

Thinking and Working Visually for Software Testers



huibschoots



ruudcox




Name tag



5 Minutes

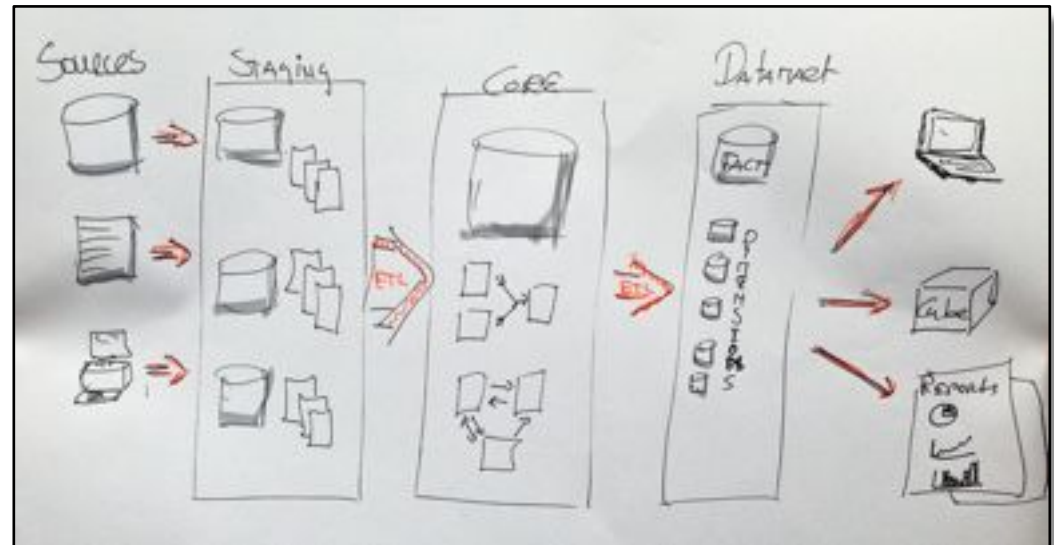


Schedule

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

Reply Retweet Favorite

Flag media



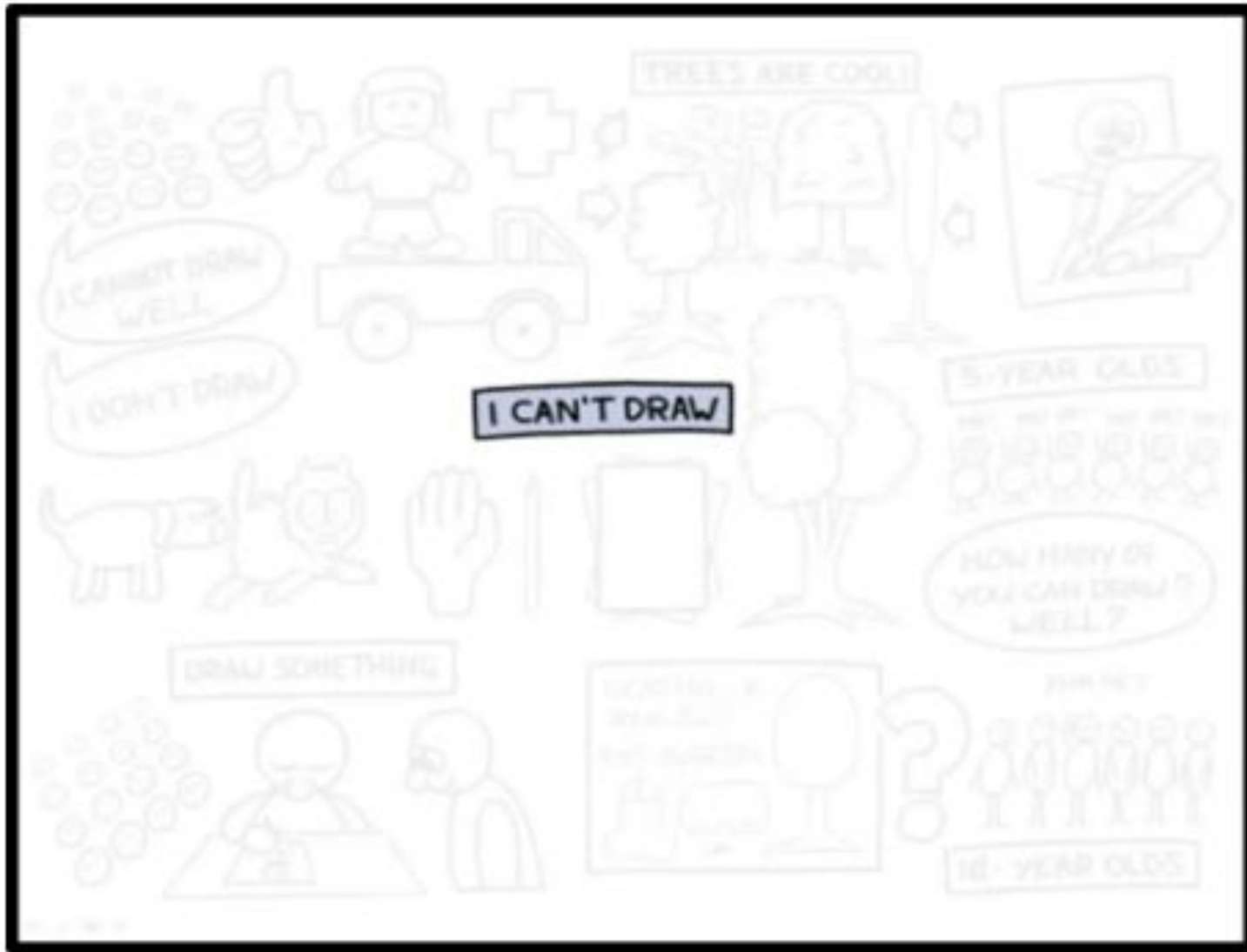
@huibschoots

@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!

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



5 Minutes



Let's Draw! Debrief

And? How did that go?





Sketchnotes

Outline of this Section

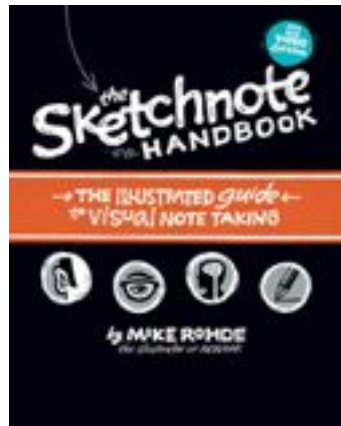
- Explain
- Exercise
- Debrief
- Examples

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



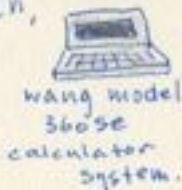
40 years of trying to play well with others

1. I GO TO BROWN UNIVERSITY 1968. freshman,

NO INNATE PLEASURE WRITING, TESTING CODE? MOVE ON!

2. IFIRST JOB Programmer, Wall Street 1972.

IT WAS REALLY HARD. WE HAD TO DO IT TOGETHER



Wang Model 360SE calculator system.

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



5. THE SUMMER

OF '75 write code to be read



My life EXPLODES

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



THE DEAD FISH PATTERN

7. A GUILD OF TALKERS AND WRITERS



WRITING HELPS YOU THINK DISTILL IDEAS

8. UNCLE SAM WANTS YOU

NO BEST PRACTICES

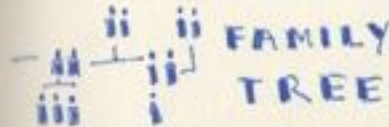


9. GOD BLESS THE CHILD



DON'T BE AN ASSHOLE

AND HERE WE ALL ARE NOW



FAMILY TREE

ENGAGED PEOPLE WERE PLANTING THE SEEDS



FEEL THE BREEZE OFF TIME

rudco

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 associationforsoftwaretesting.org)

Sketchnote them...



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?

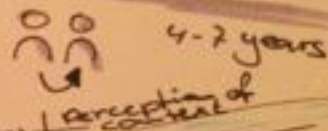
Did you do something different the second time?

Back to the Middle Ages

Bart Broekman



Traditional Teaching



Dreyfuss Model

	Knowledge	Autonomy	perception of context
Novice			
Beginner			
Competent			
Proficient			
Expert			

Masterclasses

- * Small groups
- * own experience
- * critical thinking
- * depends on facilitator skills

KSF

BACK TO THE MIDDLE AGES

Bart Broekman

COMMON PRACTICE

Apprentice Ship

1 way traffic, theory

Most apprentices aspired to become master craftsman themselves.

master classes



DREYFUSS MODEL OF SKILL ACQUISITION

KNOWLEDGE
AUTONOMY
PERCEPTION OF CONTEXT

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

WHY?



- SMALL GROUPS
- WORKING WITH THEIR MATERIAL

frudecox

CRITICAL THINKING

IP
Check in
I am ...
What's on my mind?

DEWT3

James Bach
Jerry's school T.T.
Best Book for SW Testers!
Jerry Weinberg

Thinking

System:
A set of things in meaningful interaction with each other.
• Probability
• What exists?
• What are boundaries
• Labels / grouping
• Cause / effect
• Feedback loop
• Non linearity
• Side effects

Logical → Follow the rules
Analogical → This is like that
Creative → Here's a cool idea
Critical → How might we be wrong
Systems → The situation is a system

Not competing but threads together

Purpose?

How to lie with Statistics
- Darrell Huff.

Back to go!

Illusions
"What I see is all there is..."

Thinking Fast & Slow
- Daniel Kahneman

What is a good tester?

ISTQB TMap
Certified?!
WTF? Testing?
day 3

(Joris)



TMap Book:
• Communicative
• Precise
• Convincing
• Objective
• Creative
• Sensitive

Please READ the book!
Rit

James Impressed

TMap is NOT about testing

Why is it not in the book?

Reading

Tester abilities quantifiable or qualifiable??
Social system!! Schools

TMap is not about testing but...
It's about a grasp of consultants to make money no skill!
James
enjoying
Rituals & core-money buzz words!

Skill vs. Technique

ISTQB vs. CDT
Un Smart kids



Show me what TMap says about how to do testing!!

What is Good Evidence?

GRIFFIN JONES
 TYPES QUALITIES
 TRAPS ANTI-PATTERNS

DA SOURCE

FDA



records vs testimony

QUALITIES

▶ CLEAR ...

TO WHAT DEGREE?

