

Design Innovation Methods

Individual assignment

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Original project: Handy

Handy is a physical digital hybrid game created for children between the ages of 8 and 12. It teaches children the Dutch sign language. Children can play the game in groups, but can also play it together online. It can be played in a group on one product, or apart if every player has a Handy. Kentalis en Nederlands Gebarencentrum helped in our research to build Handy.

Handy has built in motion tracking to check if the players do the signs correctly. For motion tracking it uses Pyxy3D, which is a python package used on a Raspberry Pi Pico for 3D rigging.

Handy is sold via its own website.

The game starts by showing a few signs which the children can learn, by images of the signs together with the corresponding words. After some time, the game starts. When it shows a word, the player has to do the sign. When the sign is incorrect, it will show the correct sign and the player has to do the sign correctly to still be able to score some point. Points are given based on how long it takes for a player to do the sign correctly. The player with the most points wins the game.



Fig 1 Handy

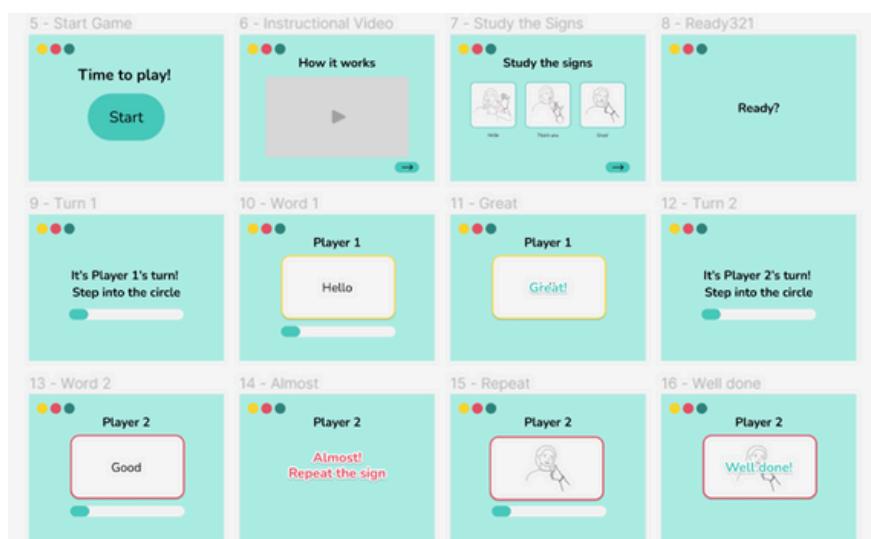


Fig 2 Handy wireframes

Business model canvas

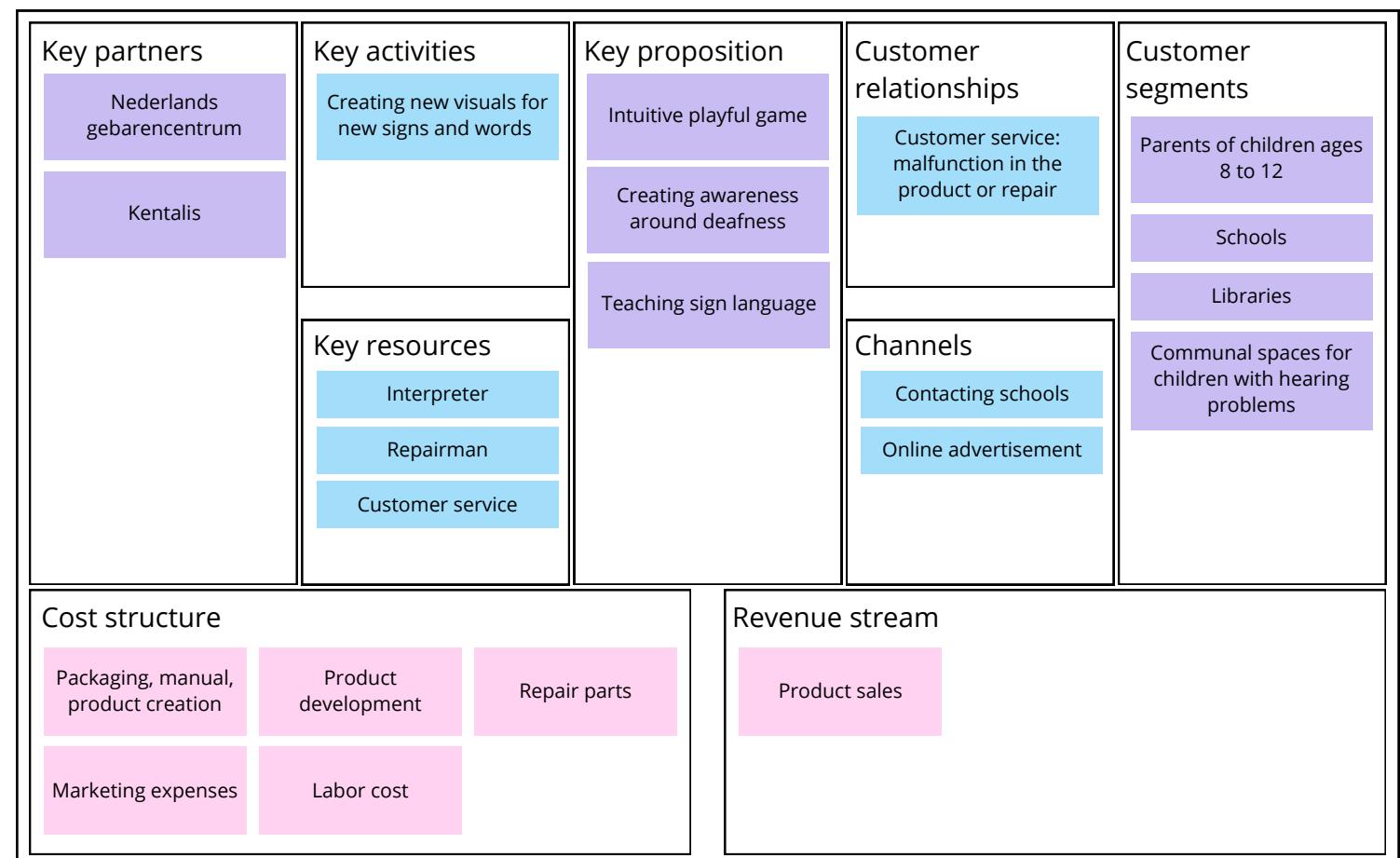
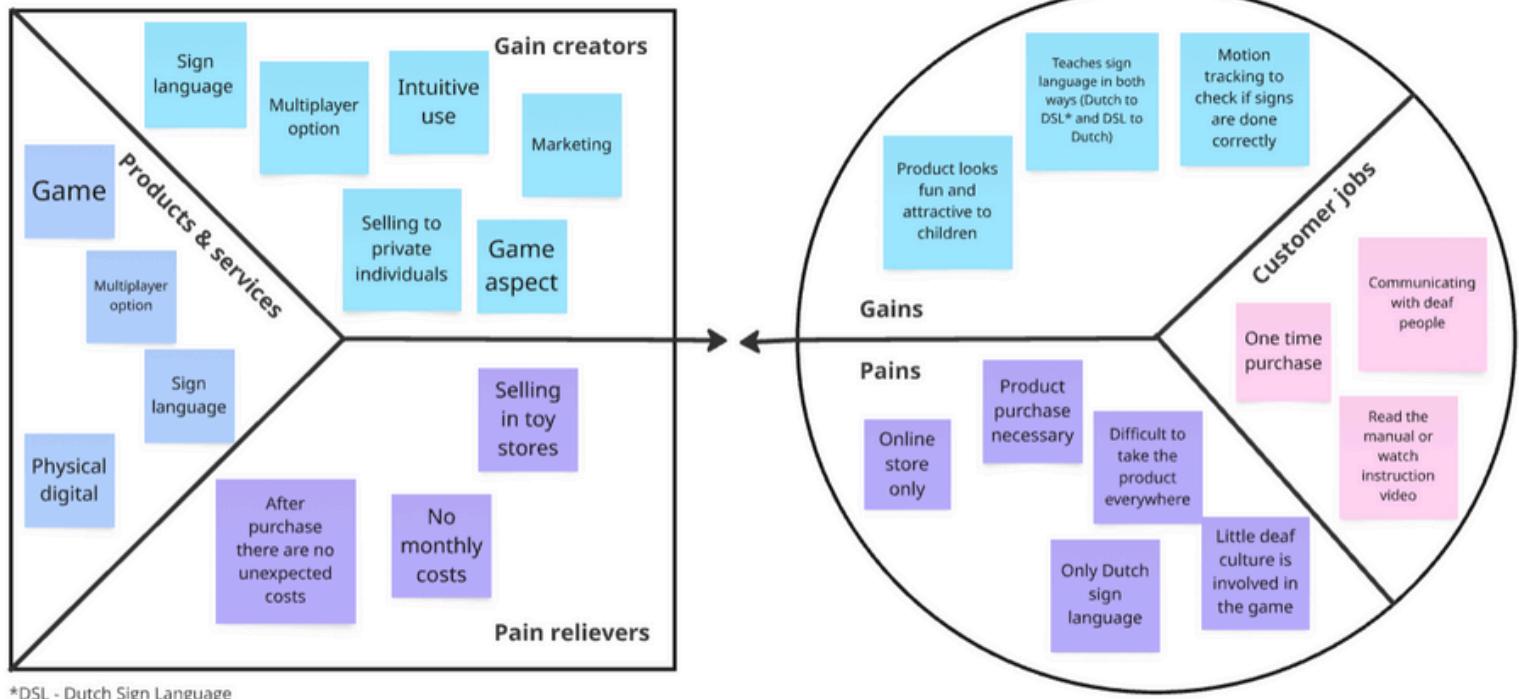


