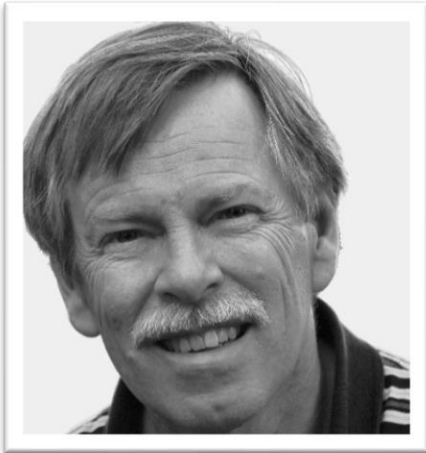
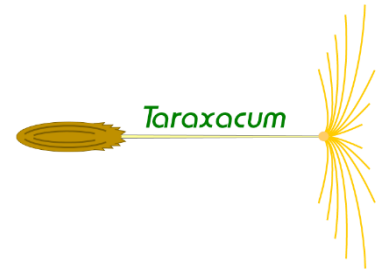


RE, the Next Generation



from **requirements** engineering
to requirements **engineering**

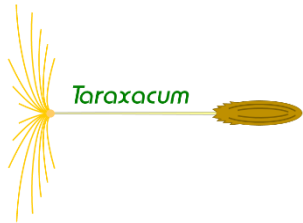
Pleased to meet you



- Hans van Loenhoud
- 35+ years ICT, 20 years testing, 5 years RE
- Trainer | coach | consultant
 - Taraxacum, the Netherlands
- Member of the International Requirements Engineering Board (IREB)

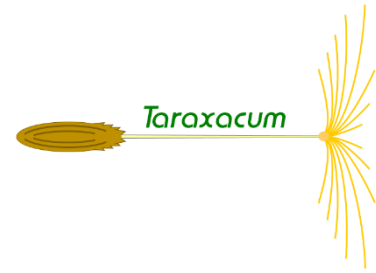


hans.vanloenhoud@taraxacum.nl

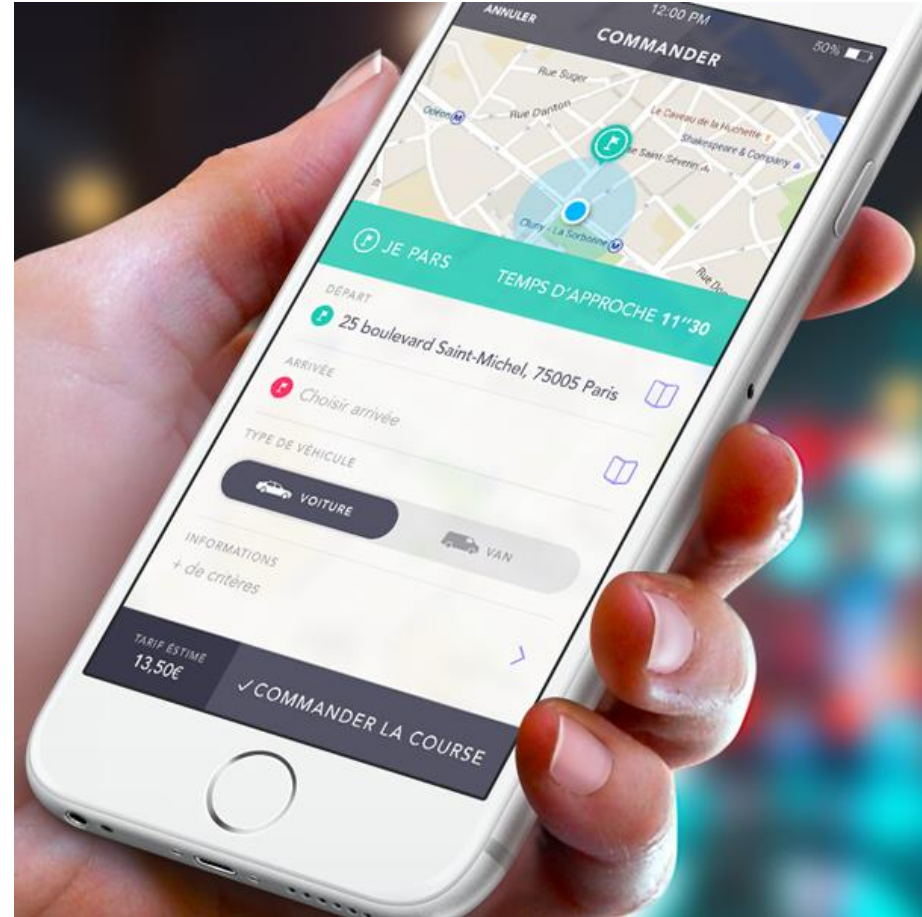
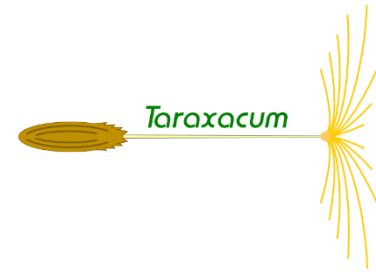


www.taraxacum.nl

Route



Taxi!

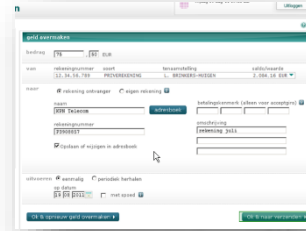


Digi ... what?

digitization

digitalization

digital transformation

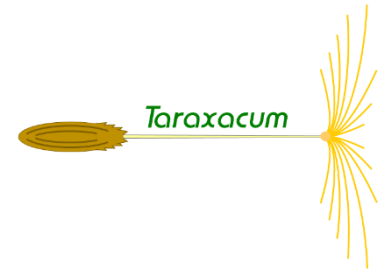


 **bitcoin**

 **Spotify®**

twitter 

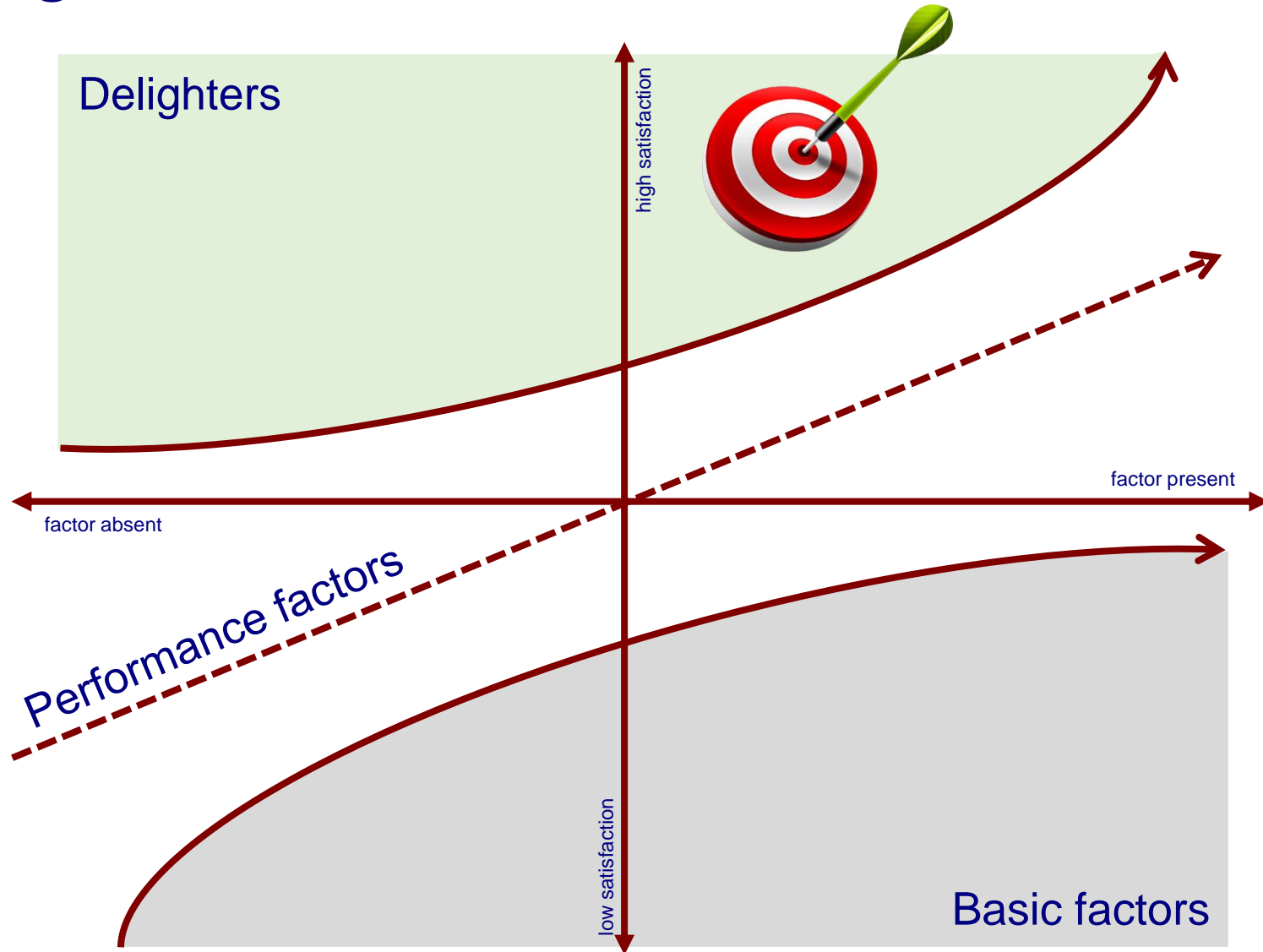
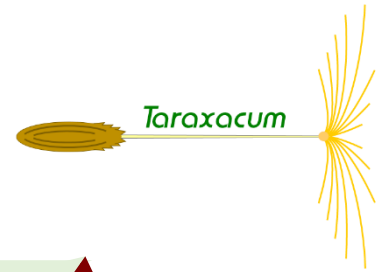
The innovation challenge



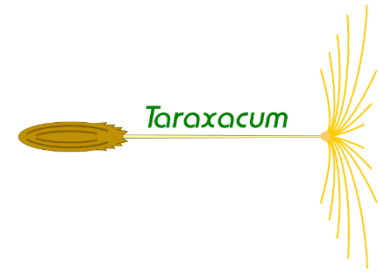
- It is a green field
 - No examples
 - No stakeholders
 - No customers (yet...)



