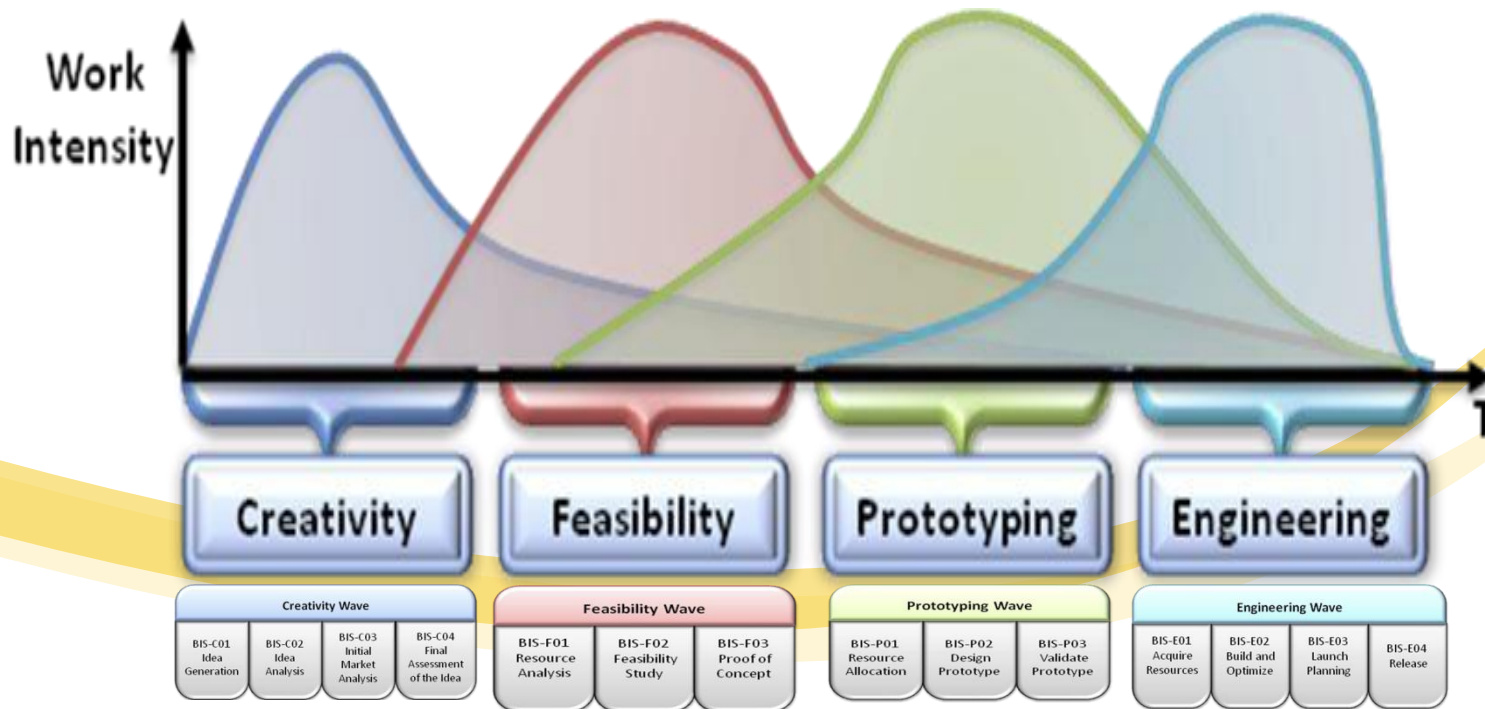
Enterprise Knowledge transformation



Value Production Space: Products, Production Processes, units, means,

BIVEE Waves...

Document driven ... Waves: Beyond the idea of process



Innovation Waves of BIVEE

Creativity: starts with an innovation idea or a problem to be solved, providing a first specification.

Feasibility: define scope and the intended impact, predicting the chance of success: a defined budget is mobilized.

Prototyping: This wave features the first implementation of the initial ideas: the idea is drawn into the real world for the first time.

Engineering: creation of production plans, testing, sourcing, and overhaul-procedures.

Innovation Monitoring Framework

Innovation-KPIs & W5H semantics. In essence, what should be monitored?

- *What,*
- *Why,*
- *Who,*
- *When,*
- *Where,*
- *How*



Conclusions

- The Nature of Innovation, requires first ...
- The deep understanding of the essence of VPS
- Proposing Innovation as a **scientific discipline**
- To this end, we want to understand the **essence** and the deep **nature, e.g., NMT**, the way it can be built, measured, assessed, ...
- But at the top there is the real world with people, environment, society, ...
- So, Creativity, human fantasy, bright ideas will remain the core, but supported by solid methodologies.

(Credits: BIVÉE Project and EC, DG Connect. www.bivee.eu)

?? Questions ??