Fig 3

User and market analysis

Value Proposition Canvas



*DSL - Dutch Sign Language

Fig 4

SWOT analysis

Strengths	Weaknesses
From sign to word AND the other way around Teaching sign language in a playful manner	Only one sign language Not available as an app on smartphones The game would not work as effectively for languages other than sign languages Expensive
Opportunities	Threats
Expanding to more sign languages There are few sign language learning tools available	Creating an app so the game can be played remotely Competition like Duolingo Not enough interest in learning sign language

Fig 5

Evaluation

Handy currently only teaches one sign language. By adding multiple sign languages, Handy could be used in many more countries and gain many users.

Since the product is quite expensive, it is not likely that many individuals will buy the product. Creating an app that has most of the same functions as the product would make it more affordable for individuals since a lot of the production and labour costs can be saved. Handy is now aimed at children ages 8 to 12. By aiming at people ages 8 and older and adding more languages, the market segment increases a lot and Handy can gain many customers.

Market segmentation

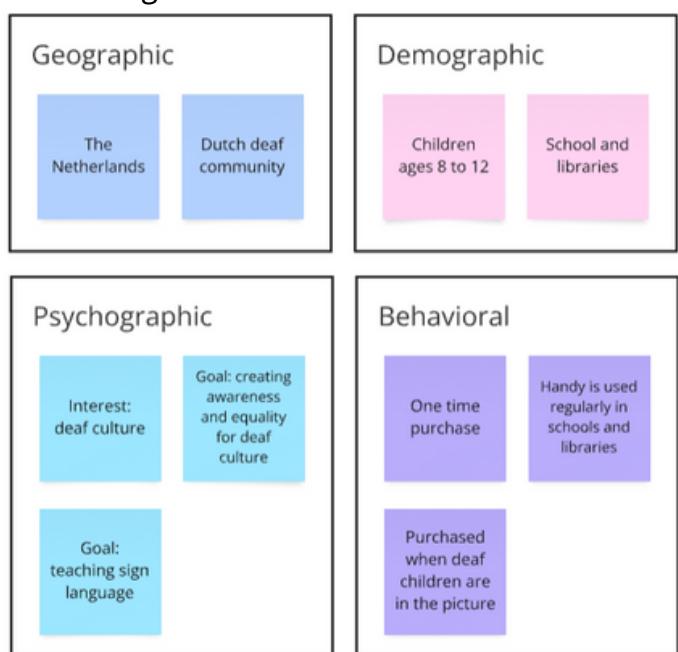


Fig 6

Technology and IP analysis

Competitor analysis

Competitor	Price	Playfulness	Social aspect	Aesthetics	Sign Language	Characteristics	# Languages
Handy	Bad	Good	Good	Neutral	Yes	Sign language. From word/sentence to sign AND the other way around. Checks if signs are done correctly using motion tracking techniques.	1
Duolingo	Good	Good	Neutral	Good	No	Quick and playful. Listening, speaking, writing.	43
Babbel	Neutral	Neutral	Neutral	Good	No	Classes with human instructors. Flashcards, speaking, writing, listening, grammar.	14
Memrise	Good	Neutral	Neutral	Neutral	No	Video examples. Language courses. Setting specific goals.	8
ASL app	Good	Neutral	Bad	Bad	Yes	Sign language. Video examples of how to do the signs.	1

Fig 7 (Duolingo, n.d.), (Memrise, n.d.), (Babbel GmbH, n.d.), (The ASL App, n.d.)

Colour	Meaning
Green	Good
Yellow	Neutral
Red	Bad

Evaluation

The competitor analysis shows that most successful competitors teach many different languages but often do not teach sign language. Playfulness and competitiveness make Handy and Duolingo outstanding and appealing for children.

Handy is the only language learning tool among these main competitors that uses motion tracking techniques to check whether signs are done correctly. Other apps use speech, which is not applicable to sign language and is an easier technology than motion tracking. However, it is questionable if the quality of this motion tracking technique is worth it and if its price negatively affects the product sales.

Design and prototyping analysis

The main problem for Handy is that it is not appealing for private individuals to purchase the product. It is expensive when compared to language teaching apps. Besides, it does not have functions like notifications and portability that mobile apps provide. It can also only teach one sign language, which is very limited and results in limited market options.

To solve most of the problems, my advised solution would be to make Handy an app which uses the smartphone camera for motion tracking. More sign languages can be added so the app can be used by many more people than just children in the Netherlands. Figure 8 shows a mock-up of what the app could look like.

