



# Thinking and Working Visually for Software Testers



huibschoots



ruudcox





# Name tag

5 Minutes

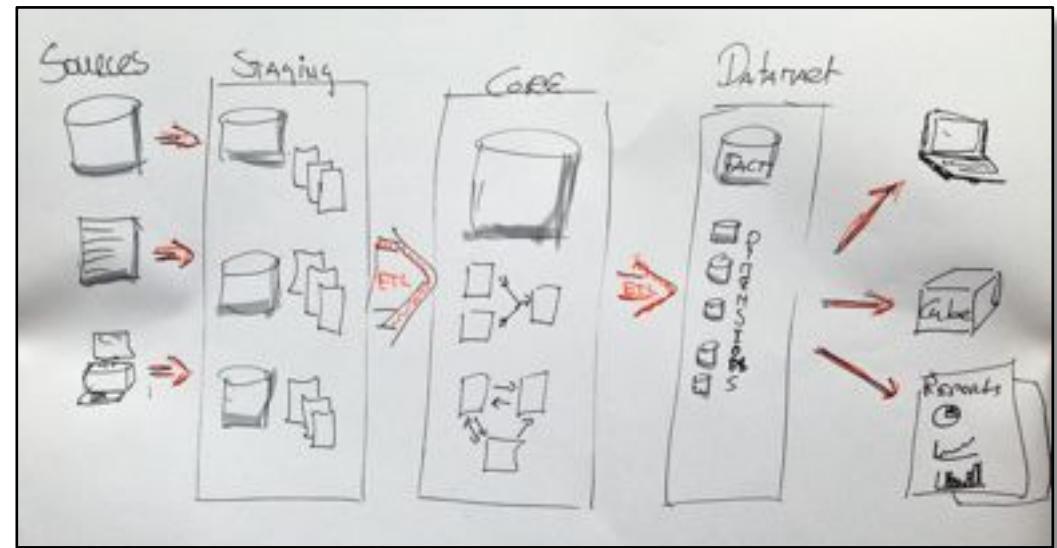


# Schedule

9:00 - 10:30	Intro & Sketchnotes
10:30 - 10:45	
10:45 - 12:30	Problem solving & Mind maps
12:30 - 13:30	
13:30 - 15:00	Modeling & drawing context
15:00 - 15:15	
15:15 - 17:00	Coverage outlines & Wrap-up

# Why Visualisation?

- Capture and structure information
- Develop ideas
- Support learning and steer thought processes
- Transfer ideas and results



# What do you want to learn?

Write down or **DRAW** your learning goals on a sticky note



# Goals for today



1. Experience and learn about visual thinking
2. Experience you do not have to be an artist to think & work visual

We will ask a lot of critical questions. We ask them to because it is important to fully understand the concepts we discuss today. Just say “pass” or “help me” if you don’t feel comfortable.

# Your tools for today



- Notebook, paper, sticky notes & index cards
- Markers, pens or pencils for drawing
- Gray marker for shading
- Colors to give your drawings some nice color

# Visual Learning Wall



Laurens Bonnema @laurensbonnema · May 11

The Big Honkin' Sketchnote Retro #flickstackr #accnl14 @accnl14 @rohdesign  
[flic.kr/p/nzeDc8](http://flic.kr/p/nzeDc8)

Reply Retweet Favorite

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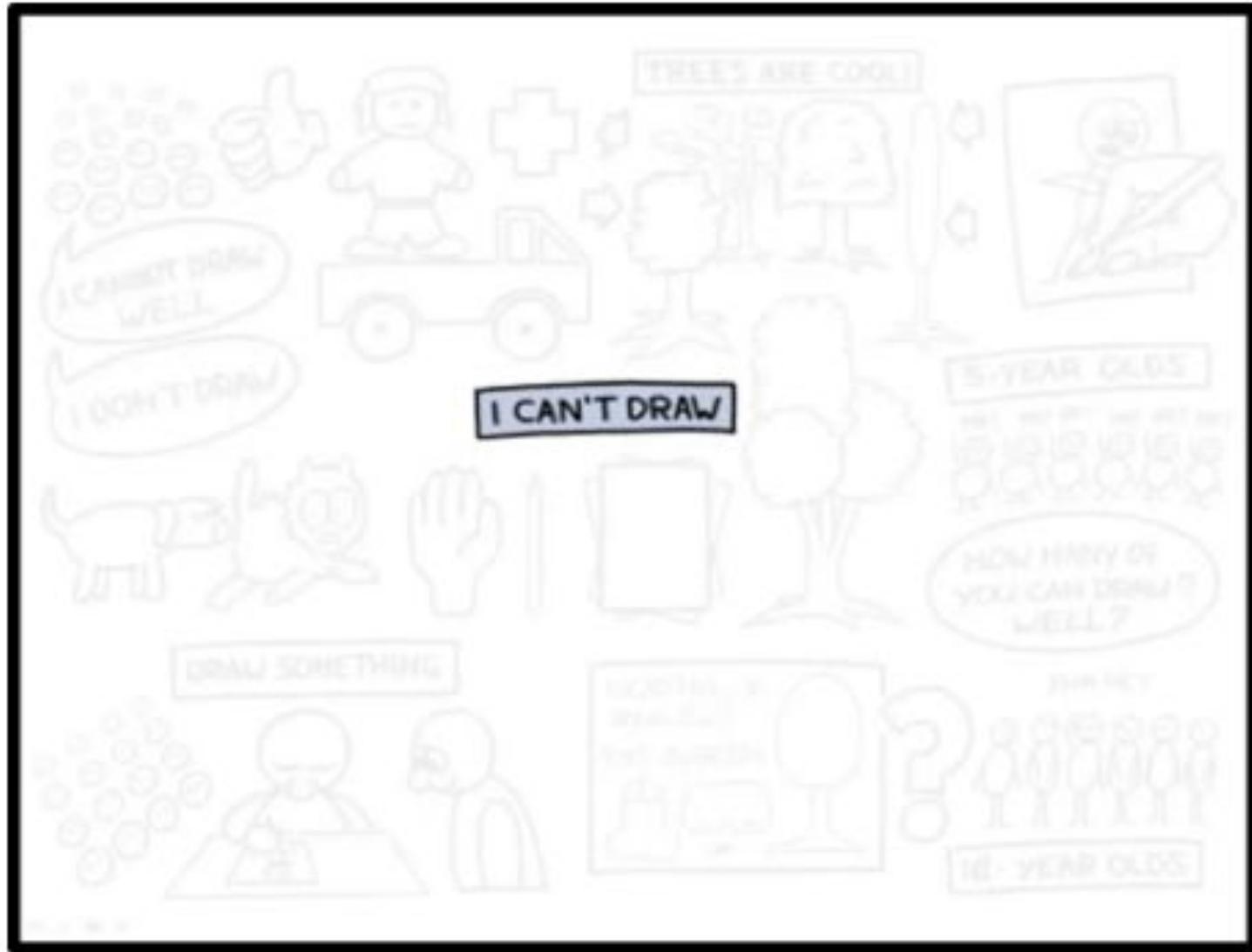
@huibschoots

@ruudcox

#ntd2014



I Can't Draw



*I Can't Draw* by Jurgen Appelo

# ... I can't draw!

Are you sure?

No fear!

All you need is paper and  
a pen or pencil!



# Ideas not art

You don't have to draw like an artist  
to tell that these both are houses



# The basics

Pick up your pencil and join me in drawing

- A point
- A line
- A triangle
- A square
- Some arrows
- A circle

Use these basics to make any shape you want

Don't be afraid. You can always erase and start again.

# Let's Draw!



*5 Minutes*



- Star figure
- Computer
- Cup of coffee
- Plates
- Utensils (knife, fork, spoon)
- Book
- Table
- Easter eggs
- Magnifying glass
- Test script
- Lamp
- Factory
- Fridge
- Idea



# Let's Draw! Debrief

And? How did that go?





# Sketchnotes

# Outline of this Section

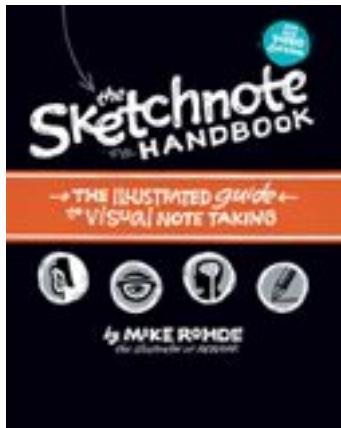
- Explain
- Exercise
- Debrief
- Examples

# What are Sketchnotes?

*“Sketchnotes are rich visual notes created from a mix of handwriting, drawings, hand-drawn typography, shapes, and visual elements like arrows, boxes and lines.”*



*Mike Rohde*



# 40 years of trying to play well with others

1. I GO TO IBROWN UNIVERSITY 1968, freshman,

NO INNATE PLEASURE WRITING, TESTING CODE?  
MOVE ON!

2. FIRST DOB programme, Wall Street 1972.

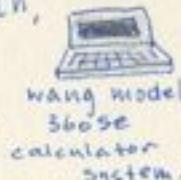
IT WAS REALLY HARD.

WE HAD TO DO IT TOGETHER



5. THE SUMMER OF 75  
write code to be read

IT'S ABOUT YOU



TOM DEMARCO IS MY PAL FOR 36 YEARS

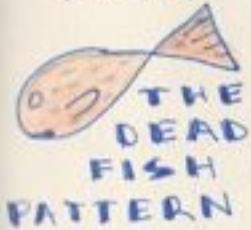
3. MY BOSS LEAVES I LEFT

I learned to work with someone who doesn't trust you.

4. TEAM LEADER FOR ONE YEAR  
PUTTING A TEAM TOGETHER IS THE MOST IMPORTANT WORK

my life EXPLODES

6. HEIRE COMES THE JUDGE panelist, always emotional, the magic finger



BUNCIE SAM WANTS YOU



WRITING HELPS YOU THINK DISTILL IDEAS

# NO BEST PRACTICES

GOD BLESS THE CHILD

DON'T BE AN ASSHOLE



AND HERE WE ALL ARE NOW

- II III FAMILY  
III I TREE

ENGAGED PEOPLE  
WERE PLANTING  
THE SEEDS

FEEL THE BREEZE OFF TIME

X RUDIE

# Sketchnotes

- Focused on capturing big ideas
- Ideas NOT art!
- Engages your whole mind
- Improve your memory and recall
- Helps you concentrate
- It's relaxing
- Dynamic and fun!



# Sketchnotes Exercises

You will now see two short movies:

1. Tablecloth Trick

(by Howcast.com & Stevespanglerscience.com)

2. Skills Based Testing by Paul Holland

(by associationforsoftwaredtesting.org)

Sketchnote them...



Howcast.com

*Tablecloth Trick*

# Sketchnotes Exercise 1 Debrief



So? How did that go?

What was easier than you expected?

What was hard to do?



*Skills Based Testing by Paul Holland*



# Sketchnotes Exercise 2 Debrief

And? How did that go?

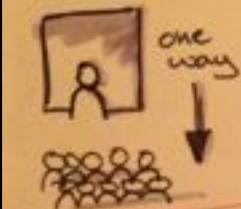
What was easier than you expected?

What was hard to do?

Did you do something different the second time?

# Back to the Middle Ages

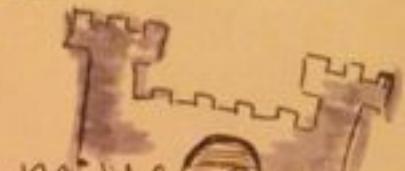
Bart Brockman



Traditional  
Teaching

Dreyfuss Model

	Novice	Beginner	Competent	Proficient	Expert
Knowledge Autonomy	low	medium	high	very high	extremely high



Middle Ages:  
Apprenticeship

4-7 years

exception of

Masterclasses

- \* Small groups
- \* Own experience
- \* Critical thinking
- \* depends on facilitator skills



# BACK TO THE MIDDLE AGES

Bart  
Brockman

COMMON PRACTICE

Skills  
1-way traffic,  
theog

KNOWLEDGE  
AUTONOMY  
PERCEPTION  
+ CONTEXT

apprentice  
ship

most apprentices aspired to  
become master craftsmen  
themselves.