- ▶ AUTHENTIC
- ▶ INTEGRITY
- ▶ READABILITY
- ▶ CHANGES
- ▶ ATTRIBUTABLE TO A SPECIFIC PERSON
- ▶ CONTEMPORARY
- ▶ AUDIT TRAIL
- ▶ RETRIEVABLE
- ▶ 3rd PARTY REVIEW / RECONSTRUCTION

TRAPS, THREADS, ANTI-PATTERNS

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

RECOGNIZE QUALITIES

TRAPS

HOW IS YOUR EVIDENCE DEFICIENT

GO OBSERVE THE WORK

runid.co.uk

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
 PURE ENJOYMENT
 NO INNATE PLEASURE? TIME TO MOVE ON!
2. MY FIRST JOB
 A DOOR! A WINDOW!
 GENIUS MENTOR
 "THIS IS REALLY HARD AND I LIKE IT!"
3. MY BOSS LEAVES
 NO TRUST
 LEAVE
4. TEAM LEADER
 FOR 1 YEAR EMPLOYEE FOR 3 HOURS
 #KTHXBAI!
 PUTTING TOGETHER A TEAM
5. THE SUMMER OF '75
 ED YOURDOWN NEW JOB!
 BEAUTIFUL CODE
 CONSUMING
 MY LIFE
6. HERE COMES THE JUDGE
 AMERICAN ARBITRATION ASSOCIATION
 DARK UNDERBELLY OF THE INDUSTRY
 IT'S ALWAYS EMOTIONAL
 POWER
7. A GUILD OF TALKERS & WRITERS
 "WALTZING WITH BEARS"
 WRITING HELPS YOU THINK
8. UNCLE SAM WANTS YOU
 AIRLIE COUNCIL
 BEST PRACTICES
9. GOD BLESS THE CHILD
 THE RED BOOK
 IF YOUR WORK IS NOT AN INNATE PLEASURE, USE YOUR FEET

COLLEAGUES

TIM LISTER DOMARCO "PEOPLEWARE" "WALTZING W/ BEARS"

PARADOXES CU'S PARADOX?

10100101
01110101
0010010

FAMILY TREE

01994

@TESTSIDESTORY

#LETS TEST



STRATEGY

BACKUP

???



SAME MACHINE

- + HELPFULL FOR ACCIDENTAL DELETION + REVERTING UNWANTED CHANGES + CHEAP
- SINGLE POINT OF FAILURE

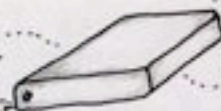
MAIN TACTICS

shadow copies

incremental backup

duplicate copy off files

EXTRA INTERNAL HD



FIREWIRE
USB
THUNDERBOLT
NAS

EXTERNAL DRIVE

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

RAID 1: MIRRORING



CO-LOCATION

REQUIRES SOLID INTERNET CONNECTION



CLOUD BASED

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

€/MND

STRUCTURE

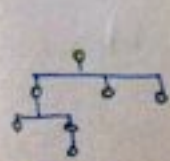
THE ARRANGEMENT OF
PUT THINGS IN A NEAT, ATTRACTIVE, OR
REQUIRED ORDER

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

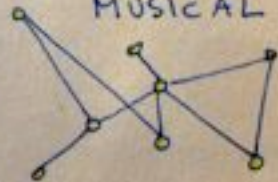
THE PARTS OR
ELEMENTS OF SOMETHING.

TYPES

PHYSICAL / CHEMICAL / DATA
BIOLOGICAL / MUSICAL / SOCIAL / SOFTWARE



HIERARCHY



NETWORK



LATTICE

PERCEPTION

PURPOSE:

perception both creates
an experience of the
environment and
enables us to act
in it.

MEMORIES
EXPECTATIONS
KNOWLEDGE

"cognitive
influences"

NEURAL
PROCESSING
the operations that
change the electrical
responses of neurons
in various ways

TRANSDUCE
TION
transformation of
energy e.g. light into
electrical signals.

STIMULUS ON
THE RECEPTORS
the image of an object
on the receptors of
the retina.

PERCEPTION

conscious sensory experience

RECOGNITION

the ability to place
an object in a
category that
gives it
meaning

ACTION

includes motor
activities e.g.
moving the head

ENVIRONMENTAL
STIMULUS

all of the things in our
environment that we
can potentially
perceive

THE
PERCEPTUAL
PROCESS

ATTENDED
STIMULUS

focus attention on
something interesting



PARADOX: EASY TO DO,
HARD TO UNDERSTAND

TOP DOWN
(knowledge)

PERCEPTION

(stimulus)

BOTTOM UP

SENSATION and PERCEPTION by E. BRUCE GOLDSTEIN



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?



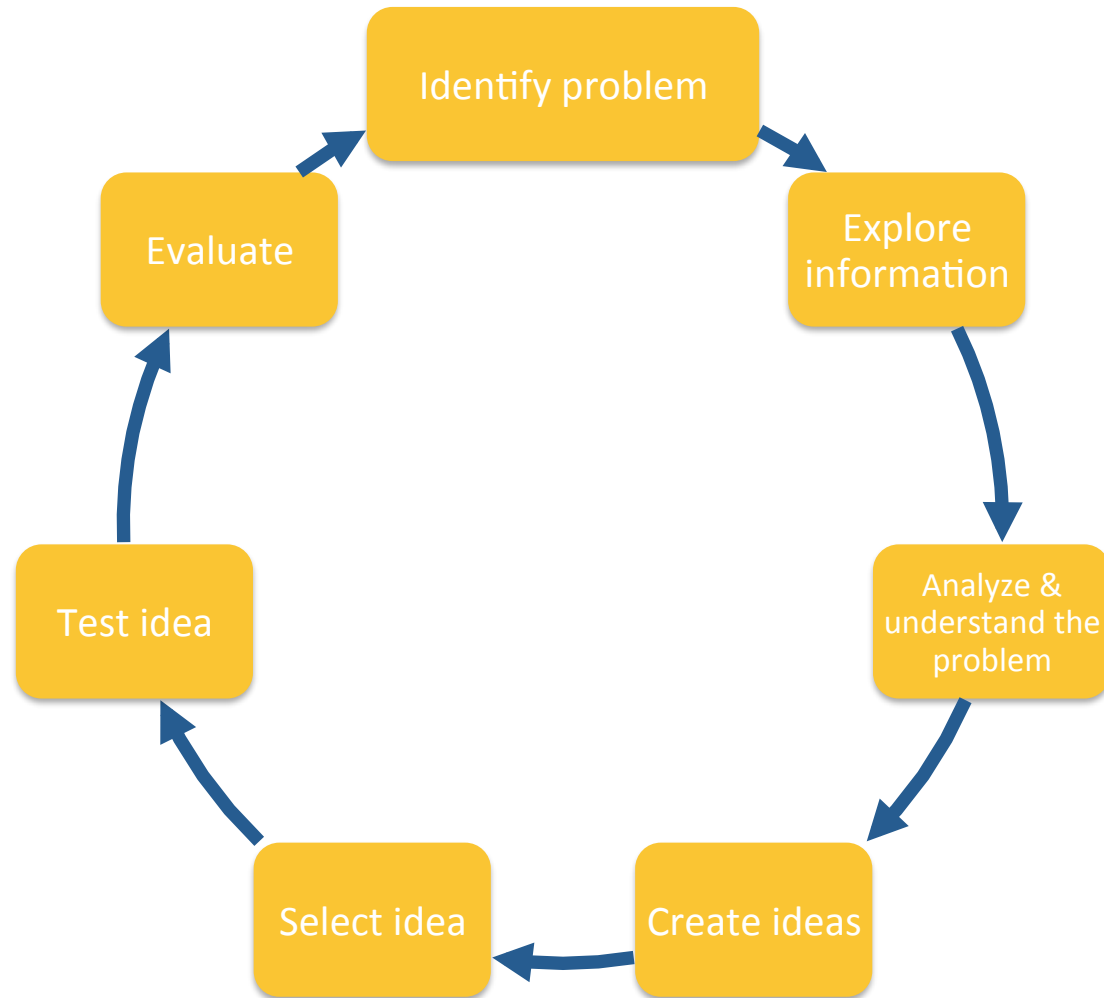


COFFEE BREAK



Problem-solving

Problem Solving Process



Developers design
a solution to a
problem

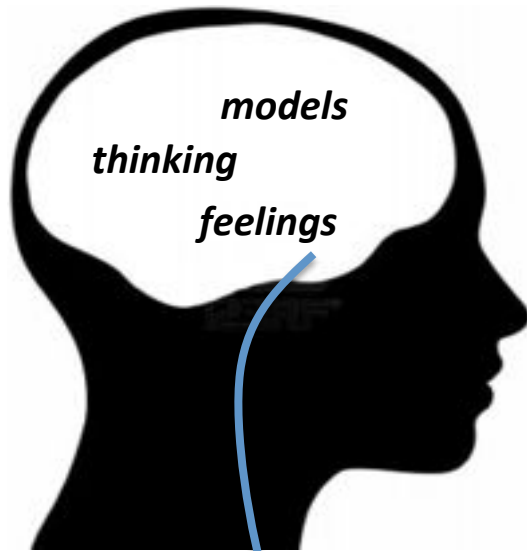
Testers investigate and
evaluate solutions...