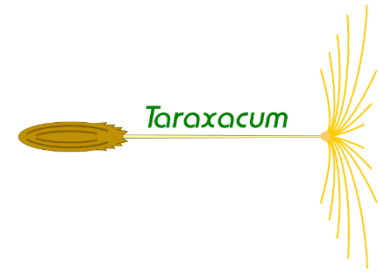
Looking for Kano



Supplier centered \Rightarrow customer centered



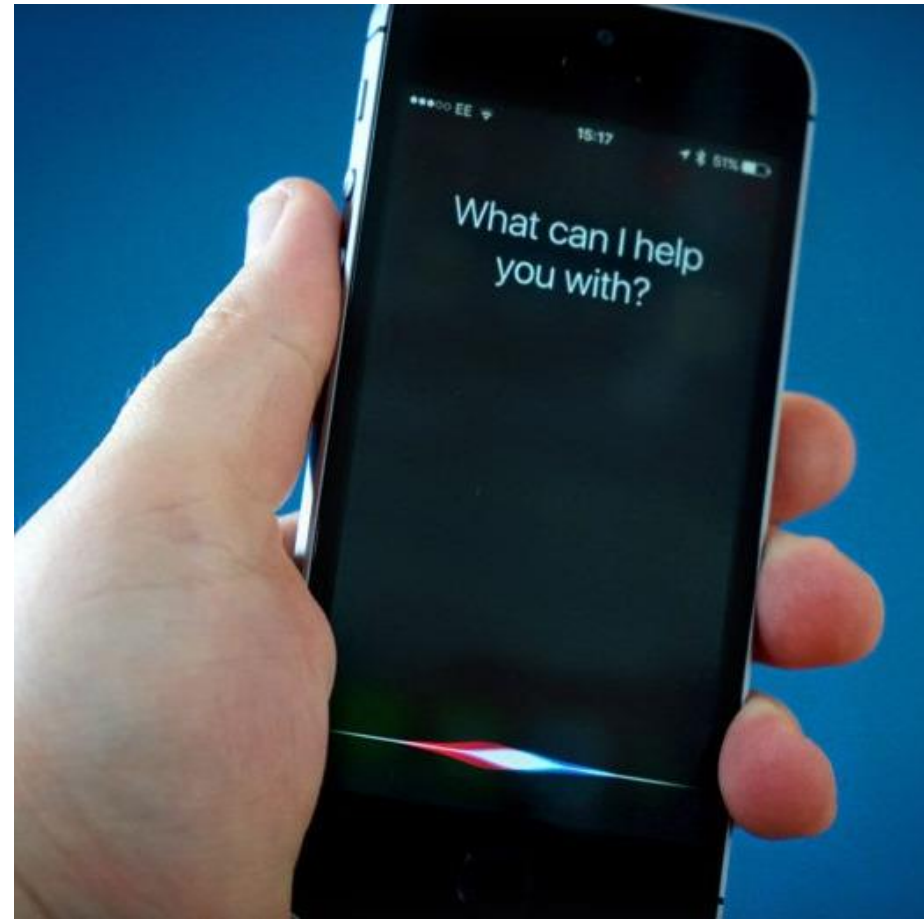
Customer affected \Rightarrow customer involved



Product oriented \Rightarrow service oriented



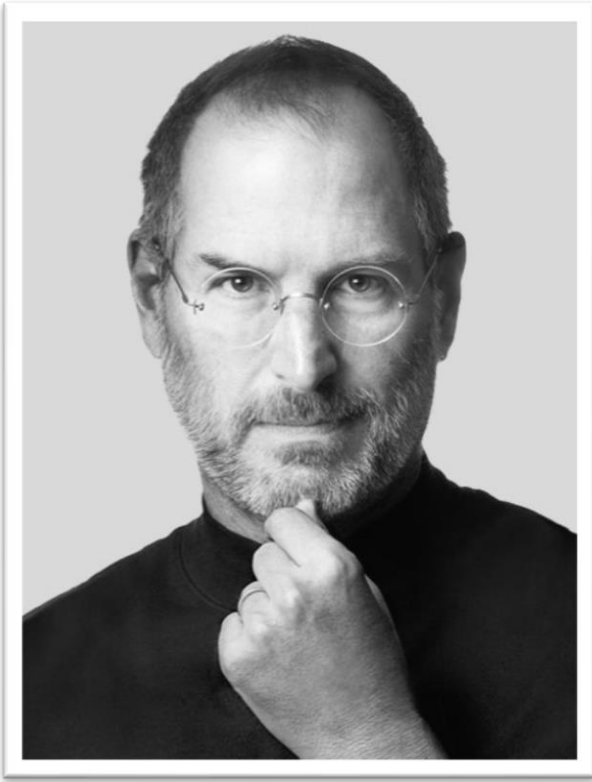
IT supported \Rightarrow IT enabled



Engineered \Rightarrow designed



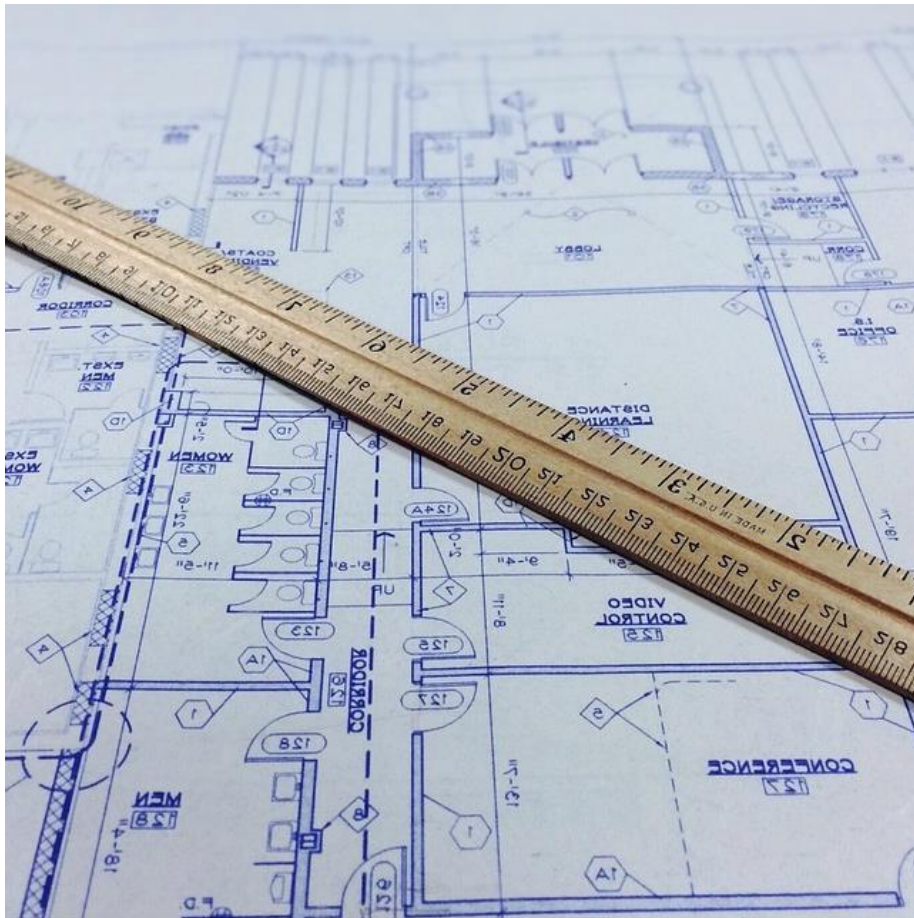
Steve Jobs on Design



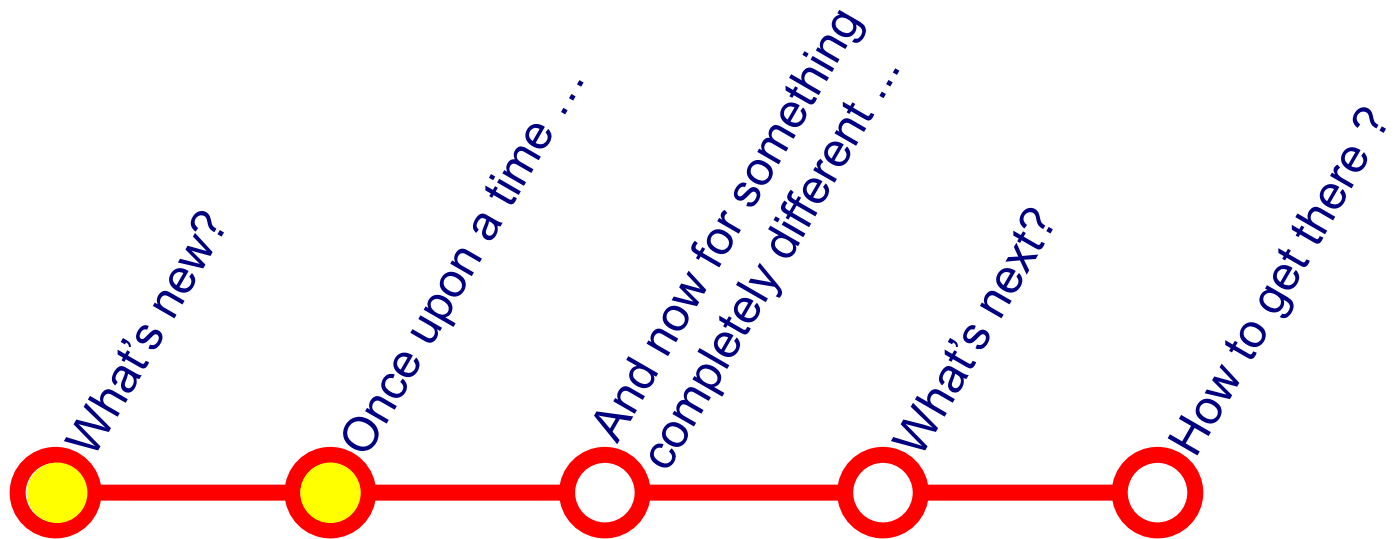
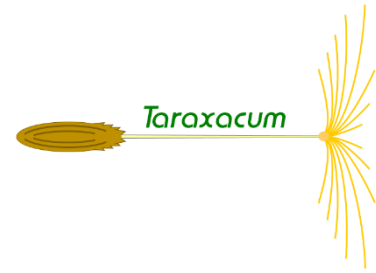
Steve Jobs
(1955 - 2011)

