RE, the Next Generation

from requirements engineering to requirements engineering
Pleased to meet you

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➢ Trainer | coach | consultant
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➢ Member of the International Requirements Engineering Board (IREB)

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Route

What's new? Once upon a time ... And now for something completely different ... What's next? How to get there?
Taxi!
Digi ... what?

digitization  digitalization  digital transformation
The innovation challenge

➢ It is a green field
  ▪ No examples
  ▪ No stakeholders
  ▪ No customers (yet...)
Looking for Kano

Delighters

Performance factors

Basic factors

Delighters

High satisfaction

Factor present

Factor absent

Low satisfaction
Supplier centered ⇒ customer centered
Customer affected ⇒ customer involved
Product oriented $\Rightarrow$ service oriented
IT supported ⇒ IT enabled
Engineered ⇔ designed
Steve Jobs on Design

- 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 then 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.

Steve Jobs (1955 - 2011)
Requirements ➔ ideas
Route

What's new?

Once upon a time ...

And now for something completely different ...

What's next?

How to get there?
... we developed by the waterfall
Requirements for a solution
Using requirements
Using requirements
Sorry for that ...
Old school

Client asks for system

RE collects requirements

Project builds system
Route

What’s new?
Once upon a time...
And now for something completely different...
What’s next?
How to get there?
The Agile storm!
From the waterfall...
... to Agile

 Analyze

 Needs

 Incremental

 Design

 Test

 Build

 Deploy

 Iterative

 Use
Requirements?
Just ask the Product Owner!
Four common misunderstandings about requirements today

- Upfront is evil
- User stories are enough
- Documentation = waste!
- Only working software counts
Route

What’s new?
Once upon a time...
And now for something completely different...
What’s next?
How to get there?
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

requirements system
Route

What's new?    Once upon a time...    And now for something completely different...    What's next?    How to get there?
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

WHAT DOES SHE
THINK AND FEEL?
What really matters to her?
What occupies her thinking?
What worries and aspirations does she have?

WHAT DOES SHE
HEAR?
What are friends, family and other influencers saying to her that impacts her thinking?

WHAT DOES SHE
SEE?
What things her environment influence her?
What competitors is she seeing?
What is she seeing friends do?

WHAT DOES SHE
SAY AND DO?
What is her attitude towards others?
What does she do in public?
How has her behaviour changed?

PAIN
What fears, frustrations or obstacles is she facing?

GAIN
What is she hoping to get? What does success look like?
Design Thinking (cont.)