...by building
mental models
from different
perspectives

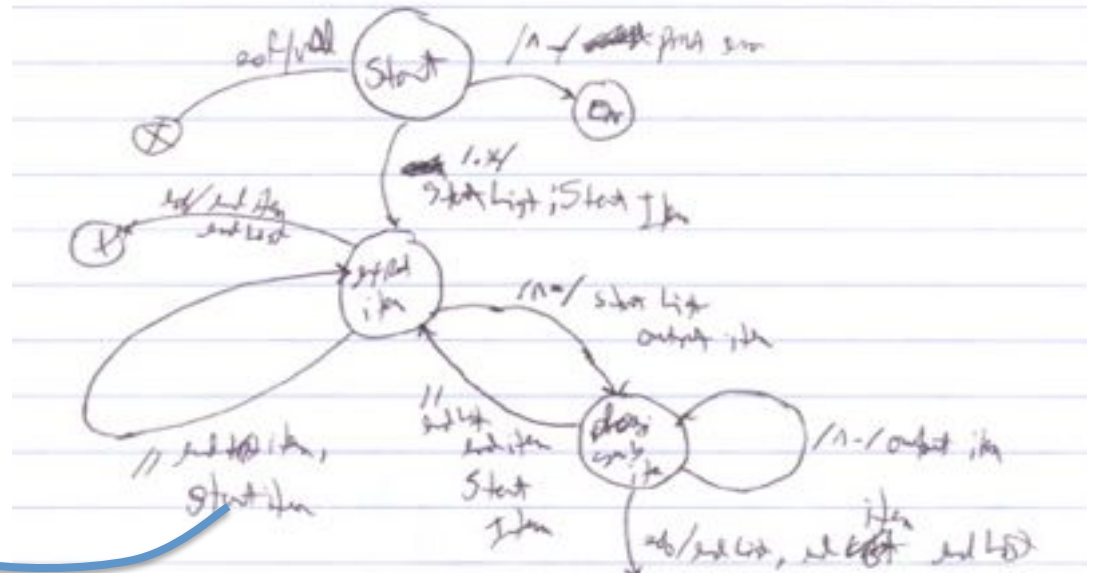


Testers solve testing problems

Drawing the Problem



External Memory



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

Drawing to Learn



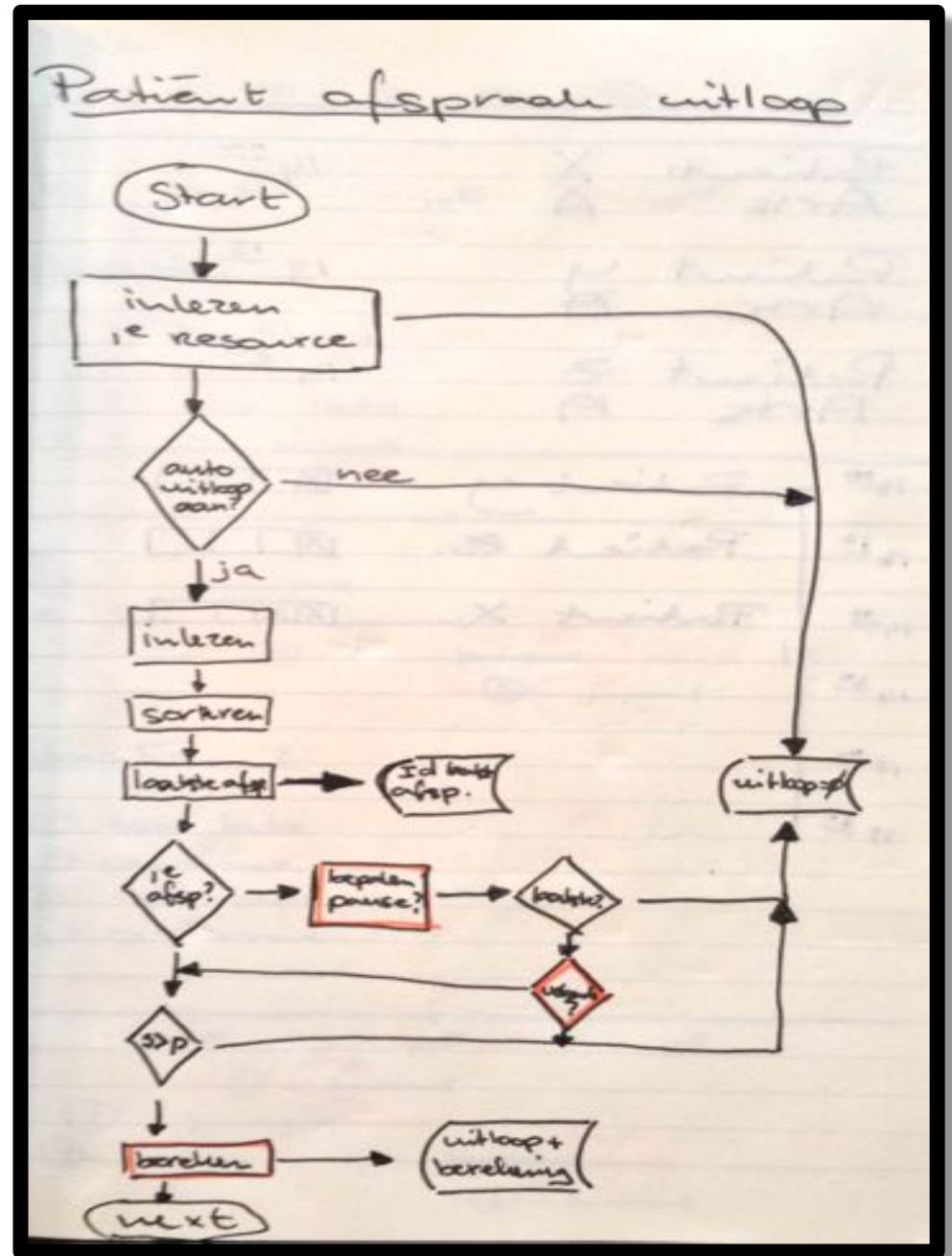
In visual learning, information is processed and understood through images and visualizing techniques

Modeling your Testing

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

Test Design Flowchart

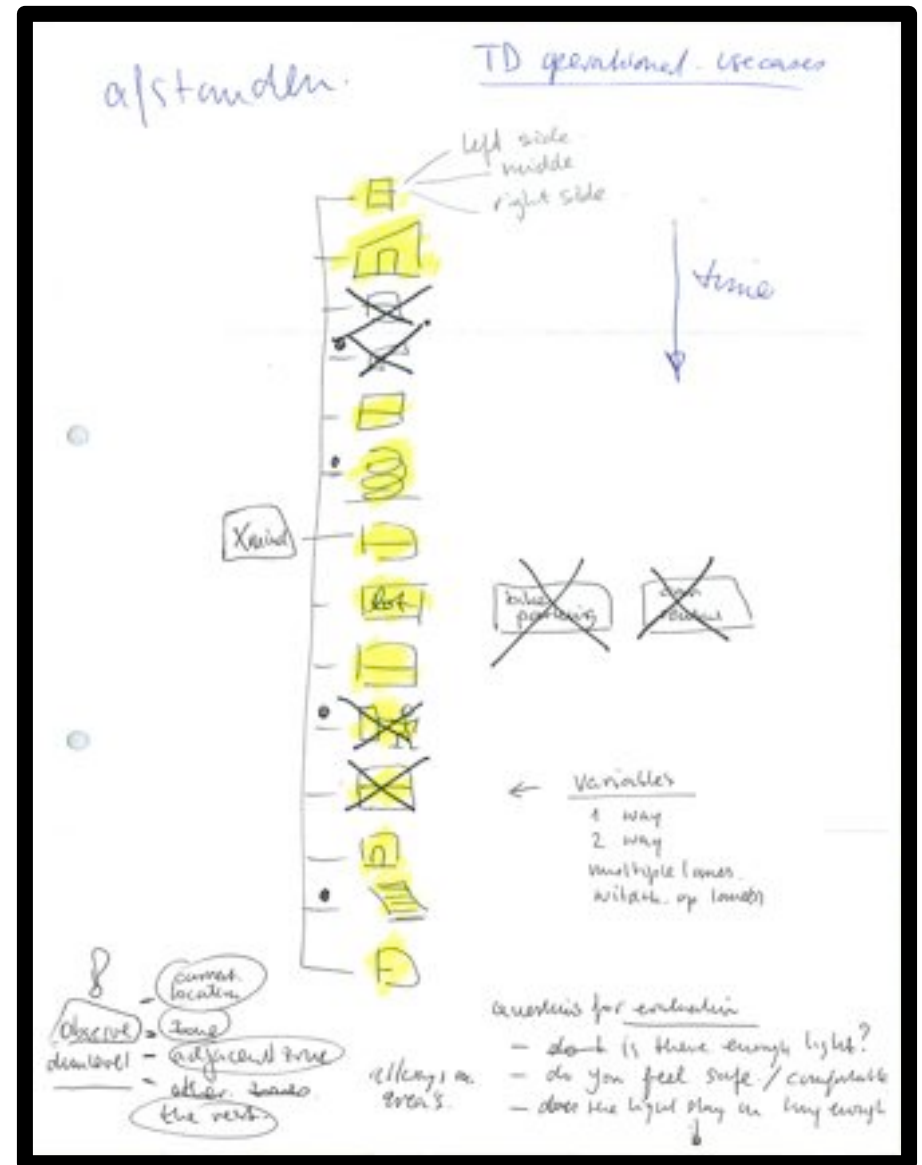
A model for deriving test
use cases



Test Design

Operational Use

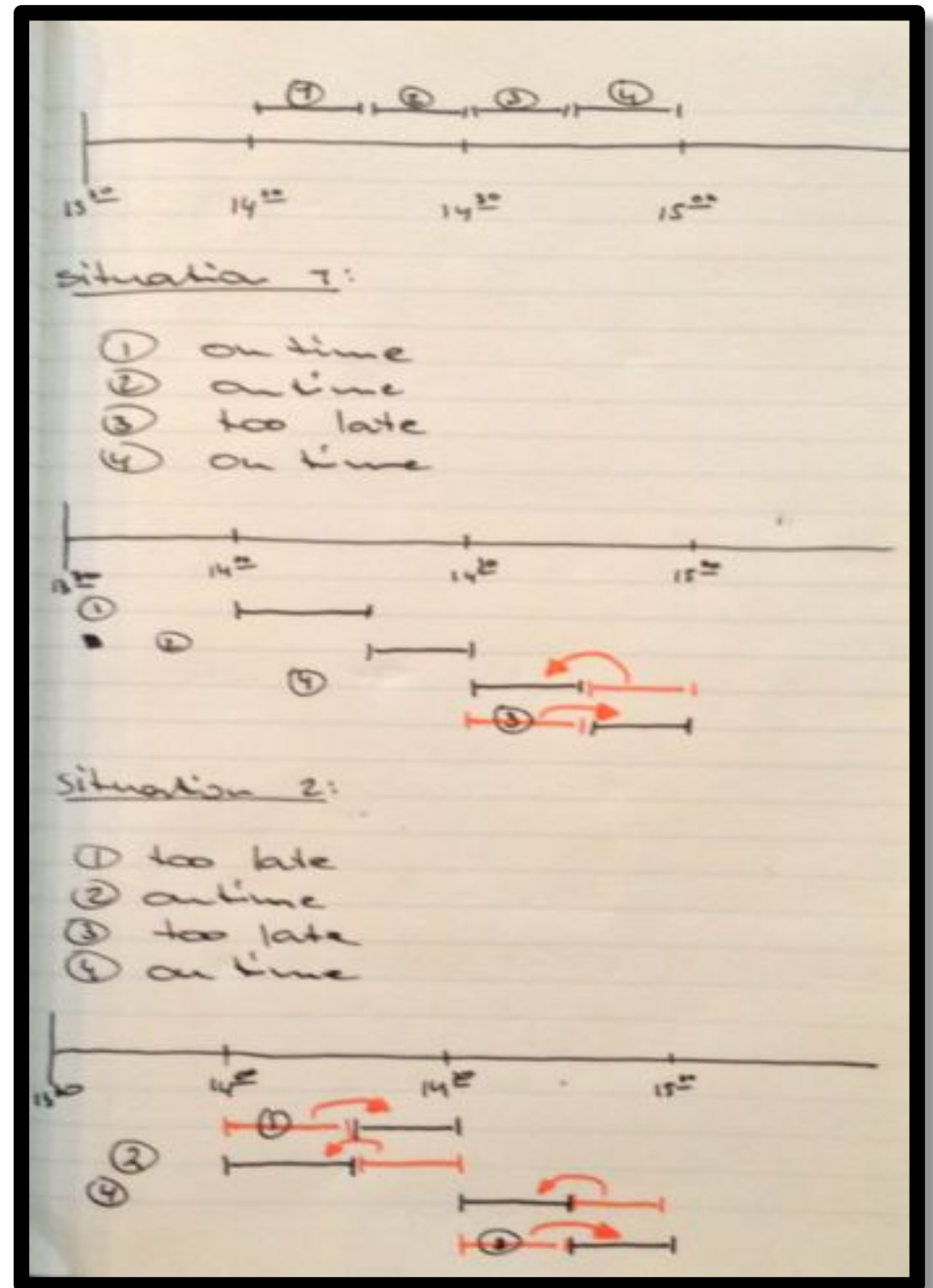
A model for deriving test use cases



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?

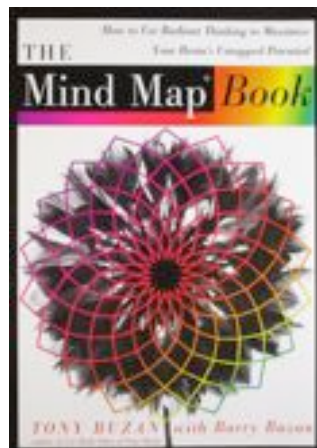
A mind map is a diagram used to visually organize information.