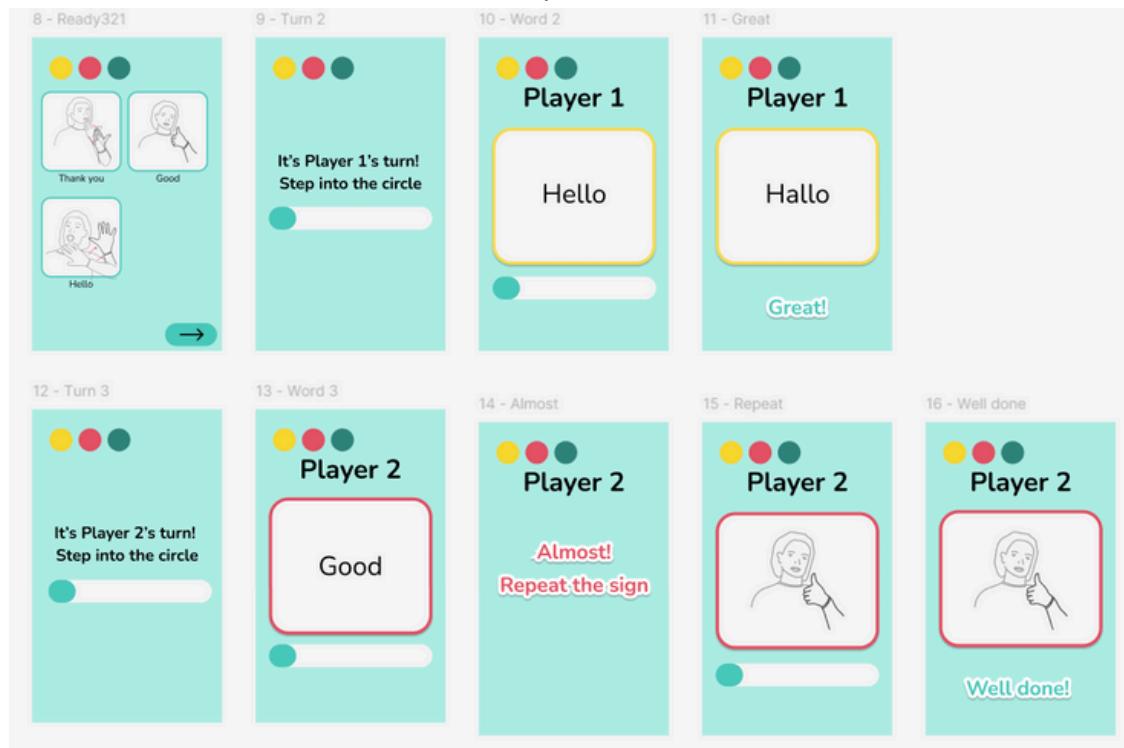


Fig 8 app design

Problem-solution fit canvas

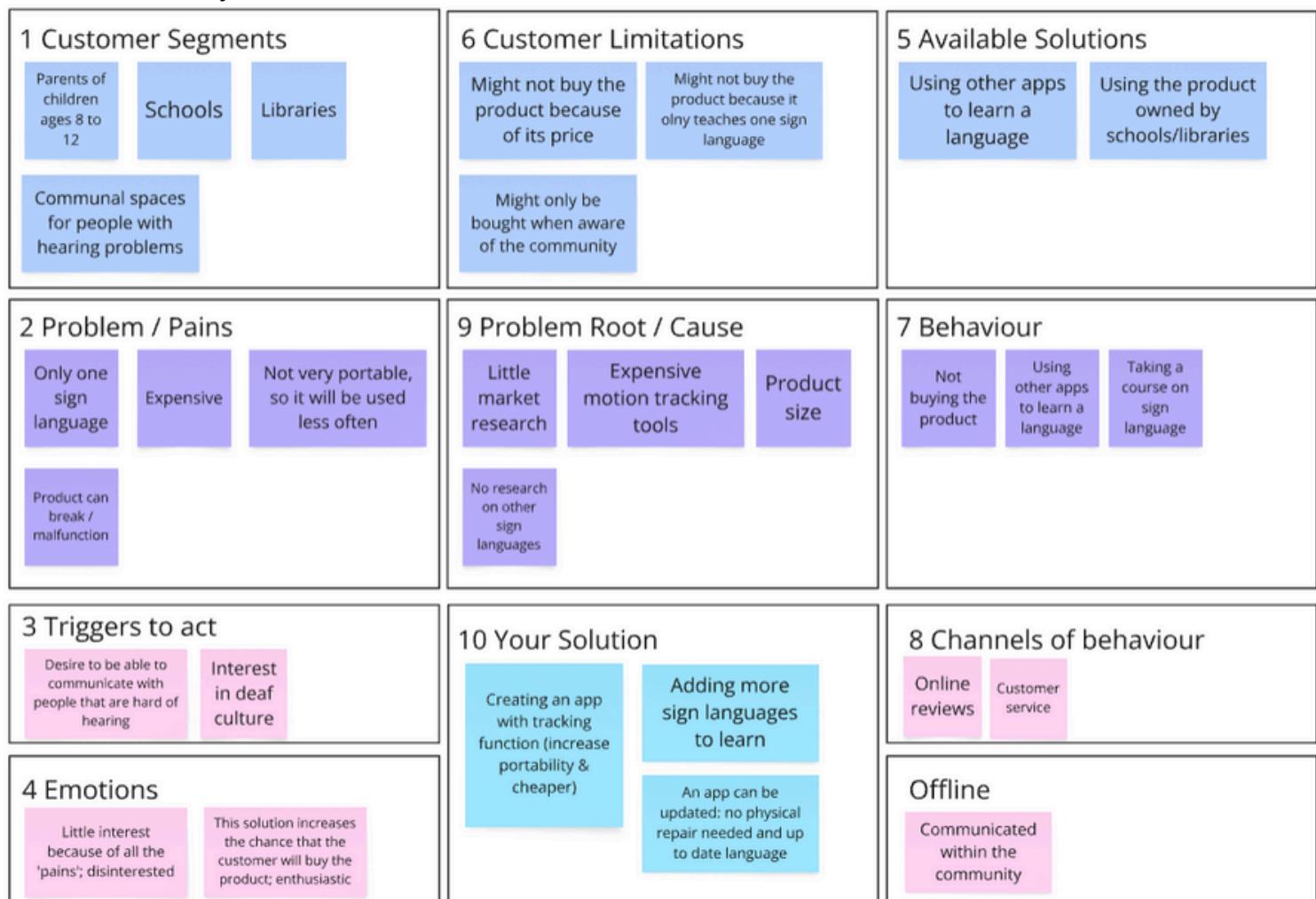


Fig 10 (Nepriakhina, 2019)