master  
classes

EXPERT  
PROFICIENT  
COMPETENT  
BEGINNER  
NOVICE

DREYFUSS MODEL OF SKILL ACQUISITION

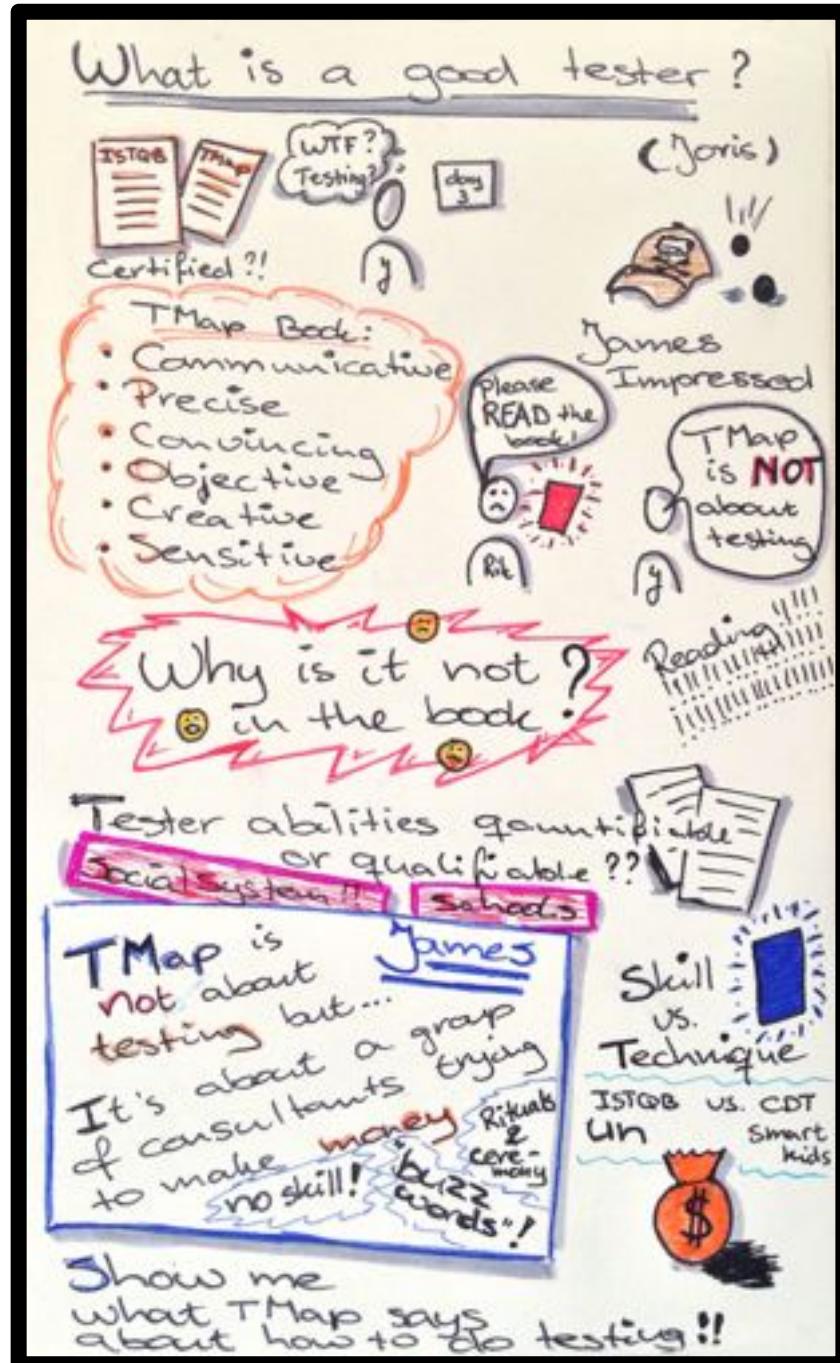
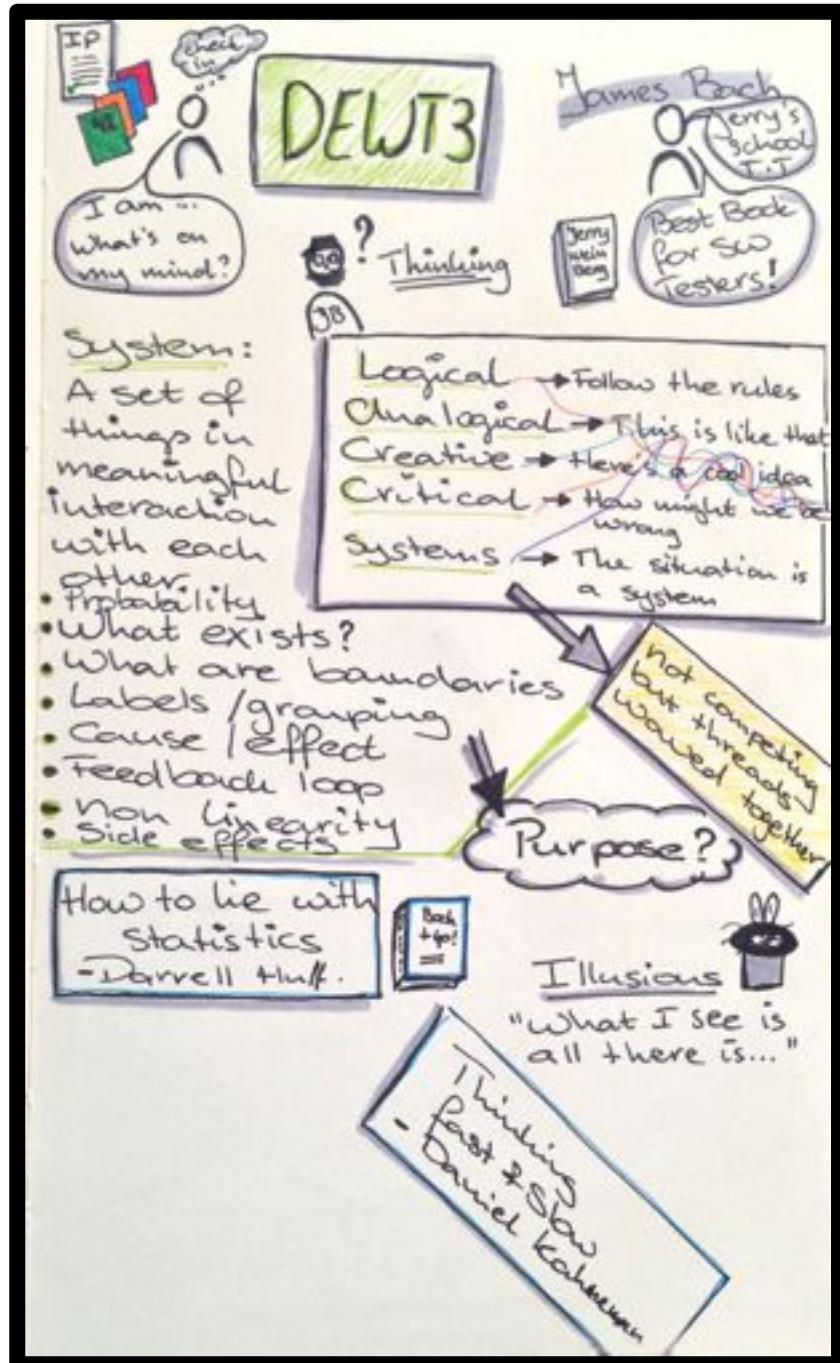
- PRODUCT RISK ANALYSIS
- TEST DESIGN
- TEST PLANNING
- ...

MUH?

▪ SMALL  
GROUPS  
▪ WORKING  
WITH THEIR  
MATERIAL

definodox

CRITICAL THINKING



# What is Good Evidence?

GRiffin  
JONES

TYPES    QUALITIES  
TRAPS    ANTI-PATTERNS

DA SOURCE



TRAPS, THREADS, ANTI-PATTERNS

- DEFICIENT QUALITIES
- FEEBLENESS
- "TASS - AS EXPECTED" CHECKBOXES  
WHAT YOU INTENDED TO DO, NOT WHAT  
YOU ACTUALLY DID.
- LULLABY LANGUAGE
- VS LEAN'S GENCHI GENBUTU  
... IT'S LIES! ALL LIES
- EFFICIENCY AND TIME PRESSURE

RECOGNIZE QUALITIES

TRAPS  
GO OBSERVE  
THE WORK

HOW IS  
YOUR  
EVIDENCE  
DEFICIENT

QUALITIES

- CLEAR ...  
TO WHAT  
DEGREE?
- AUTHENTIC
- INTEGRITY
- READABILITY
- CHANGES
- ATTRIBUTABLE  
TO A SPECIFIC PERSON
- CONTEMPORARY
- AUDIT TRAIL
- RETRIEVABLE
- 3<sup>rd</sup> PARTY  
REVIEW/  
RECONSTRUCTION

© Tim Cox

40 YEARS... OF TRYING TO PLAY WELL WITH OTHERS  
LET'S TEST  
TIM LISTER

ACTUALLY, 42 YEARS

THIS TALK IS ABOUT  
YOU  
→ 9 STORIES



1. BROWN UNI  
1968

FEEL  
THE  
BREEZE  
OF  
TIME

2. MY FIRST JOB

3. MY BOSS LEAVES

4. TEAM  
LEADER

5. THE SUMMER  
OF '75

6. HERE COMES  
THE JUDGE

7. A GUILD OF  
TALKERS & WRITERS

8. UNCLE SAM  
WANTS YOU

9. GOD BLESS  
THE CHILD

THE RED BOOK

IF YOUR WORK  
IS NOT AN INNATE  
PLEASURE, USE YOUR  
FEET

#LETSTEST

@TESTIDEASTORY

YOU



A DOOR!  
A WINDOW!

GENIUS  
MENTOR

"THIS IS  
REALLY HARD  
AND I LIKE IT!"

P  
O  
W  
E  
R

AMERICAN  
arbitration  
association

MAGIC  
DARK  
UNDERBELLY

OF THE INDUSTRY

IT'S ALWAYS  
EMOTIONAL

GIB  
BOBB  
WEINBERG  
MILLS  
PANAS  
PANTICH  
@ TREE

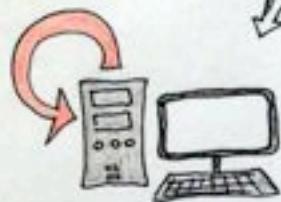
MY  
LIFE  
CONSTANTINE

PUTTING  
TOGETHER  
A TEAM

WRITING HELPS  
THINK

1994  
BEST  
PRACTICES

# STRATEGY BACKUP



## SAME MACHINE

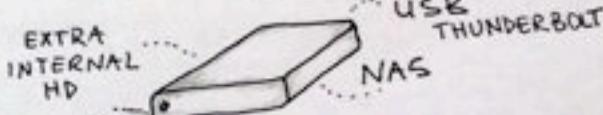
- + HELPFUL FOR ACCIDENTAL DELETION
- UNWANTED CHANGES
- SINGLE POINT OF FAILURE

## MAIN TACTICS

shadow copies

incremental backup

duplicate copy off files



## EXTERNAL DRIVE

- + INDEPENDANT FROM MAIN HD
- + FAST + PORTABLE
- + REDUNDANT - EXPENSIVE
- COMPLEX

RAID 1: MIRRORING



co LOCATION



## CLOUD BASED

- + OFF-SITE + INDEPENDENT TO OWN SYSTEM
- UPLOADING TIME
- DEPENDENT OUTSIDE COMPANY.

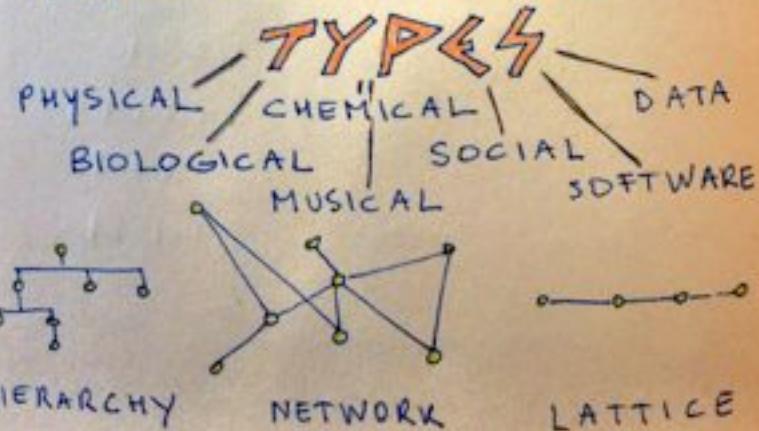
€ / MND

@ruudcox

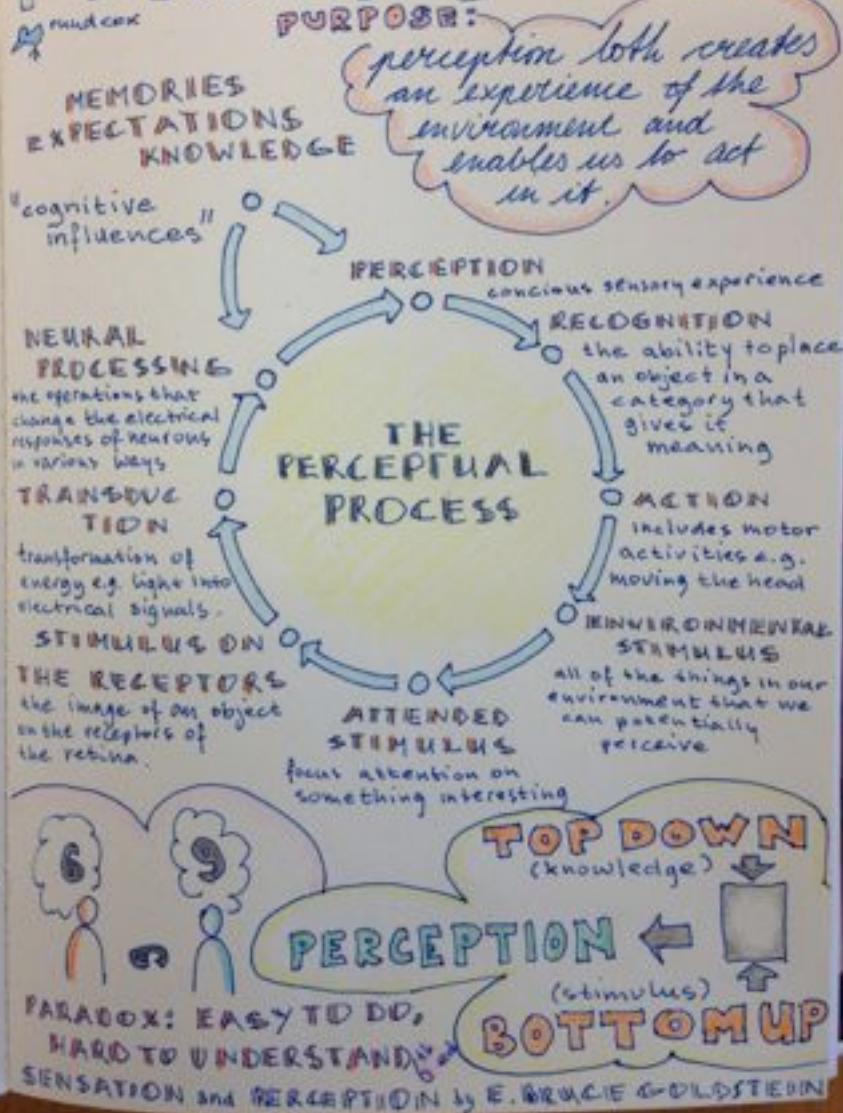
# STRUCTURE

THE ARRANGEMENT OF  
PUT THINGS IN A NEAT, ATTRACTIVE, OR  
REQUIRED ORDER

AND RELATIONS BETWEEN  
THE WAY IN WHICH TWO OR MORE  
CONCEPTS, OBJECTS, OR PEOPLE  
ARE CONNECTED; A THING'S  
EFFECT ON OR RELEVANCE  
TO ANOTHER  
PARTS OR  
ELEMENTS OF SOMETHING.



# PERCEPTION





Your House

# Exercise: your house



*2 Minutes*



1. Take 1 minute to describe your house to your neighbour in words only
  
2. Switch roles: now take 1 minute to describe your house to your neighbour not speaking only using one or more drawings

# Several houses





# Your House Debrief

And? How did that go?