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

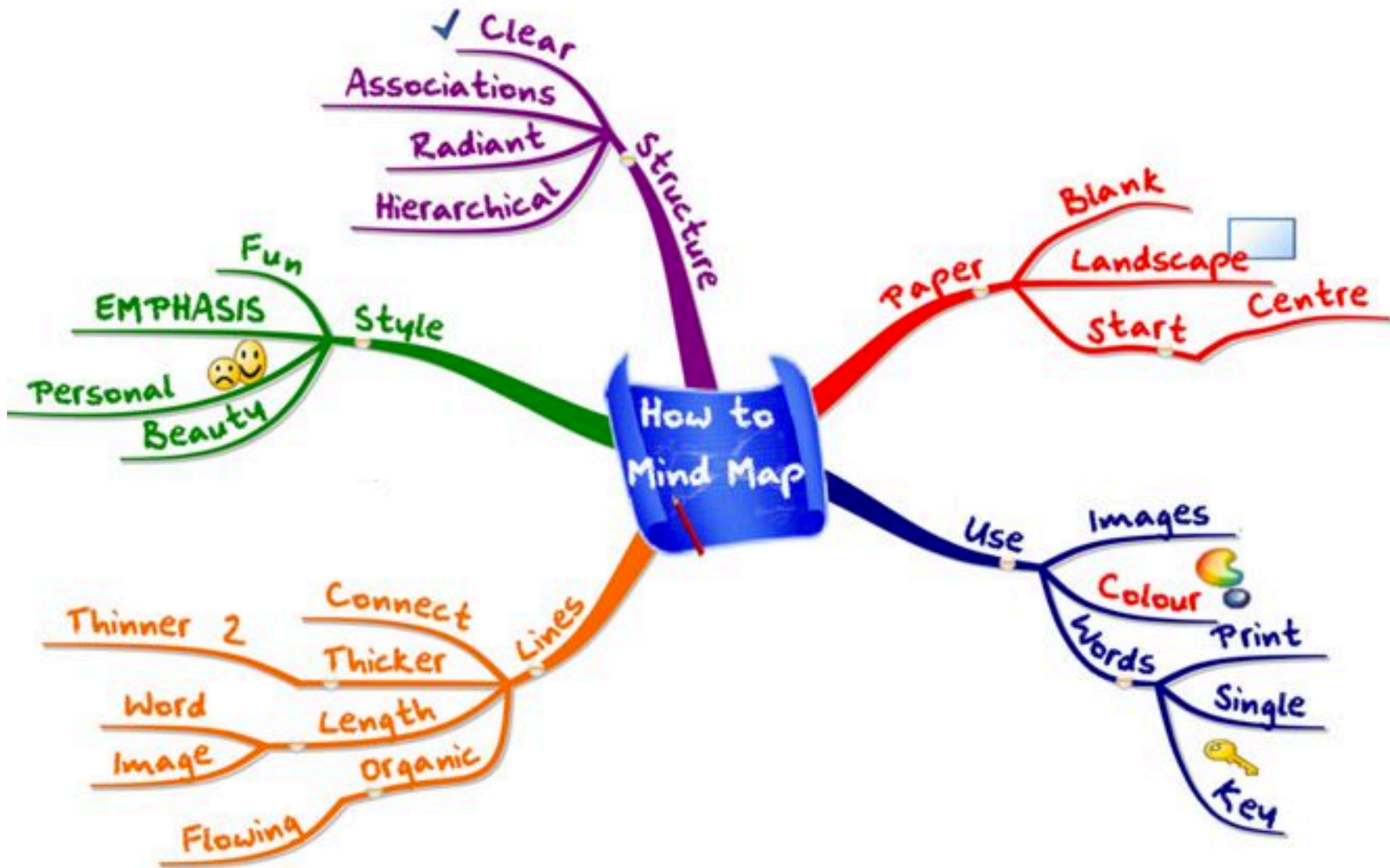


Tony Buzan

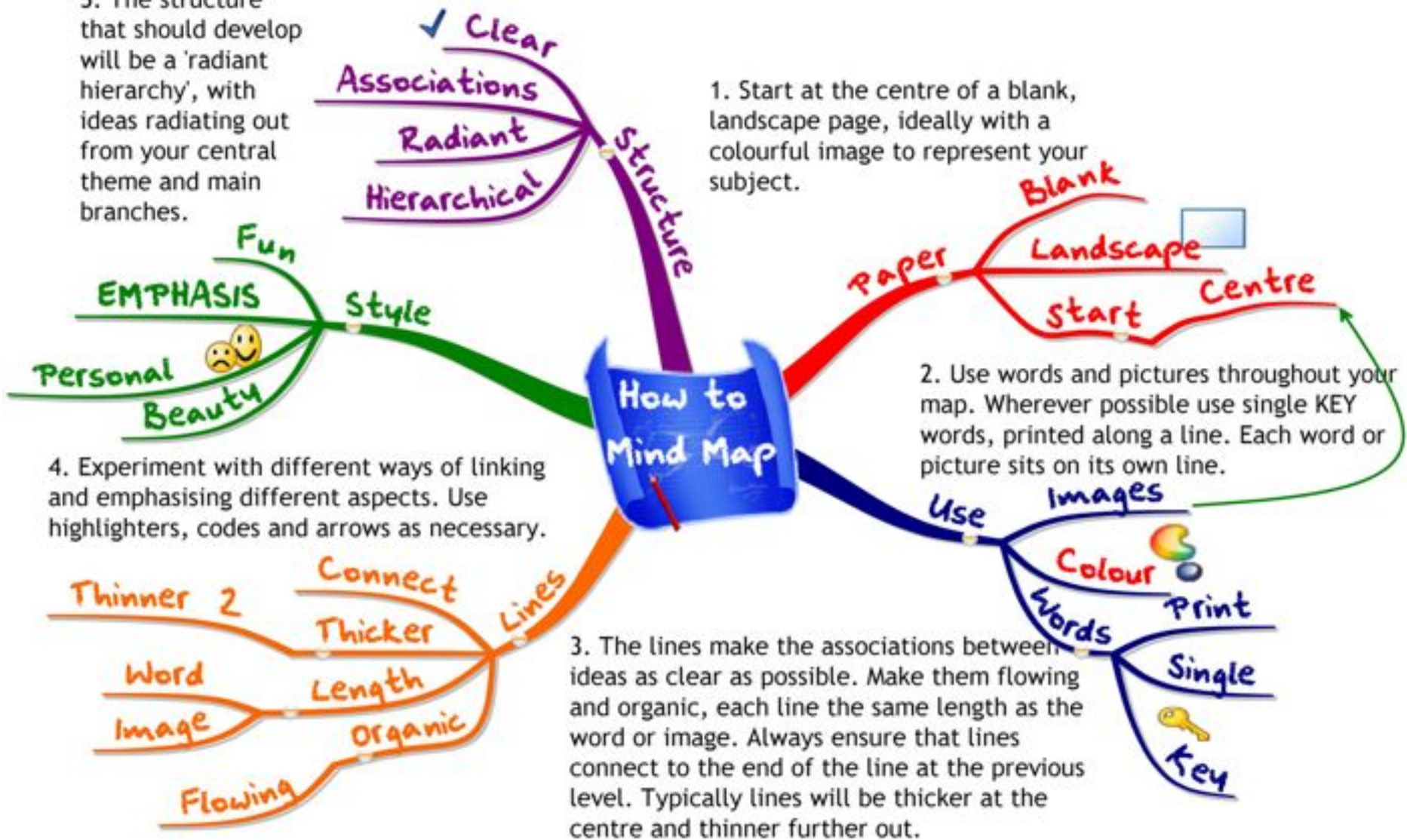








5. The structure that should develop will be a 'radiant hierarchy', with ideas radiating out from your central theme and main branches.



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.

