

APPENDICES

A. Yes!Delft Responses **Chapter 2**

B. Empirical User Research **Chapter 3**

1. Profiles of Participants & Startups
2. Interview Guide 1
3. Interview Guide 2
4. Code Tables

C. Iterative Testing **Chapter 5**

1. Profiles of Participants & Startups
2. Interview Guide
3. Instructions for Iteration 1 & 2
4. Instructions for Iteration 3
5. Instructions for Iteration 4
6. Templates for Iteration 4
7. Instructions for Iteration 5
8. Templates for Iteration 5
9. Materials of Participant 1
10. Materials of Participant 2
11. Materials of Participant 3
12. Materials of Participant 4
13. Materials of Participant 5

D. Solution Case Study **Chapter 7**

1. Forms for the Participants
2. Case Study Observations
3. Materials of Participant 1
4. Materials of Participant 2
5. Materials of Participant 3
6. Materials of Participant 4
7. Materials of Participant 5
8. Materials of Participant 6

Appendix A: Yes!Delft Responses

Referred to from Chapter 2

Source

Yes!Delft is a startup incubator in Delft, the Netherlands. It focuses on high-tech startups, which is a major category within the high uncertainty startup group this report is aimed at.

Yes!Delft has been ranked #2 of the world's business incubators in 2018 by [UBI Global](#).

The responses of Yes!Delft were obtained via email correspondence between 15 and 18 January 2019.

Original (Dutch)

Vraag: Wordt de lean startup methodology geleerd aan startups in één (of meerdere) van de programma's?

Antwoord: Ja

Vraag: Worden startups aangespoord om environmental sustainability mee te nemen in hun goals, KPI of product criteria?

Antwoord: Nee

Vraag: Worden startups aangespoord om environmental sustainability mee te nemen in hun productontwikkeling?

Antwoord: Nee

Vraag: Worden er (environmental) sustainability methodes geleerd aan startups in één (of meerdere) van de programma's?

Antwoord: Nee

Uitbreiding: YES!Delft houdt zich niet bezig met product design. Bij YES!Delft leren we business aan engineers. Daarom zijn er in onze programma's geen onderdelen opgenomen over duurzame productontwikkeling.

Wel is Cleantech by far de grootste categorie startups bij YES!Delft. Je kan al onze cleantech startups vinden door hier te filteren op cleantech <https://www.yesdelft.com/our-network/yesdelft-companies/>

Translation

Question: Is the Lean Startup methodology being taught at one (or multiple) of the programmes?

Answer: Yes

Question: Are startups encouraged to take environmental sustainability along with their goals, KPI or product requirements?

Answer: No

Question: Are startups encouraged to take environmental sustainability along in their product development?

Answer: No

Question: Are (environmental) sustainability methods taught to startups at one (or multiple) of the programmes?

Answer: No

Elaboration: YES!Delft does not concern itself with product design. At YES!Delft we teach business to engineers. That is why there are no parts of sustainable product development in our programmes.

Although, Cleantech is by far is the largest category of startups at YES!Delft. You can find all our cleantech startups by filtering here on cleantech <http://www.yesdelft.com/our-network/yesdelft-companies/>

Appendix B.1: Profiles of Participants & Startups

Referred to from Chapter 3

Company Name: Trekschuit

Sector: Transport

Product: Boats for inner-city canals, focus on trash pick-up.

Start: October 2018

Phase: last steps before pilot test

Priorities of Startup:

1. Fundraising
2. Cost calculation of the project
3. Find new employees with the skills necessary for the coming phases

Challenges with Startup:

- Too many variables for cost calculation, the pilot will make it clearer.

Interviewee: Tomas te Velde

- Founder and CEO of Trekschuit
- Master's degree in Strategic Product Design at TU Delft

Company Name: DeNoize

Sector: Internet of Things / Home Wellbeing

Product: Technology for cancelling outdoor noise coming in via windows.

Start: March 2018

Phase: Convincing first customers to buy the product.

Priorities of Startup:

1. Fundraising
2. Sign deals clients and as effect be able to be valued as company
3. Technology development

Challenges with Startup:

- Expensive to make a prototype

Interviewee: Aman Jindal

- Founder and CEO of DeNoize
- Master's degree in Aerodynamics at TU Delft

Company Name: Dexter Energy

Sector: Energy Software

Product: Make predictions on energy production and consumption to create balance on the energy network

Start: January 2017

Phase: Scaling to new customers

Priorities of Startup:

1. Servicing current clients
2. Fundraising
3. Expansion to new clients

Challenges with Startup:

- Scaleability of product
- How quick can new customers be serviced
- Integration of different systems

Interviewee: Luuk Veecken

- Founder and CEO of Dexter Energy
- Master's degree in Energy Science at University of Utrecht

Company Name: KM Turismo

Sector: Digital tourism

Product: Platform to promote cities, uniquely with 3D visuals via drones.

Start: June 2016

Phase: Development is on temporary hold until he graduates.

Priorities of Startup:

1. Find new ways to expand the business

Challenges with Startup:

- Regulations (e.g. using drones indoors)
- Finding time to work on the startup
- Making connections with public administration (e.g. municipality)

Interviewee: Kevin Mamaqi

- Founder and CEO of KM Turismo
- Almost master's degree in Integrated Product Design at TU Delft

Company Name: City Sense

Sector: Navigation

Product: tools to find the fastest route with real-time traffic

Start: December 2017

Phase: terminated (in January 2018)

Priorities of Startup:

1. Fundraising
2. Finding a product that can be sold to generate income

Challenges with Startup:

- Supporting the employees financially
- Lack of funding
- Getting clients to sell to & generate income
- Better market abroad, but expensive to go there.

Interviewee: Ivan Krešić

- Founder of City Sense
- Master's degree in Computer Software Engineering at University of Zagreb

Appendix B.2: Interview Guide 1

Referred to from Chapter 3

Introduction

Thank you for participating in this interview. This interview will be about your startup, not you specifically. We will discuss some processes inside the startup with the goal to better understand the inner-working of it. Any unique selling points of your business will be kept confidential.

1- Startup

What is the name of your company

Can you tell me a bit about your startup?

- In short, what is your startup's value proposition?
 - What do you provide to which customer group?
 - Product the company sells / is going to sell
 - Where are your customers localised? Country - in this phase
 - How can your startup be categorised?
 - Field/ Industry

2- Process & Tools

- When did you company start (year-month-day)
- What is the current main priority of your startup?
 - What are the running processes?
 - What phase are you in?
 - What is the current day to day business?
- What sort of tools or methods do you generally use in your processes?

3-A Business Model Canvas

Are you familiar with the business model canvas?
(show business model canvas to participant)

- What do you like about this tool?
- What don't you like about this tool?
- When do you use this tool?
- Are there any changes you make to it to make it fit better in your processes?

3-B IDEO Circular design guide

- Are you familiar with IDEO?
- Are you familiar with their circular design guide website?

(Let the participant use the website)

- What is your opinion on this website?
 - What do you like about this tool?
 - What don't you like about this tool?

4- Eco-design

- What do you know about eco-design?
 - What is your opinion of circularity?
- Have you used eco-design before in your startup?
 - What was the reason behind that?
 - What could trigger you to use it in the future?
- Are you (or someone else in the company) schooled in eco-design methods?

5- Participant

In my thesis can I use your name?

In my thesis can I use the company name?

6- Closing

- Do you have anything further to add to our conversation?
- What could I improve for future interviews?
- Can I make a picture of you or interview setting for my report?

Appendix B.3: Interview Guide 2

Referred to from Chapter 3

Introduction

Thank you for participating in this interview. This interview will be about your startup, not you specifically. We will discuss some processes inside the startup with the goal to better understand the inner-working of it. Any unique selling points of your business will be kept confidential.

1- Startup

What is the name of your company

Can you tell me a bit about your startup?