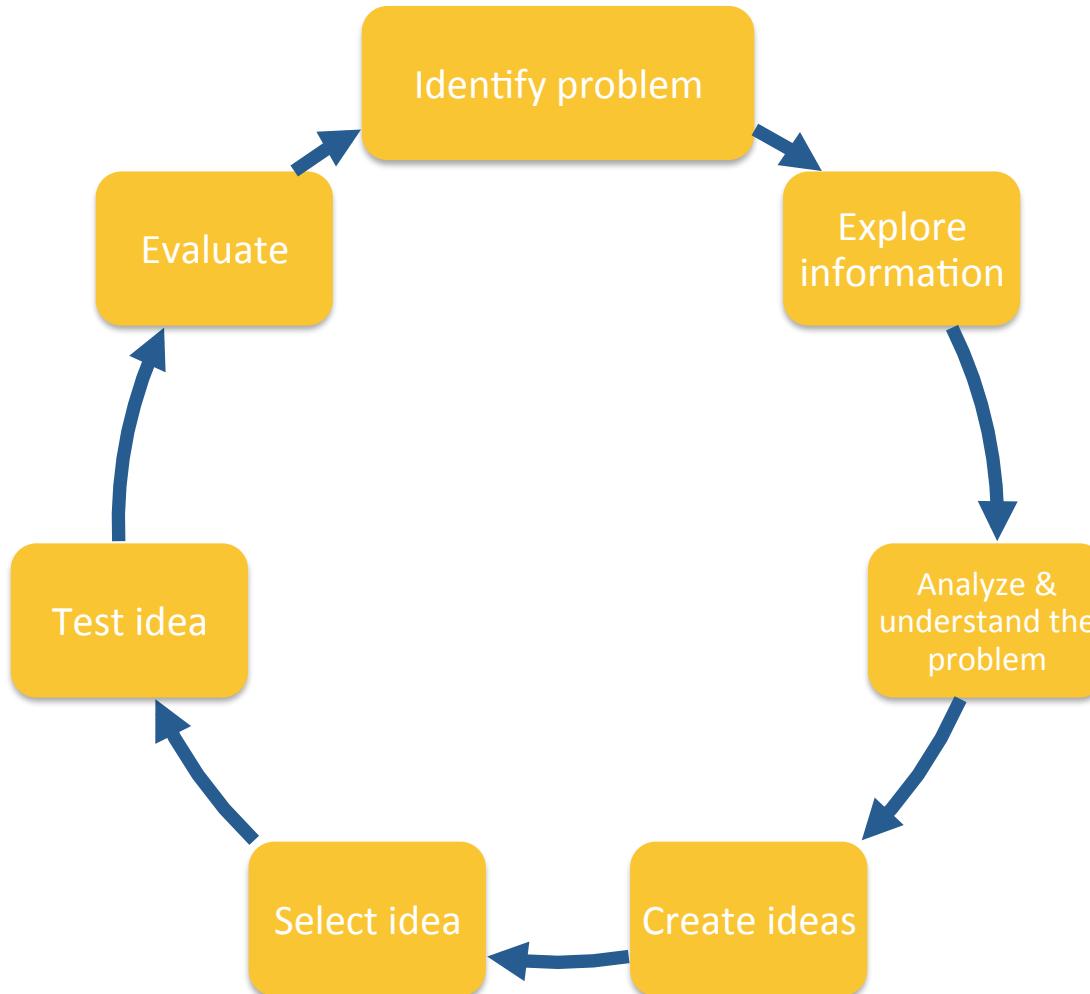


# COFFEE BREAK

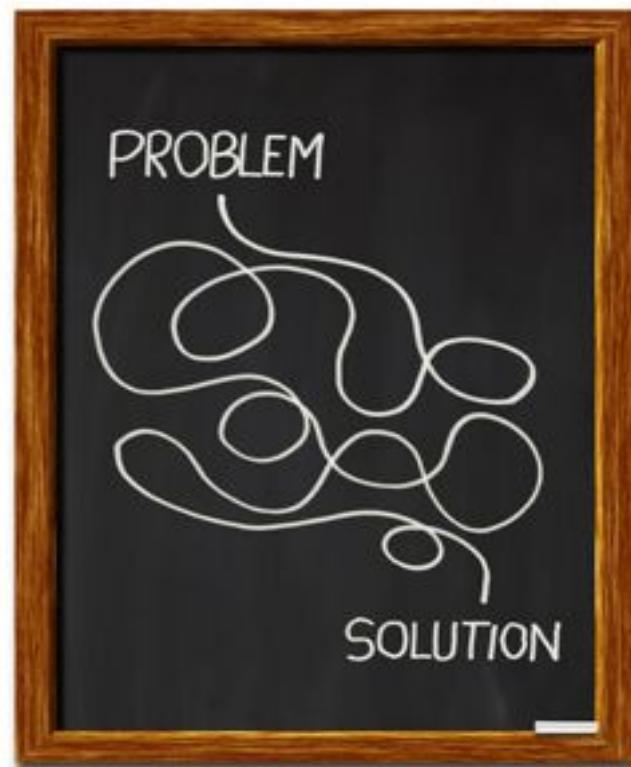


# Problem-solving

# Problem Solving Process



Developers design  
a solution to a  
problem



Testers investigate and  
evaluate solutions...

...by building  
mental models  
from different  
perspectives

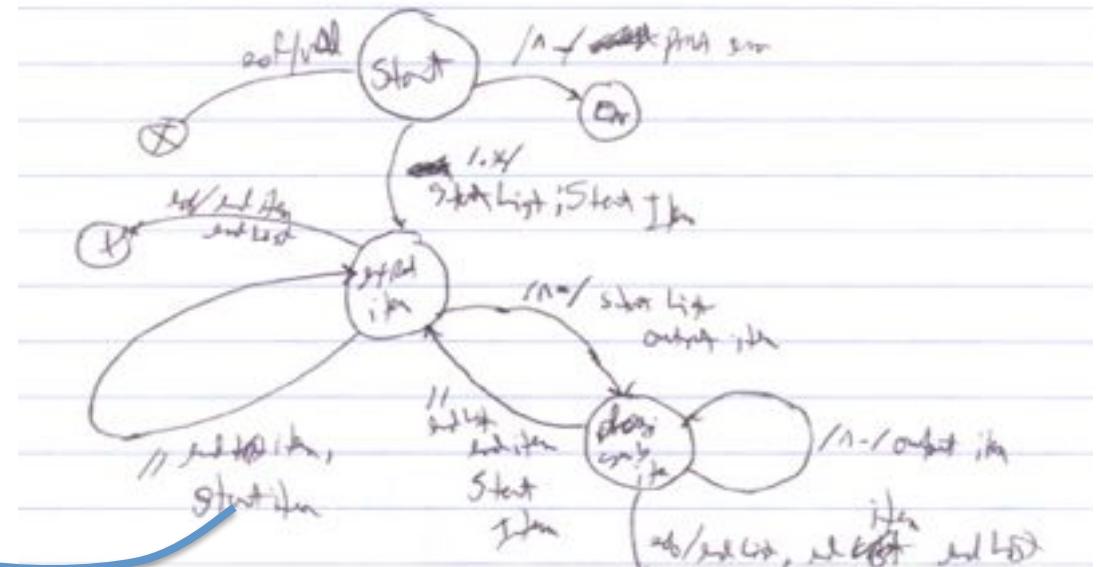


*Testers solve testing problems*

# Drawing the Problem



## *External Memory*



*Good sketches are accurate and precise in structure and message, but rough in an expressive way*

# Drawing to Learn



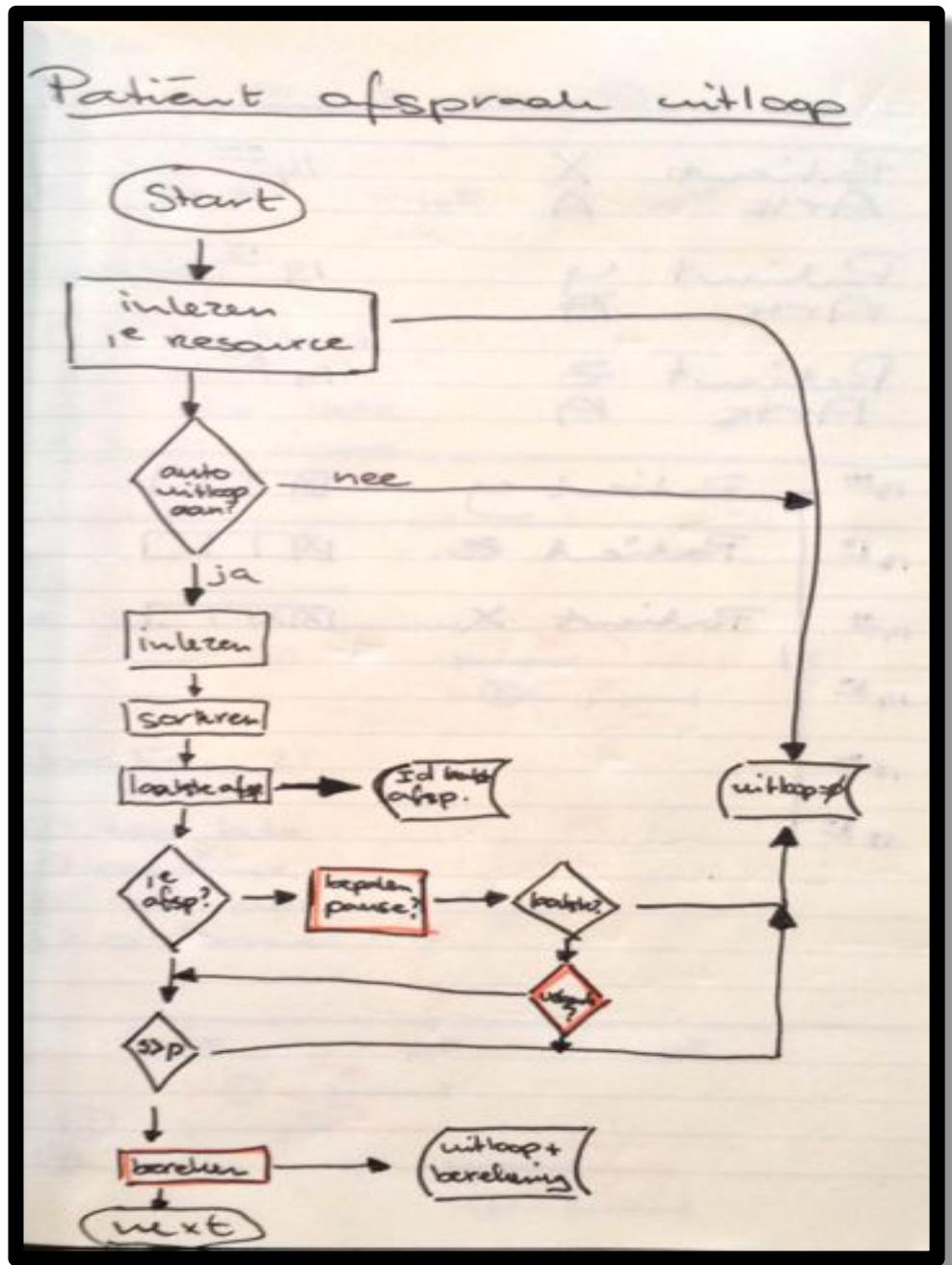
*In visual learning, information is processed and understood through images and visualizing techniques*

# Modeling your Testing

- Flowcharts
- Timelines
- Equivalence Classes
- SQL Joins
- State Transition Diagrams
- Story Boarding
- ...

