2. Methodology, Methods and Techniques

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Challenge-driven Education (CDE)

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- A framework for learning while solving real-world Challenges. The framework is collaborative and hands-on, asking participants (students and stakeholders) to discover and solve Challenges, gain in-depth subject area knowledge, develop skills, and share their thoughts with the world.

- Challenges are defined in collaboration with society (private sector, public authorities, civil society), and then further refined and turned into actionable problem statements. From the problem statements, one or more solutions are developed, tested and implemented.

Why do we need challenge-driven education?

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This is what we are trained for (mostly):

But…

How do we know we are solving the right problem?
How do we know that the solution is viable, and not just a correct solution to the stated problem?

If it is the wrong problem, then our solution is irrelevant!
There can many correct solutions to the stated problem – not all of them are viable and desired!
If the solution is not viable, then it will probably never have any impact!

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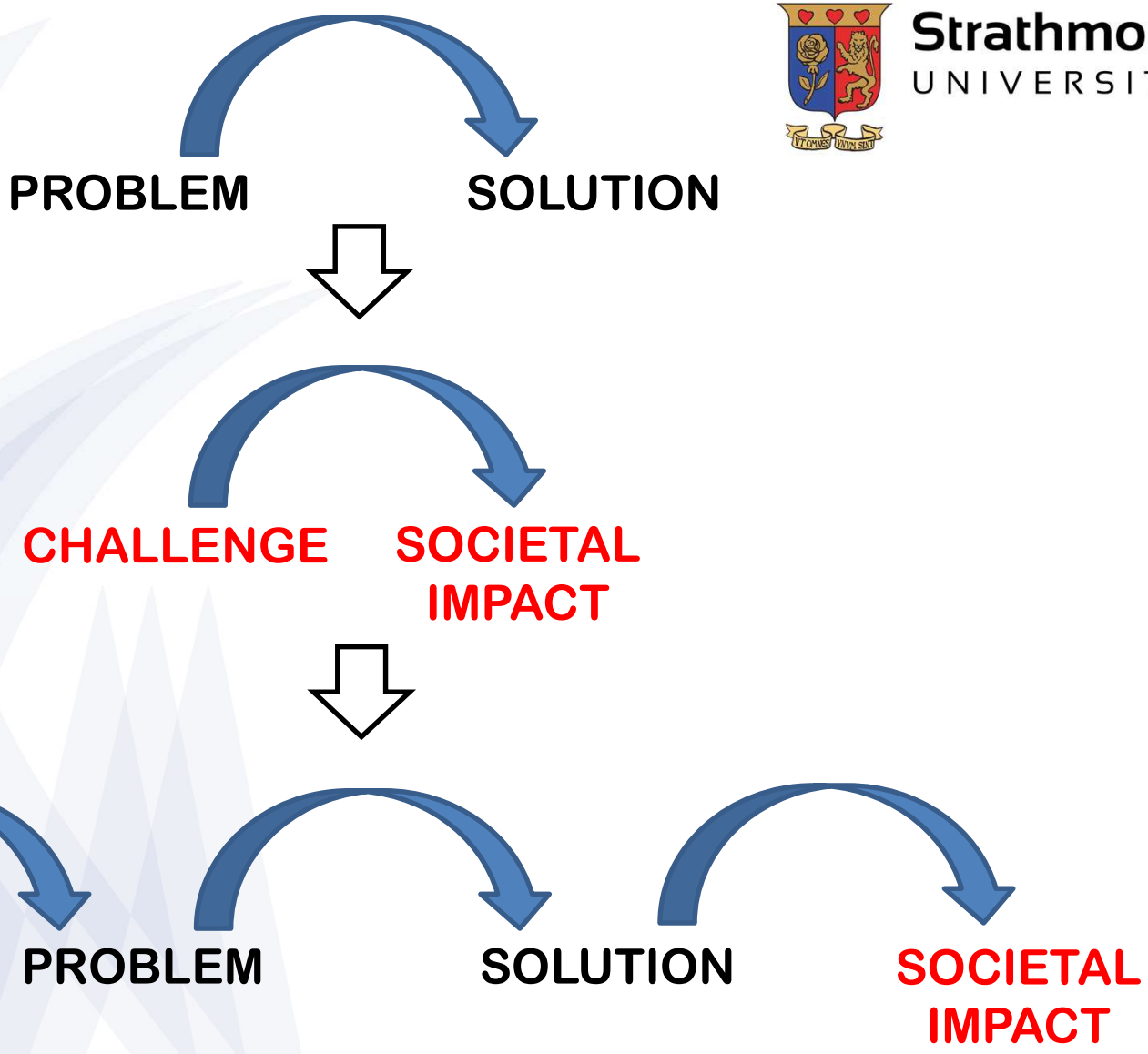
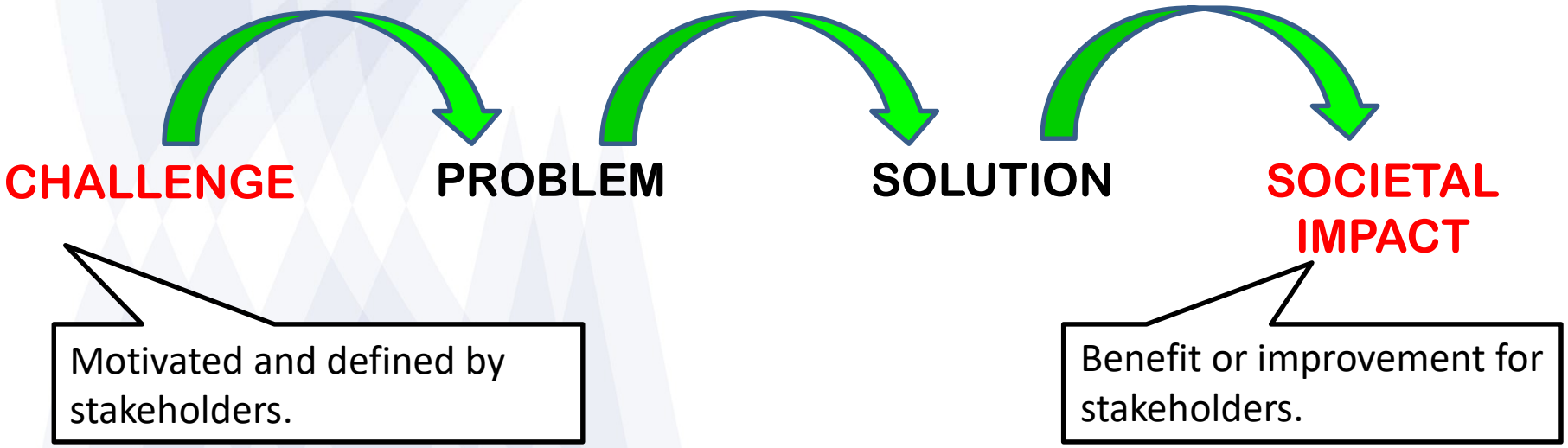


- What is a challenge as opposed to a problem?
- How do we go from a challenge to a problem?
- How can we develop a solution to a challenge?
- How can we develop a solution that can have societal impact?
- How can we achieve societal impact with our solution?



The Global Goals: For Sustainable Development

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Challenge vs. Problem

- A challenge is a problem that cannot be solved by a single actor.
- A challenge focuses a desired *change* rather than a solution.
- A challenge relates to a *beneficiary*, i.e., someone for which the change represents a benefit or an advantage.

Challenge vs. Problem

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Challenge Definition

- *CHANGE*: Describes a desired change, rather than a solution.
- *BENEFICIARY*: Always express for whom the change is needed and why.
- *OPEN*: Does not prescribe the nature of the solution.
- *COLLABORATIVE*: Focus on stakeholders and collaboration.
- *IMPACT*: The objective is to achieve the desired change through a solution.