- In short, what is your startup's value proposition?
 - What do you provide to which customer group?
 - Product the company sells / is going to sell
 - Where are your customers localised? Country - in this phase
 - How can your startup be categorised?
 - Field/ Industry

2- Process & Tools

- When did you company start (year-month-day)
- What is the current main priority of your startup?
 - What are the running processes?
 - What phase are you in?
 - What is the current day to day business?
- What sort of tools or methods do you generally use in your processes?
 - These can be tools you currently use, or have used in the past.
 - *Assumption: they don't realise they use tools*
 - *Give examples of tools/methods*
 - *Interviews*
 - *A/B testing*
 - *Customer Persona*
 - *Customer Journey*
 - *Stakeholder mapping*

3- Tackle Challenges

- What are your 3 main challenges currently?
- What actions do you take when knowledge is lacking in your company?
 - Do you have a place or person you go to for help?
 - Do you have an online place to go to?

4- Business Model

- Repeat basics of their business model
- How do challenges, like lack of knowledge, affect your business model?
- Have you considered to change your business model before?
 - In what way(s)?

5- Eco-design

- What do you know about sustainability?
- What do you know about eco-design? (Explain if lack of knowledge)
- Have you used eco-design before in your startup?
 - What was the reason behind that?
 - What could trigger you to use it in the future?
- Are you aware of the waste your company makes?

6- Practicing Eco-design

- Looking back at your process so far, where would you have liked to use eco-design?
- Let's take a look at a simplified version of the business model canvas
 - Looking at these parts, where would you be willing to make changes to be more environmentally sustainable?
- I will give you some options of what eco-design could do for you.
 - I would like to know what of these options you would take
 - Thus make the change to get the benefits

7- Participant

- Are you (or someone else in the company) schooled in eco-design methods?
- In my thesis can I use your name?
- In my thesis can I use the company name?

8- Closing

- Do you have anything further to add to our conversation?
- What could I improve for future interviews?
- Can I make a picture of you or interview setting for my report?

Appendix B.4: Code Tables

Referred to from Chapter 3

CRITERIA FOR AN ECO-DESIGN TOOL

Groups	Actions	Paraphrases
Low time investment	Takes time understand what is applicable	“Just going through the website is a lot of work, let alone specific method” - Aman, DeNoize (on Circular Design Guide)
	Executing methods is a lengthy process	“I would do eco-design if it just a 3 hour workshop, and then its all done” - Tomas, Trekschuit
Applicable to the startup	Clarity on the benefits offered are	“It is not convincing it is for me. That I need to be the one to do it” - Aman, DeNoize (on doing Eco-design)
	Redesigning as use of eco-design	“The startup is in a too early phase to have an eco-impact” - Ivan, City Sense
		“Currently not in the stage for eco-design. Not really building anything yet” - Tomas, Trekschuit
	Execution options fit with startup	“I don’t know how to apply it for my startup” - Luuk, Dexter Energy
Have an appropriate level of expertise that is required	Move away from common sense	“Never really get an Eureka-moment” - Tomas, Trekschuit (on the business model canvas)
		“Filling it in feels a bit like a school exercise” - Tomas, Trekschuit (on the business model canvas)
	Keep it away from specialised knowledge	“I don’t understand all the terms. Maybe because it isn’t in my field” - Aman, DeNoize (on doing Eco-design)
Multi-layered flow	Bird-eye view of content	“Quick view if you didn’t miss anything” - Tomas, Trekschuit
		“Easy way to communicate to other parties” - Aman, DeNoize
	Not losing focus	“Tools like business model canvas present everything at once, while not every part has the same level of priority per stage” - Aman, DeNoize
		“You can’t preach and practice at the same time” - Kevin, KM Turismo (Implying shifting between an eco-vision to design is difficult)

BENEFITS WANTED BY STARTUPS

Groups	Actions	Paraphrases
Be applicable for investments	Apply for grants	“Focusing on our green side opens up new grant opportunities” - Luuk, Dexter Energy
	Raise funding	
Generate income by sales	Finding customer	
	Servicing customers	“If the customer doesn’t value it, it is worth my time” - Luuk, Dexter Energy
Plan for future financial gains	Growing with current offerings	“Focus on growth, otherwise you can’t keep up to with future implementation speed” - Kevin, KM Turismo
	Expanding to new areas	
Reduce expenses	Figure out product manufacturing	“Prototyping our technology is expensive, but we need something to convince investors” - Aman, DeNoize
	Make savings in operations	“Wanting to make as little cost as possible, also results in less energy use” - Luuk, Dexter Energy
	Decrease operations to essentials	
Establish stakeholder connections	Create a two-way benefit	“You have to aim for the win-win solutions” - Tomas, Trekschuit
	Establish partnerships	“Find a balance between the freedom you can keep, and what you must give up to get a partner’s benefits” - Luuk, Dexter Energy & Ivan, City Sense
	Comply with the government	
	Work with green suppliers	“Our servers run via Google, which claims to be green” - Luuk, Dexter Energy
	Convince ‘greening’ stakeholders	“The municipality now has sustainable criteria. Tools that convince them we are as well could help” - Tomas, Trekschuit
Solve manpower gap	Acquire the right competences	“We need new skills for the next phase we are entering” - Tomas, Trekschuit
	Being able to afford manpower	“At one point we had to stop because we couldn’t support ourselves” - Ivan, City Sense

	Have employees with enough available time	“I should have a personal investment canvas (laughs)” - Kevin, KM Turismo
--	---	---

PROCESSES OF STARTUPS

Groups	Actions	Paraphrases
Acquiring knowledge yourself	By gathering customer Insights	“Talk to people; go on the street” - Tomas, Trekschuit & Aman, DeNoize
		“Features are based on customer suggestions” - Aman, DeNoize & Luuk, Dexter Energy
	By doing context research	“You need to do a competitor analysis. No competitors at all is a red flag” - Ivan, City Sense
Obtaining knowledge from other parties	Via an authority figure	“We get help from mentors at the incubator” - Luuk, Dexter Energy
		“I ask other startups in our community that have that expertise” - Ivan, City Sense
	Via a website	“Websites are often too general” - Luuk, Dexter Energy
		“It can be good for inspiration” - Tomas, Trekschuit
Design the business	Co-creation	“Set priorities together with clients” - Luuk, Dexter Energy
	Work flow	“Design process is most often the same, so new tools aren’t often introduced” - Tomas, Trekschuit
Communicate progress	Communicate product development	“Don’t go for something that works. (There isn’s always time for that). Work on something presentable” - Ivan, City Sense
	Communicate business development	“Setting milestones to indicate progress to stakeholders” - Aman, DeNoize
	Communicate business goals	“Business model canvas works well as an overview to communicate what you will do to stakeholders” - Kevin, KM Turismo
	Communicate preparations for the long-term	“Prepare your business for growth, for when the chance appears you are ready” - Kevin, KM Turismo

Appendix C.1: Profiles of Participants & Startups

Referred to from Chapter 5

Company Name: KM Turismo

Sector: Digital tourism

Product: Platform to promote cities, uniquely with 3D visuals via drones.

Start: June 2016

Phase: Development is on temporary hold until he graduates.

Priorities of Startup:

1. Find new ways to expand the business

Participant: Kevin Mamaqi

- Founder and CEO of KM Turismo
- Almost master's degree in Integrated Product Design at TU Delft

Product focused on for the test:

Company Name: Trekschuit

Sector: Transport

Product: Boats for inner-city canals to reduce traffic on roads.

Start: October 2018

Phase: last steps before pilot test

Priorities of Startup:

1. Make boat for pilot
2. Explore new product directions in other cities

Participant: Tomas te Velde

- Founder and CEO of Trekschuit
- Masters in Strategic Product Design at TU Delft

Product focused on for the test: Boat for garbage pick-up in Delft city centre.

Company Name: DeNoize

Sector: Internet of Things / Home Wellbeing

Product: Technology for cancelling outdoor noise coming in via windows.

Start: March 2018

Phase: Convincing first customers to buy the product.

Priorities of Startup:

1. Sign deals clients and as effect be able to be valued as company
2. Developing the technology for more complex sounds
3. Increase credibility and exposure by attending fairs and contest

Participant: Aman Jindal

- Founder and CEO of DeNoize
- Master's degree in Aerodynamics at TU Delft

Product focused on for the test: Windows on yachts

Company Name: Drones for Work

Sector: Aviation & Electronics

Product: Flight controllers for drones

Start: February 2018

Phase: Near 1st test

Priorities of Startup:

1. Finishing the product for first test
2. Product launch in September

Participant: Robert Crone

- Founder and CEO of Drones for Work
- Master's degree in Management of Technology at TU Delft
- Bachelor's degree in Aerospace Engineering at TU Delft

Product focused on for the test: Flight controller

Company Name: Envision

Sector: Healthcare AI

Product: Tools to support the visually impaired in getting around

Start: October 2017

Phase: Scaling the product

Priorities of Startup:

1. Increase sales numbers
2. Improve the product
3. Explore use of smart glasses

Participant: Karthik Mahadevan

- Founder and Chief designer of Envision
- Master's degree in Integrated Product Design at TU Delft

Product focused on for the test: visually impaired support application

Appendix C.2: Interview Guide

Referred to from Chapter 5

The below interview guide has been used in a semi-structured manner for all 5 test iterations.