➢ Define: POV – Point of Vue

➢ Ideate: HMW – How might we?
### Prototyping, prototyping, prototyping

<table>
<thead>
<tr>
<th>Concept</th>
<th>Design Intent</th>
<th>Pages</th>
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<tr>
<td><strong>1. IDEA SKETCH</strong></td>
<td>Employed at a personal level to quickly externalise thoughts using simple line work, often as a means of thinking, sketching or napkin drawings.</td>
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<tr>
<td><strong>2. STUDY SKETCH</strong></td>
<td>Used to investigate appearance, proportion and scale in greater detail than as line sketch. Often inspired by the notion application of technique.</td>
<td>2</td>
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<td><strong>3. REFERENTIAL SKETCH</strong></td>
<td>Used to record images of products, objects, figures, humans or any relevant observations for reference use as a metaphor.</td>
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<td><strong>4. MEMORY SKETCH</strong></td>
<td>Helps expand thoughts during the design process using mental models, notes and diagrams.</td>
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<td><strong>5. CODD INFORMATION SKETCH</strong></td>
<td>Provides detailed representation that categorises information to demonstrate an extant, principal or systemic.</td>
<td>5</td>
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<tr>
<td><strong>6. INFORMATION SKETCH</strong></td>
<td>Quickly and effectively communicates features through the use of contouring and simplification. Also known as explanatory or taking sketch.</td>
<td>5</td>
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<tr>
<td><strong>7. SKETCH RENDERING</strong></td>
<td>Clearly defined proposal produced by correlated sketching and use of colour to help extend character and feel. Also known as line and wash.</td>
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<tr>
<td><strong>8. PREScriptive SKETCH</strong></td>
<td>Information sketch for the exploration of technical details such as mechanisms, manufacturing materials and dimensions.</td>
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<tr>
<th>ECO-FRIENDLY</th>
<th>SYSTEMS</th>
<th>COMPONENTS</th>
<th>MATERIALS</th>
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<tr>
<td><strong>9. SCENARIO &amp; STORYBOARD</strong></td>
<td>Describes interactions between user and product, sometimes in an appropriate viewpoint.</td>
<td>6</td>
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<td><strong>10. LAYOUT RENDERING</strong></td>
<td>Defines the product's processes as a single angle orthographic projection with precise line and color.</td>
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<tr>
<td><strong>11. PRESENTATION RENDERING</strong></td>
<td>Contains a high level of evolution within the principle of rendering between all process and a specific. Created using traditional rendering, this is the application of color projection.</td>
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<tr>
<td><strong>12. DIAGRAM</strong></td>
<td>Schematic representation of the key parts of the business processes, which help to break down the complexity of individual elements.</td>
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<tr>
<td><strong>13. PERSPECTIVE DRAWING</strong></td>
<td>Continues use of components using the only and a sufficient detail to analyse an appearance. Usually drawn in third angle projection.</td>
<td>6</td>
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<tr>
<td><strong>14. GEN AMOUNTATION DRAWING</strong></td>
<td>Continues detail of components for the manufacturing process. Also known as Technical Production or Construction Drawing.</td>
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<tr>
<td><strong>15. TECHNICAL ILLUSTRATION</strong></td>
<td>Continues technical drawing with a high degree of realism that is sometimes supported with symbols. Includes exploded views.</td>
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<td><strong>17. DESIGN MODEL</strong></td>
<td>Informal, variable-defining 3D model that captures the key characteristics of form. Also allows a 3D Model for 3D Sketch.</td>
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<tr>
<td><strong>18. FUNCTIONAL MODEL</strong></td>
<td>Simple mockup used to explore and visualise the relationships between components, structures, materials and standards. Usually preserved using steel.</td>
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<td><strong>19. OPERA</strong></td>
<td>Captures the key functional features and underlying operating principles. This leads to an association with the product's final infrastructure.</td>
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<td><strong>20. APPAREANCE MODEL</strong></td>
<td>Communicates how the product's elements used with the potential ergonomic evaluation.</td>
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<tr>
<td><strong>21. ASSEMBLY MODEL</strong></td>
<td>Accurate physical representation of product appearance. Also known as a Work Model as it is not to contain any working parts.</td>
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<td><strong>22. PRODUCTION MODEL</strong></td>
<td>Enables the evaluation and development of the methods and tools required to assemble product components.</td>
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<td><strong>23. SERVICE MODEL</strong></td>
<td>Used to evaluate and develop the location and fit of all individual components and sub-assemblies.</td>
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<tr>
<td><strong>24. EXPERIMENTAL PROTOTYPE</strong></td>
<td>Supports the development and demonstration of how a product is services and maintained.</td>
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<tr>
<td><strong>25. EXPERIMENTAL PROTOTYPE</strong></td>
<td>Refined prototypes that accurately model the product and components to ensure the collection of performance data for further development.</td>
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<tr>
<td><strong>26. ALPHA PROTOTYPE</strong></td>
<td>Bring together key elements of appearance and function for the first time. Costs of accurate prototypes.</td>
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<tr>
<td><strong>27. BETA PROTOTYPE</strong></td>
<td>A refined version of an Alpha Prototype used to evaluate design and presentation for the final specification of all components.</td>
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<tr>
<td><strong>28. SYSTEMS PROTOTYPE</strong></td>
<td>Integrates components that are specific for the application, such as the characteristics of the appearance, used to evaluate electronic and mechanical performance.</td>
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<tr>
<td><strong>29. FINAL HARDWARE PROTOTYPE</strong></td>
<td>Developed from the dynamics prototype as a final hardware component for evaluation of material properties and appearance of components.</td>
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<tr>
<td><strong>30. OFF-THE-WALL COMPONENT</strong></td>
<td>Product using the testing and relative components for evaluation of material properties and appearance of components.</td>
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<tr>
<td><strong>31. PRE-PRODUCTION PROTOTYPE</strong></td>
<td>Highly detailed representation that contains functionality with modelled appearance. Takes or evaluates production materials.</td>
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<tr>
<td><strong>32. PRODUCTION PROTOTYPE</strong></td>
<td>Final prototype produced using production components. Many prototypes used in small volumes for testing prior to full scale production.</td>
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RE the Next generation v11
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,** we recognize that the success factors are on the left.

- **Genuine empathy** and techniques, models, and templates
- **Creative solution design** and comprehensive elicitation
- **In-time elaboration** and upfront specification
- **Shared understanding** and proper documentation