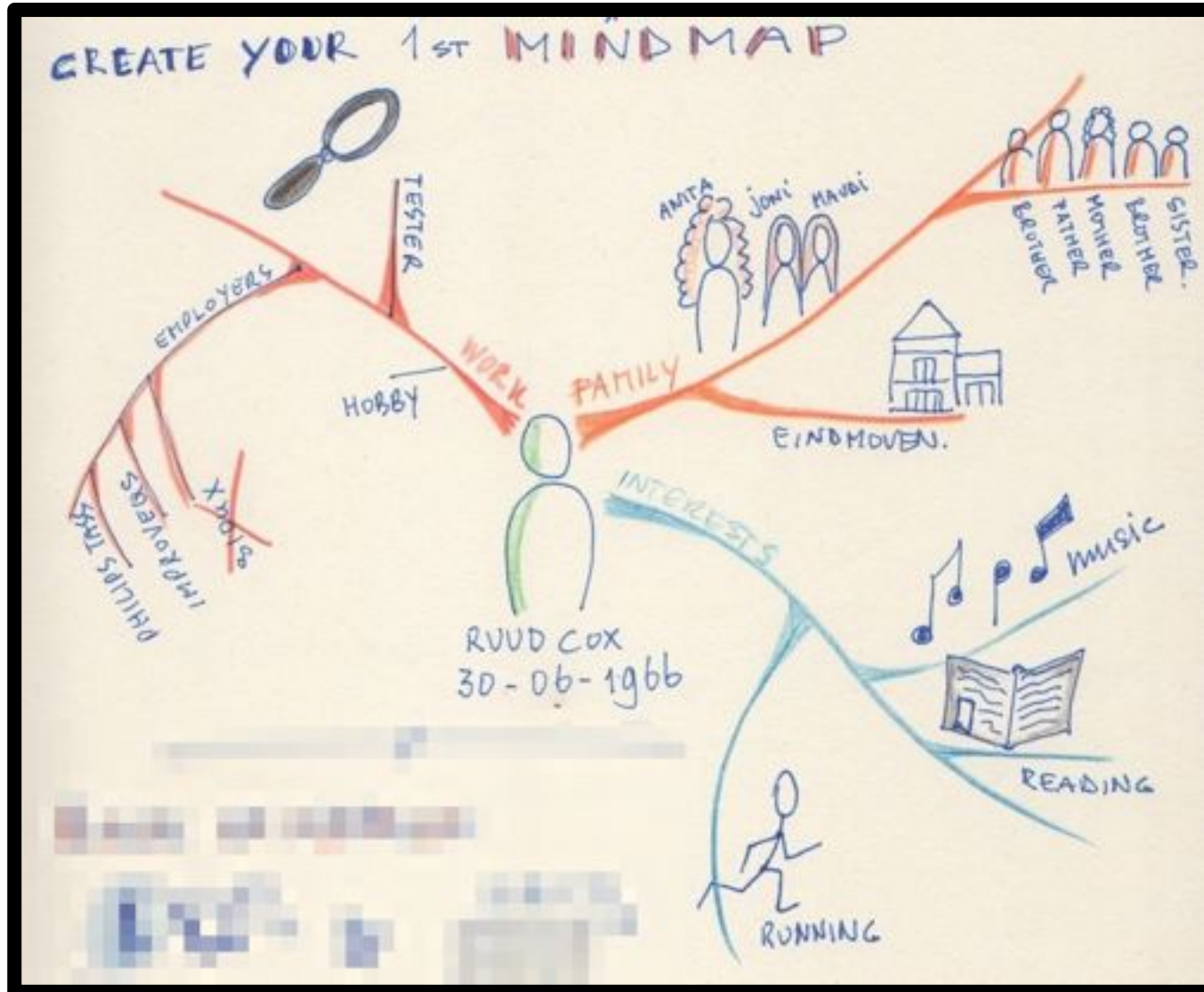
Mind Map Exercise Debrief



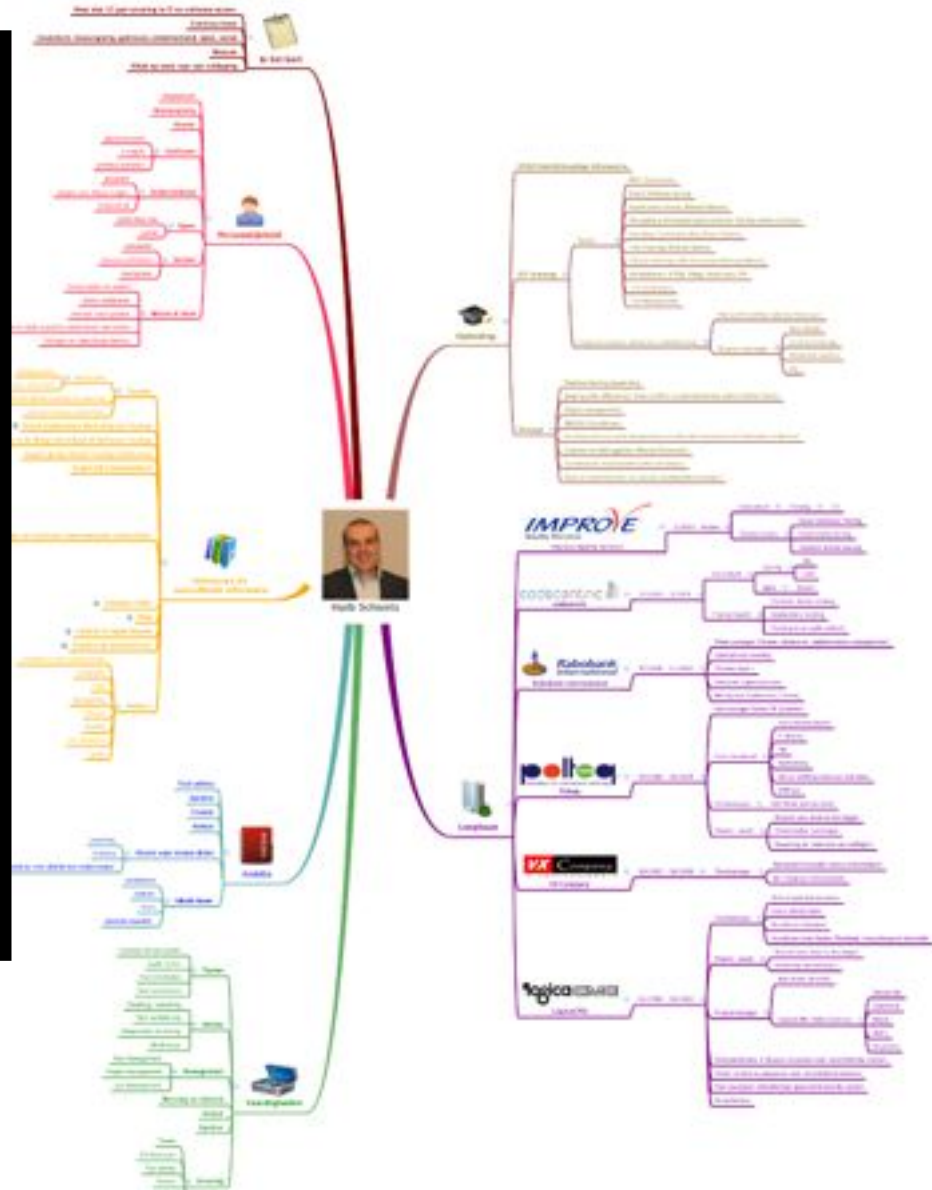
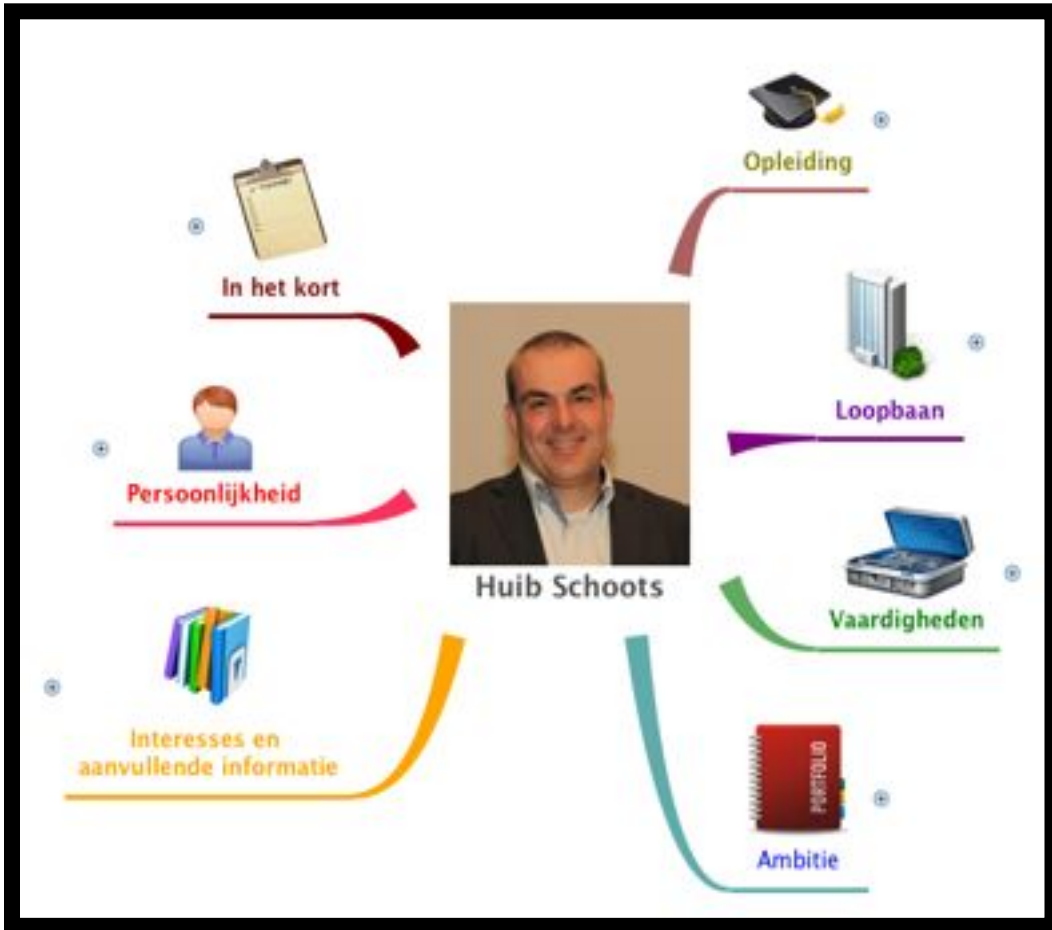
So? How did that go?