Introduction to Interview

Thank you for participating in this test. The main goal of this test is to improve the tool I am designing. This tool is to be used in the future by startup founders, just like you, so anything you think of could lead to improvements. Thus I would like you to say anything that comes to mind out loud.

1 - Startup

First, I have some questions about your startup itself.

- 1.1. What is the name of your company?
- 1.2. Can you tell me in short what your startup does?
 - What is your startup's value proposition?
 - Who is your customer group?
 - Where are your customers located?
 - What is your revenue stream?
- 1.3. In what field of industry can your startup be categorised?
- 1.4. When was your startup founded? (year-month-day)
- 1.5. What are the current main priorities of your startup?
 - What are the running processes?
 - What is the current day to day business?

2 - Testing

Again, I like to emphasise, you can mention anything that comes to mind. Wrong answers don't exist.

- from here the instruction guides are used -

3 - Test Results

I have done the calculations let's talk through the results and tool.

- 3.1. Does any part of the outcome surprise you?
- 3.2. What scores seem logical to you?
- 3.3. Would you adjust your business operations based on these outcomes?
 - What could these changes be?

4 - The Tool

- 4.1. How did you experience using the tool?
 - What did you like?
 - What did you dislike?
 - What was easy to do?
 - Where any parts unclear to you?(address more specific parts of the tool, if you as researcher observed that during uses)
- 4.2. What benefits can you see in the use of this tool?
- 4.3. Could you see this tool being used in your startup?

5 - Getting the Tool

In the future this tool might become publicly available.

5.1. Where you expect to find such a tool?

- Would you expect someone to tell you about it?

5.2. Would you make an investment to get this tool?

5.3. Would you make an investment (besides the execution) to get the benefits this tool provides

6 - Permission

6.1. In my thesis can I use your name?

6.2. In my thesis can I use the company name?

6.3. Can I make some pictures to use for my thesis?

7 - Closing

7.1. Do you have anything further to add to our conversation?

Appendix C.3: Instructions Iteration 1 & 2

Referred to from Chapter 5

These instructions were presented by the researcher to the participant step by step.

1. List the value offered to the Stakeholders
2. Rank the values per stakeholder
3. Rank the values in total on your startup's prioritisation (Vision)
4. List the functions of your business model
 1. Product and/or Service
 2. Deployment/Delivery
 3. Payment Method(s)
5. Grade the strength of the relation between the values and business model functions
6. Calculate which are the most important functions - by researcher
7. Evaluate the outcome

Appendix C.4: Instructions Iteration 3

Referred to from Chapter 5

These instructions were given on paper to the participant.

1. List Pains & Gains of the Paying Customer
2. List Pains & Gains of the User
3. Write down how much these stakeholders care about the environment. Examples:
 1. product transport
 2. electricity use
 3. product durability
 4. after sales services
 1. repair
 2. maintenance
 5. end-of-life
 1. how to throw it away
 2. recycling
4. Rank the Pain, Gains and Environment based on the priority ranking of the stakeholders.
5. List the functions/features of your value proposition.
6. Score how much the function/features are required for realising the ranked priorities with Non, Low, Medium or High.

Appendix C.5: Instructions Iteration 4

Referred to from Chapter 5

These instructions were given on paper to the participant.

1. The Voices of the Stakeholders

1. Define your stakeholders
 1. (e.g. are your paying customer and product user the same people?)
2. List the pains and/or gains of each particular stakeholder
 1. For the purpose of this test 3 per stakeholder or 9 in total are sufficient
 2. Use phrasing that implies a size or scale, for example more or smaller.
 3. Leave one row empty between stakeholders

2. Ranking the Voices

1. Assign a rank to all the pains and/or gains you listed
 1. For example, if you wrote 3 pains and gains for a stakeholder, you grade them from 1 to 3.

3. Your Business Model

1. Write down the following details part of your business model on the X-axis
 1. Product (or service) features
 2. Method of Payment
 3. Deployment
2. For the purpose of this test between 3 and 6 is sufficient

4. Improving Your Business

1. From the company gains (other side of the paper) select 1 to 4 gains.
2. Look at the suggestions connected to those gains to the right and select per gain a suggestion.
3. Add these suggestions to the right of your business model on the X-axis

5. Grading the Relations

1. Grade how much each part on the X-axis is required to fulfil the pains and/or gains of the stakeholders.
 1. Grade with Non (leave empty), Low (red), Medium (yellow) or High (green).
 2. For the selected suggestions you might need to translate it to a customer gain in your mind. For example, could lower cost for you translate into lower cost for the customer?

6. Intermezzo

1. The researcher will play the part of calculator for this test.
2. You can take a break

7. Results are presented

Appendix C.6: Templates for Iteration 4

Referred to from Chapter 5

Company Gain	Suggestions for Business Model changes
Lower Assembly Cost	Design for Disassembly
	Modular Design
	Design with snap-fits
Lower Material Cost	Decrease Variety of Materials
	Use Recycled Materials
Lower Deployment Cost	Less Packaging Volume
	Less Packaging Materials
Lower Iteration Cost	Design for Disassembly
	Decrease Product Features
	Bring out the product in Modules
Lower Manufacturing Cost	Decrease Variety of Materials
	Decrease Product Features
Easier Scaling	Bring out the product in Modules
	Keep product ownership to enable improvements
Less Manpower Used	Decrease Product Features
	Enables Users to put product together
Lower Fixed or Variable Cost	Switch between product or service focus

Appendix C.7: Instructions Iteration 5

Referred to from Chapter 5

These instructions were given on paper to the participant.

1. Company Pains

1. Write down 3 (max.) things you would like to improve in your company

2. Business Model Changes

1. Look on the back side of this paper to see suggestions on how to resolve the company pains.
2. Write down some potentially interesting business model changes in column 2.

3. Grading

1. Grade how much the items on the X-axis and Y-axis are related to each other.
 1. Grade with Non (leave empty), Low, Medium, or High.

4. Score

1. The researcher will do the scoring for you.

5. External Stakeholders

1. Do this step together with step 6. Pains & Gains
2. Define your stakeholders
 1. (e.g. are your paying customer and product user the same people?)

6. Pains & Gains

1. List the pains and/or gains of each particular stakeholder
 1. For the purpose of this test 3 per stakeholder is sufficient
 2. For the pains and/or gains use phrasing that implies a size or scale, for example more, smaller, easier.

7. Ranking

1. Rank the importance of each pain and gain by choosing high, medium or low.

8. Business Model

1. Write down the main features of your business business model on the X-axis.
2. Also think about aspects like:
 1. Extra services
 2. Method of Payment
 3. Deployment
 4. Repair and Recycle

9. Grading

1. Grade how much the items on the X-axis and Y-axis are related to each other.
 1. Grade with Non (leave empty), Low, Medium, or High.

10. Relation Score

1. The researcher will do the scoring for you.

11. Grading

1. Grade how much the items on the X-axis and Y-axis are related to each other.
 1. Grade with Non (leave empty), Low, Medium, or High.

12. Score

1. The researcher will do the scoring for you.

Appendix C.8: Templates for Iteration 5

Referred to from Chapter 5

1. Company Pains →

1.

2.

3.

2. Business Model Changes
↓

3. Grading
↘

4. Score
↓

	1.	2.	3.	4.
1.				
2.				
3.				
4.				
5.				
6.				
7.				