Problem statement

- *SOLUTION*: Describes a desired solution to a problem.
- *OWNERSHIP*: Who owns (is responsible for) the problem and the solution?
- *CLOSED*: Prescribes the solution to some extent.
- *INTROVERT*: Our capacity to come up with a solution is the focus.
- *DELIVERY*: The objective is expressed in terms of delivering a solution.

Challenge vs. Problem

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Scenario:
A school needs a study room where the students can read. The designated room is too dark.

”This room needs more lighting.”

Solution: install electrical light.

”This room needs more light.”

Solution: install electrical light.
Solution: open up larger or more windows.

Problem statements

The students need a room to read in. They can’t read in this room.

Solution: Use another room.

Challenge Definition!

Examples:

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Challenge Themes

1. Efficient use of resources – water, energy, ~~staff, rooms~~ etc.

Problem: Inefficient use of resources

Cause	Consequence	Draft Challenge
1. Less caring/aware Mindset 2. Lack of innovative incentives.	1. Dry taps 2. Water rationing 3. Blackouts 4. Power rationing.	How might we create awareness in efficient use of resources?

2. Sustainable Transportation Service to/from/within the University.

Problem (Mainly on social sustainability): Unreliable, expensive, unsecure and inefficient movement of people to and from the university

Cause	Consequence	Draft Challenge
1. Less social Mindset 2. Lack of innovative incentives. 3. Unpredictable traffic 4. Unsecure surrounding	1. Lateness 2. Social stress due to insecurity in transport 3. High cost of transport 4. Long Queues and traffic jams.	How might we make movements of people to and from the university in a more reliable, economic, safe and efficient way?

Real work Scenario: GDH

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Innovation Capacity

IMPACT

Learning Process

Your Project

Stakeholder engagement/ Challenge definition

Challenge refinement

Problem statement

Solution(s)

Innovation

IMPACT

Innovation Process

Design Thinking

- A methodology for designing solutions that are relevant, viable and feasible.

- "Traditional problem-solving often takes a methodical, almost scientific form. Pinpoint a problem, define the steps to take and tools to use to reach a solution, then stick to the plan and hope for the desired result.

  It is straightforward, but not always flexible, innovative or effective. What if the issue identified isn't the real source of the problem? What if the steps don't lead to the *right* solution?"

- "Instead of starting with a problem, design thinking starts with observation. It's informed by an understanding of the culture and the context of a problem (what people need), rather than the problem."

  - *Janie Kliever*

The Goals of Design

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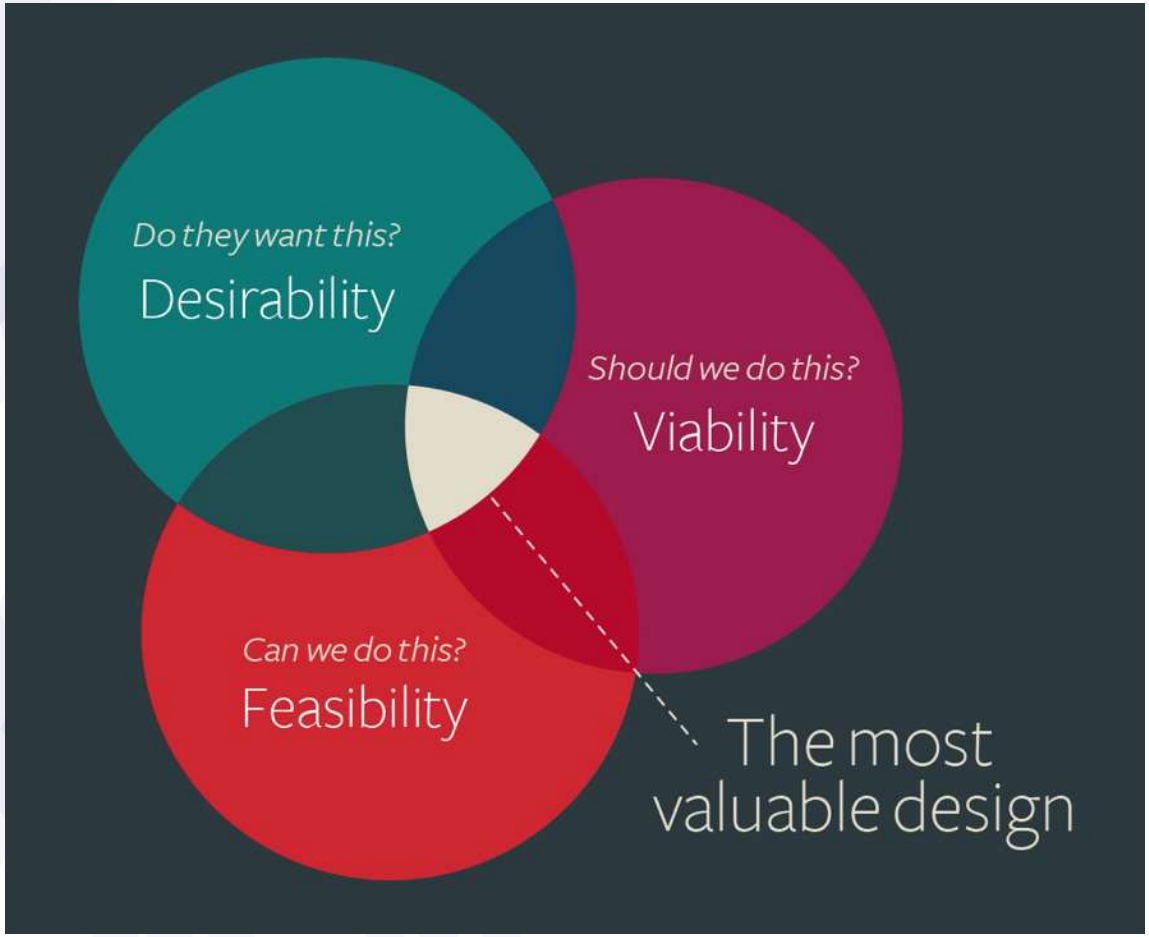

Approaches to Finding Solutions

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Analysis –
Reducing (solving) a problem in order to understand what the right solution should look like.

Synthesis –
Combining existing components in search of the right solution.

Design Thinking –
Combine analysis and synthesis in a structured methodology that yields desirable, feasible and viable solutions.