# *Test Design Flowchart*

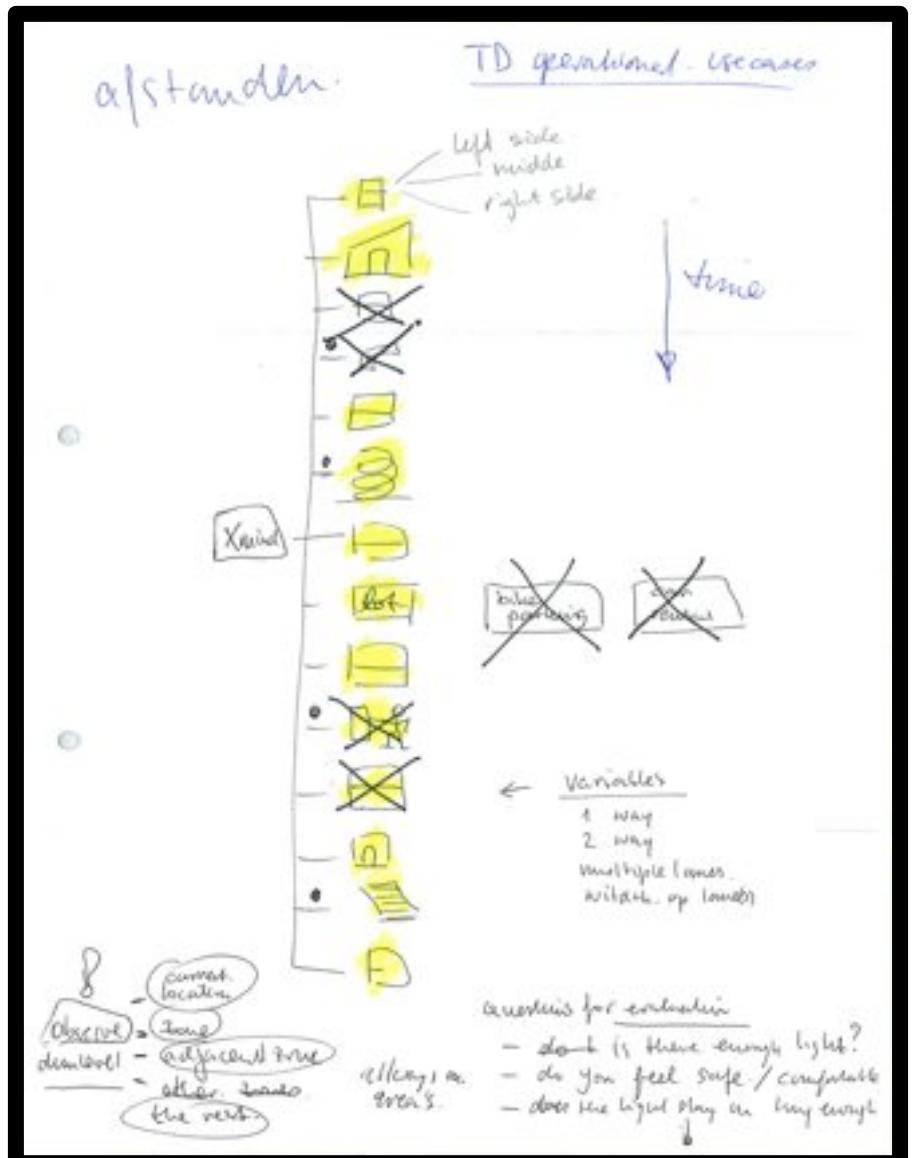
*A model for deriving test  
use cases*



# *Test Design*

## *Operational Use*

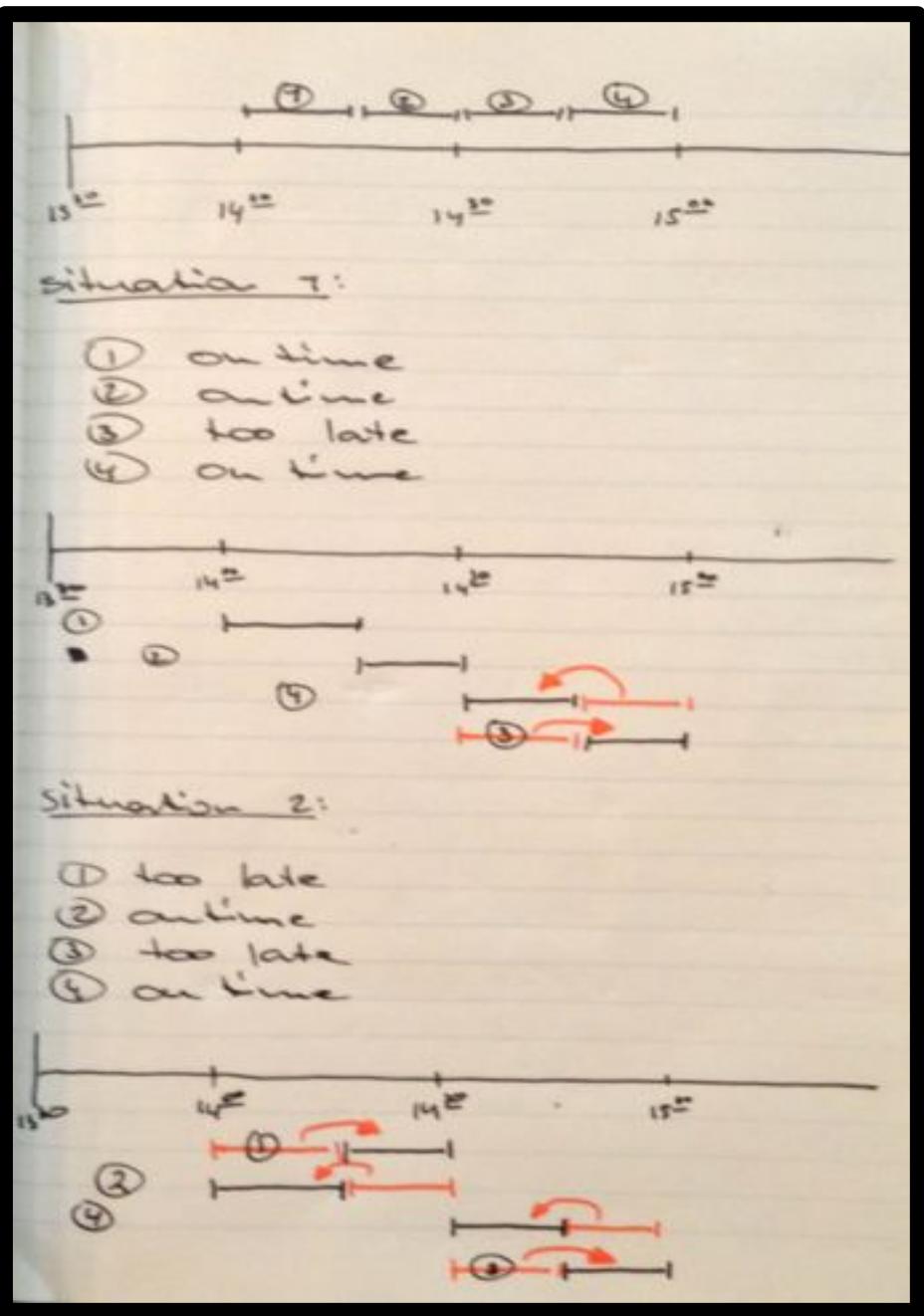
*A model for deriving test use cases*



# *Test Design*

## *Equivalence Classes*

*A model for deriving test cases*





# Exercise Credit Card

*15 Minutes*



1. Read the “Interface Specification Credit Card Authorisation”
2. Group 1-3: Study data  
Group 4-6: Study processing
3. Use drawing techniques to visualize your thinking



# Credit Card Exercise Debrief

So? How did that go?





# Mind Maps

# Outline of this Section

- Explain
- Exercise
- Debrief
- Examples

# What are Mind Maps?

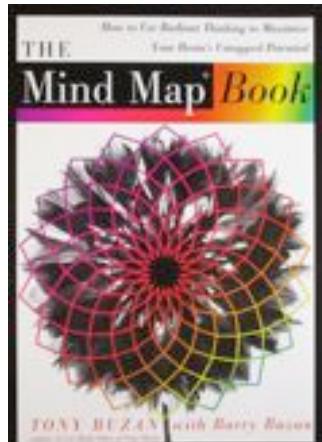
*A mind map is a diagram used to visually organize information.*

*A mind map is often created around a single concept, drawn as an image in the center of a blank landscape page, to which associated representations of ideas such as images, words and parts of words are added. Major ideas are connected directly to the central concept, and other ideas branch out from those.*

-- Wikipedia



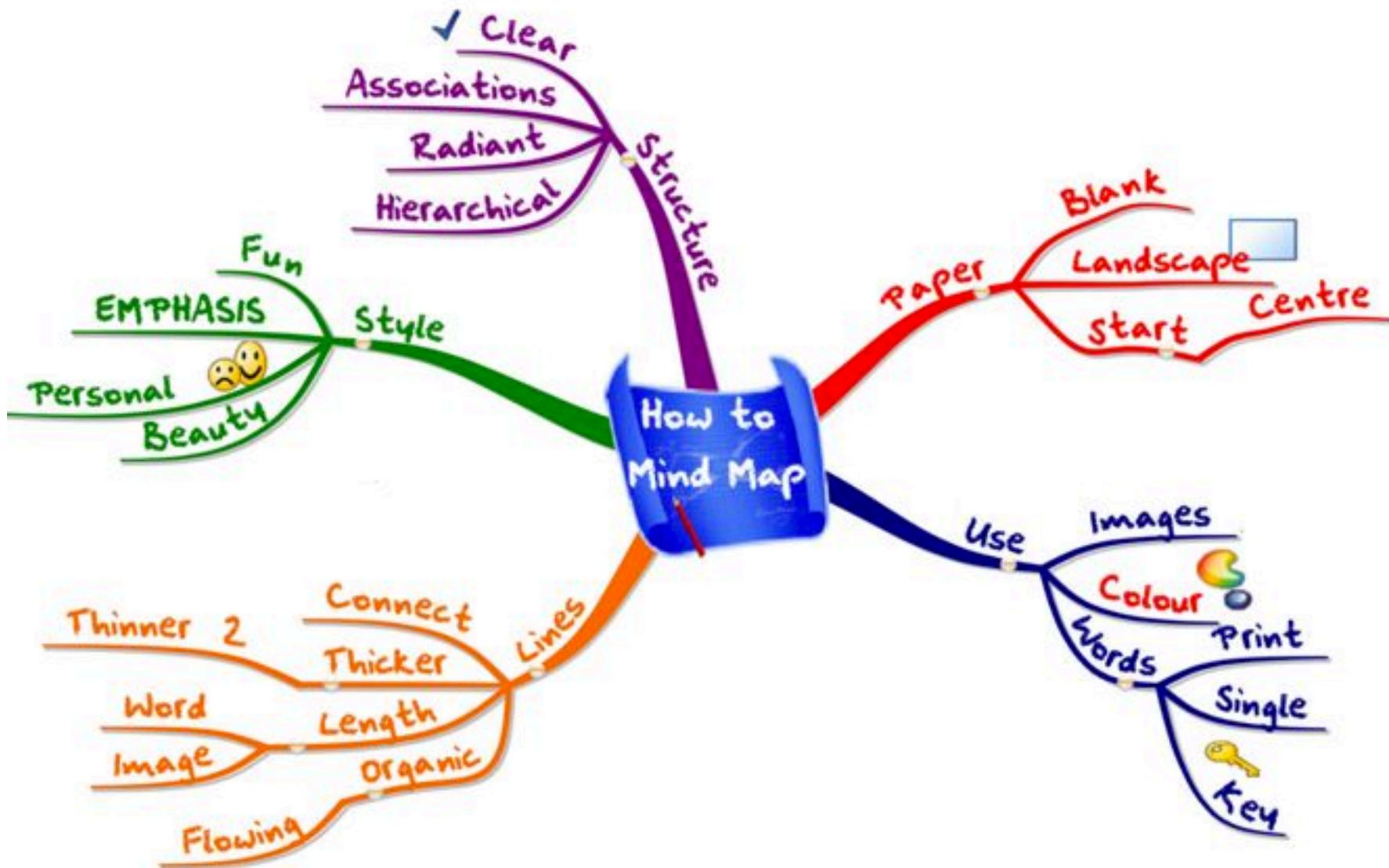
Tony Buzan



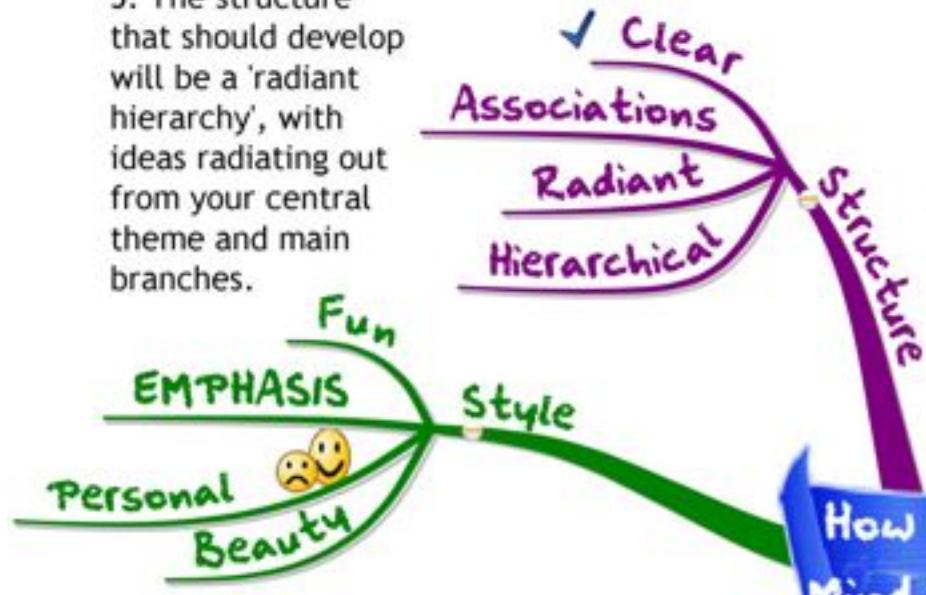


Source: <http://www.mind-mapping.co.uk>

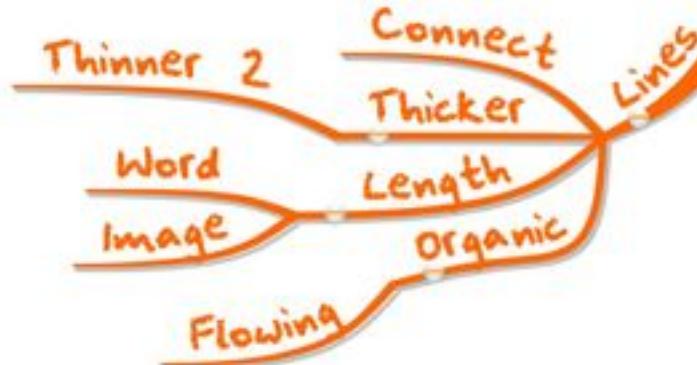




5. The structure that should develop will be a 'radiant hierarchy', with ideas radiating out from your central theme and main branches.

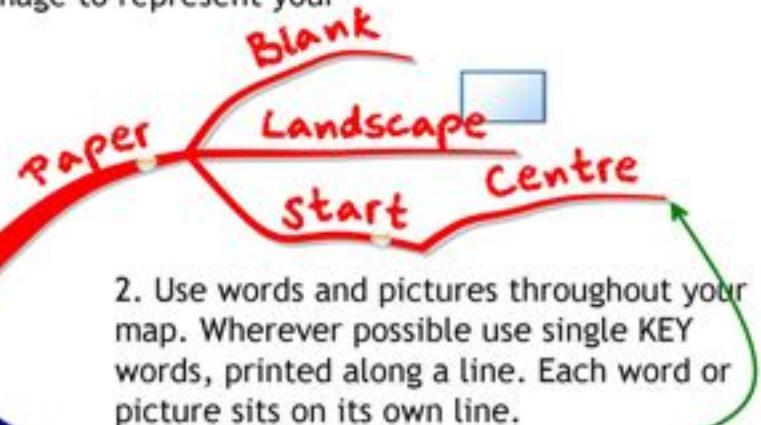


4. Experiment with different ways of linking and emphasising different aspects. Use highlighters, codes and arrows as necessary.

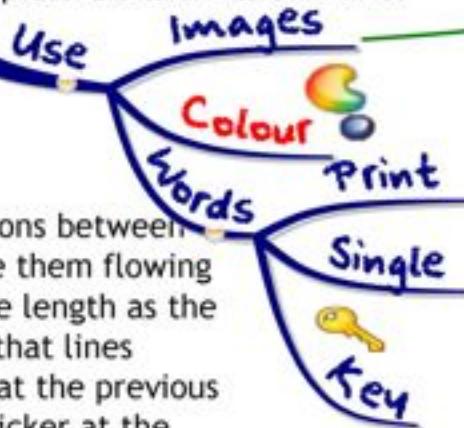


3. The lines make the associations between ideas as clear as possible. Make them flowing and organic, each line the same length as the word or image. Always ensure that lines connect to the end of the line at the previous level. Typically lines will be thicker at the centre and thinner further out.

1. Start at the centre of a blank, landscape page, ideally with a colourful image to represent your subject.



2. Use words and pictures throughout your map. Wherever possible use single KEY words, printed along a line. Each word or picture sits on its own line.





# Mind Map Exercise

*10 Minutes*



Draw a mind map of yourself and let yourself inspire by Family, Education, Work, Hobbies, Where you live and/or anything else that you'd like to share.

Present your mind map to the group.