8. Business Model →			1.	2.	3.	4.	5.	6.	7.
5. External Stakeholders ↓	6. Pains & Gains ↓	7. Ranking ↓	9. Grading ↓						
1.		Low							
		Medium							
		High							
2.		Low							
		Medium							
		High							
3.		Low							
		Medium							
		High							
4.		Low							
		Medium							
		High							
5.		Low							
		Medium							
		High							
6.		Low							
		Medium							
		High							
7.		Low							
		Medium							
		High							
8.		Low							

		Medium								
		High								
9.		Low								
		Medium								
		High								
10.		Low								
		Medium								
		High								
11.		Low								
		Medium								
		High								
12.		Low								
		Medium								
		High								
13.		Low								
		Medium								
		High								
14.		Low								
		Medium								
		High								
15.		Low								
		Medium								
		High								
16.		Low								
		Medium								
		High								

**10. Relation
Score** →

Suggestions of links between company gains and changes to make in the business model

Company Gain (Suggestions)	Suggestions for Business Model changes
Lower Assembly Cost	Design for Disassembly
	Modular Design
	Design with snap-fits
Lower Material Cost	Decrease Variety of Materials
	Use Recycled Materials
Lower Deployment Cost	Less Packaging Volume
	Less Packaging Materials
	Lighter product
Lower Iteration Cost	Design for Disassembly
	Decrease Product Features
	Easier assembly
	Bring out the product in Modules
Lower Manufacturing Cost	Decrease Variety of Materials
	Decrease Product Features
Easier Scaling	Bring out the product in Modules
	Keep product ownership to enable improvements
Less Manpower Used	Decrease Product Features
	Enables Users to put product together
Lower Fixed or Variable Cost	Switch between product or service focus

Appendix C.9: Materials of Participant 1

Referred to from Chapter 5

Product/
Science

Deployment/
Delivery

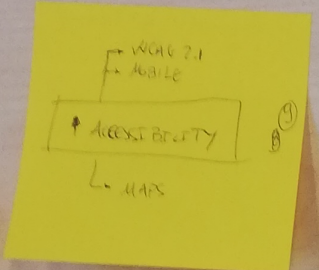
Payment
Methods

- VIDEO 360 A
- AERIAL VIDEO B
- BIG PHOTOGRAPH C
- SCHEMA COMPATIBLE D
- LOW ENTRY COST E
- NCA 2.1 COMPLIANT F
- LOW LEARNING CURVE G

- LOCAL PRESS A
- + CONTESTS B
- FREE SAMPLE / REGION C
- EMAIL MARKETING TO SPECIFIC PEOPLE D

- A - SUBSCRIPTION MODEL
- B - CONTACTS
 - TRAVEL
 - ADVERTISING
 - BUSINESS

User

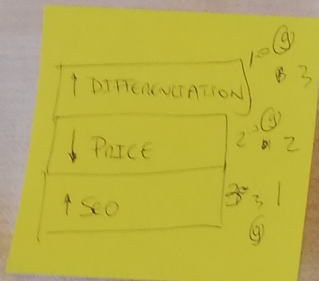


- F. 8
- C. 7
- D. 5

- A. 9
- ~~B.~~
- ~~C.~~

X

Customer

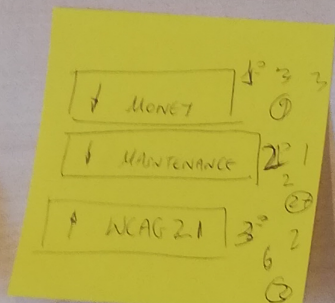


- B. 9
- C. 7
- A. 5
- F. 3
- D. 1

- A. 9
- B. 5

- A. 9
- B. 5

Regulators



- E. 9
- G. 7
- F. 5

- C. 9

- B. 9

Suppliers
Attorneys

↑ STEADY INCOME

X

X

X

Appendix C.10: Materials of Participant 2

Referred to from Chapter 5

Electrifi
Vanom

Digitale
Kant met
sensors

Afval
scheiding
systeem

Autonomie
vanom

Intelligente
partij

Evolutie
systeem

Resistente
systeem

Annieken
van
AFVAL

Schoon
en
slim
business

Staat te weten
van welke
informatie

Directie met
Zwaartwicht

Bewonen
Vakken
HAR Borden
AFVAL

AFVAL
scheiding

Impeden
Viel
of
STRAAT

Gemeente
AFVAL
scheiding

Impeden
POLAST
of de
weg

Voordeel in
sociale
interactie
Tendens

afvalverval
sociale interactie

Impeden
de Klare
STAPPEN

Appendix C.11: Materials of Participant 3

Referred to from Chapter 5

Functions ⑤

- Active noise cancellation for glass structures

- Music from the glass

- Invisible to users.

Customer ①

PAINS

- Structural-borne noise in owner's cabin. ③
- Delay in delivering the yacht. ①
- Loss of comfort & ②

GAINS

- More luxurious yacht. ④
- More € value from their clients. ⑤

Envir. Concern

- Electricity usage a bit. ③
- ↳ more fuel efficient yacht. ④
- After sales service. ①
- And material usage. ③

PAINS

- Noisy cabins ①
- ↳ uncomfortable.
- Dissatisfaction ②
- ↳ € for value.

GAINS

- More comfort. ③
- High-tech feeling. ④

Envir. Concern

- They don't really care except few exceptions.

	H	N	L
	M	N	N
	H	L	M
	H	H	H
	H	H	H
	M	M	N
	H	M	N
	M	M	L
	H	N	L
	H	M	H
	H	H	H
	H	H	L

User ②

Customer 250 ①

User 194 ①

Total: 452 ①

C: 106 ② U: 120 ③ T: 226 ②

C 91: W: 130 ③ T 221 ③

(2) *Environmental EM:*

- ✓ Weight: the weight of the product.
- ✓ Volume: the volume of the product.
- ✓ Number of parts: the number of parts in the product.
 - Number of types of materials: the number of types of materials in the product.
 - Likelihood of getting dirty: the speed of change of the exterior color by the effect of dirt.
- ✓ Hardness: the hardness of the parts in the product.
- ✓ Physical lifetime: the physical lifetime of the product.
- ✓ Amount of energy consumption: the amount of energy consumption along with all the life-cycle stages.
 - Rate of recycled material: the rate of recycled materials in the product.
- ✓ Noise, vibration, electromagnetic wave: the volumes of the noise, vibration, electromagnetic wave given out during the use of the product.
- ✓ Mass of air pollutant: the mass of emission of air pollution substances along with all the life-cycle stages.
 - Mass of water pollutant: the mass of emission of water pollution substances along with all the life-cycle stages.
 - Mass of soil pollutant: the mass of emission of soil pollution substances along with all the life-cycle stages.
 - Biodegradability: biodegradability of the materials of the parts to be landfilled.
- ✓ Toxicity of materials: toxicity of the materials of the product.

Appendix C.12: Materials of Participant 4

Referred to from Chapter 5

		3. Business Model	Reliable flight controller	Customizable for any configuration/environment	Flight test convenience features (data logging/analysis)	[10%] of revenue license fee	Bring out product in market	Enables users to take product to market	Similar between product/service focus	
1.1. Stakeholders	1.2. Pains & Gains	2. Ranking	5. Grading							
Plane Manufacturers	Improved product (1) Ease of use (2) Customizable (3)									51
Plane Users	Reliability improvement (1) New use cases (2)									27
Investors	High upside potential High risk									11
Employers	Working on new tech (1) Learning & Development Low base compensation									21
R&D Partners	Subsidy partners (2) New solution creation (3) New business opportunity (4)									56
			36	30	21	12	22	12	31	

Appendix C.13: Materials of Participant 5

Referred to from Chapter 5

Appendix D.1: Forms for the Participant

Referred to from Chapter 7

Case Study

by M.J.H. Kersten

Introduction

This document describes a company and its business model. The information is to be used in conjunction with the 'Improvement Identifier' canvas for the purpose of testing the canvas. You are asked to place yourself in the shoes of decision maker at the company. With the canvas you are asked to identify potential direction this company could go in in the future. The company this case is about is a young startup, which means none of the elements are set in stone for this business and are open for adjustments. Both the company and its business model are fictional. You aren't permitted to search for any information to use besides what is stated in this case. This document exists out of 3 parts: business model, stakeholders, and business operations.

Business Model

Vision

Noise-cancelling headphones are becoming more popular, however they can be a hazard in traffic. A bicyclist with headphones on often doesn't hear cars coming, especially since cars are also becoming more silent. The vision of your startup is to reduce dangerous traffic situations caused by sound.