Core Elements of Design Thinking

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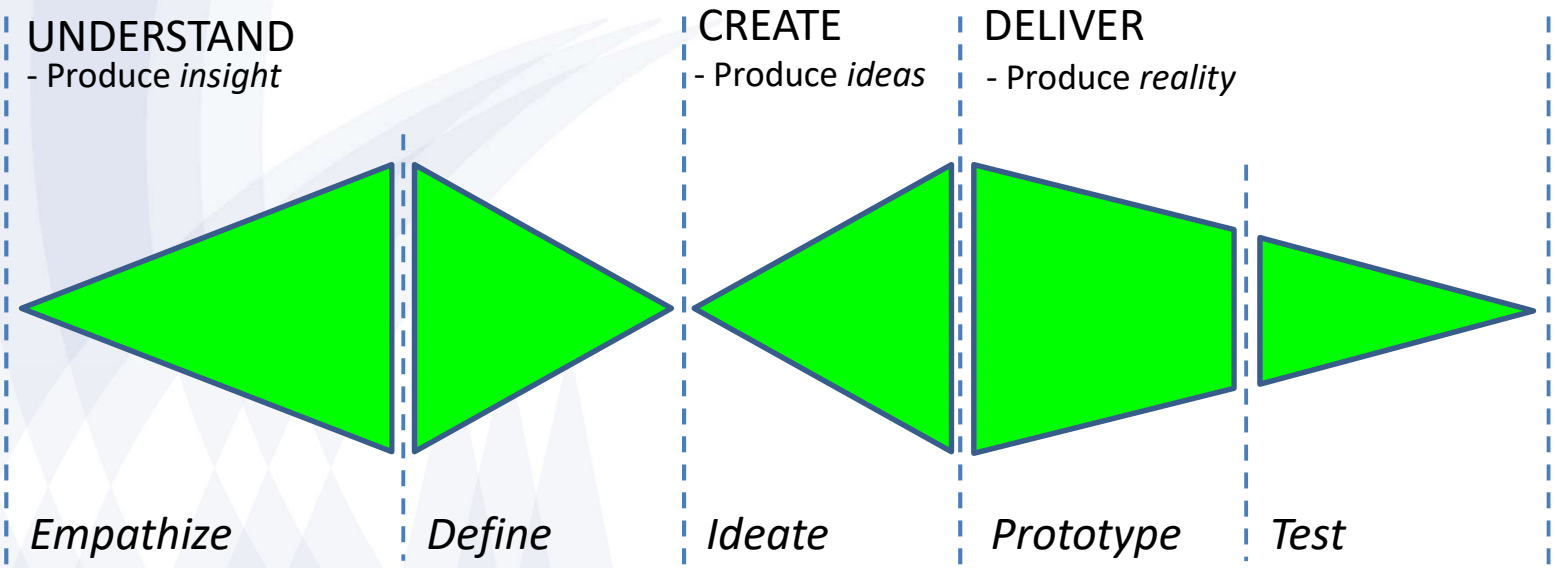
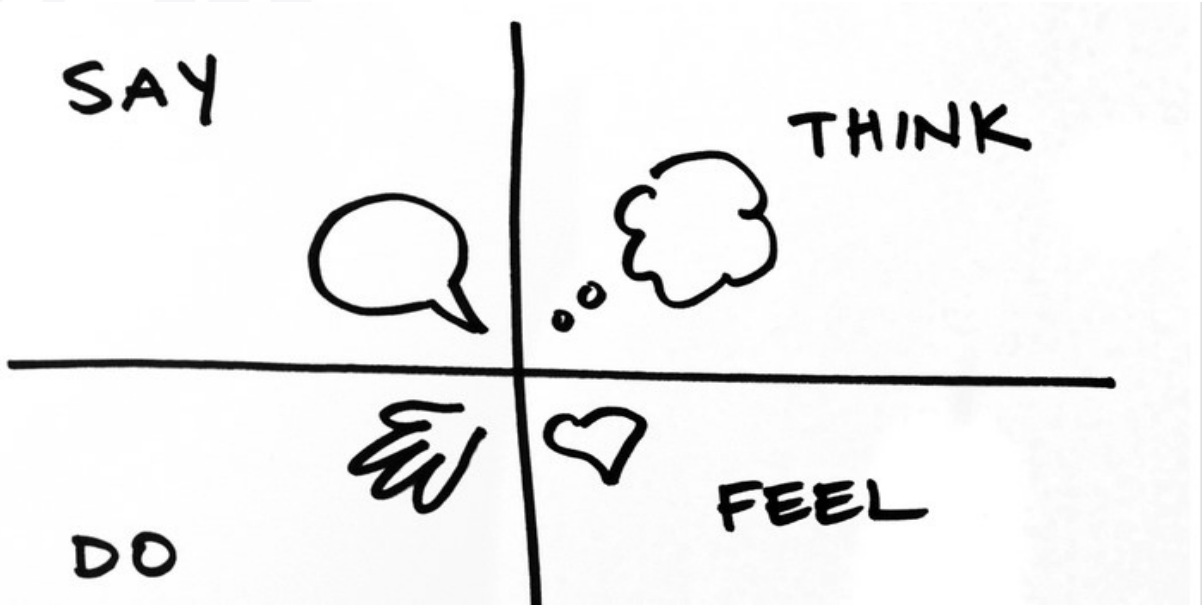


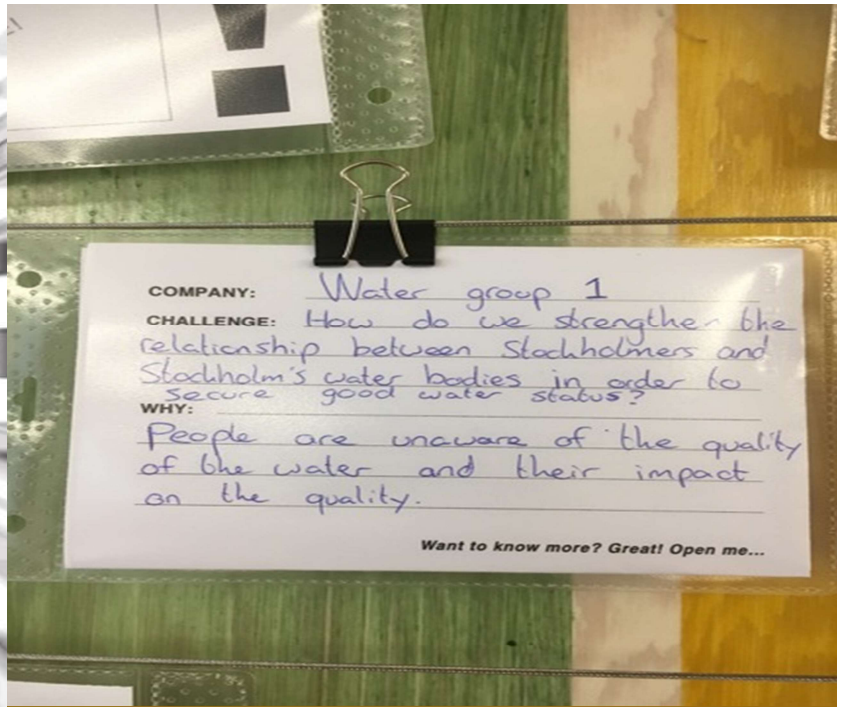
Empathize

- Learning about the users/stakeholders that you are designing for.
- Understand the challenge from their point of view.
- Understand how different users/stakeholders relate to each other.



Define

- Formulate a problem statement based on your insights from the empathize stage.
- Define a problem for which a solution would be desirable for the users/stakeholders.



Ideate

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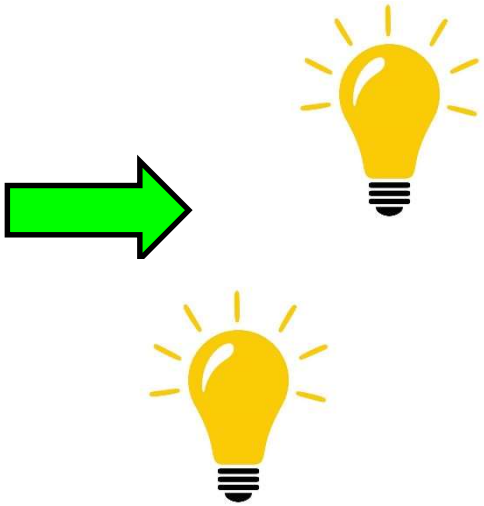
- Generate possible solutions to the stated problem.
- Pick the “best” solutions (2-3 at most). Make the choice based on feasibility and viability, i.e. solutions we can and should do.