Minimum viable product experiment

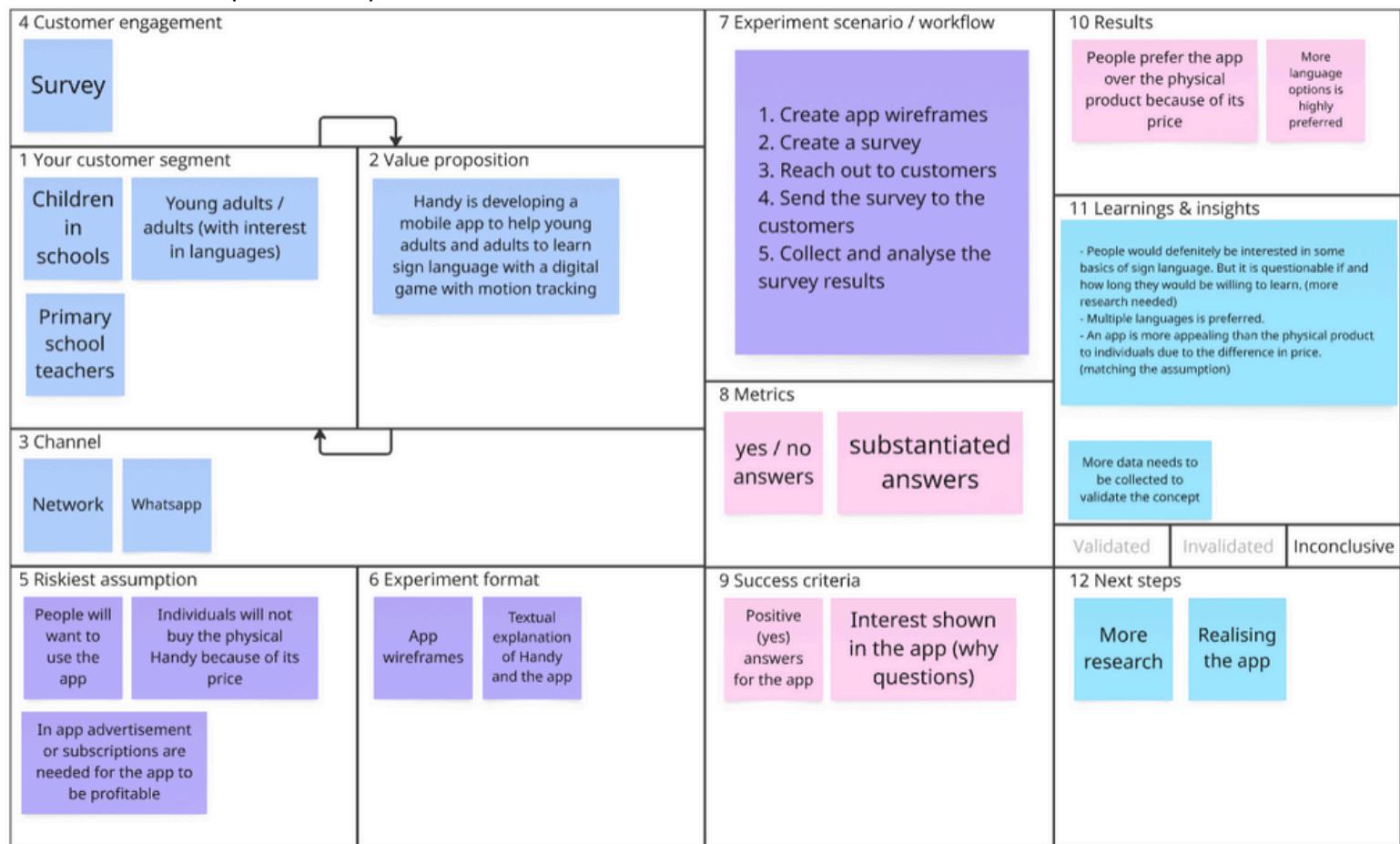


Fig 9

Evaluation

The physical version of Handy can still be used in schools and libraries, for which the price of Handy is not an issue. But the additional app will make it more affordable and appealing for private individuals to use. This broadens the customer segment and will increase revenue.

Even though more research needs to be done to validate the Handy app, it seems that it would have a good added value when adding multiple languages.