Value Proposition

You aim to develop a headphone that filters most noises, except some specific ones like the noise of car engines. This isolation of sounds should make it easier to hear a car coming for a bicyclist. Keeping the noise-filter feature allows users to still enjoy their music or podcasts to the fullest.

Product

The headphones you have designed have a classic look to it. In the picture you can see an exploded view of the components of the headphones. With the noise-filter technology you developed, the casing has become a little bulkier. This is because it needs to include electronics that capture sounds from the surroundings and process it. This also requires extra electricity, so both sides have a switchable battery in it, which can be placed by removing the 'wooden' parts. Currently the batteries last for approximately a day. The headphones connects to devices with a standard audio-jack cable. Most of the parts of the product are made out of plastics, even the 'wood' is a printed pattern on plastic, that could be customised. For creating a high quality feel the aim is to make the headrest and ear-cushions of real leather.



Production & Delivery

Currently, you order headphones and electronics online in small batches. At a workshop of a startup incubator, you adjust the headphones, build up the electronics for the noise-filter technology, and place the technology in the headphones. You go to your nearest post office to get the product packaged and send to customers.

Revenue Model

You are confident that when the technology is fully developed that it could give an experience to compete with the bigger brands like a Bose or Sony. With an estimated sales price of €300 it is premium priced compared to competition's price range between €200 and €350, but of course you have an extra feature. Also, you need to ask this price to reach the payback time of your investment, which you aim to reach in 2 years.

Marketing & Sales

Via a simple self-made website you are selling in the Netherlands your first headphones for a low-price (€75), since the headphones are still prototypes and do not function optimally. So customers have the risk that their product breaks quickly, but they did not pay a lot for it as well. You have been in contact with some stores to see if you can sell your product there. However, you have not yet established a concrete branding or marketing plan for your startup yet.

Stakeholders

These are some statements of groups that are potentially relevant for your business model. Stakeholders can be in overlapping groups. You can also define a new group as a combination.

Headphones Users

- "The feeling of being in your own world with noise-canceling headphones is so amazing."
- "Untangling cables is so annoying."
- "I had a cable break two times within a year, so now I am on wireless."
- "Sound quality is definitely number one priority! I heard that with cables it is best."
- "I like the freedom of a wireless headphone."
- "I often forget to charge my headphones, so I am out of music in the middle of the day".
- "A headphone should be ease to take with you."

Cyclists

- "the ear parts of my current headphones sometimes get a bit sweaty when I cycle for a longer time or with hot weather."
- "I am quite annoyed when I am cycling and I accidentally pull out a cable of my headphone."
- "Sometimes the cable gets stuck and it gets pulled out."
- "It is nice when you don't have to get your phone out of your pocket."
- "A light-weight headphones is preferable on the bike."
- "I don't get the problem with music in traffic. I see the cars coming, don't I?"
- "I don't really care about the music, I like to call while cycling. But apparently that will be forbidden soon."

Luxury Electronics Customers

- "I prefer to match my devices with my style or outfit."
- "When I can identify with the brand, I always recommend the product to all my followers."
- "Noise-canceling technology is heavily for getting in your own world in the back of an Uber".

Car Drivers

- "From July smartphones on the bike will be forbidden, maybe headphones should be next!"
- "They (cyclists) seem to be in their own world with the headphones on. Sometimes they don't even react to me honking."
- "I had to do an emergency brake on multiple occasions, because of a cyclist suddenly coming around the corner."

Electronics Store

- We aren't interested yet, because it isn't clear how the product's quality is different from competing products.
- We aren't convinced that people want to buy this headphone just because it is better for cycling.

Delft Municipality

- The large amounts of students with bicycles on the road don't always go well together with the other traffic, especially during rush hours.
- We had some complaints of motorists that the student cyclists tend to be reckless drivers.
- Some citizens have voiced the concern that they feel unsafe walking through the city centre.
- We aim for constructing more dedicated cycling paths to ease the load on the shared roads.

European Union

- You are obligated to offer a 2-year warranty for electronic products. This means that if the product turns out to be faulty within the first 2 years after purchase a customer has the right to return the product and get a refund. You cannot give a customer any lower warranty period than this.
- Electronics should fulfil the WEEE directives, stating which materials aren't allowed in the product, because they can be harmful in the waste streams.

Investors

- We acknowledge that distractions in traffic are becoming a real problem, like you can see with the bans on smartphones.
- We aren't convinced yet that your product will give a sound quality that can compete with major brands.
- What keeps other companies from copying your technology? Patenting can be an expensive, long, and cumbersome process, thus preferably you have a unique factor that is hard to copy.
- How will you be able to grow your business? Currently, you sell, build, and send the product yourself. If you would get many product orders, can you keep up with the demand?
- Who takes responsibility when the technology malfunctions? For example, when a user gets in accident because they don't hear a car coming.

Business Operations

You started this startup half a year ago via a startup incubator programme. Here you also found your co-founder, Dirk. You bonded over a conversation about music, which led to this startup idea. Dirk focuses on developing the electronics, while you are focused on the business development. Both of you aren't experts for your position, Dirk is actually in a master about AI, but your shared commitment to put in your best efforts keeps the startup going.

It would be nice to find some employees with expertise, especially for the technology development, but that has proven rather difficult. You don't earn enough from the startup to pay yourself, let alone an employee. Next to that you still need to find the right angle to promote your startup on.

Via your personal networks you have been able to make a couple of sales. You have sold 4 headphones, all in the last month, which is a good rate of sales. But due to short duration you haven't been able to get much feedback on the use yet.

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1	2	3	4	5
I wouldn't. I keep the business as it is				Very likely to pursue a change

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

How many of the stated changes would you consider pursuing?

(Write a number)

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1	2	3	4	5
None are to my liking				I definitely would use a method

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

Did you experience any difficulties with the case study description?

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

Did you experience any difficulties with the use of the 'Change Diagram'?

Appendix D.2: Case Study Observations

Referred to from Chapter 7

Participant 1

Improvements that benefit the customer:

- focus is on company operations (expansion, marketing, batch size), which not benefit the customer.

Proposed change(s) in relation to eco-design:

+ Collaborate with partner, could be beneficial as described by Stevels (2001) about Suppliers.

Preferred change(s) in relation to eco-design:

- no eco-design relation. The outcome focus is on online marketing.

Preferred method(s) of implementation in relation to eco-design:

- none mentioned

Relations to use with Lean Startup method:

+ Collaboration with other parties to share workload, as proposed change.

- Increase batch size, as proposed improvement, generally doesn't work well together with early phase Lean startups.

Participant 2

Improvements that benefit the customer:

+ Increase customisability

+ Simplifying the design, could lead to cost reductions and lower price for the customer.

Proposed change(s) in relation to eco-design:

+ Create modularity

+ Collaborate with partner, could be beneficial as described by Stevels (2001) about Suppliers.

+ Sell updates to decrease focus on product sales. This could lead to a product service system.

+ Design for disassembly

+ Simplify assembly

Preferred change(s) in relation to eco-design:

+ Create modularity

+ Sell updates to decrease focus on product sales. This could lead to a product service system.

+ Collaborate with partner, could be beneficial as described by Stevels (2001) about Suppliers.

Preferred method(s) of implementation in relation to eco-design:

+ Modular design

+ Product service systems

Relations to use with Lean Startup method:

+ Collaboration with other parties to share workload, as proposed change.

+ Modular design allows to make a more step by step process.

~ Product service system increases the amount of customer touch points you have to think of, but it decreases dependence on product sales as only income source.

Participant 3

Improvements that benefit the customer:

+ Higher feedback from customers

+ Reduce failure of the technology

Proposed change(s) in relation to eco-design:

+ Modularisation

Preferred change(s) in relation to eco-design:

- no eco-design relation. Chosen is 'clear differentiation'

Preferred method(s) of implementation in relation to eco-design:

+ Modular design

Relations to use with Lean Startup method:

+ Modular design allows to make a more step by step process.

Participant 4

Improvements that benefit the customer:

- + Decrease the product size
- + Improve specs (battery life, wireless function)
- + Increase the choice for the customer by offering two versions
- + Customisation dependent on environment of use

Proposed change(s) in relation to eco-design:

- the changes are mainly related to further research into the customer and market landscape

Preferred change(s) in relation to eco-design:

- no eco-design relation. Chosen is research in new opportunities

Preferred method(s) of implementation in relation to eco-design:

+ Modular design

Relations to use with Lean Startup method:

- + Proposed to do future research iteratively
- + Modular design allows to make a more step by step process.