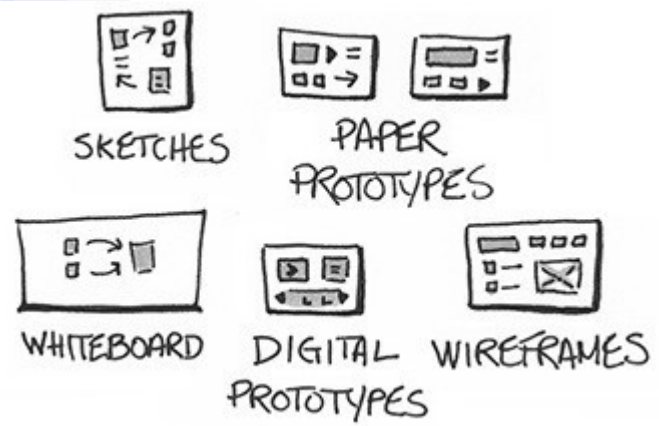


Ideate (Cont.)


teamwork
share
idea
vision
Like
Like!
project
Big Idea
Strategy!
plan
target
@ planing
team work
IDEA
@ Success!
growth
idea
team
think
work
talk @
OK!
network
mail
& plan

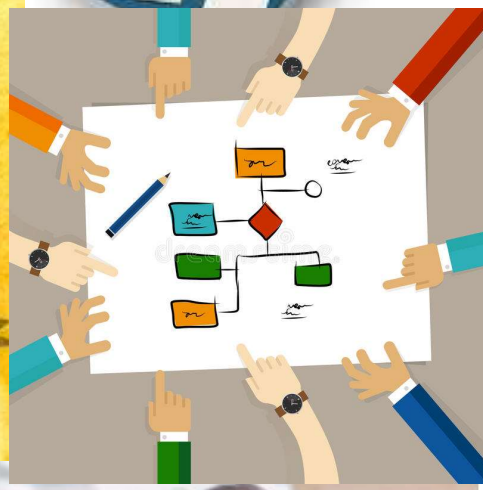
Prototype

- Build a representation of one or more of the chosen solutions.
- Use as simple means as possible:
  - Paper, glue, post-it notes.
  - Story telling – scenarios
  - …
- The purpose of prototyping is to be able to communicate with stakeholders more than to test technical feasibility!




Profile
Notifications

review
prototype
refine



More Examples of Prototypes

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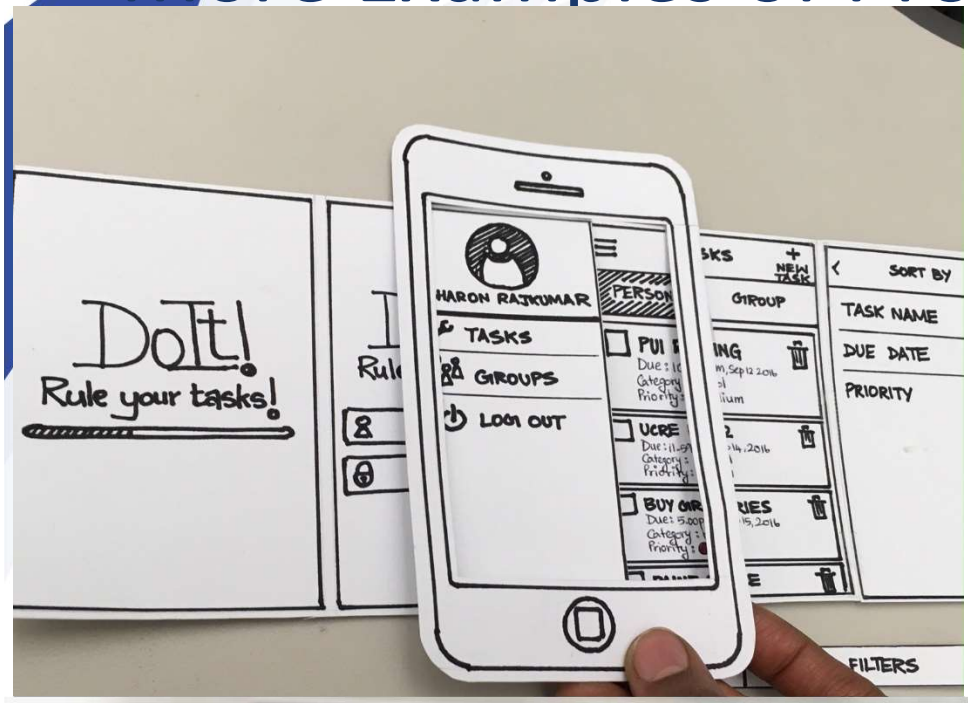
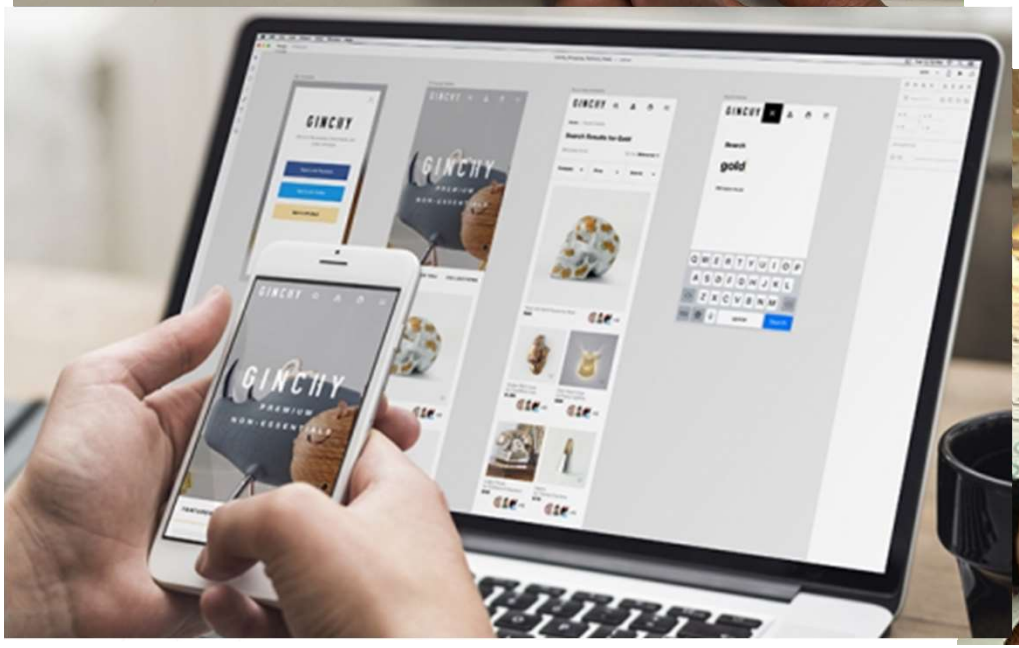
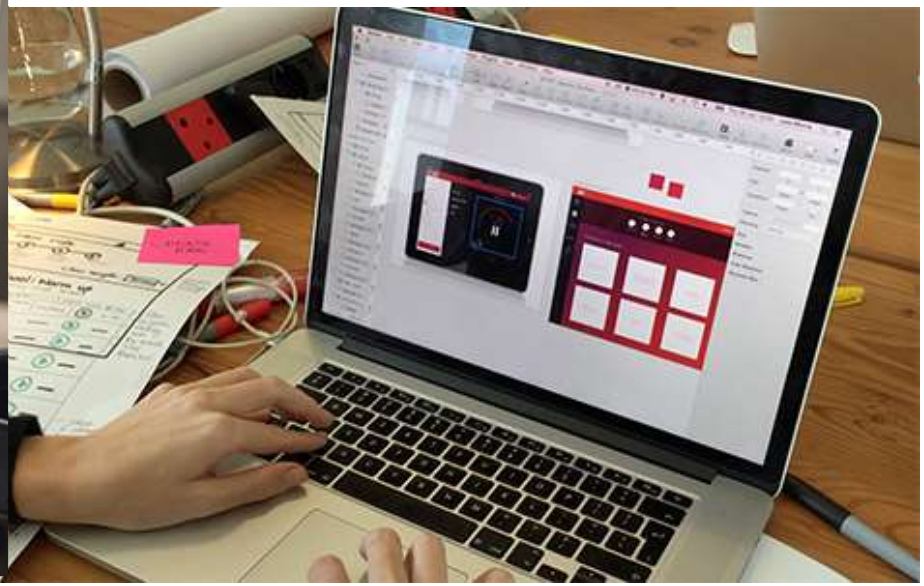
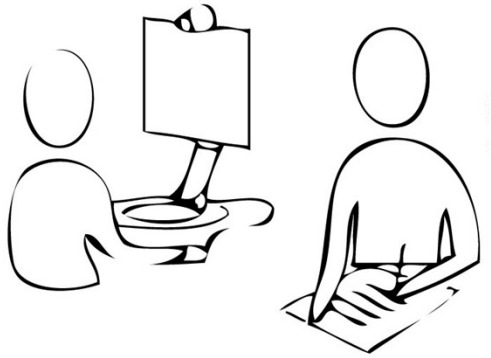