- *Design is not just what it looks like. Design is how it works.*
- *The broader one's understanding of the human experience, the better design we will have.*
- *Simple can be harder than complex. You have to work hard to make your thinking clean to make it simple.*
- *Most important, have the courage to follow your heart and intuition.*

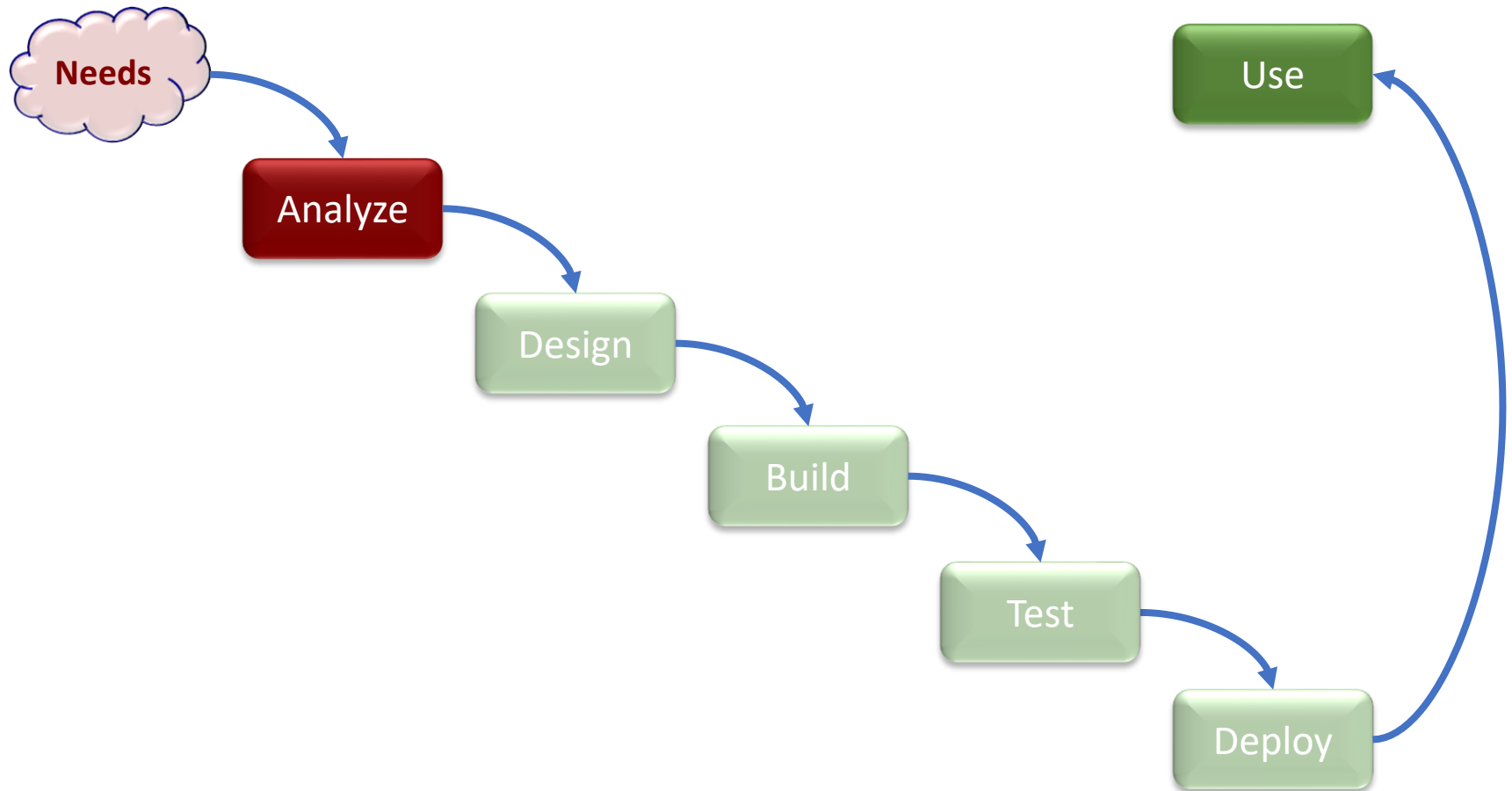
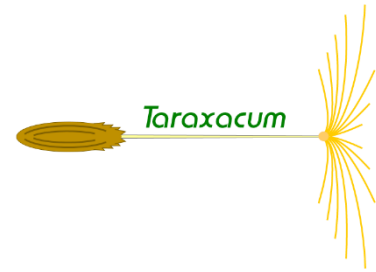
Requirements \Rightarrow ideas



Route



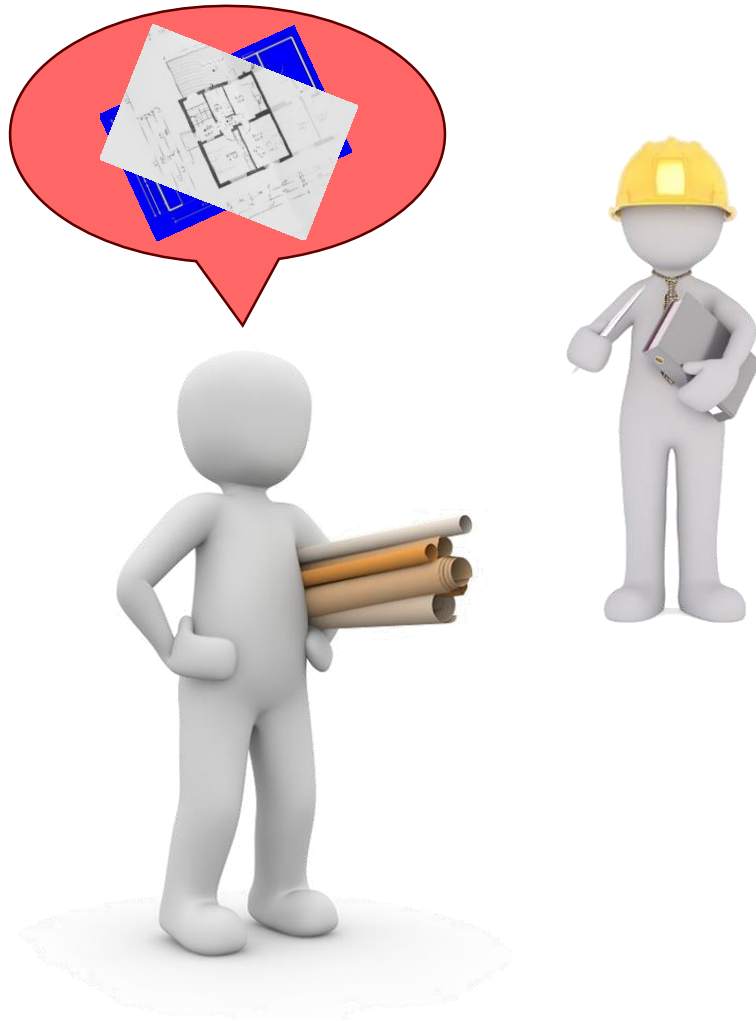
... we developed by the waterfall



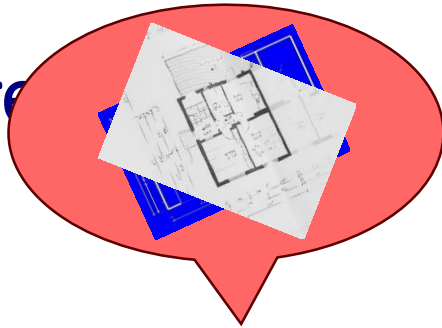
Requirements for a solution



Using requirements



Using require



Sorry for that ...