Participant 5

Improvements that benefit the customer:

+ Longer development, so the quality of the product will be better

Proposed change(s) in relation to eco-design:

- + Collaborate with specialists, could be beneficial as described by Stevels (2001) about Suppliers.
- + Material and design adjustments
- + Services for a better delivery of the value
- + Design for disassembly

Preferred change(s) in relation to eco-design:

- + Services for a better delivery of the value
- + Collaborate with specialists
- + Material and design adjustments
- + Design for disassembly (note: end score was 0)

Preferred method(s) of implementation in relation to eco-design:

?

Relations to use with Lean Startup method:

- proposed improvement to have longer development contradicts with Lean Startup

~ improvement suggestion to make it desirable for all stakeholders, while Lean Startup proposes a focus.

Participant 6

Improvements that benefit the customer:

+ recognise quality

Proposed change(s) in relation to eco-design:

- + Collaborate with partner, could be beneficial as described by Stevels (2001) about Suppliers.
- + Material adjustment with recycled materials
- + Simplifying use of the product
- + Focus on the outcomes you want to provide instead of product. Relates to 'Paradigm shift' Stevels (2001).

Preferred change(s) in relation to eco-design:

- + Collaborate with partner, could be beneficial as described by Stevels (2001) about Suppliers.
- + Focus on the outcomes you want to provide instead of product. Relates to 'Paradigm shift' Stevels (2001).

Preferred method(s) of implementation in relation to eco-design:

~ debatable, instead of resolving the problem by means of the proposed product in the case, it should be resolved by increasing awareness of the problem.

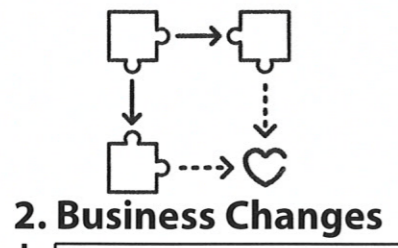
Relations to use with Lean Startup method:

- ~ the propose next step is focused on awareness, which seems unlikely to make a business model around
- + Collaboration with other parties could lead to shared workload.

Appendix D.3: Materials of Participant 1

Referred to from Chapter 7

Phase 1 Identify Improvements



1. Focus on expanding market using the unique technology.



2. Furnish a proper social media aggressive marketing campaign to INCREASE the outreach of the product.

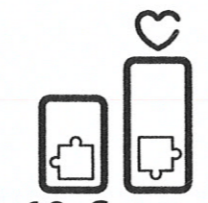
X. Invest time in bigger batch orders sale compared to one orders.



1. Invest on the website, social media campaigns for buyers.	Medium (3)	High (9)	Medium (3)	15
2. With more buyers try to collaborate with other business who might need the	High (9)	Medium (3)	Medium (3)	15
3. technology - For example, motor cycle helmets with integrated sound systems etc.				
4. Collaborating with schools / smaller companies (who are buying for employees) so	Medium (3)	Medium (3)	High (9)	15
5. that big batch orders can be sold.				
6.				
X.				

Phase 2 Mapping your Business Model

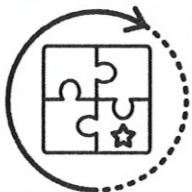
		8. Business Features	1.	2.	3.	4.	5.	X.	
5. Stakeholders Investors & Shareholders	6. Benefits 1. More profit eventually 2. Can lead to product diversity making it a	7. Importance Grades Low Medium High	1. Limited market	2. Focussed on young adults who can afford luxury products.	3. Focussed on safety of cyclists.				
			High			High	NON		
			2. High			MEDIUM	HIGH		
Distributors	3. Possibility of international product outreach - leading to higher brand value and better pricing eventually. 4. Possibility of larger orders reducing shipping costs	Low Medium High	High Quality (HP) specifically catering to the mission.						
			Low	High	NON				
			Medium	High	NON				
Customers	5. Popular product can also be kept in higher stock numbers. 6. Sustainability 7. Product upgrades & newer versions.	Low Medium High	High						
			Medium	High	NON				
			High	High	High				
			3. Medium	High	NON				
			4. Medium	Low	NON				
			5. Low	Medium	Low				
			6. High	High	High				
			7. High	High	Low				
			10. Scores	228	309	90			



10. Scores

Phase 3 Linking the Present to the Future

Improvement Identifier Canvas
by M.J.H. Kersten



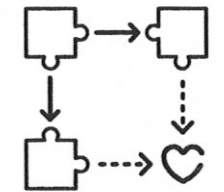
12. Scores

195
60
135



11. Relation Grades

1st 135 + 45	F	Medium	High	Low.	1-C
		Med.	Low	Non	2-C
		Med.	Med.	Med.	3-C
		F1	F2	F3	



2. Business Changes

1.
2.
3.
4.
5.
X.



8. Business Features

1.	2.	3.	4.	5.	X.
----	----	----	----	----	----

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1 I wouldn't. I keep the business as it is	2	3	4	5 Very likely to pursue a change
---	---	---	---	-------------------------------------

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

Investon website - Social media Campaigns.

How many of the stated changes would you consider pursuing?

(Write a number)

2

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1 None are to my liking	2	3	4	5 I definitely would use a method
----------------------------	---	---	---	--------------------------------------

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

Website

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

Aerospace

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

No, non at all almost contrary is true.

Did you experience any difficulties with the case study description?

Nope.

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

Sometimes, especially step 5-6

Did you experience any difficulties with the use of the 'Change Diagram'?

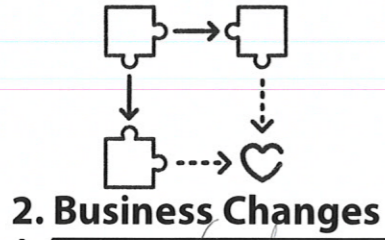
Change diagram was fine. No problems.

Appendix D.4: Materials of Participant 2

Referred to from Chapter 7

Phase 1 Identify Improvements

Improvement Identifier Canvas
by M.J.H. Kersten

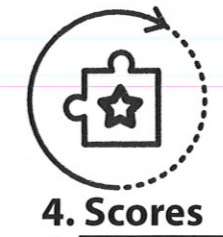


1.
Increase the customability, with the current production volume, a stronger niche can improve sales.
Goal/Style/ ^{Smart} ~~Light~~ as ~~Heavy~~ Comfort

3. Relation Grades ↓

2.
~~Increase~~ the ~~Decrease~~ the amount of distracting components. You want to have your product screen safety

X.
Increase the customer loyalty, make them stick after the first sale



Business Changes	Relation Grades	2.	X.	Scores
1. ^{create modulation cycles} branches of new branches branches offer a market opportunity	High	High	Medium	21
2. Replace parts when our requirements change Collaborate with a partner	High	Medium	Low	13
3. Sell cycles, which can decrease work into sales	High	High	Medium	21
4. Scorecard / Reviews			High	9
5. Design for Disassembly / Repair	High	Medium	Medium	15
6. Simplify assembly Process	Medium	Low	Medium	7
X.				