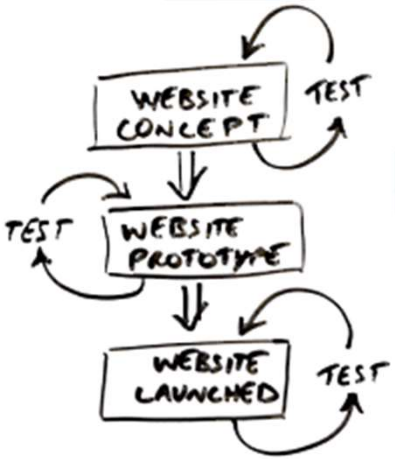


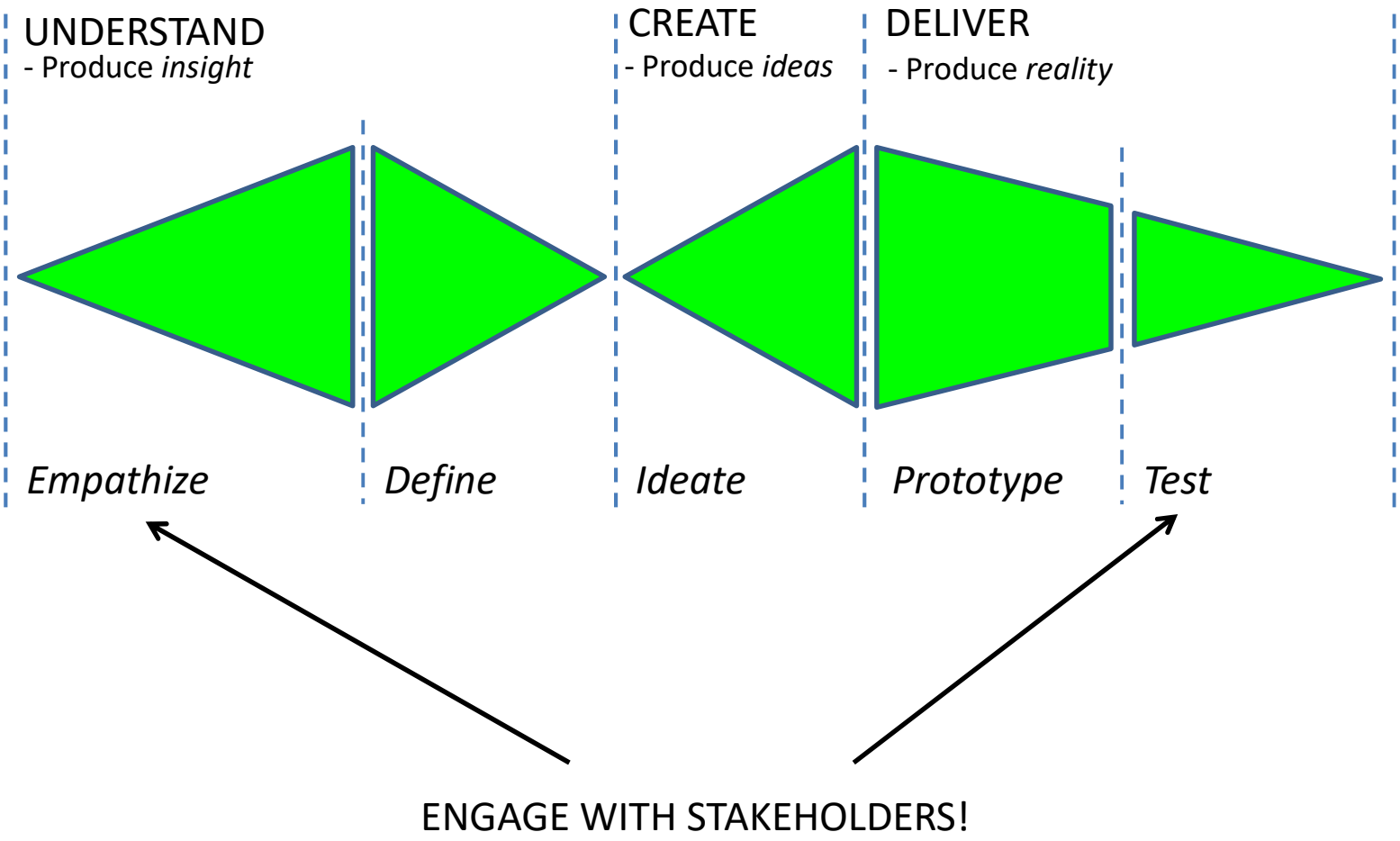


Test

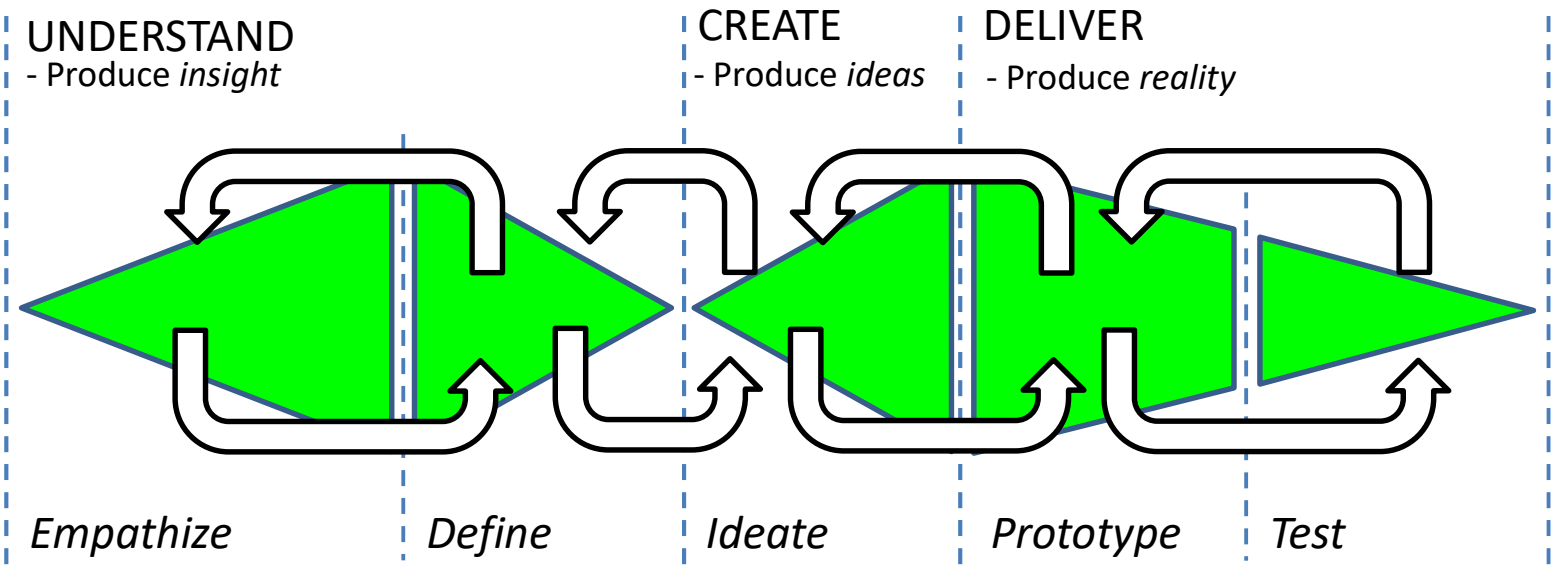


- Return to your stakeholders and use the prototypes to test yo




UNDERSTAND
- Produce *insight*
CREATE
- Produce *ideas*
DELIVER
- Produce *reality*
Empathize
Define
Ideate
Prototype
Test
ENGAGE WITH STAKEHOLDERS!