Old school

Client asks for system



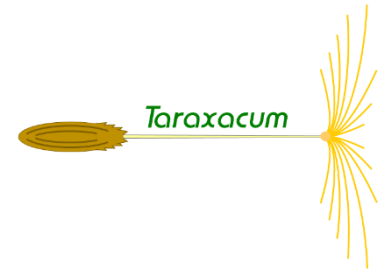
RE collects requirements



Project builds system



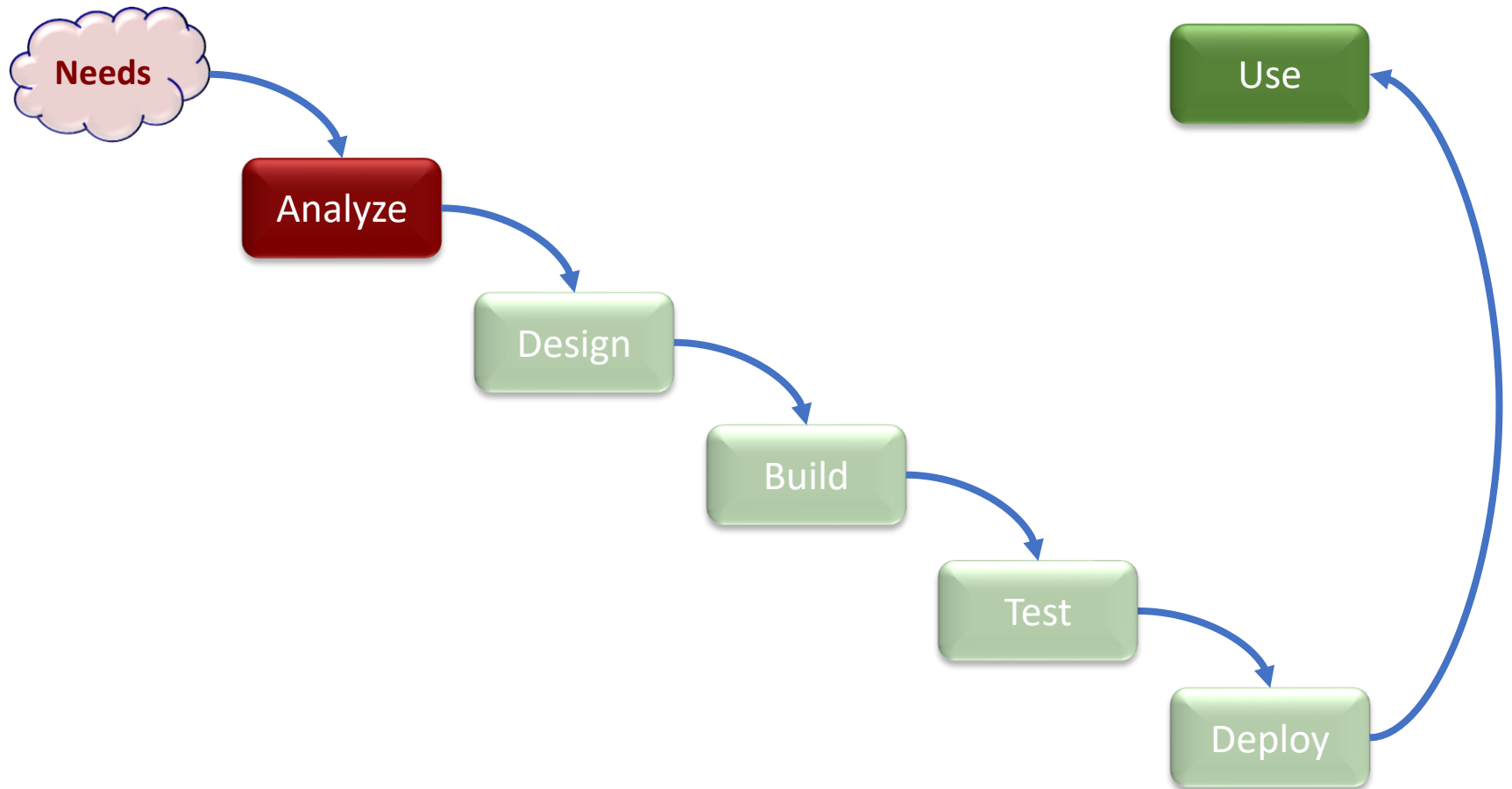
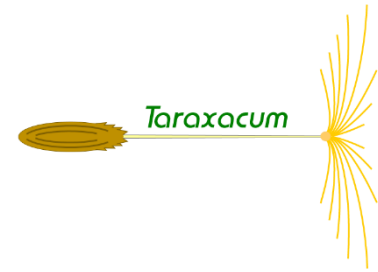
Route



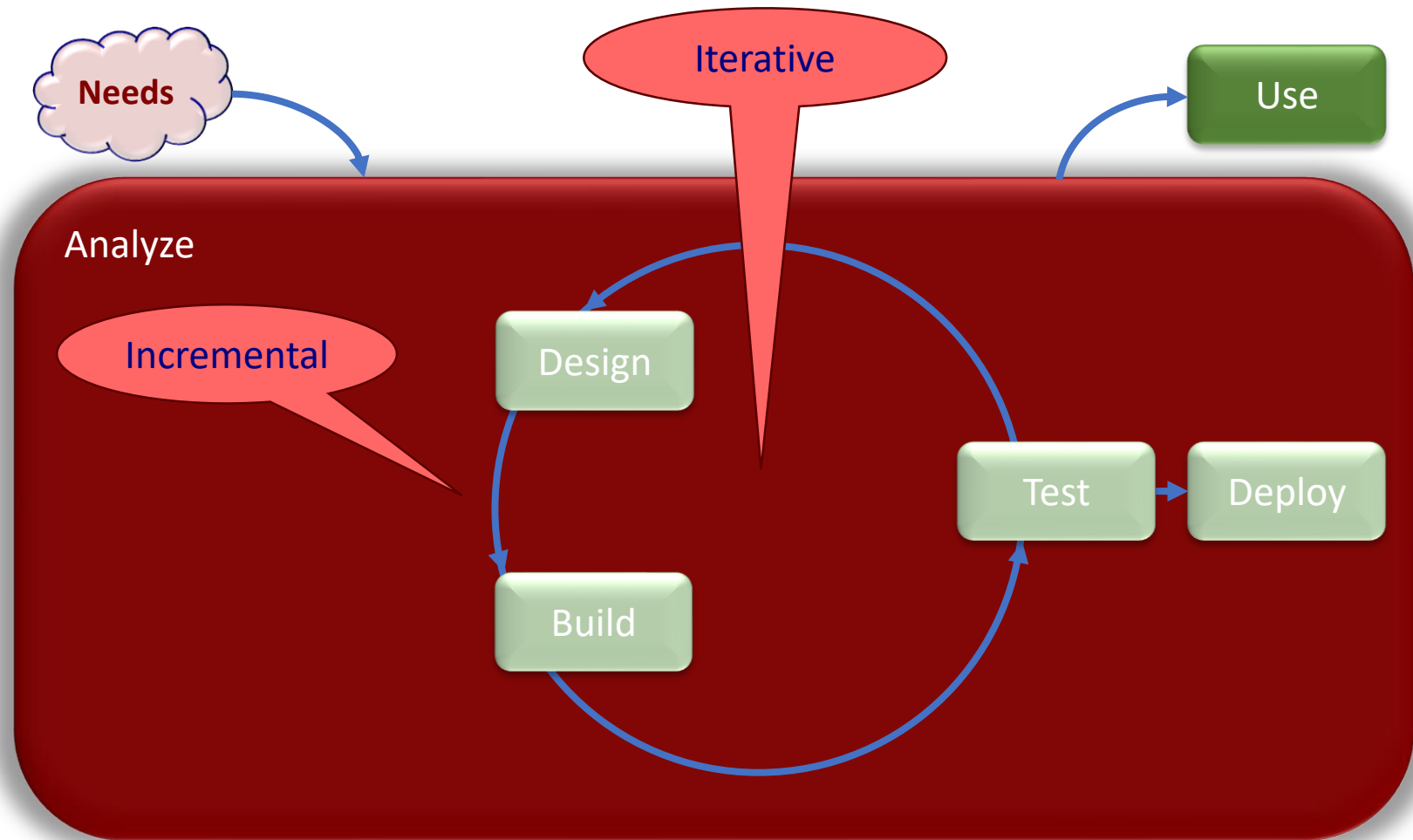
The Agile storm!



From the waterfall...



... to Agile

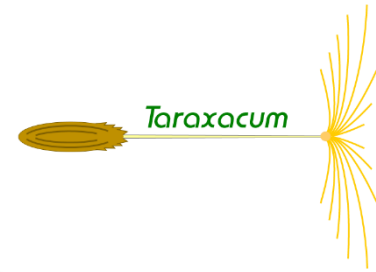


Requirements?

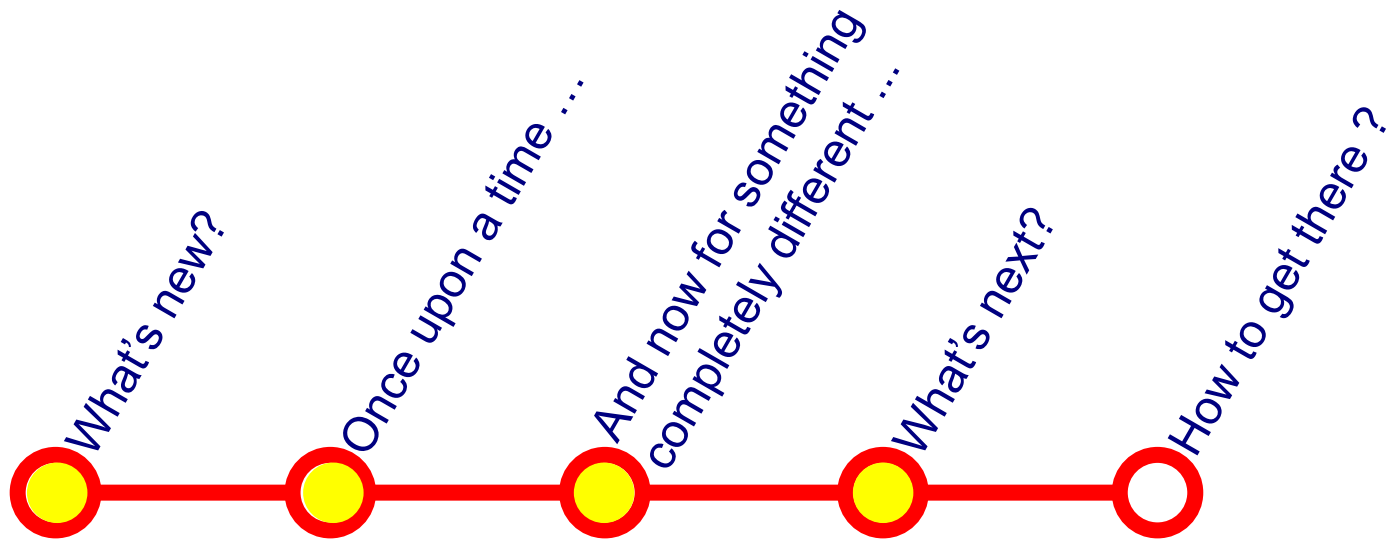
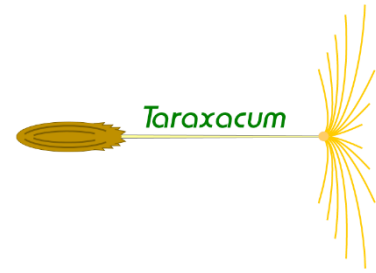
Just ask the Product Owner!