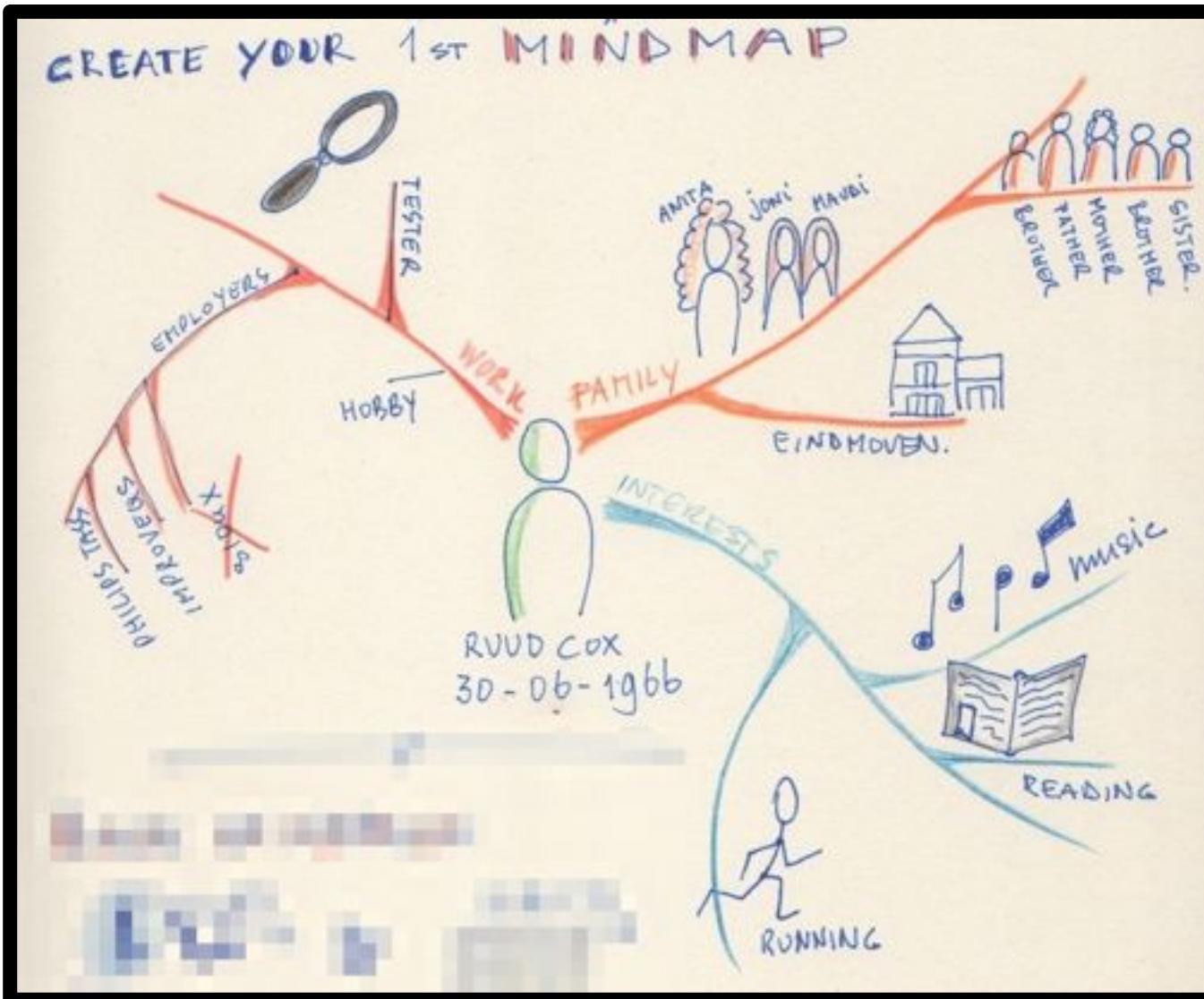


# Mind Map Exercise Debrief

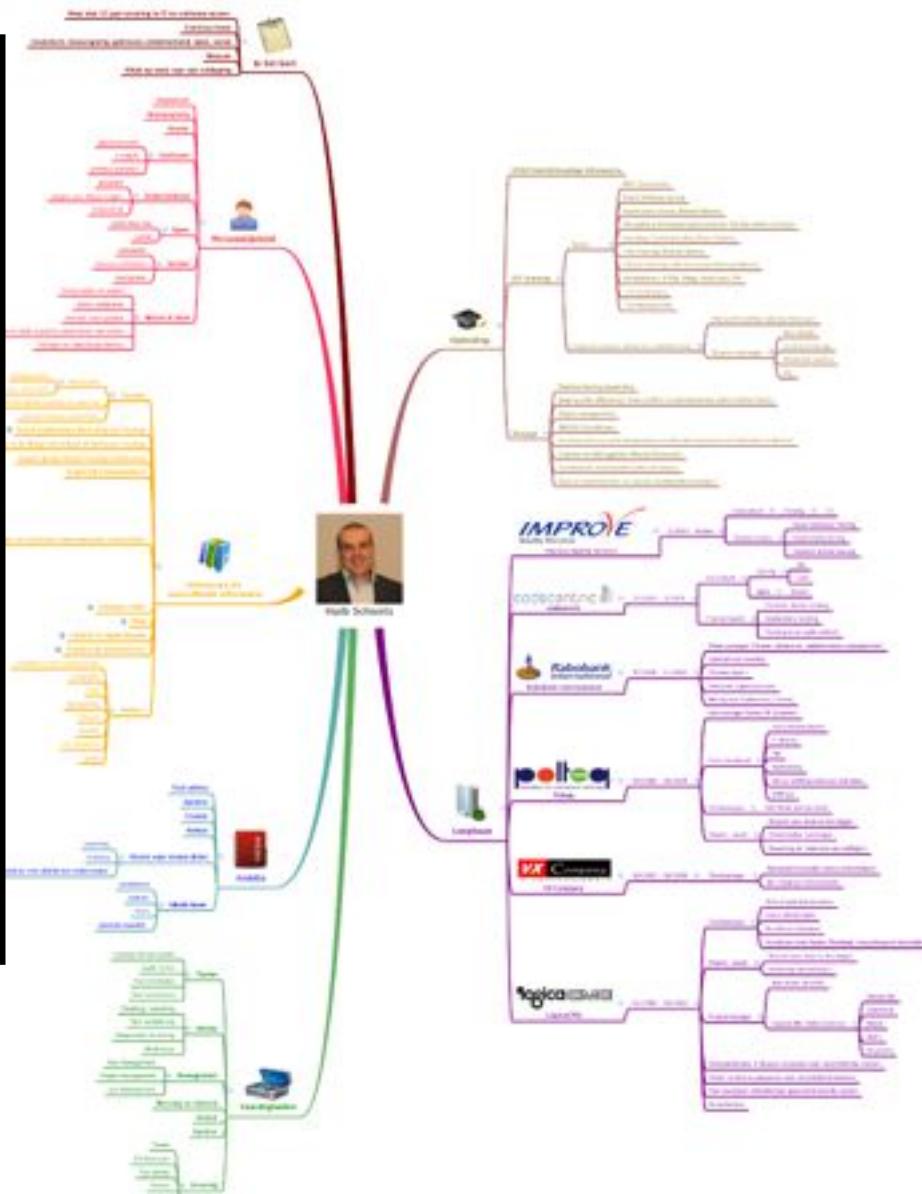
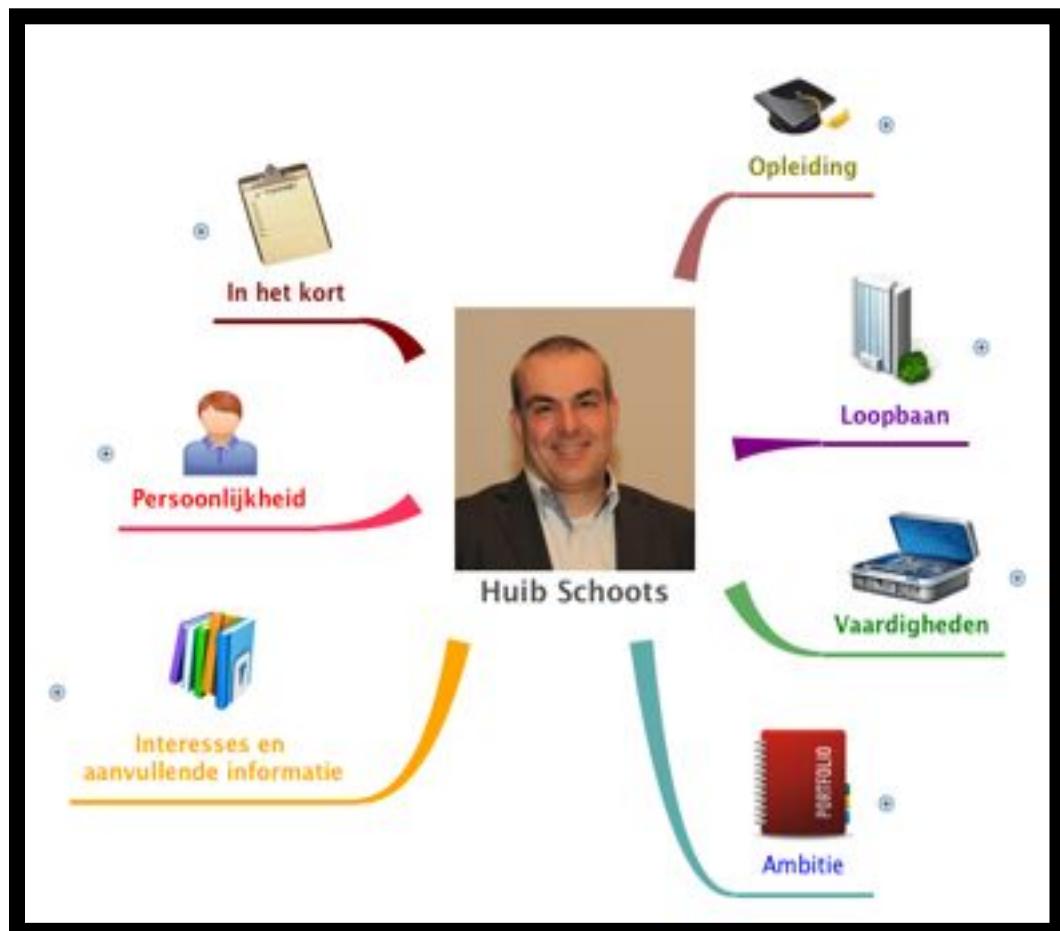
So? How did that go?