ITERATE!


UNDERSTAND
- Produce *insight*
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Design Thinking benefits from:

- Multi-disciplinarity – We bring different knowledge.
- Multi-perspective – We have different backgrounds.

These things exist in the project teams and is also brought in through stakeholder engagement!

Key questions:

- What knowledge and backgrounds do you have in your project team?
- What knowledge and backgrounds can be contributed by stakeholders?

Design Thinking Exercise

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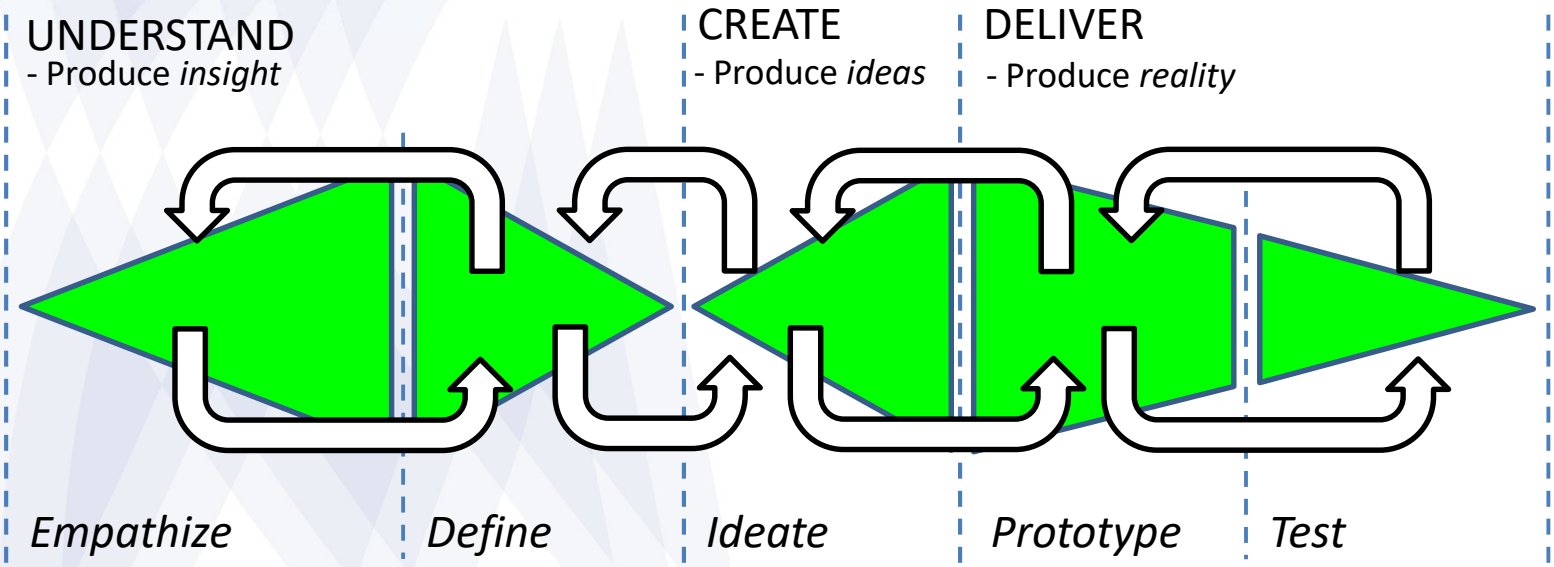
The Strathmore University students council elections are conducted in a less effective and efficient way.

We want to improve the effectiveness, efficiency and transparency of the Strathmore students council elections.



Design Thinking Exercise 1

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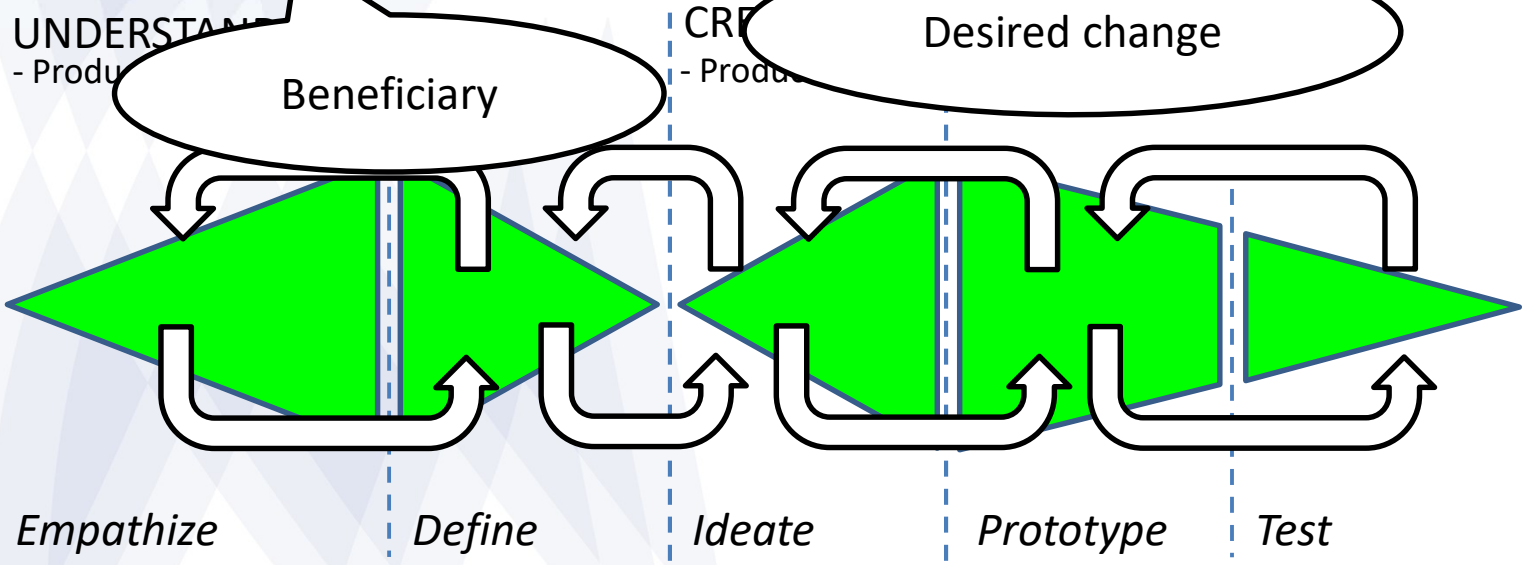
Observation

The Strathmore University students council elections are conducted in a less effective and efficient way.

We want to improve the effectiveness, efficiency and transparency of the Strathmore students council elections.

