Working Backward Questions

1. Who is the **customer**?

   *Our customer is a **Munich-based citizen** who is digitally affine and uses his / her cellphone regularly. They would most likely be part of the LOHAS[1] (Lifestyle of Health and Sustainability) group, as they are interested in sustainable behaviour and therefore might be keen to learn about recycling and the correct disposal of goods. Our typical customer is between **20 - 60 years old**[2]**.** Our customer's needs include convenience (as they do not have an unlimited amount of time) and transparent information.*

2. What is the customer **problem** or **opportunity**?

   We are trying to solve the following problem:

   TODAY Martha, 40 year old citizen of Munich
   HAS TO spend a lot of time researching for relevant information
   WHEN she wants dispose of trash, broken electronics or other household items correctly and responsibly to combat climate change.

   The challenge:

   How might we reduce the amount of time Martha has to spend on researching for the correct information regarding recycling?

   The ultimate impact we are trying to have:

   We want to create awareness for recycling and motivate more Munich citizens to separate their trash correctly.

3. What is the most important customer **benefit**?

   THE BIG IDEA: Enabling and motivating the citizens of Munich to inform themselves easily about recycling processes of their products, creating awareness for a circular economy.

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[1] IfD Allensbach (2021): Allensbacher Markt- und Werbeträger-Analyse – AWA 2021, cited after de.statista.com, URL https://de.statista.com/statistik/daten/studie/982618/umfrage/umfrage-unter-lohas-in-deutschland-zur-altersgruppenverteilung/, accessed on 10.12.2021

[2] IfD Allensbach (2021): Allensbacher Markt- und Werbeträger-Analyse – AWA 2021

MOST IMPORTANT CUSTOMER BENEFIT: Easy-to-use, fast, and fun way to gain information and education on trash separation through an application at no cost for the customer.

4. How do you know what customers **need or want**?

   Main insights stem from a customer survey, conducted online at the end of October 2021 with 46 participants. The full survey can be found in the appendix.

   The survey results showed that mostly, our target customers receive information on waste sorting through friends and family members (15 respondents), from local waste companies (7) or the internet (6). The main issues they are facing when trying to separate their waste is general uncertainty and lack of knowledge about how and where to dispose of their garbage (7), or that the waste sorting point is too far away from their home (6). According to the respondents, they would be encouraged to sort their waste properly through receiving more information on the impact of recycling or not recycling their products (11), a reward system like coupons, vouchers, or cashback (5), or fun and interesting marketing campaigns (4). In an application, our target customer would like to receive information about how to recycle their waste correctly (10).

   This means for our solution that we need to target the knowledge gap of the Munich Citizens regarding recycling practices and the empower them to act responsibly without having to put a lot of effort in educating themselves.

5. What does the **customer experience** look like?

   Storyboard - Storyline:

   1. Martha wonders how she can dispose correctly of an empty carton of milk. She knows it is not to be recycled as bottles, but is unsure of the materials that the package contains and thus ponders between different choices of bins.

2. Searching information regarding milk carton recycling on the internet is tiresome and time-consuming, and Martha does not have the capacity to invest this time. Moreover, she just moved to Munich and regulations are different everywhere.

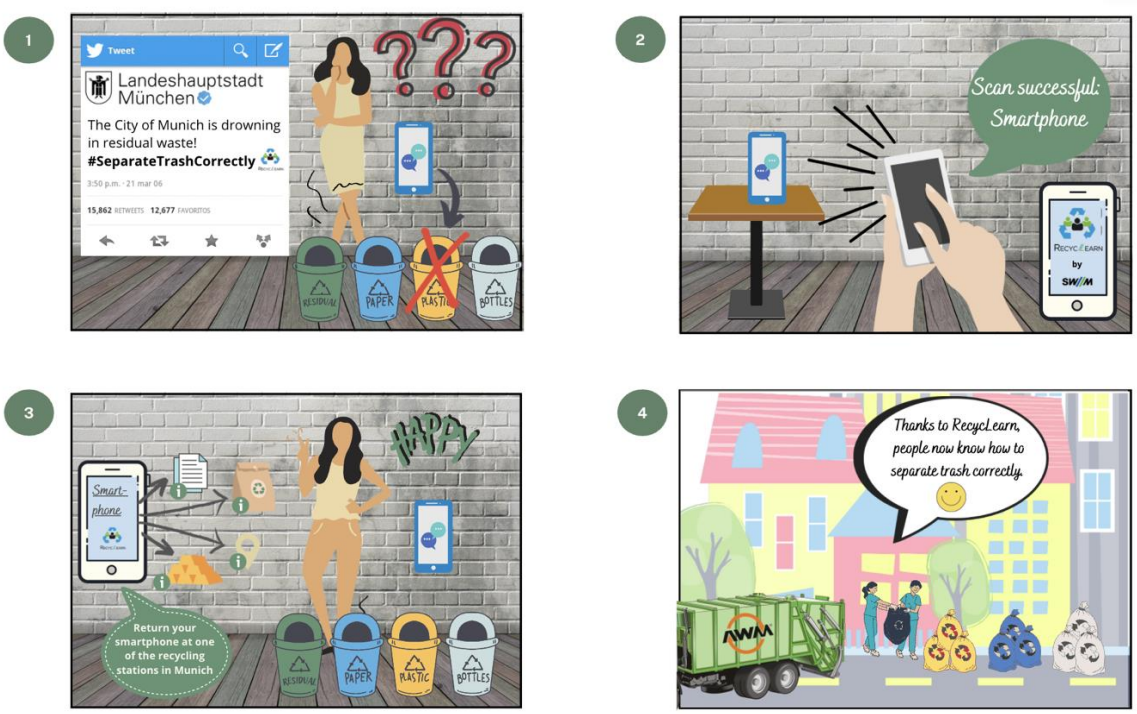
3. Martha is hopeful that there might be an application to support her daily problem dealing with waste. She remembers that a friend of her is working at SWM and thus created an application for smartphones that could help her in the current situation.