Four common misunderstandings about requirements today



Route



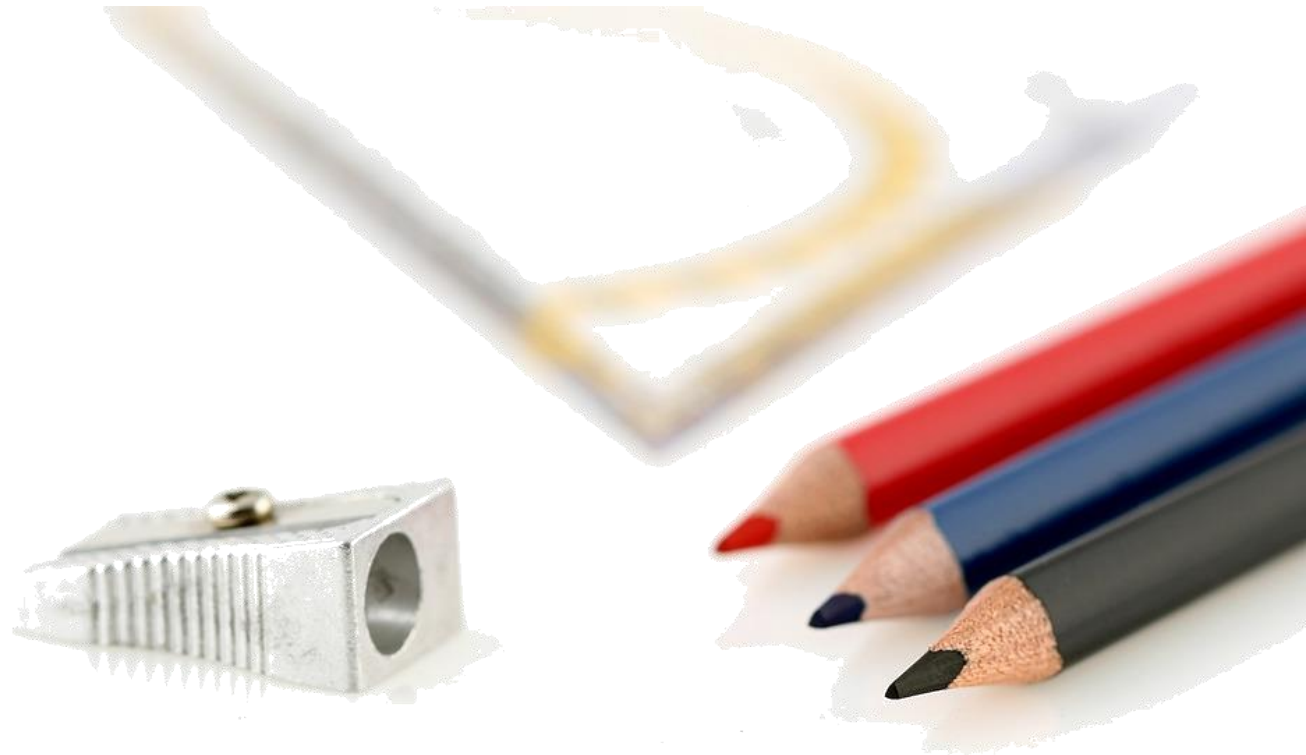
The Next Generation

- From **requirements** engineering
to requirements **engineering**
 - From **descriptive** to **creative**

- RE to create business value by providing solutions
 - Participate in projects creating IT-systems that effectively support the needs of clients

Requirements

A requirement is 'a condition or capability
needed by a user to **solve** a problem or achieve an objective'
(IEEE Std 610.12 - 1990)



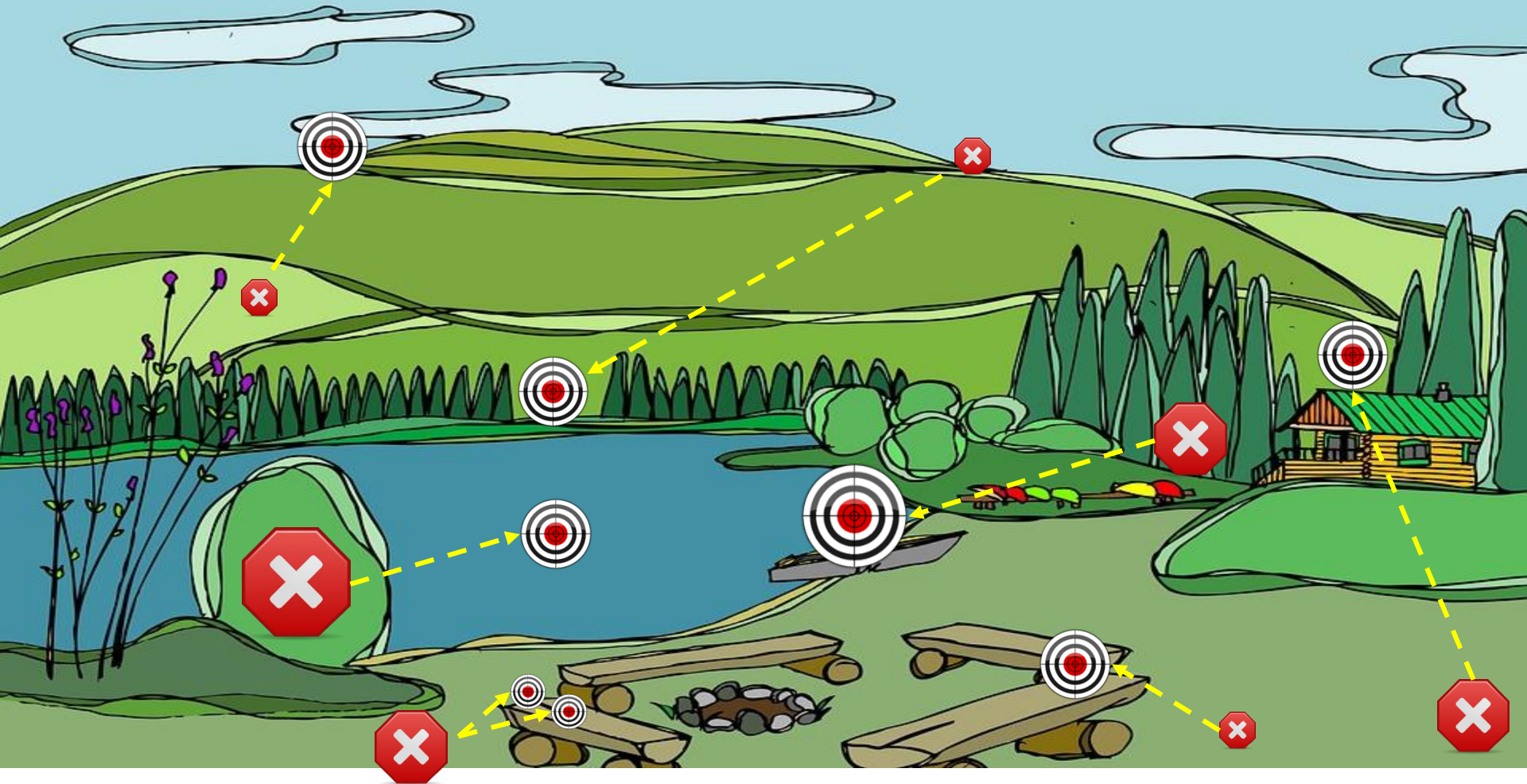
Engineering

Engineering is 'the **creative** application of scientific principles to **design** or develop structures, [... etc. ...] all as respects an **intended function**, economics of operation or safety to life and property'