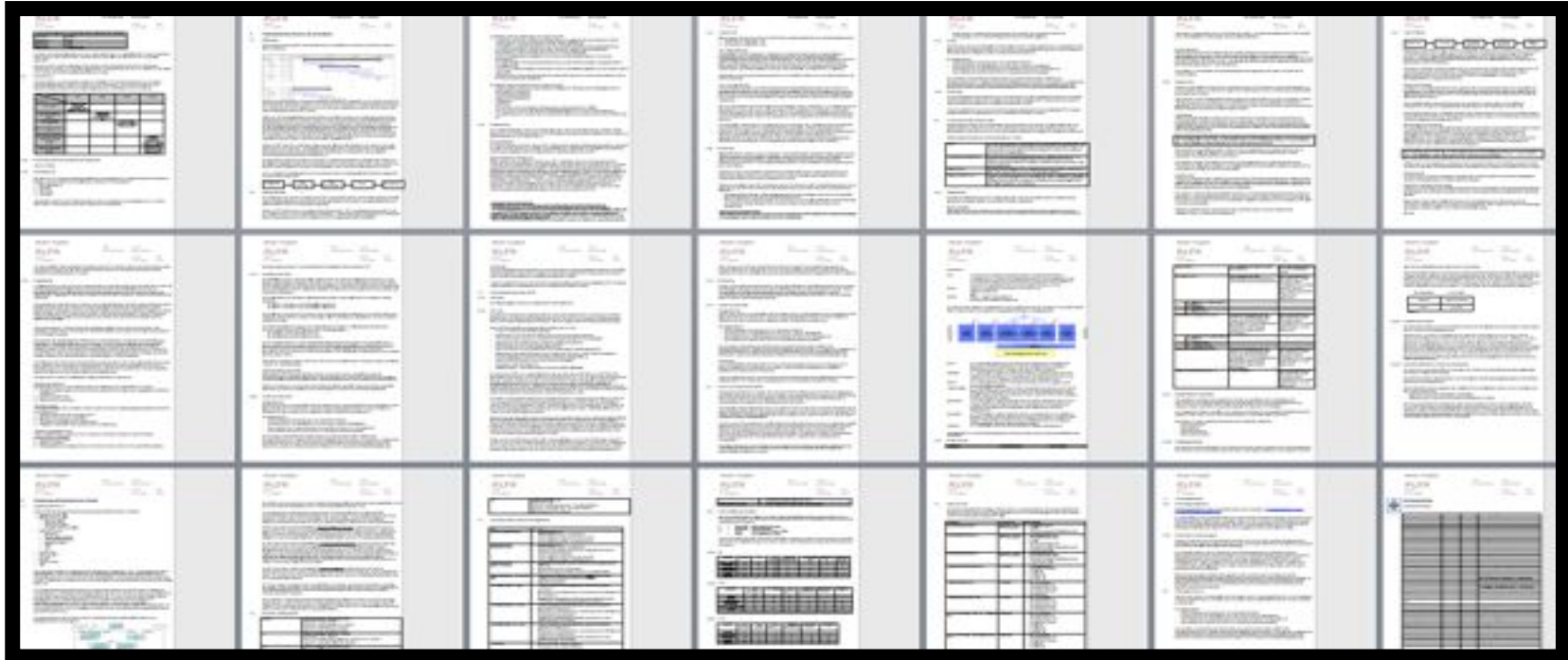
Ruud Cox



Huib's Resume

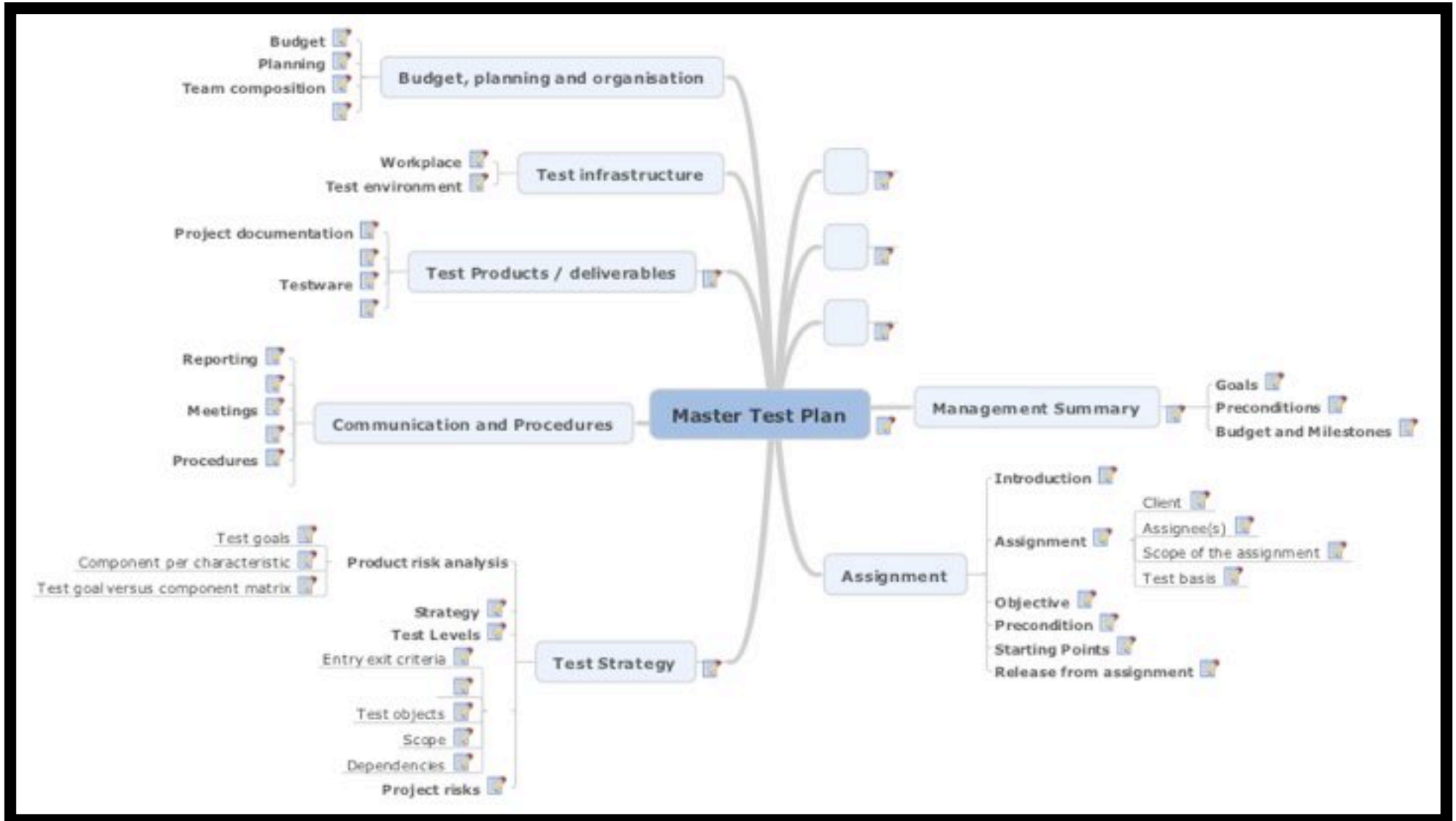


Test Plan (Text)



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

Test Plan (Mind Map, Imported Doc)



Test Plan (Mind Map)



Test Ideas, Test Cases

The screenshot shows a mind map software interface with two windows: 'Ciboode.usmind' and '*Ciboode2.usmind'. The mind map is centered on 'Customer -> Chat Session' and branches into various categories like 'Interactions', 'Web Links (Admin)', 'Chat Services', 'Approval Files', 'Templates (Admin)', 'Teams (Admin)', 'Foot Chat Control Panel', and 'Outcomes'. A red box highlights a node under 'Outcomes' labeled 'Transfer'. A red arrow points from a text box to this node. The text box contains the text: 'Selected node on mind map' and 'Test conditions added as notes'. Below the mind map, there is a notes pane with the following content:

Core Ciboode UI | Web Chat

Notes

Accessibility:

Read only outcome codes: When one of these is added how does a JAWS user know that they are read only? Does the description text or some link text explain this? Do we rely upon a validation message.
-Like wise how do they know they are auto added?

Usability:

Read only outcomes codes: How easy is it to extend these to another channel? (E.g. telephony)

Functional

Verb History: Sensible verb history should be recorded all possible paths in a web chat transaction.

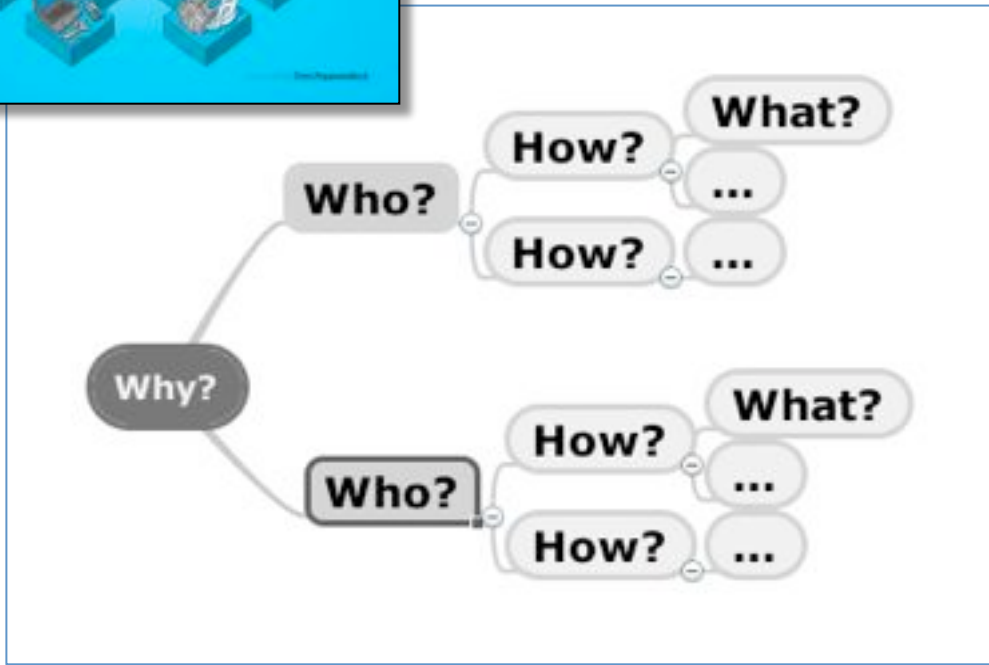
Chat Sessions: Agent can return to the chat session by clicking exit on the **PPAPUP** form.
-Chat session will be in it's previous state
-Verb history should be recorded for time spent in **PPAPUP**

Read only outcome codes: Let the chat session time out and **PPAPUP**. a read only outcomes code will be added into the "Selected Outcome" **datatable** saying "Session Timed out", confirm you can't remove this outcome code from the **datatable**.
-Confirm you can still add items from the Available Outcomes option menu
-Confirm you can removed items added via the Available Outcomes option menu
-Confirm you can **PPAPUP** with a read only outcome code added.

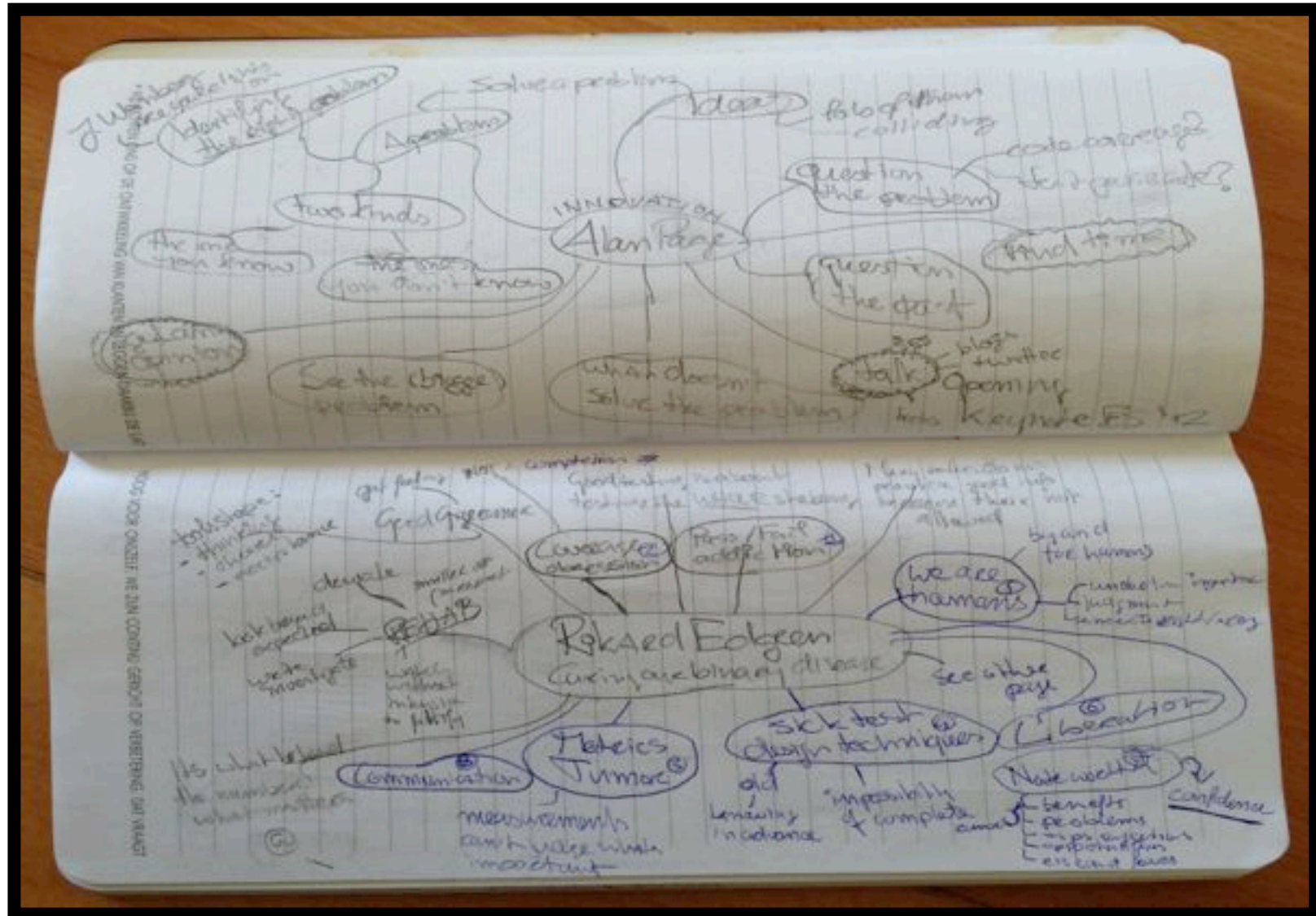
Rules

Read only outcome codes: These will be added if the chat session is terminated **manually**, **timed out** or **transferred**.

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.