Organization and finance analysis

Future cone

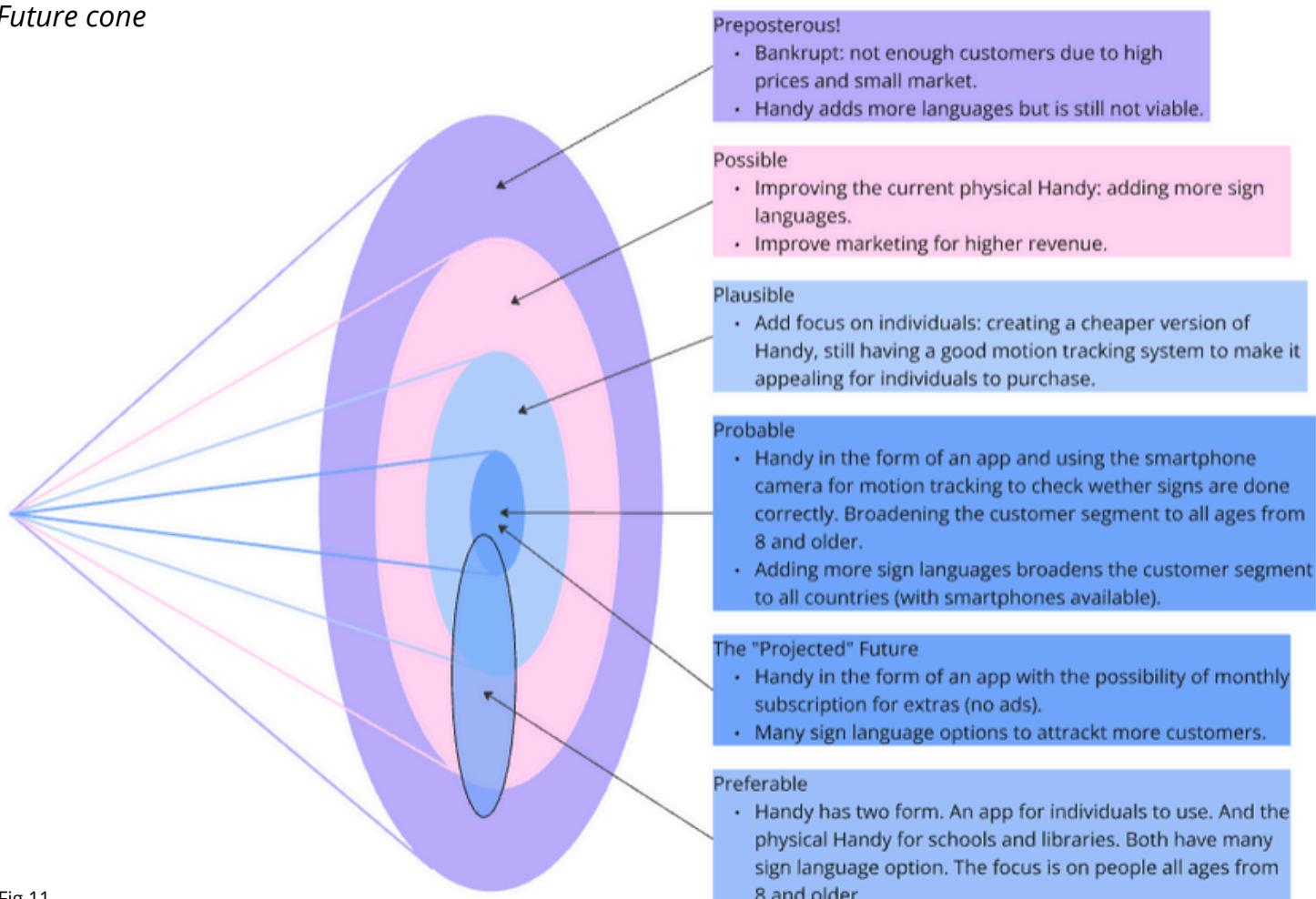


Fig 11

Stakeholder onion map

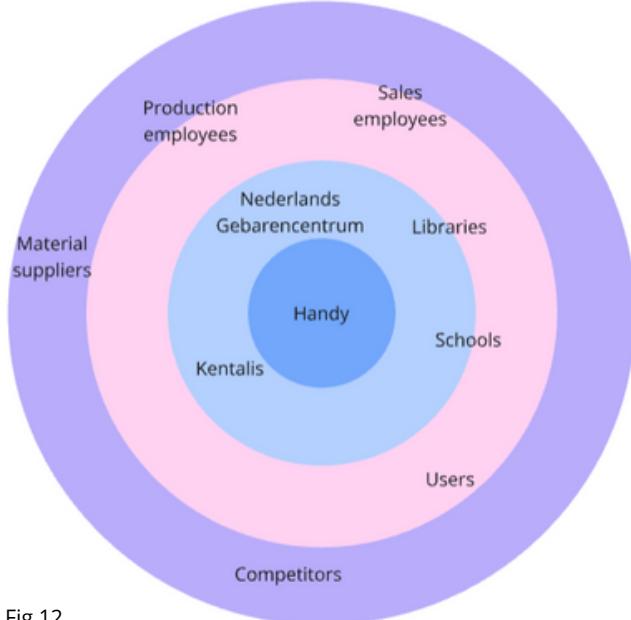


Fig 12

Evaluation

The most optimal path to develop Handy is creating two versions for Handy. To create awareness of deaf culture it would be a great opportunity to collaborate with schools and libraries, since these are places that are all about learning and language. Schools and libraries can purchase or rent the physical Handy. Reaching out to schools and libraries would be the main marketing focus. When children get in touch with sign language there, they can continue learning it using the mobile app.

The stakeholder onion map (fig 13) also shows Kentalis and Nederlands Gebarencentrum. Collaborating and sharing knowledge with them is important for community, research, education and an updated dictionary. Kentalis is also very helpful for product development and marketing.

Proposition

Redesigning the product / service / business model

Most opportunities for Handy lie in adjusting the product and business model. The main aspects that can greatly influence the amount of customers are portability, price and language options.

Two versions of Handy would be optimal. The physical product can be used in schools and libraries. The other version is an app that can be used by private individuals.

The **physical Handy** will be for schools, libraries and deaf communal spaces. The higher cost for the physical product is not a problem for these customers. It aims to create awareness of deaf culture and can stimulate people to start using the app to learn more sign language. So it will also play a role in marketing. This can be done in collaboration with Kentalis, libraries and schools.