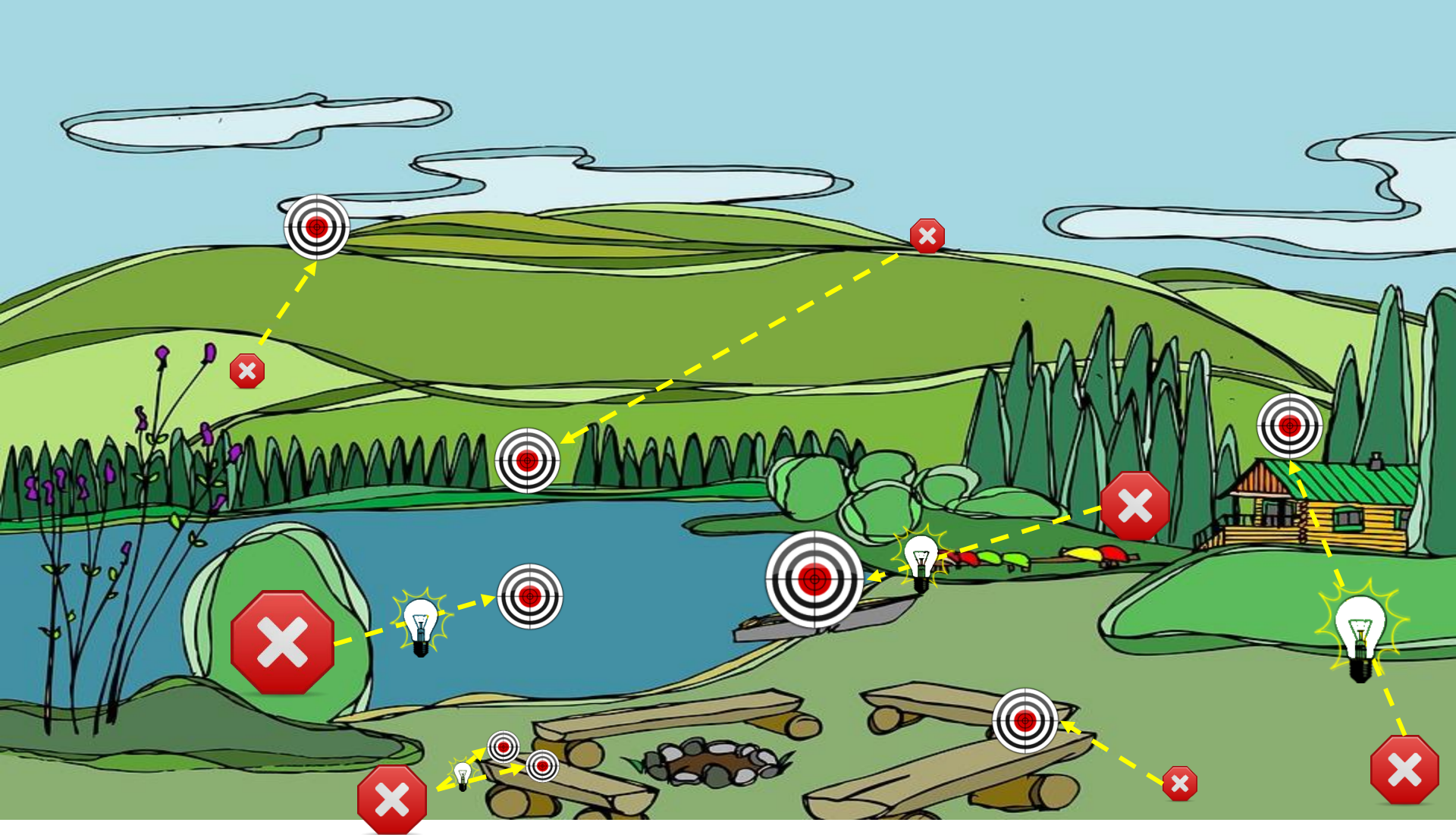
(American Engineers' Council for Professional Development)



The landscape of problems and goals



Solutions for relevant P/G pairs



Help the client to decide

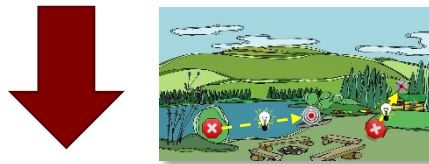


New school

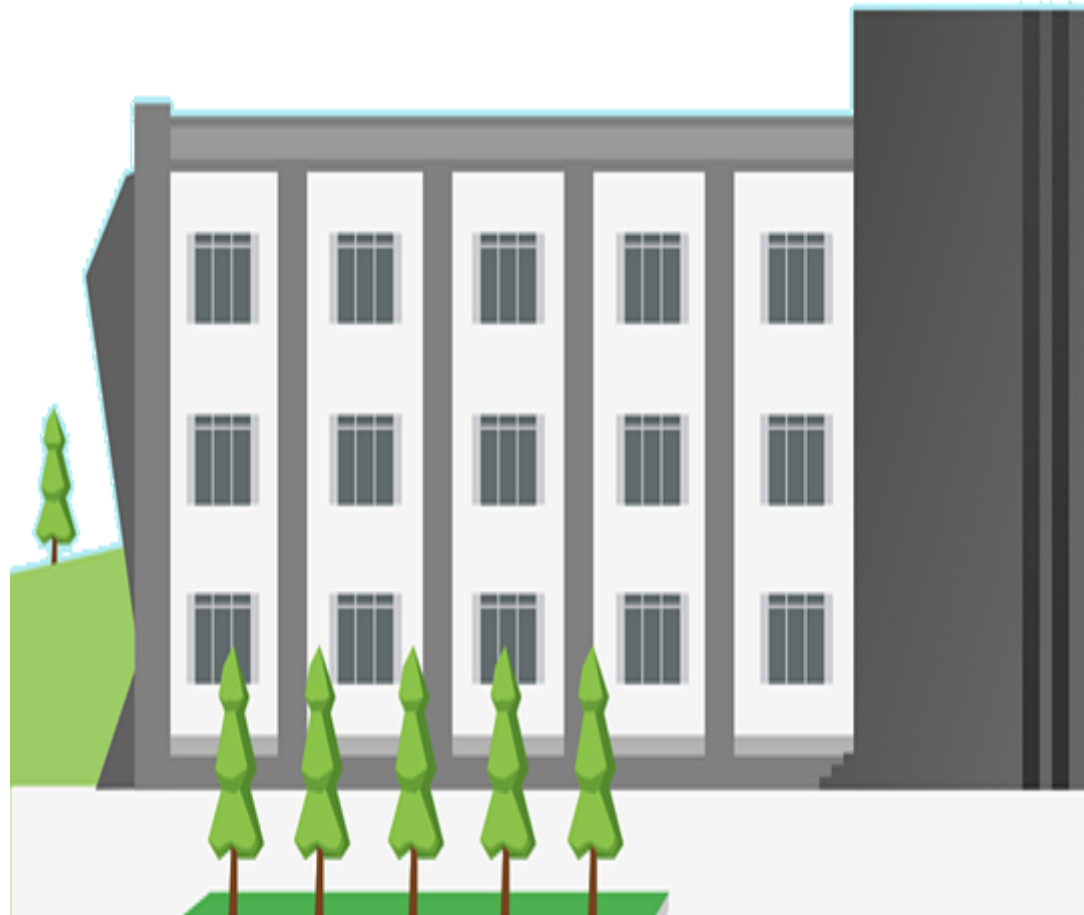
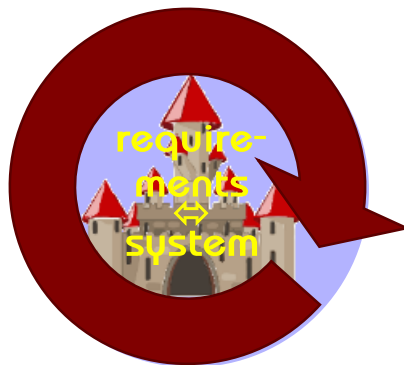
Client asks for help



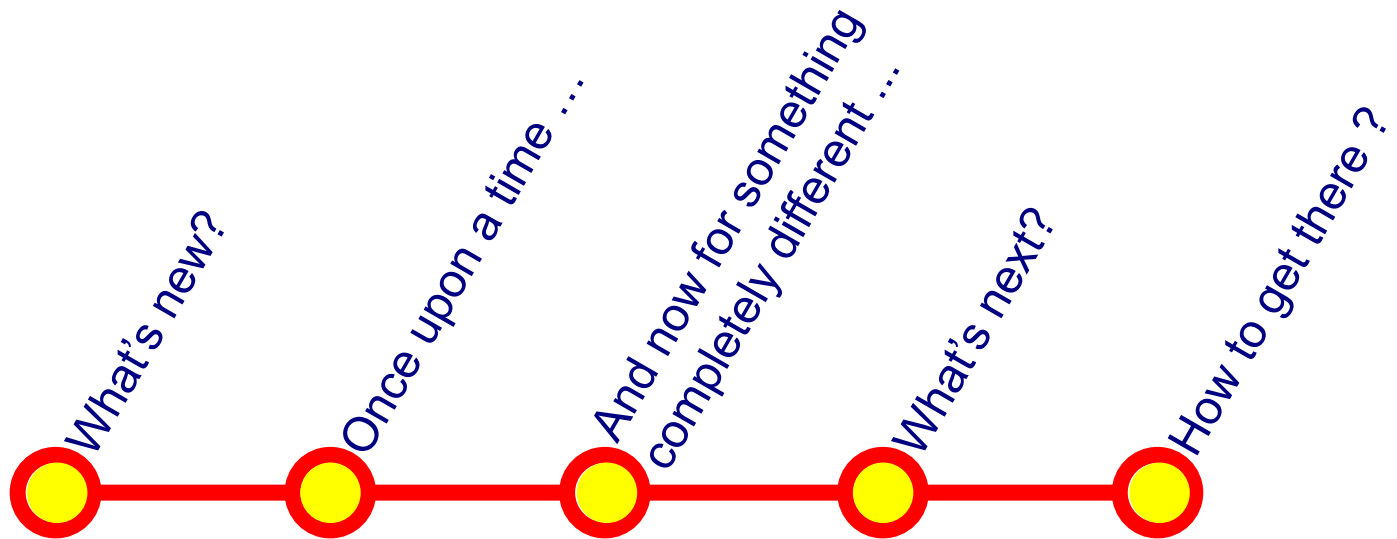
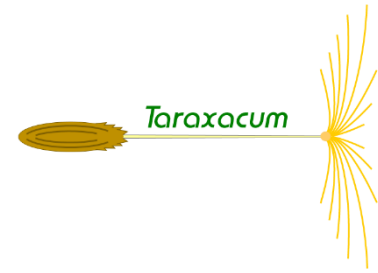
RE analyzes context
and proposes solutions