Phase 2 Mapping your Business Model

5. Stakeholders	6. Benefits	7. Importance Grades	9. Relation Grades	1.	2.	3.	4.	5.	X.	
Governmental	1. Cyclists that don't kill themselves driving (Higher world ranking!)	Low	Low	The headphones last for one day on laptop	Aside from the leather headrest and cushion, the material is fully or mainly made out of plastics	The headphones is covered with a standard audio-job	The "wooden pattern" can be exchanged for another customisable pattern	The casing is a little bulkier.	The sound-reproduction system allows you to hear specific sounds, bass and thus!	
		Medium								Medium
		High								Medium
Society	2. Less dents in their cars / less young family members crashes	Low	Low	The headphones last for one day on laptop	Aside from the leather headrest and cushion, the material is fully or mainly made out of plastics	The headphones is covered with a standard audio-job	The "wooden pattern" can be exchanged for another customisable pattern	The casing is a little bulkier.	The sound-reproduction system allows you to hear specific sounds, bass and thus!	
		Medium								Medium
		High								Medium
Customers	3. To legally drive around with some drunk music	Low	Low	The headphones last for one day on laptop	Aside from the leather headrest and cushion, the material is fully or mainly made out of plastics	The headphones is covered with a standard audio-job	The "wooden pattern" can be exchanged for another customisable pattern	The casing is a little bulkier.	The sound-reproduction system allows you to hear specific sounds, bass and thus!	
		Medium								High
		High								Low
Suppliers and Partners	4. To deliver more parts	Low	Low	The headphones last for one day on laptop	Aside from the leather headrest and cushion, the material is fully or mainly made out of plastics	The headphones is covered with a standard audio-job	The "wooden pattern" can be exchanged for another customisable pattern	The casing is a little bulkier.	The sound-reproduction system allows you to hear specific sounds, bass and thus!	
		Medium								High
		High								High
Investors	5. To reduce the risk / have a more steady income	Low	Low	The headphones last for one day on laptop	Aside from the leather headrest and cushion, the material is fully or mainly made out of plastics	The headphones is covered with a standard audio-job	The "wooden pattern" can be exchanged for another customisable pattern	The casing is a little bulkier.	The sound-reproduction system allows you to hear specific sounds, bass and thus!	
		Medium								High
		High								High
	X.									

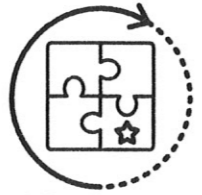
8. Business Features

7. Importance Grades

9. Relation Grades

10. Scores

9	11	90	11	36	154
---	----	----	----	----	-----



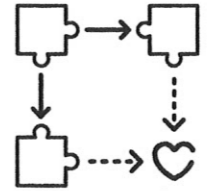
12. Scores

756
117
282
54
45
14



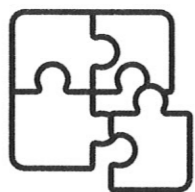
11. Relation Grades

High	High	High	High		
	High				
	Medium	High			High
				Medium	Medium
low			Low	low	
			low	low	



2. Business Changes

1. The headphones test for a day
2. Aside from the leather headrest
3.
4.
5.
X.



8. Business Features

1.	2.	3.	4.	5.	X.
----	----	----	----	----	----

② Hajo

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1	2	3	4	5
I wouldn't. I keep the business as it is				Very likely to pursue a change

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

~~Create modular~~ ~~Modular Design~~, ~~Product Service Systems~~
 Create modular systems, Sell products, Collaborate with a partner

How many of the stated changes would you consider pursuing?

(Write a number)

4

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1	2	3	4	5
None are to my liking				I definitely would use a method

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

Modular Design, Product Service Systems, Branding

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

Aerospace Engineering

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

Nope

Did you experience any difficulties with the case study description?

It lacked some detail regarding supplies

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

That I did not finish reading the slide

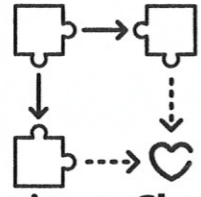
Did you experience any difficulties with the use of the 'Change Diagram'?

None

Appendix D.5: Materials of Participant 3

Referred to from Chapter 7

Phase 1 Identify Improvements



1. Increase number of employees
~~Increase number of employees~~



Less
As ~~increase~~
lower need
for expertise

2. Higher feedback from customers and stakeholders.

Get it
Find a investor that will invest

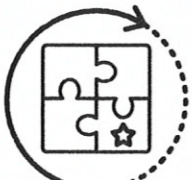
X. Clear marketing plan
Improve
Create differentiation

Reduce possible features or ~~hardware~~ noise technology
Reduce few lens on headphones
(Reliability for investors and customers)



2. Business Changes	3. Relation Grades		X.		4. Scores
1. Increase number of employees Get Getting involve with communities	low	low	High	low	15
2. Clear differentiation	low low	None	Medium	low	5
3. Create a marketing plan	Medium	None	low	Medium Medium	7
4. Reduce Find modularization and chain production	None	low	None	Medium	7
5. Get insurance	None	low	None	low	2
6.					
X.					

Phase 3 Linking the Present to the Future



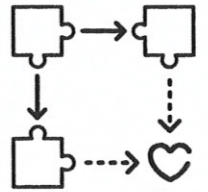
12. Scores

17
10
10



11. Relation Grades

H		L	M	M		
			H			
H						



2. Business Changes

1.
2.
3.
4.
5.
X.



8. Business Features

1.	2.	3.	4.	5.	X.
----	----	----	----	----	----

③ Roberto

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1	2	3	4	5
I wouldn't. I keep the business as it is				Very likely to pursue a change

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

- Clear differentiation

How many of the stated changes would you consider pursuing?

(Write a number)

3

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1	2	3	4	5
None are to my liking				I definitely would use a method

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

If would research into modularisation, branding

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

Computer Science

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

No.

Did you experience any difficulties with the case study description?

~~Explained~~ Concepts could be a bit easier to understand.

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

Yes. Sometimes it can be confusing as concepts can be seen as closely related.

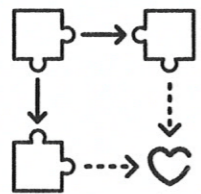
Did you experience any difficulties with the use of the 'Change Diagram'?

Diagram is clear. 😊

Appendix D.6: Materials of Participant 4

Referred to from Chapter 7

Phase 1 Identify Improvements



1.
 (A) Make the size smaller (of the batteries & the car-piece)
 ⇒ Increase venture with e-commerce retailer like Bob.com
 (B)

3. Relation Grades
 (A) low (1) (B) Medium (3)



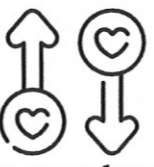


(C) The batteries last for more than one day.
 (D) Research in drawing wireless systems with combined battery for filter & headset.
 (E) Have two versions of the product. Increase the choice

(F) ⇒ Increase research in audio-filtering, like storing recent traffic noises saved & amplify when necessary.
 (G) ⇒ More customizing in terms of daily usage or environment used.

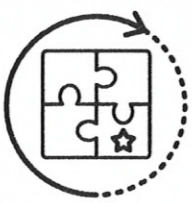


1. Expenditure on customer relations & marketing	(A) low (1)	(B) Medium (3)	(C) low (1)	(D) low (1)	(E) High (9)	(F) low (1)	(G) Medium (3)	19
2. Further research phase after opportunity framing. Re-iterative research phases.	(A) High (9)	(B) low (1)	High (9)	High (9)	High (9)	High (9)	Medium (3)	49
3. Maybe look for growth opportunities by expansion or venturing with prospective relations	(A) Medium (3)	(B) High (9)	Medium (3)	low (1)	Medium (3)	low/medium (1) (3)	High (9)	29/31
4. Forecasting the beach-head market & prospective diffusion strategies.	(A) Medium 3	(B) Medium 3	Medium 3	High 9	Medium 3	Medium 3	Medium 3	27
5. Maybe looking at niches within headphone industry. Headphone Alexa?	(A) High 9	(B) low 1	low 1	Medium 3	low 1	Medium/High (3) (9)	High 9	27/33
6.								
X.								