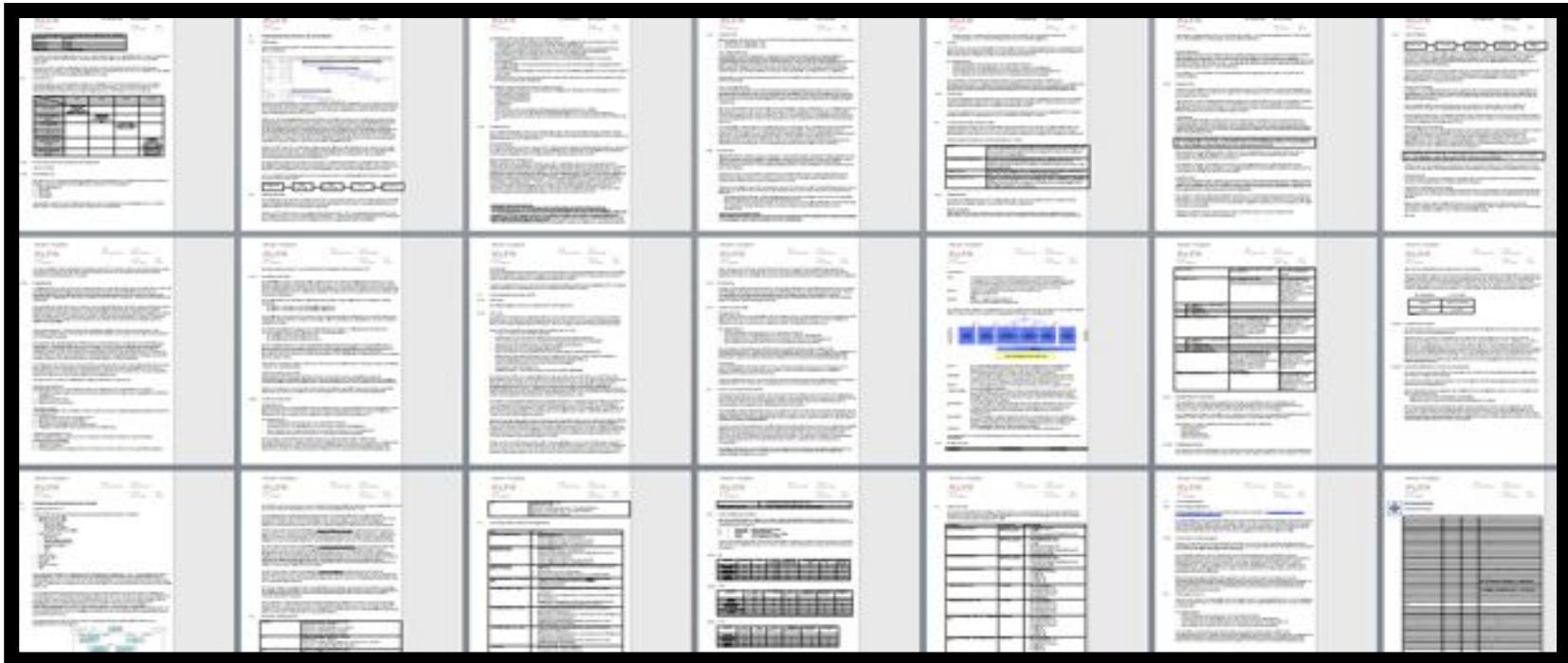
# Ruud Cox



# Huib's Resume

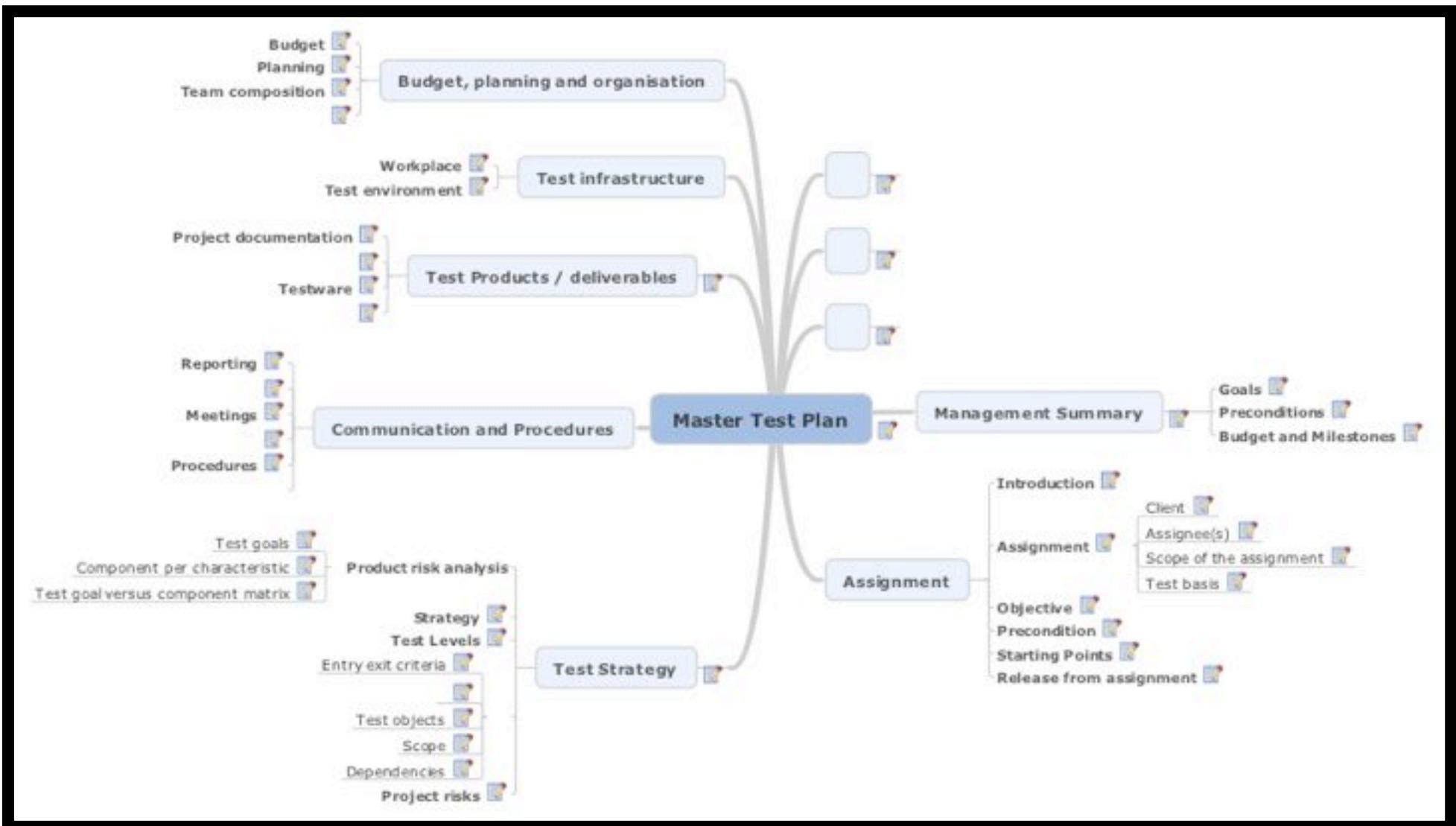


# Test Plan (Text)



- Text Example, 55 pages!!!
- Inaccessible
- Does anybody really read these?

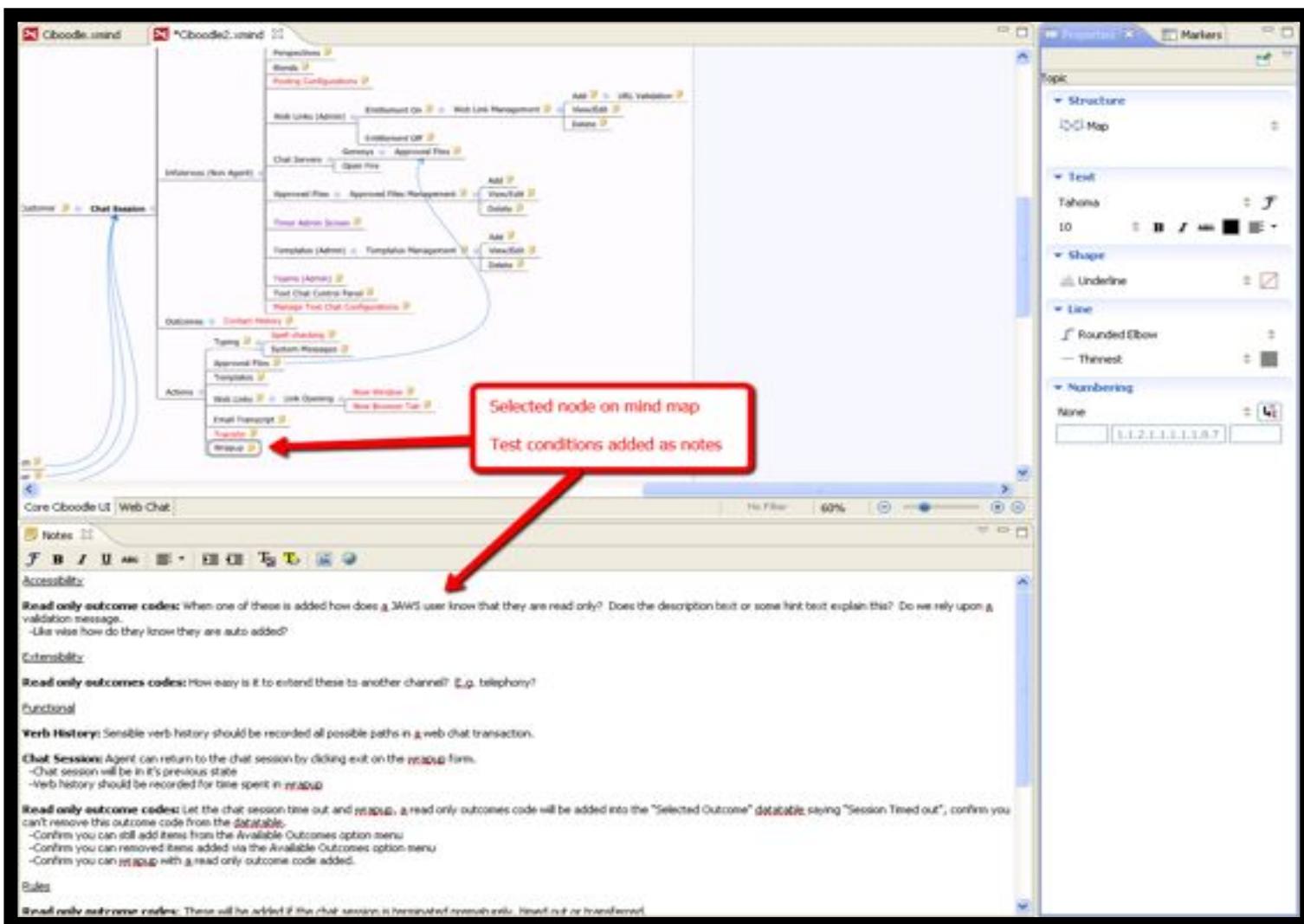
# Test Plan (Mind Map, Imported Doc)



# Test Plan (Mind Map)

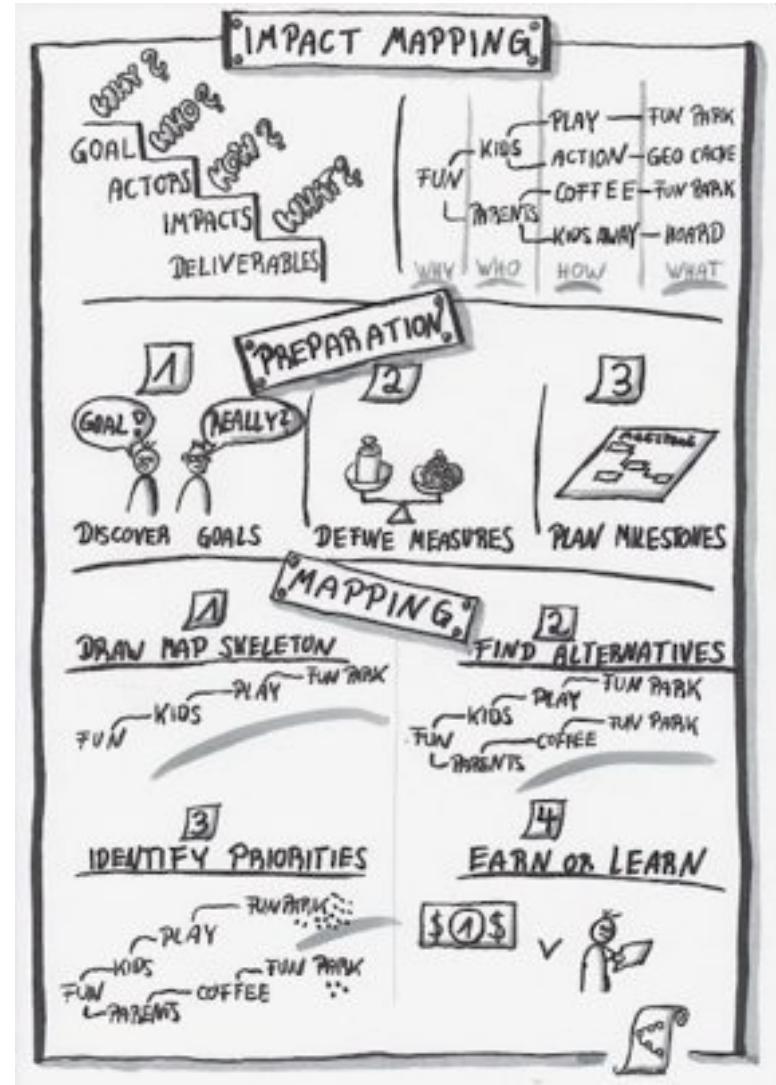
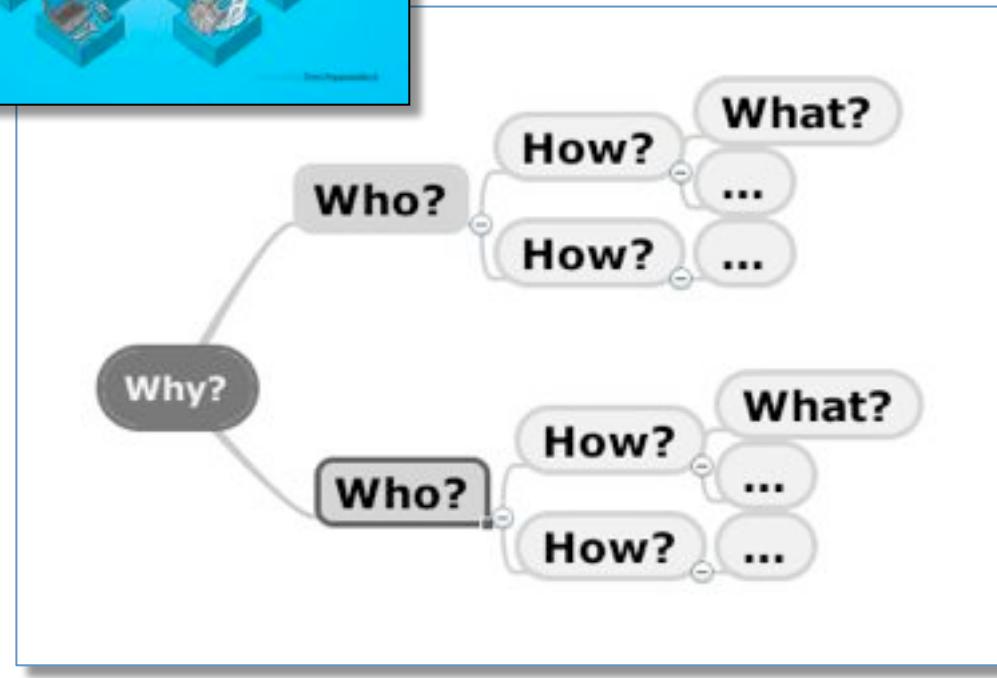
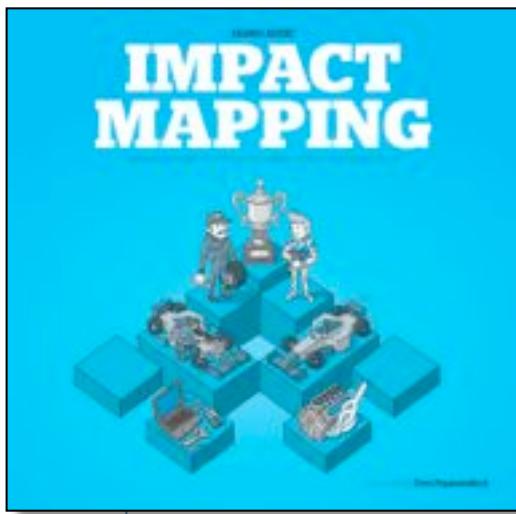


# Test Ideas, Test Cases

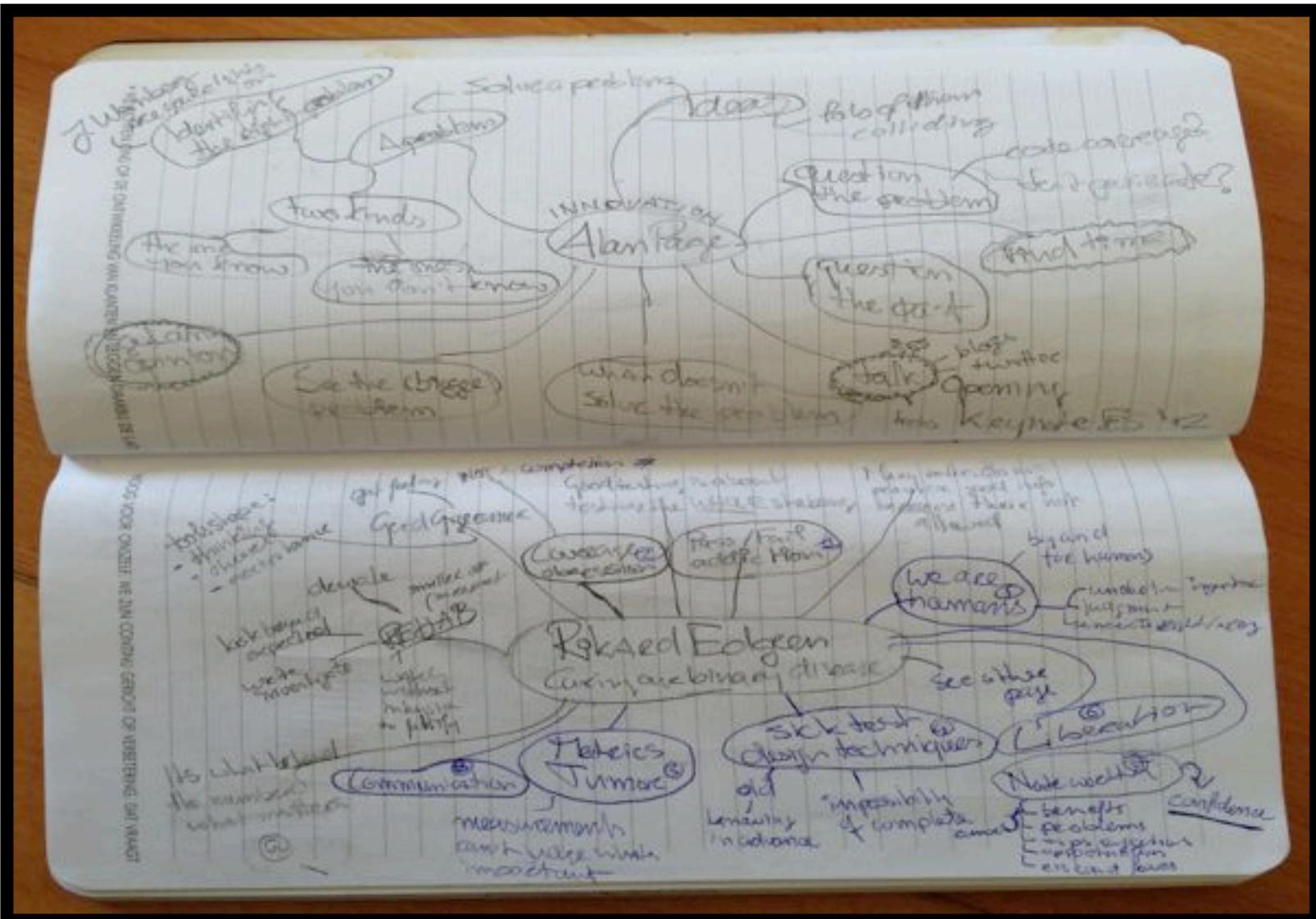


Source: <http://www.bettertesting.co.uk>

# Impact Mapping



# Session Notes





# Recap of this Morning

Let's  
Recap



# Context?

*When I say “context” I mean the totality of a situation that influences the success or failure of an enterprise.*