The **Handy app** uses motion tracking technology that mobile phones nowadays have. Although this will decrease the quality, it does save a lot of labour costs and materials. Besides, it is no longer necessary to have packaging, a physical manual and repairmen, which also saves a lot of money. This will also result in lower costs for the customer. This will make it more appealing for private individuals. The customer segment for the app is people of all ages from 8 years and older. Because of the added language options, it can be used in all countries where smartphones and WiFi are available. An app also creates the opportunity to update the app with new technology, new vocabulary and new visuals. A free version of the app would allow users to learn one language and the game would have advertisements. The advertisements would be the main source of income for the free version of the Handy app. An additional subscription can be bought to learn multiple languages and to play the game without advertisements. Further research is still needed to validate the options for the Handy app.

Appendix

The project Handy was created by Megan van Gerwen, Dante Linssen, Jeppe van Broekhoven, Sophie Hulsman and Siebe Nieuwhof. The report is uploaded separately to the assignment.

References

Figure 7

- Duolingo - Learn a language for free @duolingo. (n.d.). Duolingo. <https://www.duolingo.com/info>
- Memrise. (n.d.). Leer een taal. Memrise is authentiek, handig en gepersonaliseerd. <https://www.memrise.com/nl/>
- GmbH, B. (n.d.). About us | Babbel. Babbel GmbH. <https://www.babbel.com/about-us>
- The ASL app. (n.d.). The ASL App. <https://theaslapp.com/>

Figure 10

- Nepriakhina, D. (2019, 8 oktober). The Problem-Solution Fit canvas. - Daria Nepriakhina - Medium. Medium. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe>

Figure 9

- survey results:

For the following questions: imagine being a primary school child

Would you like to play this game with the physical Handy?

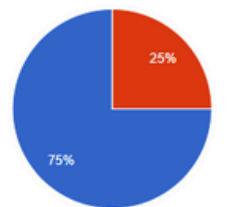
4 antwoorden



Diagram kopiëren

Would you like to play the game outside of school?

4 antwoorden



Why?

4 antwoorden

Als kind lijkt het me leuk dit soort dingen te doen in "spelletjes" vorm

I am curious

it looks fun

Handy looks cool

Why?