Phase 2 Mapping your Business Model

5. Stakeholders	6. Benefits	7. Importance Grades	9. Relation Grades	2.	3.	4.	5.	X.
 music enthusiasts / niche users	 1. Exclusiveness (high) * spreading word (low) (center of attention) * Getting / influencing (medium)	 Low Medium High	 8. Business Features → 1. Customization of the device for different environment & physical. 9. Relation Grades High (9)	Increased customer outreach & relations.	joint ventures with other companies & stores.	Increasing circularity in economy / Reducing carbon footprint on recyclability.	further Research in batteries, size of the product, device updates & new versions	
Normal consumers / masses	2. Better electronics (medium) broad music / added features at lower costs	Low Medium High	Medium (3)	High (9)	Medium (3)	Low (1)	High (9)	
Incumbents / cell phone companies / store owners	3. New market collaboration on new technology getting fresh ideas & increasing revenue	Low Medium High	Low (1)	Medium (3)	High (9)	Medium (3)	High (9)	
Drivers (motorists) governmental / environmental	4. Increased safety lower smartphone usage in streets Recyclability	Low Medium High	High (9)	Low (1)	Low (1)	High 9	Low (1)	
cyclists / fitness fanatics	5. Increased connections / awareness of surroundings	Low Medium High	Medium (3)	High (9)	Low (1)	Medium 3	Medium (3)	
Inventors	X. New revenue stream & prospective market new technology acquisition	High Low	Medium (3)	Medium (3)	High (9)	High 9	High (9)	
		 10. Scores →	28	32	24	26	34	

Phase 3 Linking the Present to the Future

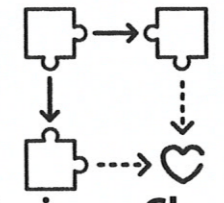


12. Scores



11. Relation Grades

Low. (19 x 1)	High (19 x 9)	Medium (19 x 3)	Low. (9 x 1)	Low. (19 x 1)	
High (49 x 9)	Low 49	High 49 x 9	High 49 x 9	High 49 x 9	
Low. 29/31 x 1	Low. 29/31	High (29/31) x 9	Low. (29/31) x 1	Medium. 29/31 x 3	
Medium 27 x 3	Medium. 27 x 3	Medium 27 x 3	Low. 27 x 1	High 27 x 9	
High. (27/33) x 9	Medium. (27/33) x 3	High. (27/33) x 9	Medium. (27/33) x 3	Medium (27/33) x 3	



2. Business Changes

1. expenditure on CRM.
- 2.
- 3.
- 4.
- 5.
- X.



8. Business Features

1.	2.	3.	4.	5.	X.
----	----	----	----	----	----

④ Abshay

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1 I wouldn't. I keep the business as it is	2	3	4 ✓	5 Very likely to pursue a change
--	---	---	--------	--

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

Research & opportunity framing.

How many of the stated changes would you consider pursuing?

(Write a number)

4

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1 None are to my liking	2	3	4	5 ✓ I definitely would use a method
-------------------------------	---	---	---	--

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

Modular design & branding are needed to go in the required or desired direction

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

MSc - SET.

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

Designing microfluid systems.

Did you experience any difficulties with the case study description?

No

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

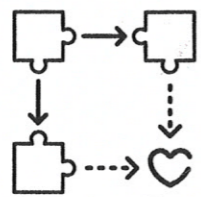
A little bit

Did you experience any difficulties with the use of the 'Change Diagram'?

No.

Appendix D.7: Materials of Participant 5

Referred to from Chapter 7



1. ^{expertise.} more employees with. ~~testing~~ even if you don't have the budget in the beginning, you will have a payback once the sales will be increased since there would be a guarantee of your product's quality



2. spend more time in the full development of your product and not selling prototypes which may mal function within 2 years since. This will affect your company's reputation

X. define better the target group. trying to develop a product desirable by all the ~~potential~~ stakeholders. involve the risk of low demand, ~~if you develop~~ ^{for example} ~~product targeting~~ ~~the target~~ ~~group of specific groups of people~~ ~~instead of everybody.~~ ~~can help you to focus on~~ ~~specific characteristics and convince them to buy even if the need.~~



1. Collaboration → collaborate with specialists	High	High	Medium	9+9+3 = 21
2. material adjustment. use and design	High	High.	Medium	9+9+3 = 21
3. Services → define better the delivery of value	Non.	Non	High	9
4. packaging & Transport.	Non	Non	Non.	0
5. Design for disassembly.	High	High	Non	9+9 = 18
6.				
X.				

⑤ Mary -

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1	2	3	4	5
I wouldn't. I keep the business as it is				Very likely to pursue a change

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

Services - Change delivery of value

How many of the stated changes would you consider pursuing?

(Write a number)

1, 2, 3, 5

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1	2	3	4	5
None are to my liking				I definitely would use a method

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

Construction management

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

No

Did you experience any difficulties with the case study description?

No

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

Maybe writing about the business features. It wasn't clear to me if I should define which are the most important ones

Did you experience any difficulties with the use of the 'Change Diagram'?

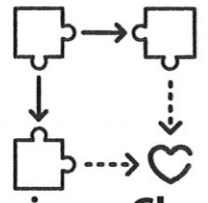
No -

according to my opinion
So maybe write
I definition

Appendix D.8: Materials of Participant 6

Referred to from Chapter 7

Phase 1 Identify Improvements



1.
 Increase awareness at the cyclist of the danger of isolation of sounds during cycling

3. Relation Grades ↓

2.
 Increase knowledge in your company




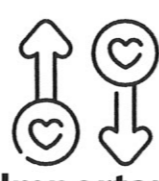

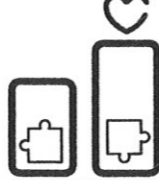
X.
 Recognise quality



1. Collaboration	Medium	Medium	Low Non	6
2. Material adjustment (recycled material)	Non	Non	Low	1
3. Simplifying use of product	Non	Non	Low	1
4. Focus on the outcomes you want to provide instead of product means	Medium Non	Non	Medium	3
5.				
6.				
X.				

6

Phase 2 Mapping your Business Model

 <p>5. Stakeholders</p>	 <p>6. Benefits</p>	 <p>8. Business Features</p>	 <p>7. Importance Grades</p>	 <p>9. Relation Grades</p>				X.
Headphone user in traffic	1. Better sound experience		Low Medium <u>High</u>	non	non	non	Low	
	2. Safer to join the traffic		Low <u>Medium</u> High	High	non	non	non	
Pelt Municipality	3. Less accidents		Low Medium <u>High</u>	High	non	non	non	
Investors Other potential users (Army, workers)	4. Less unnecessary car damage		Low Medium <u>High</u>	High	non	non	non	
	5. Safer work environment		Low Medium <u>High</u>	High	non	non	non	
	X.			36	0	0	3	
			 <p>10. Scores</p>	36	0	0	3	

1. Giving the right sounds when danger situation is being near by

2. Redesign design that the headphone and can handle a fall of 2,5 meter

3. Light weight of 200 gram

4. Switch on, switch off when you for the special noise cancelling

8. Business Features

6. Benefits

5. Stakeholders

9. Relation Grades

7. Importance Grades

6. Benefits

5. Stakeholders

10. Scores

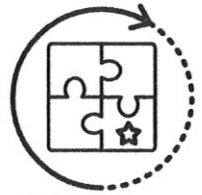
10. Scores

6. Benefits

5. Stakeholders

Phase 3 Linking the Present to the Future

Improvement Identifier Canvas
by M.J.H. Kersten



12. Scores

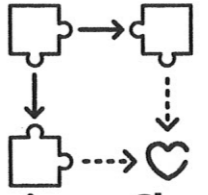
6x5

30
2
3
36



11. Relation Grades

Non Medium	Low Low	Low Low	non		
non	Low	Low	non		
non	non	non	medium		
medium	medium	medium	medium		



2. Business Changes

1.
2.
3.
4.
5.
X.



8. Business Features

1.	2.	3.	4.	5.	X.
----	----	----	----	----	----

Closing Questionnaire

The following questions are for at the end of the test. You can fill it in after you have taken step 12 of the 'Improvement Identifier'.

For the first questions stay in the role of a decision maker at the startup.

How likely would you be to pursue one of the changes you stated at step 2?

1	2	3	4	5
I wouldn't. I keep the business as it is				Very likely to pursue a change

What change would you be most likely to pursue?

(Write down what you wrote at step 2 of the canvas)

~~Focus on the outcomes you want to provide, instead of the product~~ Collaboration

How many of the stated changes would you consider pursuing?

(Write a number)

2

Flip-over the 'Change Diagram' and have a look at the methods of realisation related to the changes you stated.

Would you consider choosing any of these 'methods of realisation', if you would be proceeding with changes to your startup?

1	2	3	4	5
None are to my liking				I definitely would use a method

What would be the next steps you would take for your startup?

If you are interested in a 'method of realisation', add how that method would factor into the future?

Increasing awareness of the danger to use noise cancelling headphones without the technology

The next questions are for you personally. You can step out of the startup role.

What is your field of study?

Civil Engineering

Do you have previous experience with environmentally conscious design?

If yes, please elaborate.

No

Did you experience any difficulties with the case study description?

No

Did you experience any difficulties with the use of the 'Improvement Identifier' instructions?

Yes, because No

Did you experience any difficulties with the use of the 'Change Diagram'?

Yes, because the grading is very subjective and there are no rules. Why a topic is better related than the other