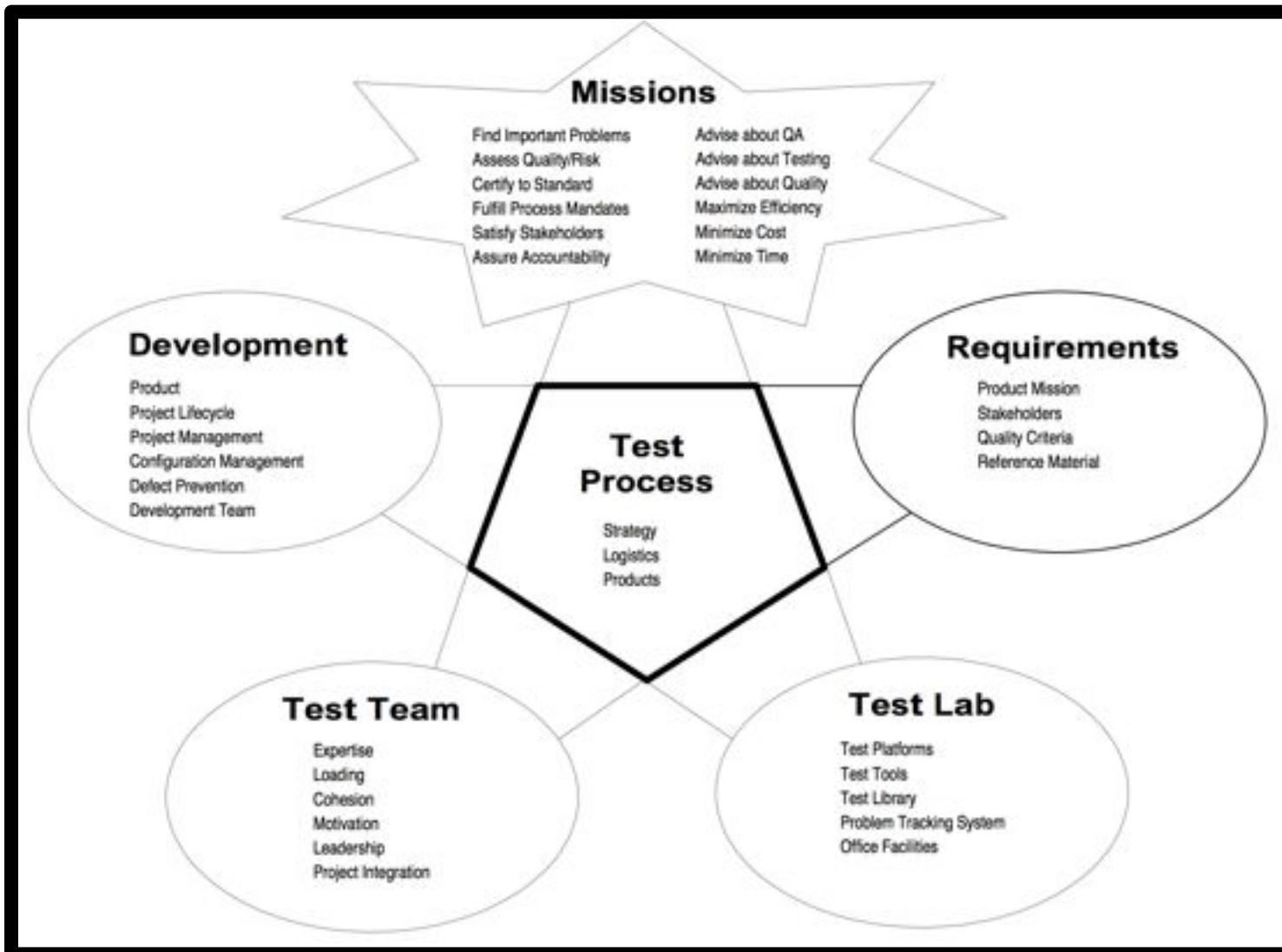
-- James Bach, [Context-Driven Methodology](#), Satisfice.com/blog 2006

*What is Context-Driven Testing?*

*“People evaluating a product by learning about it through experimentation in a manner organized and motivated by a systematic consideration of all the factors that significantly influence the problems and solutions that lie within the scope of their mission.”*

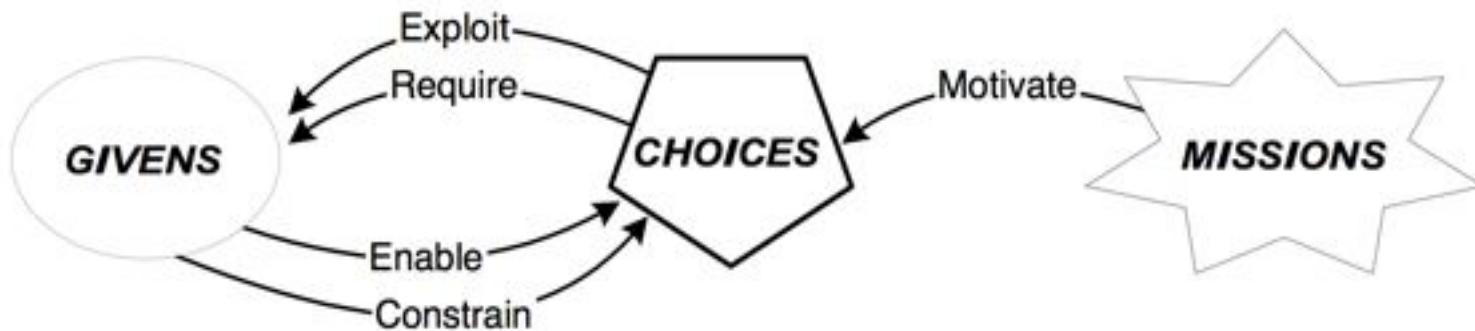
-- James Bach, [How do I Know I am Context-Driven?](#), Let's Test 2013

# A Model



# So?

## How Context Influences the Test Plan



1. Understand who is involved in the project and how they matter.
2. Understand and negotiate the GIVENS so that you understand the constraints on your work, understand the resources available, and can test effectively.
3. Negotiate and understand the MISSIONS of testing in your project.
4. Make CHOICES about how to test that exploit the GIVENS and allow you to achieve your MISSIONS.
5. Monitor the status of the project and continue to adjust the plan as needed to maintain congruence among GIVENS, CHOICES, and MISSIONS.



# Context Exercise



*35 Minutes*



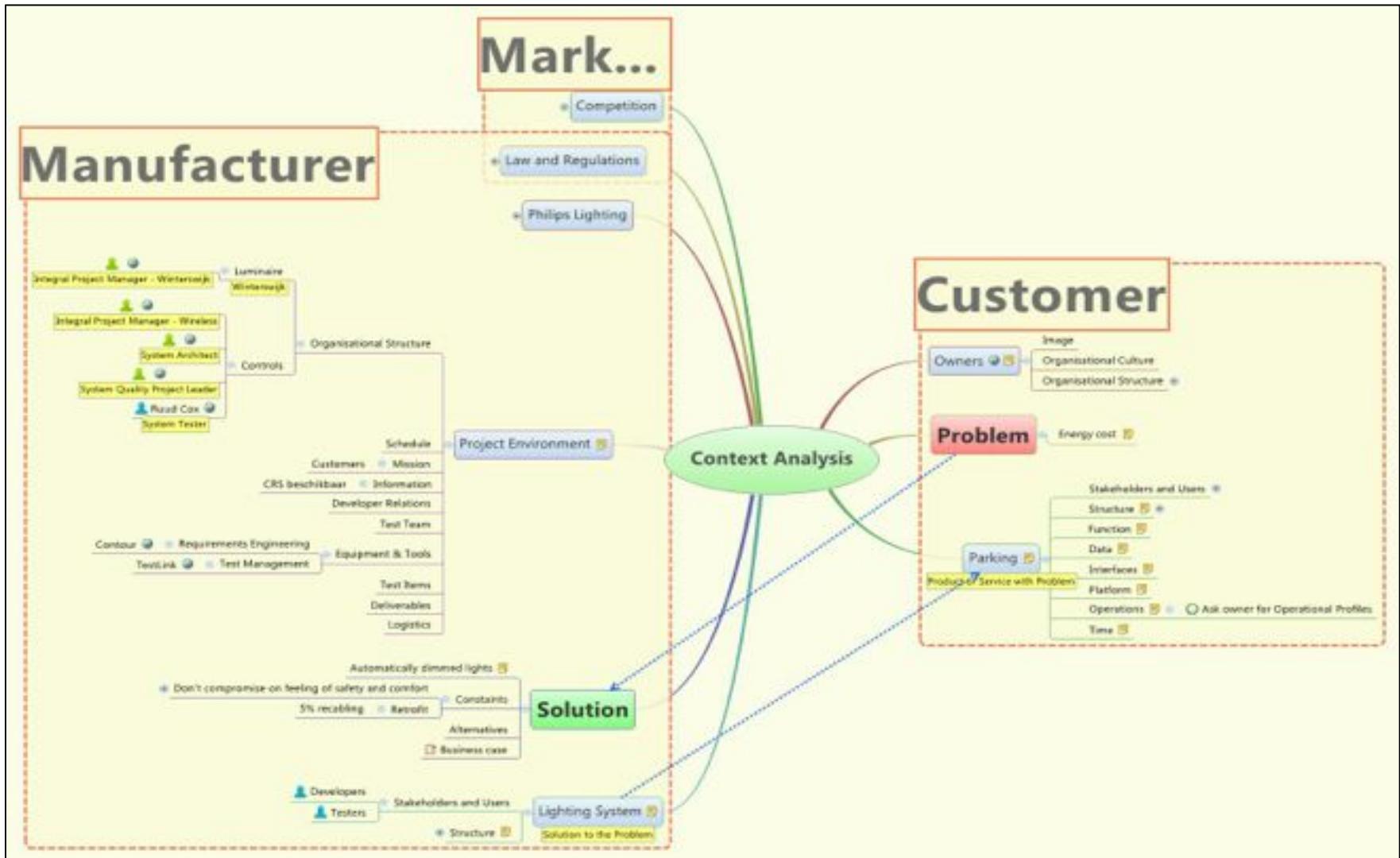
1. Make groups of 5 people
2. Name context factors that matter and influence your testing in your current project
3. Discuss how these factors can be made visual
4. Visualize the context in the “DNA Analyzer” case not using a mind map



# Context Exercise Debrief

So? How did that go?





*Context analysis: 1<sup>st</sup> iteration*

Roger Detwiler  
Franklin D. Roosevelt School

P1R - sedan. Bynamn:  
EEC 604.

Peter Fitzsimon ARCH.  
zigbee team

Answers

0% culture

## Business

The diagram is a hand-drawn mind map with 'Sustainable Solutions' at the center. Major branches include:

- Renewable Energy** (top left)
  - Solar
  - Wind
  - Tidal
  - Geothermal
- Green Building** (top right)
  - LEED Certified
  - BREEAM Approved
  - Green Roof Systems
  - Waterwise Landscaping
- Waste Management** (bottom left)
  - Recycling
  - Composting
  - Landfill Management
- Transportation** (bottom right)
  - Cycling Infrastructure
  - Public Transport
  - Electric Vehicles
- Water Conservation** (far right)
  - Greywater Systems
  - Waterwise Landscaping
- Indoor Air Quality** (bottom center)
  - Green Paint Systems
  - Ventilation
  - Low VOC Paints
- Structural Solutions** (top center)
  - Lightweight Structures
  - Modular Construction
  - Green Roofs
- Normal Stress - Overcoming** (bottom center)
  - Stress Management
  - Problem Solving

~~Commission~~

Complication -

negotiations

Carebeam Wo 11-12 -

marked segment.

Answer  
(Q&A)

uncertainties

3-year payback time  $\leq 24\%$

fixed at  $P_{\text{ext}}^{(0)}$

87  
culture

278

Why? —

## Business

Image

- ↳ Empathetic
- ↳ Trust worthy
- ↳ Knowledgeable
- ↳ Courageous
- ↳ Credible

Sysareh  
PST  
did not react on any  
move.

## problem

reduce energy costs.  
(lighting 70% save)  
energy costs.

Without compromising on safety  
unsafe feelings customers.

Unter der Substanz verdeckt

16

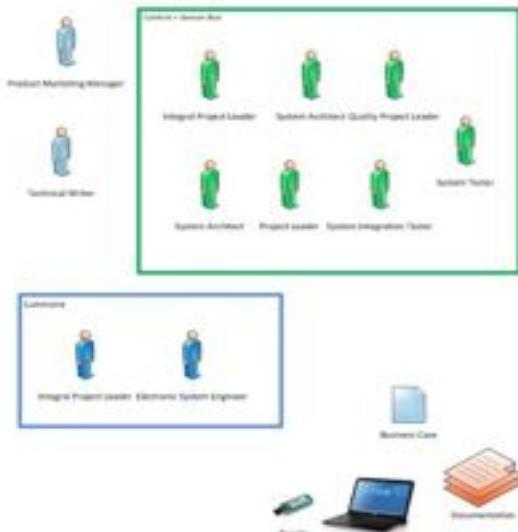
the long parrot  
garage went. of  
long, long.