4. Martha opens her phone and downloads the application of SWM, called RecycLearn. There is a product scanner included that enables Martha to scan the empty carton by taking a picture with her phone camera. Now the RecycLearn App tells her instantly that the scan was successful and shows that it correctly identified her trash as a package of milk.

5. Right after the pop-up message regarding success of the scanning, a dashboard overview and an information card is shown on the app. By navigating on this dashboard, Martha can access information about the raw materials used in the packaging, information on recycling processes of the product, locations where to recycle this kind of trash or how and where she has to dispose her package of milk correctly.

6. Martha places the empty and dry milk carton into the correct recycling bin, and is very happy due to the easiness and swiftness of the RecycLearn App. Moreover, the dashboard enhanced her knowledge of recycling and how to deal with trash in private household. She will definitely use the scanner again and tell other about her good experience with the App of SWM.

After having done some reviews with the client and Working Backwards Experts, the Storyboard could have been updated. See the new Storyboard in the following:



Storyboard – New Storyline:

1. The city of Munich wants to draw attention to the problem of residual waste being burned and therefore causing CO2 flowing into the air. That's why they are using Twitter in order to ask people to use RecycLearn and therefore enabling citizens to separate trash correctly. And Martha, a Munich based citizen, just read the Twitter post. Now, she feels caught and wants to achieve an impact that's why she wonders how she can dispose trash correctly in private households. With RecyClearn she can avoid tiresome and time-consuming research for information in books or on the internet. Martha simply does not have the capacity to invest that much time.

2. Now Martha downloads the app RecycLearn by SWM. There is a product scanner included that is based on AI to give Martha access to information about the packaging raw materials and about information on recycling processes of the product. She can simply use the Scanner by either talking a picture directly within the app or upload an image from her photo library directly from her phone.

3. She receives a result and Martha can now dispose her smartphone correctly. In this case, the smartphone doesn't belong to household trash bins, but has to be brought to landfills or recycling stations within the city of Munich. By doing so, she is very happy due to the easiness of the RecycLearn App and her small contribution to a clean city.

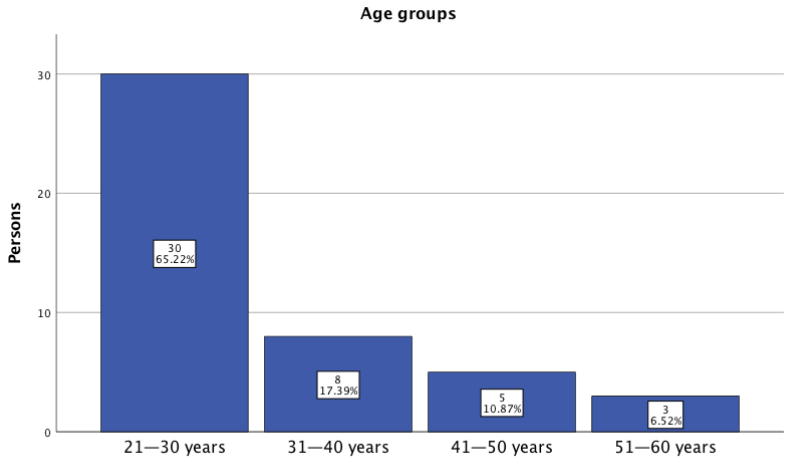
4. As RecycLearn becomes more popular and people are talking about the app, a strong user base within RecycLearn is being created. Sometime later an impact is even visible to AWM and SWM, because it turns out that people are now separating waste correctly and the amount of burned residual waste in Munich is being reduced quiet heavily.