Beneficiary

Desired change



Design Thinking Exercise 2

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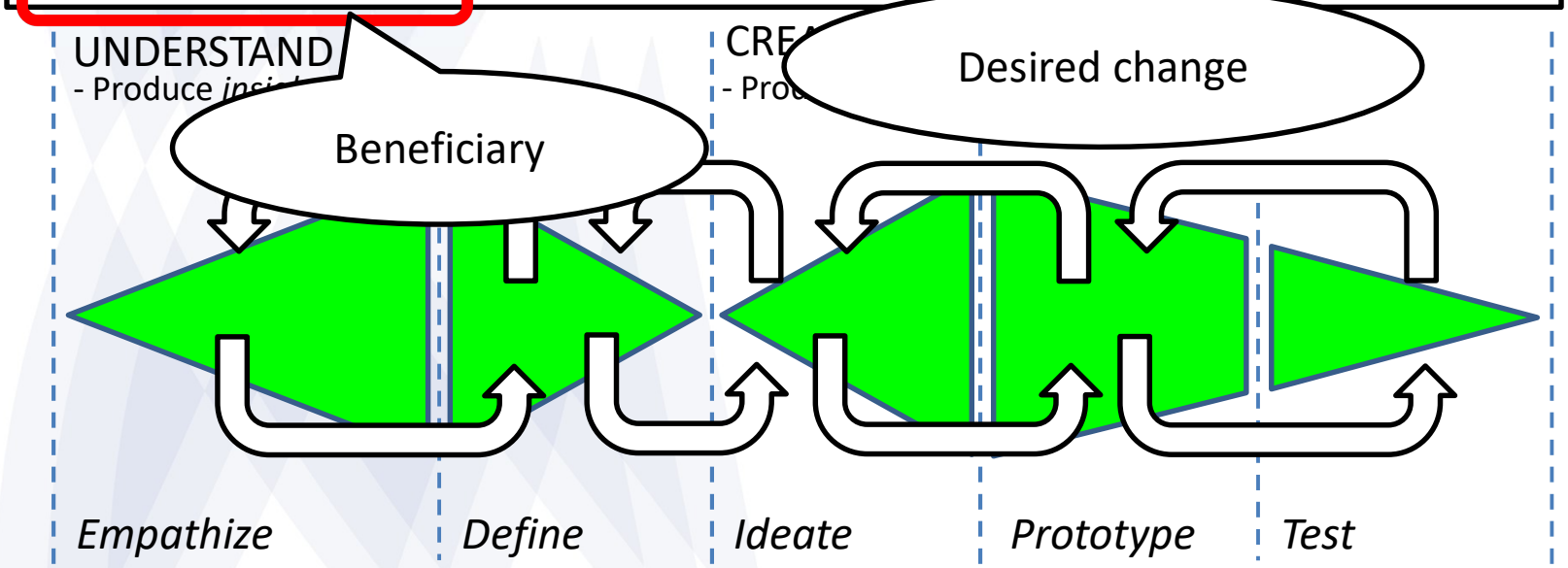
Observation

The Strathmore University time tabling for students is not well organized.

We want to improve the organization and overall preparation of the Strathmore students timetabling process.



Design Thinking Exercise 3

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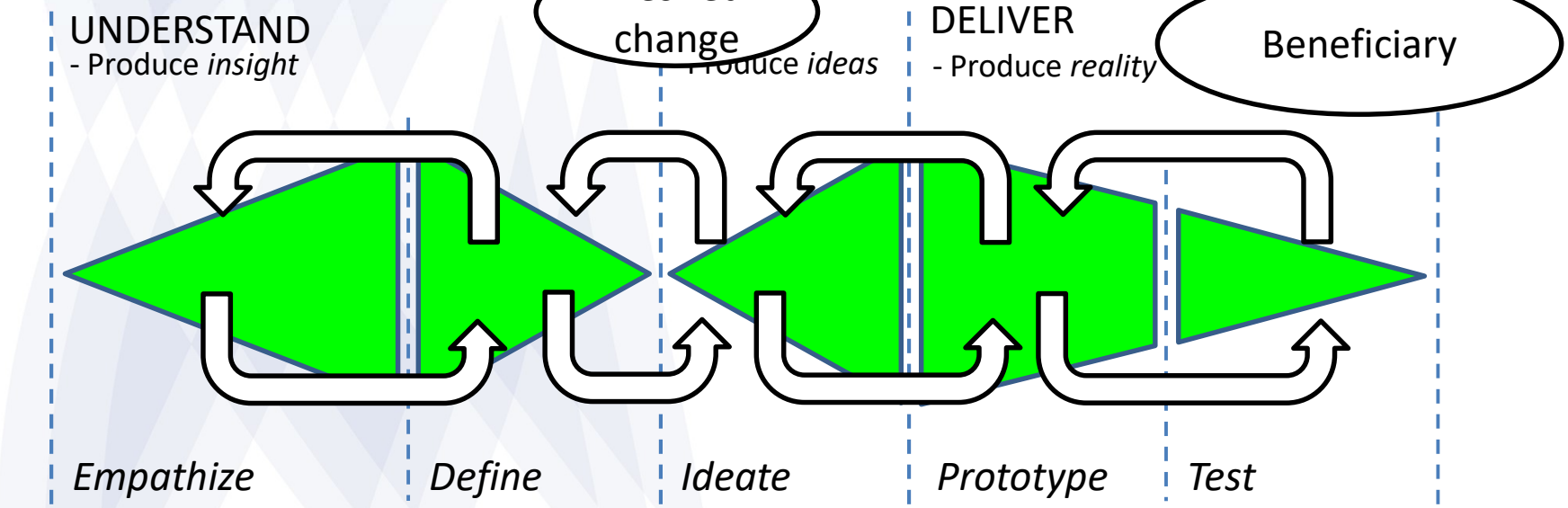
Observation

Movement of students into and within the university is quite challenging.

We want to improve the movement of students, staff and visitors into and within Strathmore university.

Desired change

Beneficiary



Design Thinking Exercise 4

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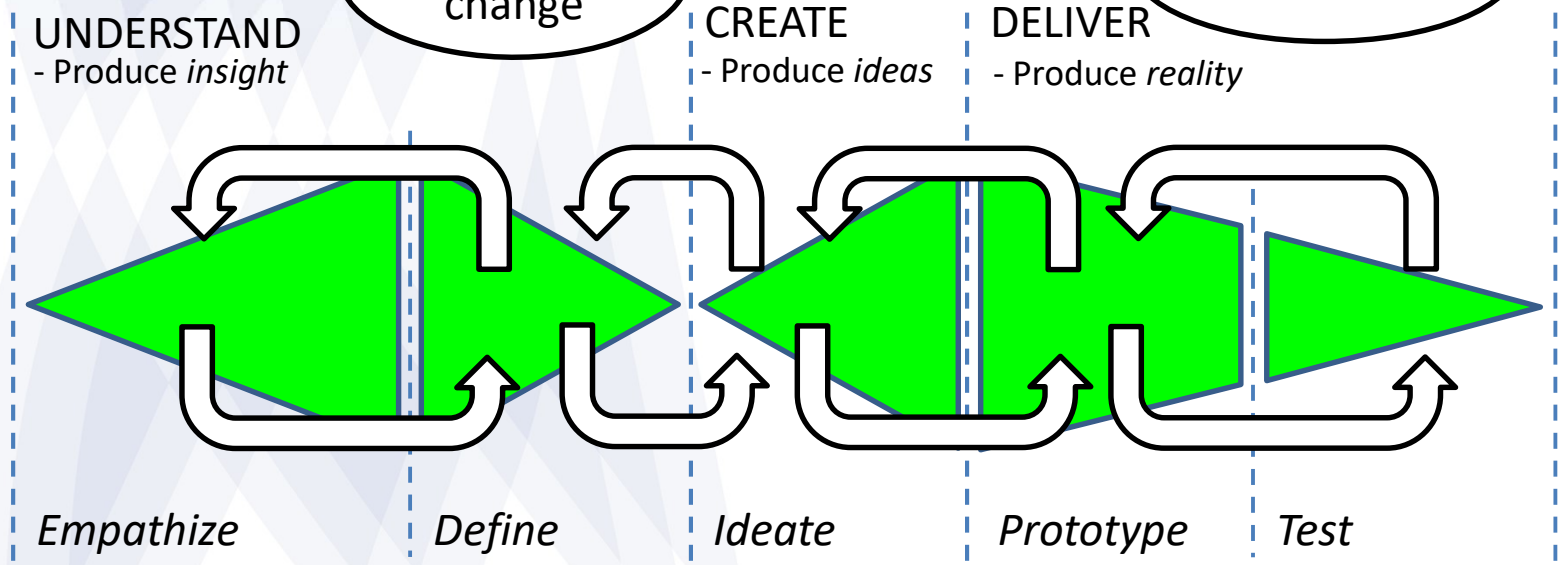
Observation

Having a meal at the cafeteria/snackbar can be quite challenging.