Project builds chosen solution

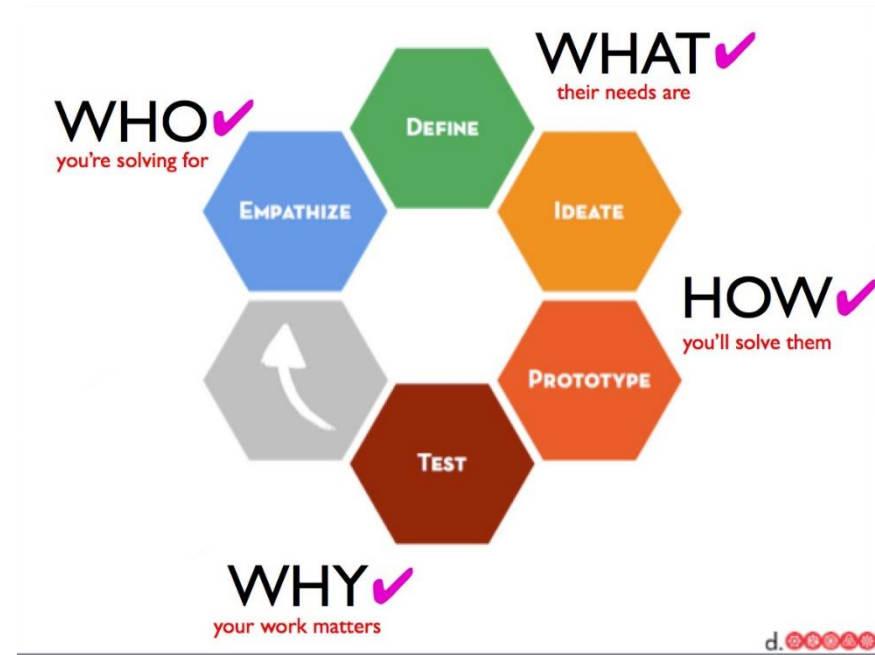


Route

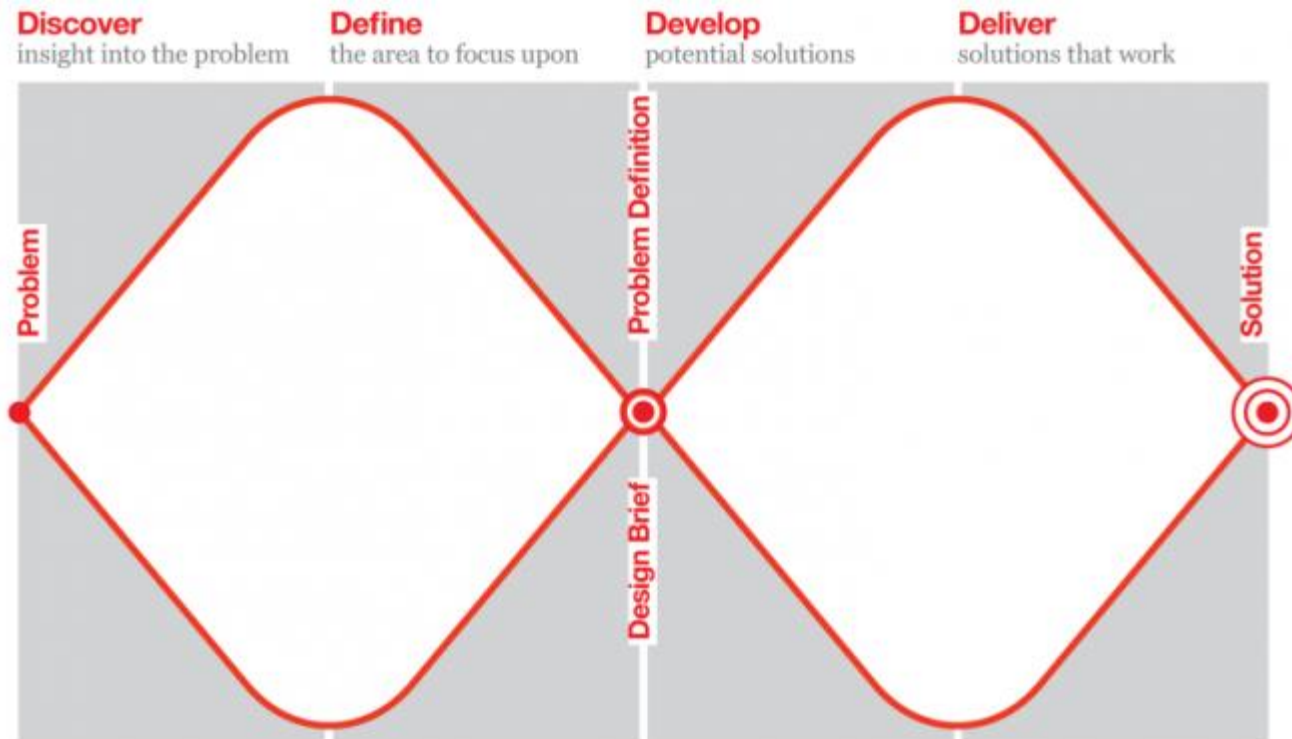
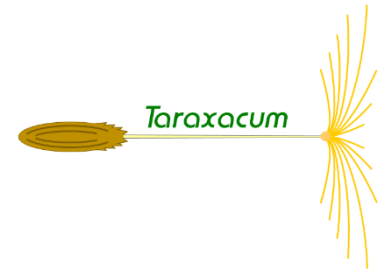


Design Thinking

- Develop practical and sustainable solutions for wicked / ill-defined problems
- A light-weight process using different methods & techniques
- Focus on developing cheap and quick prototypes
- *'Fail faster to succeed sooner'*



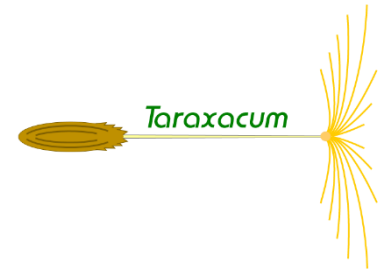
Design Thinking (cont.)



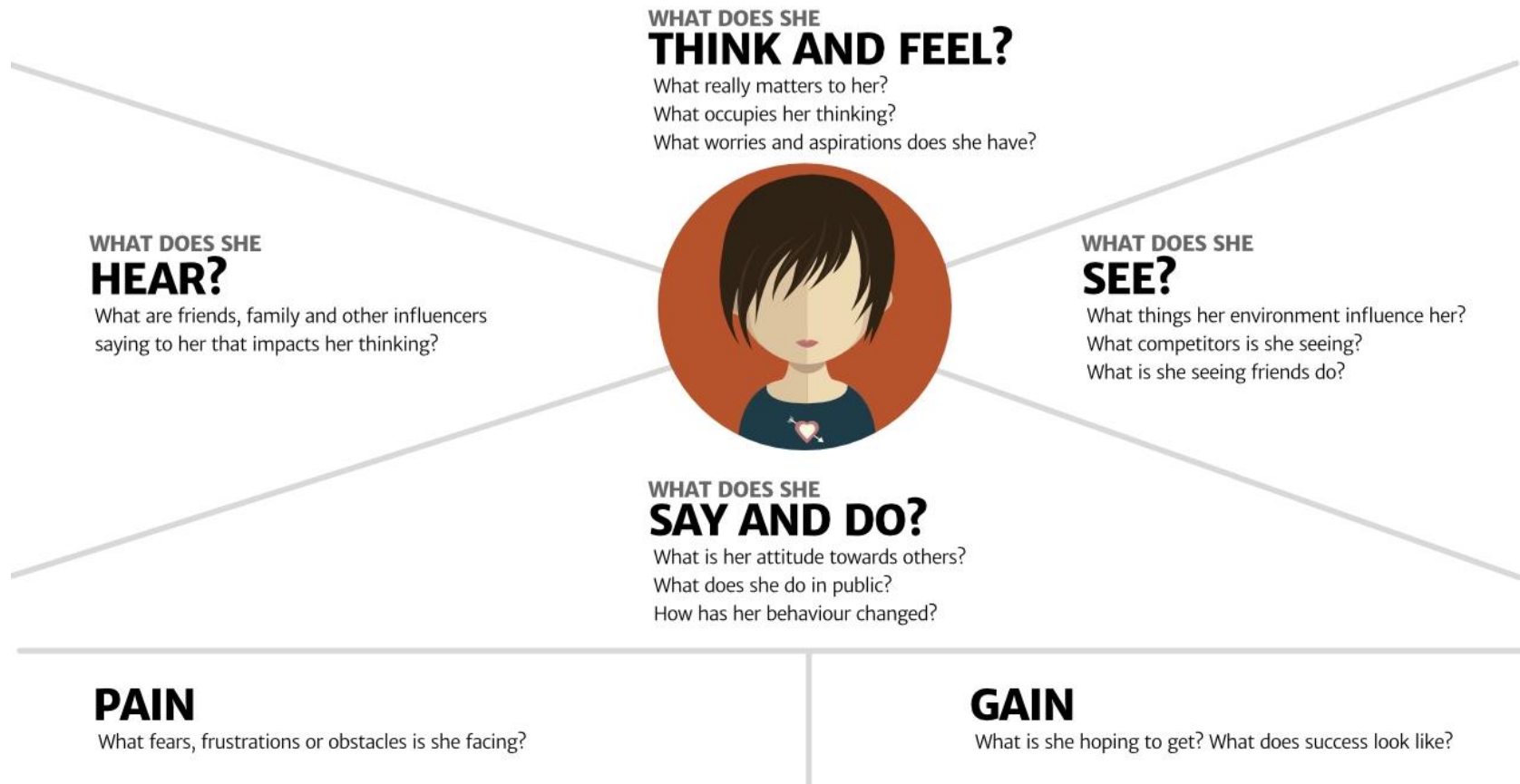
The Double Diamond

<http://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond>

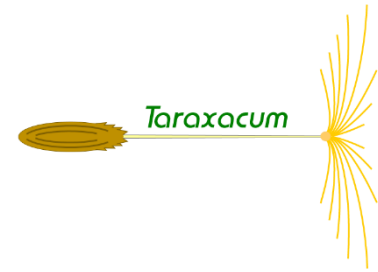
Design Thinking (cont.)