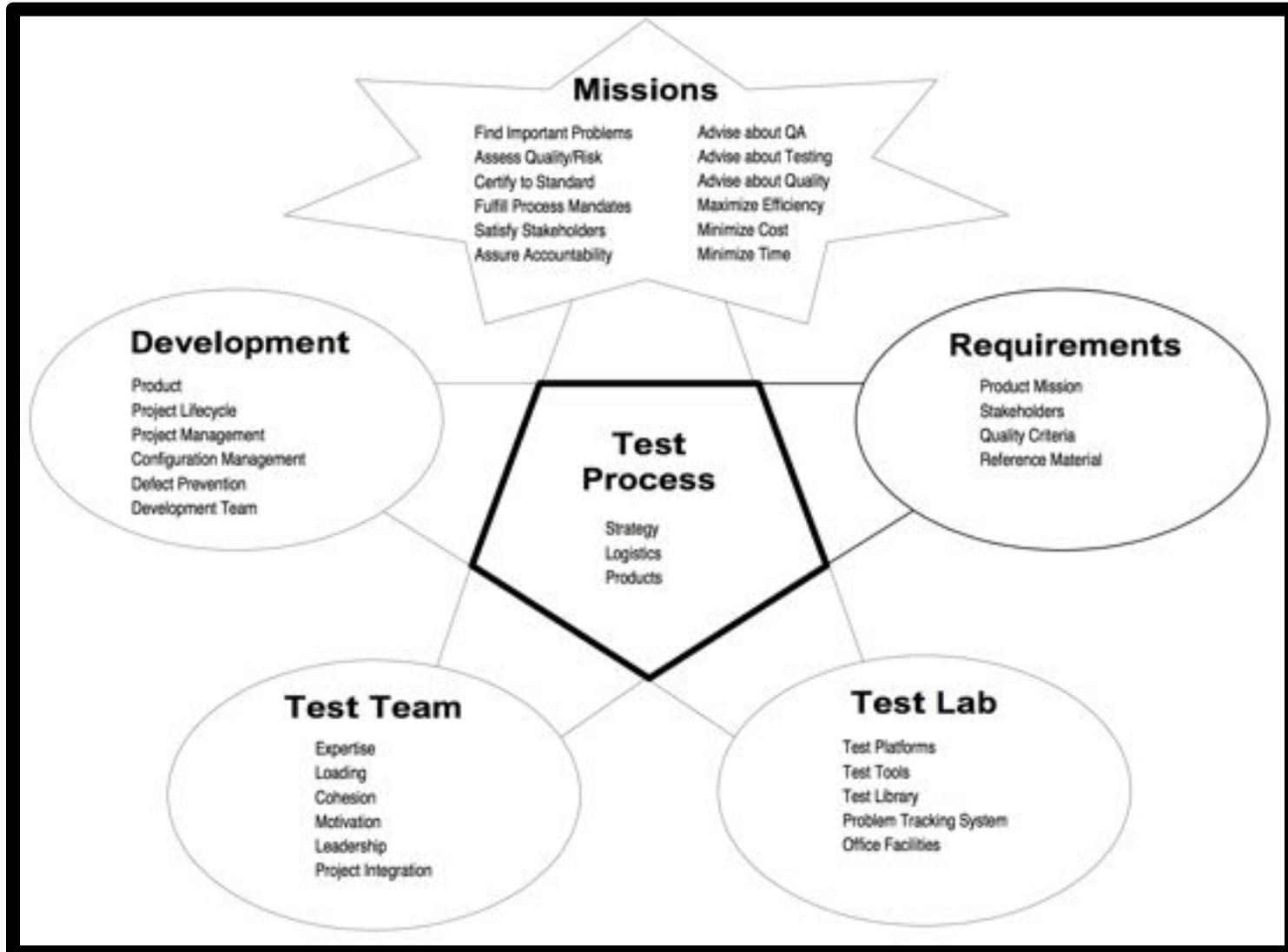
-- James Bach, [Context-Driven Methodology](#), *Satisfice.com/blog* 2006

What is Context-Driven Testing?

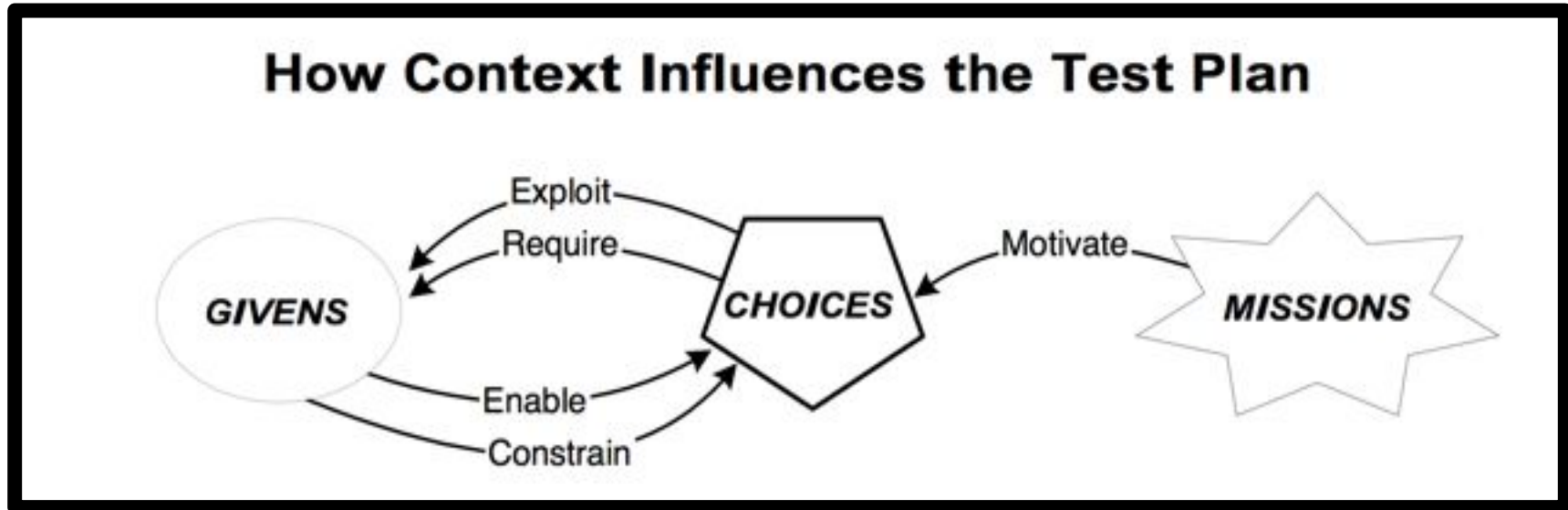
*“People evaluating a product by learning about it through experimentation in a manner organized and motivated by a systematic consideration of **all the factors that significantly influence the problems and solutions that lie within the scope of their mission.**”*

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

A Model



So?



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



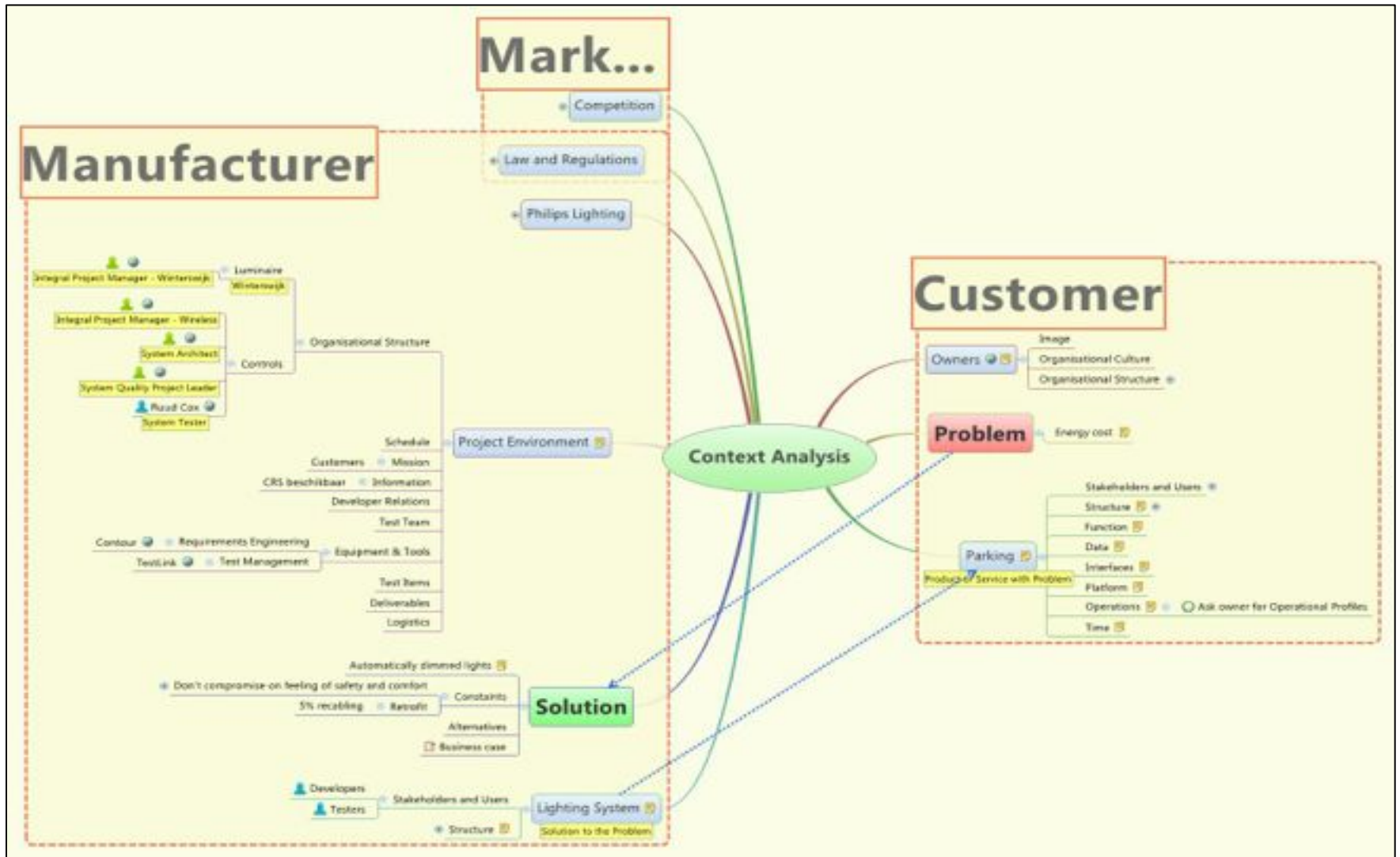
1. Make groups of 5 people
2. Name context factors that matter and influence your testing in your current project
3. Discuss how these factors can be made visual
4. Visualize the context in the “DNA Analyzer” case not using a mind map

Context Exercise Debrief



So? How did that go?





Context analysis: 1st iteration

Rogier Reboij
 Functie Overneming
 PIR - leden. Byenhoof.
 EEC 604.

Peter Fitzki ARCH.
 Eigen team

Core team Wo 11-12-

Competition -
 regulation -

market segment.

Author (Qpart)

uncertainty
 system payback time ≤ 2 yrs.

Richard van Plas

org culture.

Business



Business

org culture

org structure

why? -

reduce energy costs.
 (lighting 70% van)
 energy costs.
 without compromising on safety
 vs safe feelings customers.

Problem



did not react on any move.

16 -> 120 #nodes / Bus.

Uncertainty -
 change in network -
 coverage
 secured net.