We want to improve the access to meals by students, staff and visitors at the Strathmore university. cafeteria/snackbar

Desired change

Beneficiary



1. Empathize

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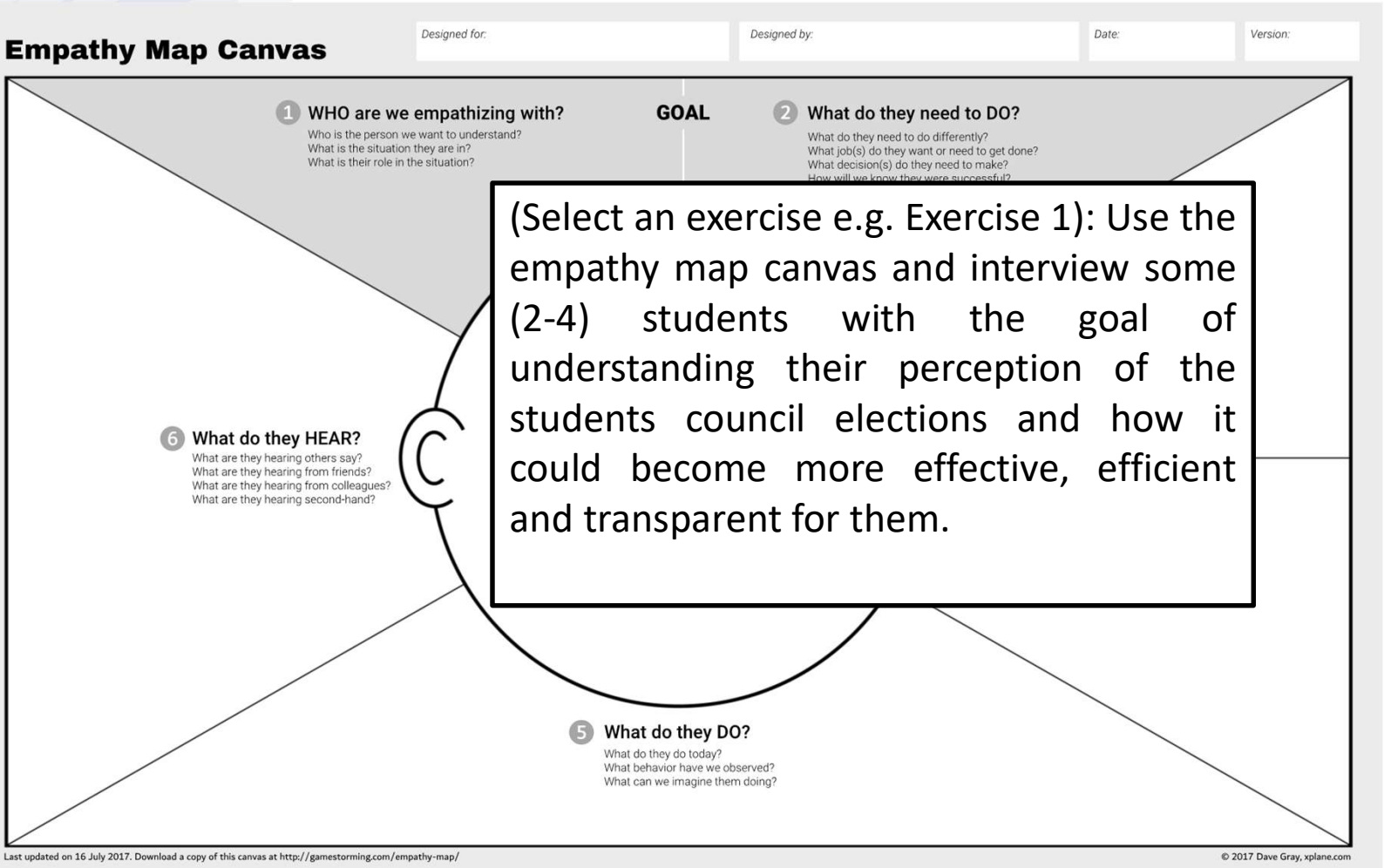

(Select an exercise e.g. Exercise 1): Use the empathy map canvas and interview some (2-4) students with the goal of understanding their perception of the students council elections and how it could become more effective, efficient and transparent for them.

2. Define

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Based on your findings in the empathize stage, define a problem statement that express why the students council elections are conducted in a less effective, efficient and transparent way.

- What is lacking in the conduct of the elections?
- Why don't students participate in the elections?
- What could make the elections more effective, efficient and transparent?

3. Ideate

- Starting from the problem statement, brain-storm possible solutions!

Next Stage(s)? Assignment

- In your Groups: Assign the following roles to Participants: Interviewee, Interviewee, Observer, Notes Taker.
- Task: How to Improve the Daily Routine of Person X
- Where Person X is the person being interviewed.
- Task can be done on a shared document or WhatsApp as long as you send me the writeup.

Format for taking Notes

- Team Name
- Team members Names & Student IDs

- Task:
- Interviewer Name
- Interviewee Name
- Observer Name
- Notes Taker Name
- Medium Used i.e. Gogle Docs, WhatssApp etc.
- Question 1
- Response
- Question 2
- Response
- .
- .
- Question n
- Response n

- Observer Comments:

- Conclusions

Method, Methodology and Techniques

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- The term methodology refers to the overall approaches & perspectives to the research process as a whole and is concerned with the following main issues:
  - Why you collected certain data
  - What data you collected
  - Where you collected it
  - How you collected it
  - How you analyzed it

- A research method refers only to the various specific tools or ways data can be collected and analyzed, e.g. a questionnaire; interview checklist; data analysis software etc.
- Research techniques refer to the behavior and instruments we use in performing research operations such as making observations, recording data, techniques off processing data etc.

Difference between Methods and Techniques

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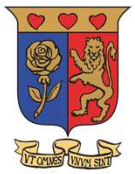
Type	*Methods*	*Techniques*
1. Library Research	(i) Analysis of historical records	Recording of notes, Content analysis, Tape and Film listening and analysis.
	(ii) Analysis of documents	Statistical compilations and manipulations, reference and abstract guides, contents analysis.
2. Field Research	(i) Non-participant direct observation	Observational behavioural scales, use of score cards, etc.
	(ii) Participant observation	Interactional recording, possible use of tape recorders, photographic techniques.
	(iii) Mass observation	Recording mass behaviour, interview using independent observers in public places.
	(iv) Mail questionnaire	Identification of social and economic background of respondents.
	(v) Opinionnaire	Use of attitude scales, projective techniques, use of sociometric scales.
	(vi) Personal interview	Interviewer uses a detailed schedule with open and closed questions.
	(vii) Focussed interview	Interviewer focuses attention upon a given experience and its effects.
	(viii) Group interview	Small groups of respondents are interviewed simultaneously.
	(ix) Telephone survey	Used as a survey technique for information and for discerning opinion; may also be used as a follow up of questionnaire.
	(x) Case study and life history	Cross-sectional collection of data for intensive analysis, longitudinal collection of data of intensive character.
3. Laboratory Research	Small group study of random behaviour, play and role analysis	Use of audio-visual recording devices, use of observers, etc.

From what we have seen, we can say that methods are more general. It is the method that generates the techniques. However, in practice, the two terms are taken interchangeable and when we talk of methods, we do, by implication, include research techniques within their compass.



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