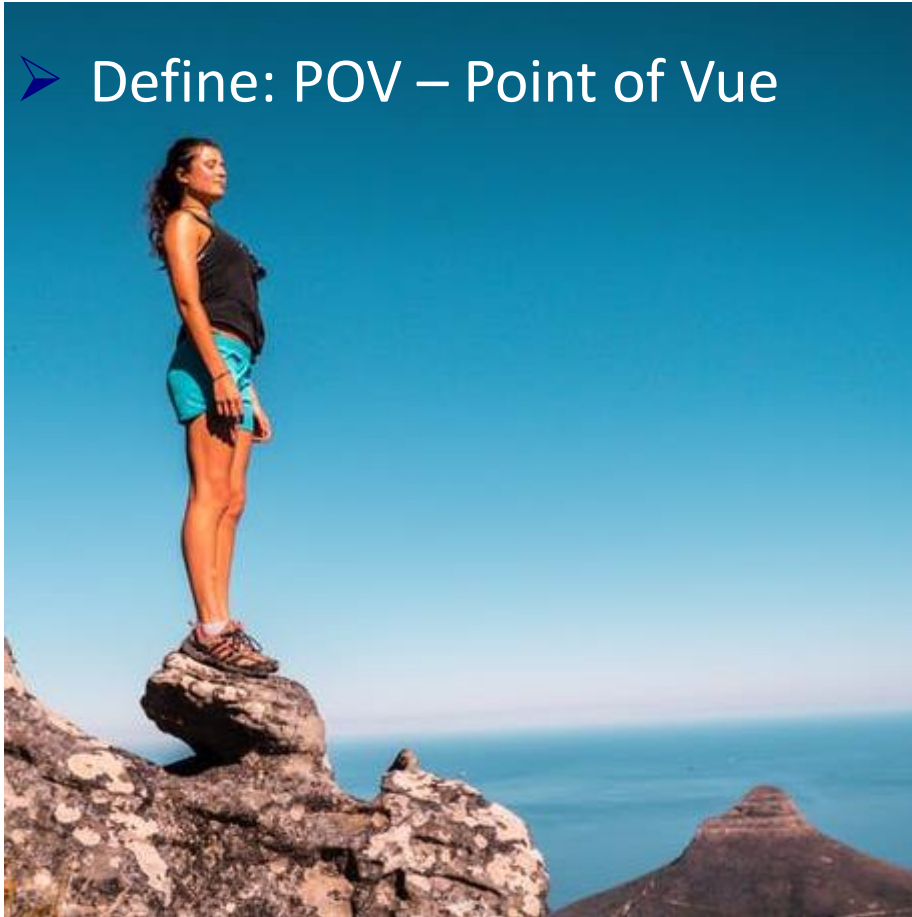
➤ Empathy map



Design Thinking (cont.)



➤ Define: POV – Point of View



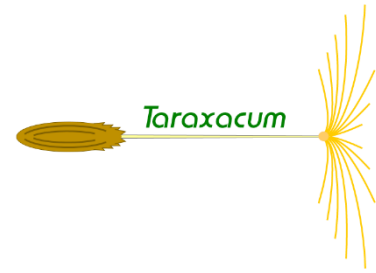
➤ Ideate: HMW – How might we?



Prototyping, prototyping, prototyping

1. IDEA SKETCH  CONCEPT DESIGN INTENT <p>Employed at a personal level to quickly externalize thoughts using simple line-work. Also known as Thumbnail, Thinking or Napkin Sketch.</p>	2. STUDY SKETCH  CONCEPT DESIGN INTENT <p>Used to investigate appearance, proportion and scale in greater detail than an Idea Sketch. Often supported by the loose application of tone/color.</p>	3. REFERENTIAL SKETCH  CONCEPT DESIGN INTENT <p>Used to record images of products, objects, living creatures or any relevant observations for future reference or as a metaphor.</p>	4. MEMORY SKETCH  CONCEPT DESIGN INTENT <p>Helps expand thoughts during the design process using mind maps, notes and annotations.</p>	5. CODED SKETCH  CONCEPT DESIGN INTENT <p>Informal coded representation that categorizes information to demonstrate an underlying principle or scheme.</p>	6. INFORMATION SKETCH  CONCEPT DESIGN INTENT <p>Quickly and effectively communicates features through the use of annotation and supporting graphics. Also known as Explanatory or Talking Sketch.</p>	7. SKETCH RENDERING  CONCEPT DESIGN INTENT <p>Clearly defined proposal produced by controlled sketching and use of color/tone to enhance detail and realism. Also known as First Concept.</p>	8. PRESCRIPTIVE SKETCH  DEVELOPMENT COMPONENTS <p>Informal sketch for the exploration of technical details such as mechanisms, manufacturing, materials and dimensions.</p>
9. SCENARIO & STORYBOARD  DEVELOPMENT SCENARIO OF USE <p>Describes interactions between user and product, sometimes in an appropriate context.</p>	10. LAYOUT RENDERING  DEVELOPMENT FORM COMPONENTS <p>Defines the product, proposals as a third angle orthographic projection with precise line and color.</p>	11. PRESENTATION RENDERING  DEVELOPMENT FORM <p>Contains a high level of realism to fully define product appearance as a perspective view. Particularly useful for decision making by non-designers.</p>	12. DIAGRAM  DEVELOPMENT COMPONENTS <p>Schematic representation of the operating principle of relationship between components. Also known as a Schematic or Diagrammatic Drawing.</p>	13. PERSPECTIVE DRAWING  DEVELOPMENT FORM <p>Defined as a view produced using perspective drawing technique. Created without the application of color.</p>	14. GEN ARRANGEMENT DRAWING  EMBOIDMENT COMPONENTS <p>Exterior view all components using line only and with sufficient detail to produce an Appearance Model if required. Usually drawn in third angle projection.</p>	15. DETAIL DRAWING  DETAIL DIMENSIONS <p>Contains detail of components for the manufacturing product. Also known as Technical, Production or Construction Drawing.</p>	16. TECHNICAL ILLUSTRATION  EMBOIDMENT COMPONENTS <p>Communicates technical detail with a high degree of realism that is sometimes supported with symbols. Includes Exploded views.</p>
17. SKETCH MODEL  DEVELOPMENT FORM <p>Informal, relatively low definition 3D model that captures the key characteristics of form. Also known as a Foam Model for 3D Sketch.</p>	18. DESIGN DEVELOPMENT MODEL  DEVELOPMENT ASSETS OF CONCEPT COMPONENTS <p>Simple mock-up used to explore and visualize the relationships between components, cavities, interfaces, and structures. Usually produced using CAD.</p>	19. FUNCTIONAL MODEL  EMBOIDMENT PERFORMANCE <p>Captures the key functional features and underlying operating principles. Has limited or no association with the product's final appearance.</p>	20. OPERATIONAL MODEL  DEVELOPMENT USABILITY & OPERATION <p>Communicates how the product is used with the potential ergonomic evaluation.</p>	21. APPEARANCE MODEL  EMBOIDMENT FORM <p>Accurate physical representation of product appearance. Also known as a Block Model as it tends not to contain any working parts.</p>	22. ASSEMBLY MODEL  EMBOIDMENT ASSEMBLY <p>Enables the evaluation and development of the methods and tools required to assemble products components.</p>	23. PRODUCTION MODEL  DEVELOPMENT CONSTRUCTION <p>Used to evaluate and develop the location and fit of individual components and sub-assemblies.</p>	24. SERVICE MODEL  EMBOIDMENT ASSEMBLY <p>Supports the development and demonstration of how a product is serviced and maintained.</p>
25. EXPERIMENTAL PROTOTYPE  DEVELOPMENT PERFORMANCE <p>Refined prototype that accurately models physical components to enable the collection of performance data for further development.</p>	26. ALPHA PROTOTYPE  DEVELOPMENT CONSTRUCTION <p>Bring together key elements of appearance and functions for the first time. Uses of simulates production materials.</p>	27. BETA PROTOTYPE  EMBOIDMENT USABILITY & OPERATION CONSTRUCTION <p>A refined evolution of an Alpha Prototype used to evaluate ongoing design changes in preparation for the final specification of all components.</p>	28. SYSTEMS PROTOTYPE  EMBOIDMENT PERFORMANCE <p>Integrates components specified for the production item without consideration of the appearance, used to evaluate electronic and mechanical performance.</p>	29. FINAL HARDWARE PROTOTYPE  DETAIL PERFORMANCE <p>Developed from the Systems Prototype as a final representation of the product's functional elements.</p>	30. OFF-TOOL COMPONENT  DETAIL MATERIALS <p>Product using the tooling and materials intended for production to enable the evaluation of material properties and appearance of components.</p>	31. APPEARANCE PROTOTYPE  DETAIL DESIGN INTENT PERFORMANCE <p>Highly detailed representation that combines functionality with exact product appearance. Uses or simulates production materials.</p>	32. PRE-PRODUCTION PROTOTYPE  DETAIL PERFORMANCE <p>Final prototype produced using production components. Manufactures in small volumes for testing prior to full scale production.</p>

The end



RE Manifesto



Over the years, we have developed requirements as a cornerstone for the delivery of successful IT-systems. Through this work we have come to value:

While there is much value in the basic factors on the right,

Genuine empathy *and*
techniques, models, and templates

Creative solution design *and*
comprehensive elicitation

In-time elaboration *and*
upfront specification

Shared understanding *and*
proper documentation

we recognize that the success factors are on the left.