4 antwoorden

Er zijn dingen die interessanter zijn als kind, zoals filmpjes kijken of gamen. Ik denk dat dat lastig te verslaan is

I don't attend school

fun game with friends

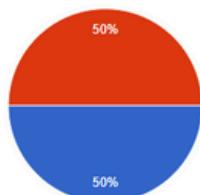
It is fun to communicate in sign language with my best friend because then most people dont understand us

For the following questions: imagine being the parent of a child that played this game in school

Diagram kopiëren

Would you buy this product for your child?

4 antwoorden



Why

4 antwoorden

Ik zou mijn kinderen liever andere dingen leren dan sign language

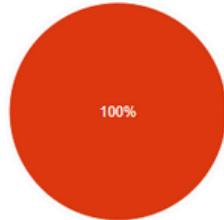
Heel leerzaam

learning languages is good for childrens development. nice that it is multiplayer

Depends on how interested he/she is in it and the price but probably very expensive because of the whole physical robot, apps might do the same..

Would you be willing to pay 100 euros for this product?

4 antwoorden



Why?

4 antwoorden

Ik zou liever 100 euro aan iets anders uitgeven

I never pay such an amount for a game

it is too expensive, not worth it

Same reason as above, 100 is too much, aould consider buying for 50

If Handy would be a mobile app with motion tracking, would you download this app for your child?

4 antwoorden



Diagram kopiëren

Why?

4 antwoorden

Ik zou het misschien wel downloaden, maar ik vraag me af of een kind deze app zou opstarten in plaats van bijvoorbeeld fortnite ofzo

Toegankelijk en altijd bij de hand

good for development, still looks like a nice game to play with friends

Apps are much cheaper and I think the app does the same as the physical handy. Also, my kid usually likes apps for games so I don't see why I would pay much more for a physical one if this also exists

Would you stimulate your child to use the app?

4 antwoorden

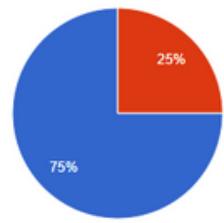


Diagram kopiëren

Why?

4 antwoorden

Ik zou ze eerder wat anders proberen te leren

Because it's a special educational game

good for development

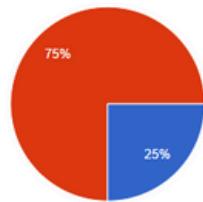
I like the bigger goal of the company, it resonates with my strong inclusivity values

Just like normal languages, sign language also had different languages for different countries. Answer the following questions from your own opinion/perspective.

Do you want to learn sign language?

Diagram kopiëren

4 antwoorden



Why?

4 antwoorden

Ik besteed mijn tijd liever aan het leren van andere dingen (die ik elke dag kan gebruiken)

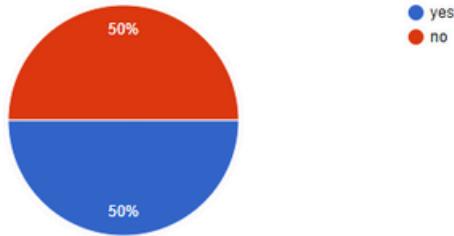
I am learning another language right now

don't know anyone that uses it or is deaf

Some basics of every language is useful

Would you buy a physical product to learn a language?

4 antwoorden



Why?

4 antwoorden

Wederom: ik besteed mijn geld liever ergens anders aan

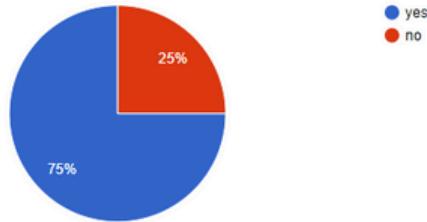
It helps me learn with more ease

probably expensive

But only if i think i will need to Use that language within a few months

Would you buy a physical product to learn a language?

4 antwoorden



Why?

4 antwoorden

Ik leer liever andere dingen

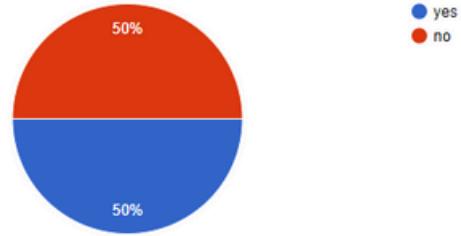
It supports me and you can use the app anywhere

it is fun like Duolingo, easy to use whenever you want

Useful

And if it had only one sign language option?

4 antwoorden



Why?

4 antwoorden

Zie vorige vraag

Inetersting

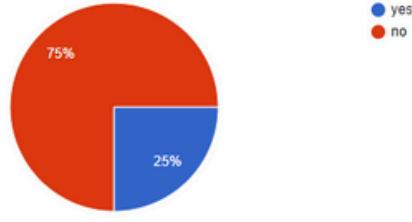
defenitely not worth it if you can only learn one language when it could also teach multiple

If i want to learn sign language i dont need more

Diagram ko

And if it only had one sign language option?

4 antwoorden



Why?

4 antwoorden

Zie vorige vraag

X

after learning the language you would probalby not use it anymore, it is always nice to learn multiple languages

If it is a language that i want to learn