Solution



Green Parking System

LED driver controller

humans

logic / grid / Ema

predefined sensor area

claim: green building

VED. in inhibition, command, or duty

given to a person or group of people

Under fan

- Temperature -
 T_a
 -30 to $+40^\circ C$

get over temperature
 ? raised needs

intruder, sabotage, vandalism

ghost

neighbor

installer

working operation

in the business van etc

temporarily storage want of long sleep

electron

installer

car (electric)

van

installeer

installeer

bitlyde

person

bird

mouse

bee

attributes

size

texture

movement-speed

pattern

Philipp Professional
 Lighting Solutions

outdoor
 indoor

normal? Stress
 drink handle
 power
 game

idle (green van)

Commissioning
 cost

technical installer

org structure

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

idle (green van)

Commissioning

cost

technical installer

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

idle (green van)

Commissioning

cost

technical installer

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

idle (green van)

Commissioning

cost

technical installer

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

idle (green van)

Commissioning

cost

technical installer

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

idle (green van)

Commissioning

cost

technical installer

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

idle (green van)

Commissioning

cost

technical installer

Philipp Professional

Lighting Solutions

outdoor

indoor

normal? Stress

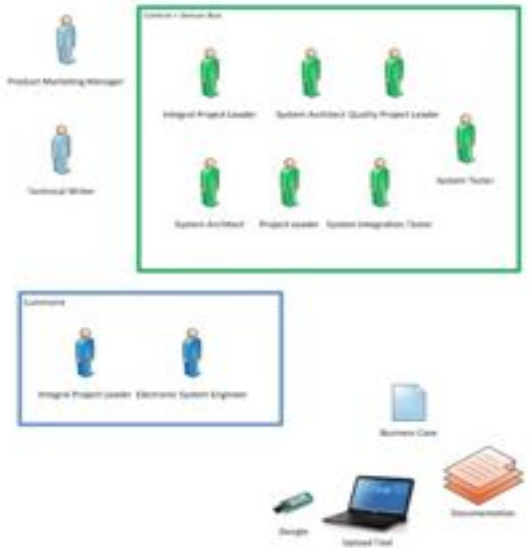
idle (green van)

Commissioning

cost

technical installer

Research & Development



Market



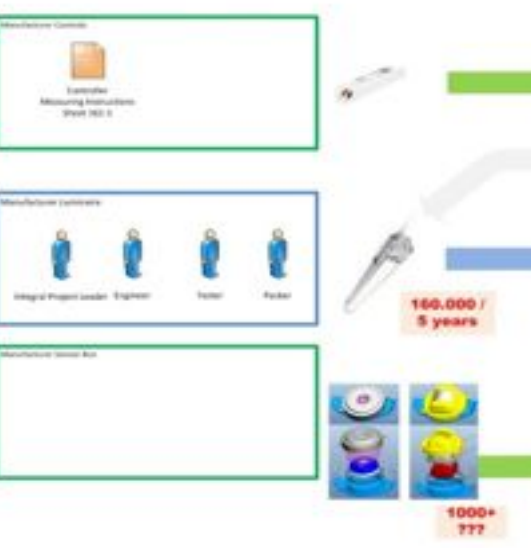
Marketing & Sales



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.

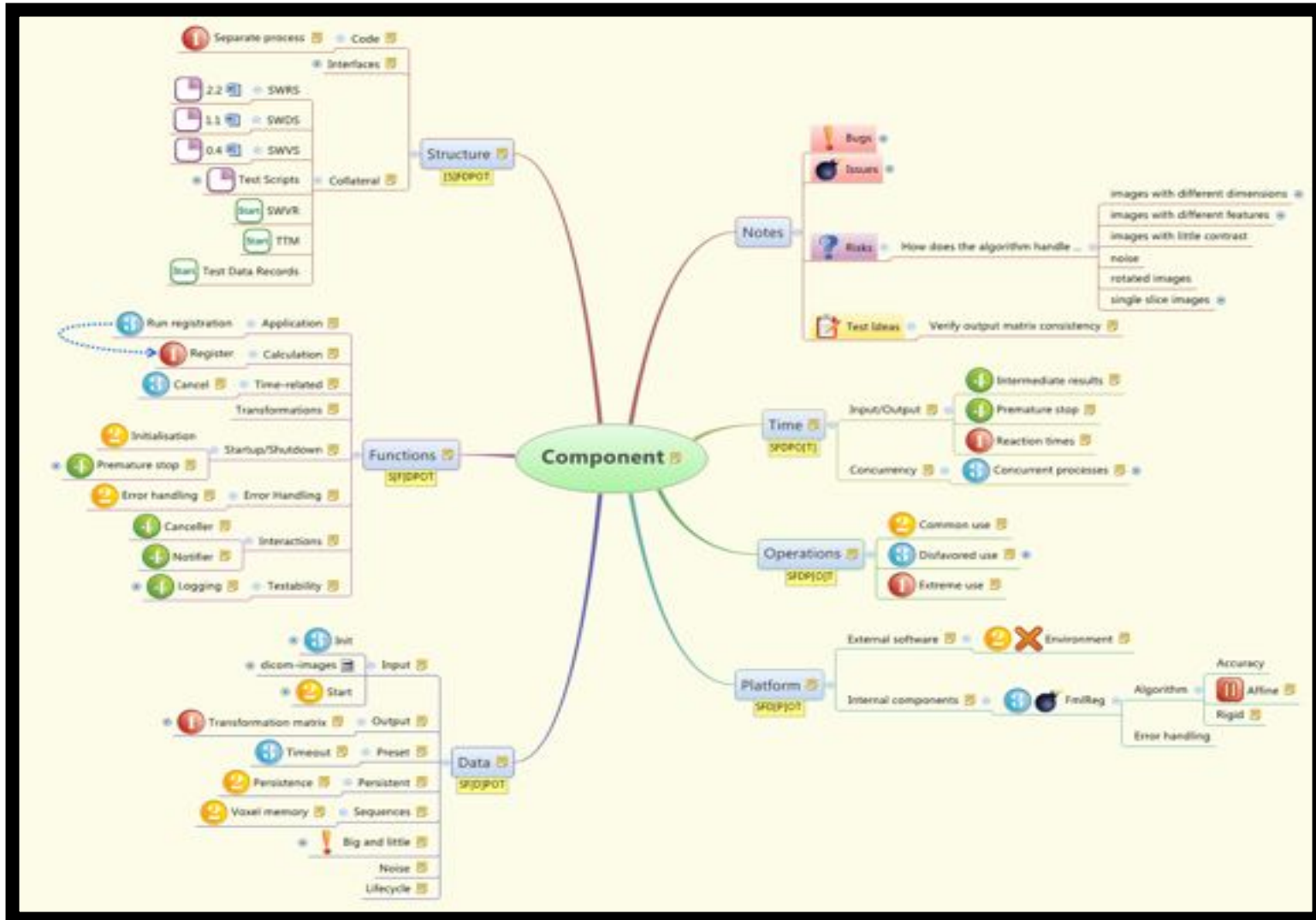
Coverage Exercise Debrief



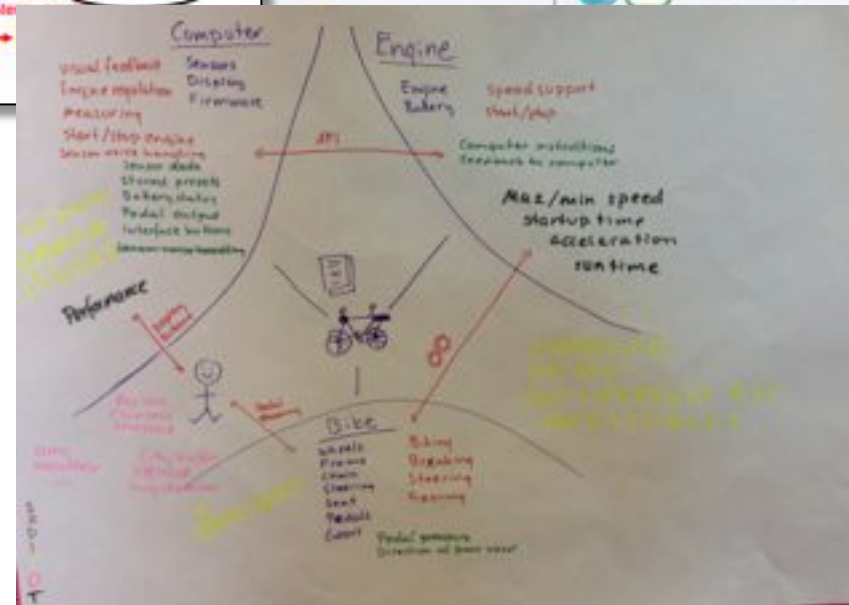
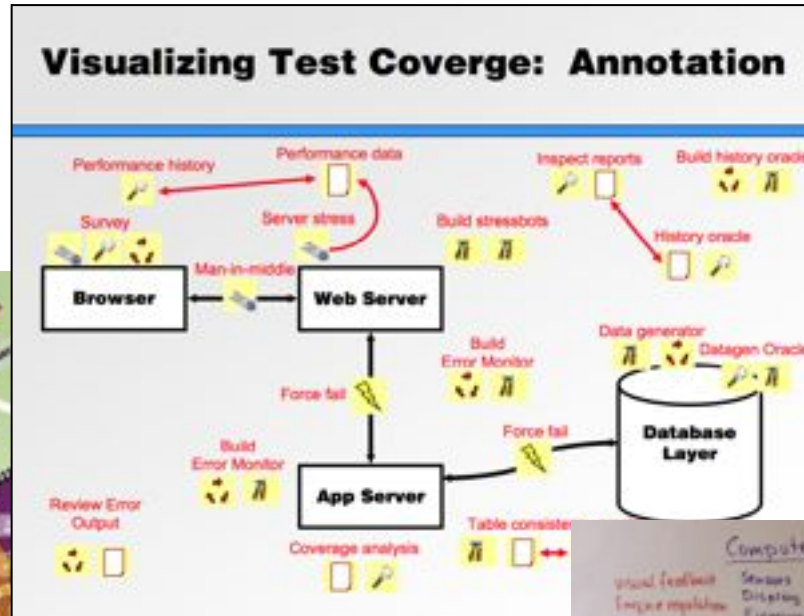
So? How did that go?



Test Coverage Outline



Visual coverage is like a map

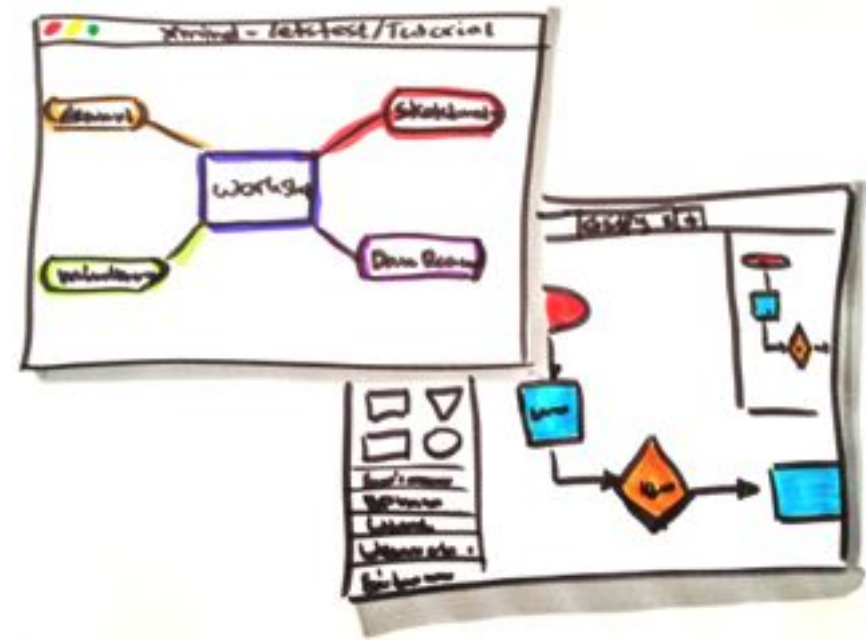




Wrap-up

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
- **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
- **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

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
- 📄 **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.aclairfication.com/2012/08/big-visible-testing/>



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Huib Schoots

 *hsc@improveqs.nl*

 *huibschoots*

Ruud Cox

 *rco@improveqs.nl*

 *ruudcox*