Attributes  
size  
texture  
movement-speed  
pattern

e- Ta  
 -30 to +40°C  
 ge soft  
 temperature  
 I arrived  
 person  
 bird, mouse,  
 house

given to a person or group of people

## Research & Development



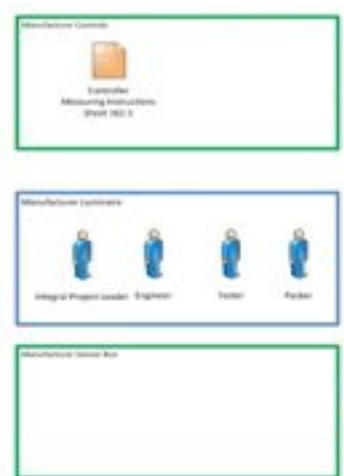
## Market



## Customer



## Manufacturing



## Logistics



# COFFEE BREAK



# Test Coverage Outline

# Test Coverage?

... **Coverage** is how thoroughly you have examined the product with respect to some model of ...

## Interesting kinds of coverage

- Product coverage: *What aspects of the product did you look at?*
- Risk coverage: *What risks have you tested for?*
- Requirements coverage: *What requirements have to tested for?*



# Coverage Exercise

*35 Minutes*



1. Work in groups
2. Name types of coverage that matter in your current project
3. Discuss how coverage can be made visual
4. Visualize ... coverage of a “kitchen timer”



## **Digital kitchen timer / stopwatch**

Set to 99 minutes (M) and 59 seconds (S).

With hook, table stand/belt clip and magnet.

Clear and large LCD display.

### **The kitchen timer:**

Press the M and S buttons to select the minutes and seconds.

Then press the START/STOP button to start the countdown.

Press the START/STOP button to stop.

Press the START/STOP button to continue with the countdown.

After the countdown, the alarm will sound for one minute.

Press the START/STOP button to stop it.

Set the time to 00:00 by pressing the M and S buttons at the same time.

### **The stopwatch:**

Press the START/STOP button to start the counting.

Press the START/STOP button to stop.

Press the START/STOP button to continue adding further.

Set the time to 00:00 by pressing the M and S buttons at the same time.

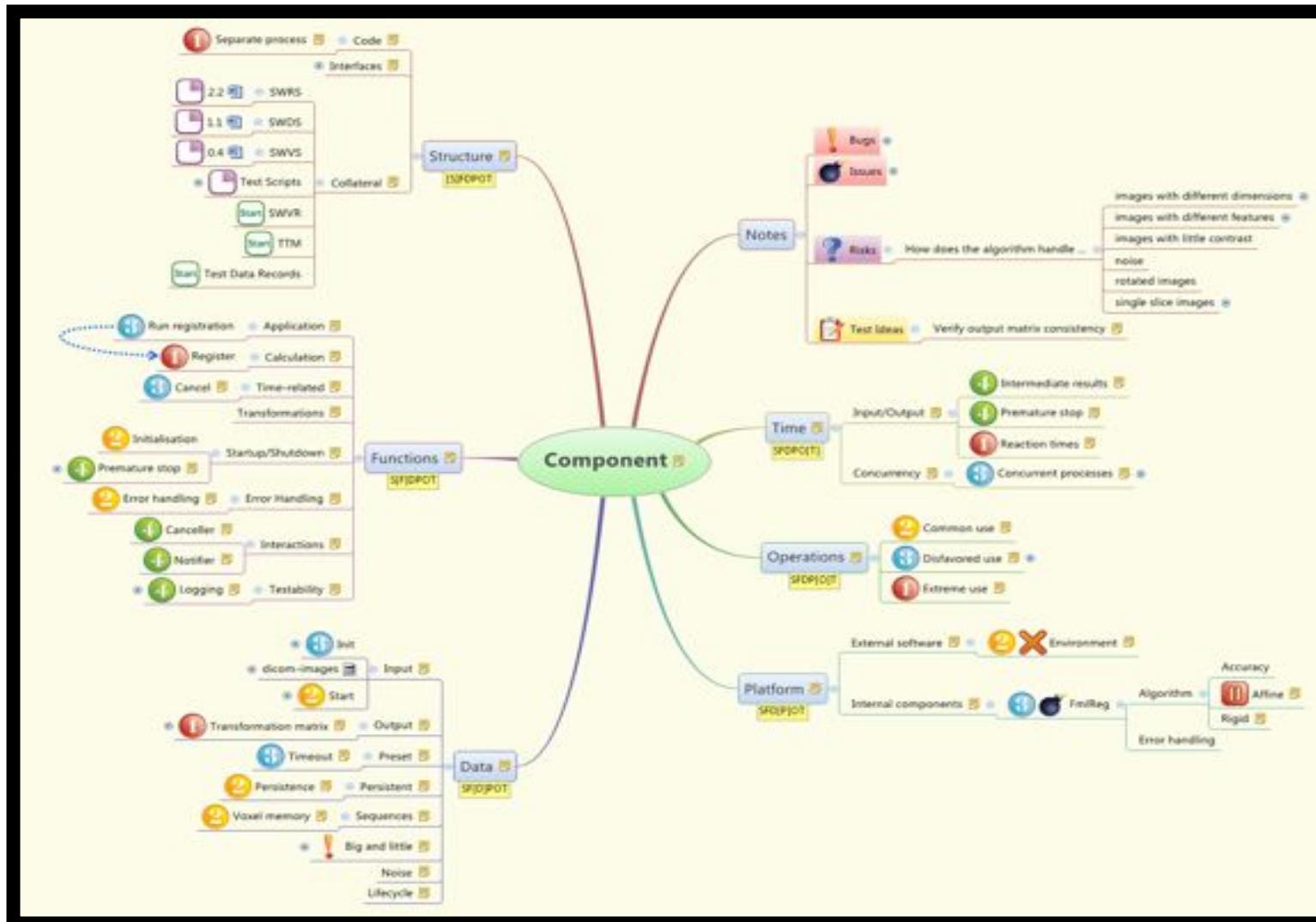


# Coverage Exercise Debrief

So? How did that go?

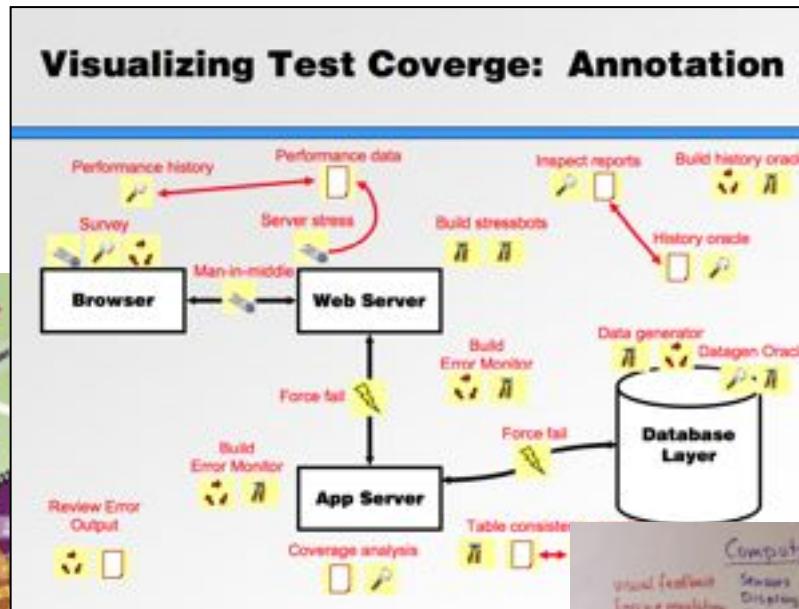


# Test Coverage Outline



Source: Ruud Cox, Testing in a Medical Device Context, EuroStar 2012

Visual coverage is like a map

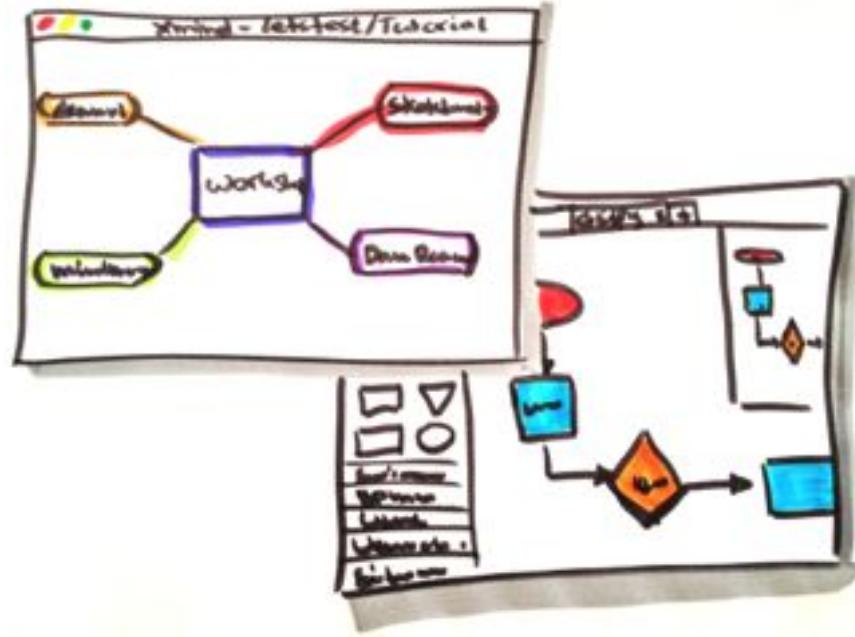




# Wrap-up

# Tools

- Freemind
- XMind
- Paper (ipad)
- Sketchbook (Android)
- Gliffy
- yEd
- pixlr.com
- Notepad++, UltraEdit, Textwrangler
- Powerpoint
- Excel
- Screen Capture



And your notebook and fineliners ☺

# Example of Project



# Wrap-up

- Visual Feedback Wall
- Learning Objectives
- Questions
- Next steps
- Tips
- Books
- References



# Goals for today



1. Experience and learn about visual thinking
2. Experience you do not have to be an artist to think & work visual

# Learn More - Testing



- **Rapid Software Testing – James Bach & Michael Bolton**  
[http://www.satisfice.com/info\\_rst.shtml](http://www.satisfice.com/info_rst.shtml)
- **Heuristic Test Strategy Model – Designed by James Bach**  
<http://www.satisfice.com/tools/htsm.pdf>
- **Heuristic Test Planning – James Bach**  
<http://www.satisfice.com/tools/satisfice-cm.pdf>
- **Heuristic Risk-Based Testing – James Bach**  
<http://www.satisfice.com/articles/hrbt.pdf>

# Learn More - Books



- ☞ Sketchnotes (Mike Rohde)
- ☞ The Mind Map book (Tony Buzan)
- ☞ The DOODLE revolution (Sunni Brown)
- ☞ Thinking things through (Leone Burton)
- ☞ The mind at Hand: what drawing reveals (Michael J Strauss)
- ☞ Visual Mojo (Lynne Cazaly)
- ☞ Beyond Words (Milly R. Sonneman)
- ☞ Bikablo 1 + 2 (Neuland)

# Learn More - Videos



- **Sunni Brown: Doodlers, unite!**

[http://www.ted.com/talks/sunni\\_brown.html](http://www.ted.com/talks/sunni_brown.html)

- **Rachel Smith: Drawing in class**

<http://www.youtube.com/watch?v=3tJPeumHNLY>

- **Alan Richardson: Thinking Visually In Software Testing**

<http://www.youtube.com/watch?v=K4hvAbN2QbE>

- **Rob Sabourin: Whiteboarding for Testers, Developers and Customers too**

<http://vimeo.com/55845357#>

- **Hans Rosling: Stats that reshape your worldview**

[http://www.ted.com/talks/hans\\_rosling\\_shows\\_the\\_best\\_stats\\_you\\_ve\\_ever\\_seen.html](http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html)

# Learn More - Presentations



- **Ruud Cox – Drawing to learn, Sketching for testers**

<http://lets-test.com/wp-content/uploads/2014/03/tasting-lets-test-nl-2014-drawing-to-learn-sketching-for-testers-ruud-cox.pdf>

- **Rob Sabourin – Visual Test Design**

[http://www.amibugshare.com/workshops/Workshop\\_Visual\\_Test\\_Design.zip](http://www.amibugshare.com/workshops/Workshop_Visual_Test_Design.zip)

- **Visual Thinking - Liz Burow**

<http://www.slideshare.net/burowe/visual-thinking-presentation-for-united-health-innovation-day>

- **Solving Problems with pictures - Santo Thie**

<http://www.slideshare.net/stsanto>

# Learn More - Websites



- **Patterns for Information Visualization**

<http://www.targetprocess.com/articles/information-visualization/>

- **Sketchnote Army**

<http://sketchnotearmy.com/>

- **Sketchnote Index**

<http://sketchnoteindex.com/>

- **Sketchnoting for absolute beginners – Laurens Bonnema**

<http://laurensbonnema.blogspot.nl/2013/02/sketchnoting-for-absolute-beginners.html>

- **Building a visual vocabulary**

<http://sachachua.com/blog/2013/03/sketchnotes-building-my-visual-vocabulary>

<http://cheryllowry.com/2013/05/03/sketchnote-building-blocks-visual-vocabulary/>

<http://austinkleon.com/category/visual-note-taking/>

# Learn More - Blogposts



- **An Example of a Product Ecology for Testers**

<http://ruudcox.wordpress.com/2013/10/25/an-example-of-a-product-ecology-for-testers/>

- **PEST 4.5 – Workshop on visualization**

<http://kristjanuba.wordpress.com/2014/05/17/summary-of-my-presentation-at-pest-4-5/#more-312>

<http://thepainandgainofedwardbear.wordpress.com/2014/04/27/pest-4-5-workshop-on-visualization/>

- **14 Ways to Present Information Visually**

<http://www.velocitypartners.co.uk/our-blog/infographics-14-ways-to-present-information-visually/>

- **Breaking the Tyranny of Form – Fiona Charles**

<http://quality-intelligence.blogspot.nl/2012/06/breaking-tyranny-of-form-part-1.html>

- **Visualisation – Huib Schoots**

<http://www.huibschoots.nl/wordpress/?p=927>

- **Big Visible Testing – Claire Moss**

<http://blog.aclareification.com/2012/08/big-visible-testing/>



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Thank you !!



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