Appendix

Report on customer survey: recycling and your level of knowledge on the separation and treatment of waste

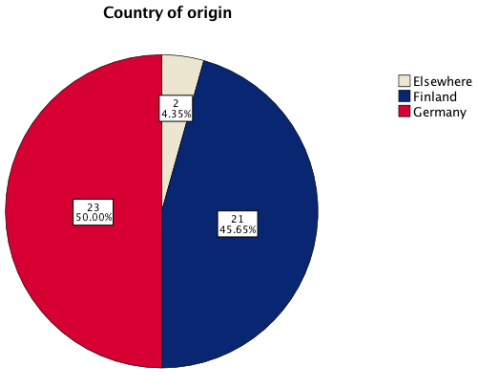
How old are you?

The total count of responses to the survey was 46. Average age of respondents was approx. 31 years, while the median of age of the responders was approx. 27 years. Standard deviation for age was approx. 10 years. Majority of responders were 21—30 years.



Where do you live?

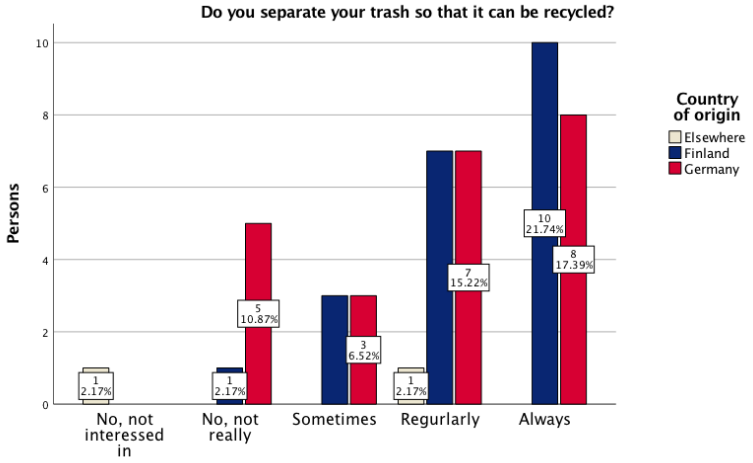
The responses came mostly from Germany and Finland, one response came from Austria, and one came from Thailand.



Do you separate your trash so that it can be recycled?

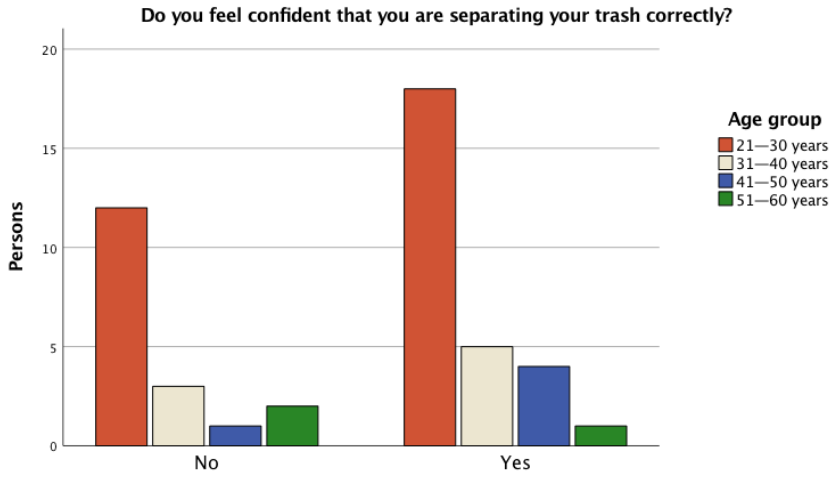
The frequency of separating trashes was on rather high level, and some responders from each age group told that they separate their trash always. One responder from age group 41—50 years old told that recycling did not interest him / her at all.

Trash separation frequency was viewed also through country of origin. Some difference was notable between the country of origin. More responders from Germany said they did not really separate their trash and more of responders from Finland said that they always separate their trash.



Do you feel confident that you are separating your trash correctly?

When asked whether the responders felt confident that they separated their trash correctly, 27 responders answered ‘yes’, and 19 responders answered ‘no’. Only age group that was more unconfident than confident was the group of 51—60 years old.



How did you gain the required knowledge for this (separating trash correctly)?

Respondents have received information on waste sorting in the following ways:

From friends and family members (15)

From local waste company (web pages, flyers) (7)

Google/Internet (6)

Info on product packages (4)

Media (3)

Signs on the trash bins (2)

What are the issues you are facing when trying to separate your trash?

Issues when trying to separate waste:

General uncertainty/lack of knowledge about how/where to sort/dispose garbage (7)

There are no separate bins for the waste, or the waste sorting point is too far away (6)

Time consuming/ need extra effort/ laziness (6)

No space for separate bins at home (6)

One product may have a mixture of different materials (e.g., paper and plastic) (4)

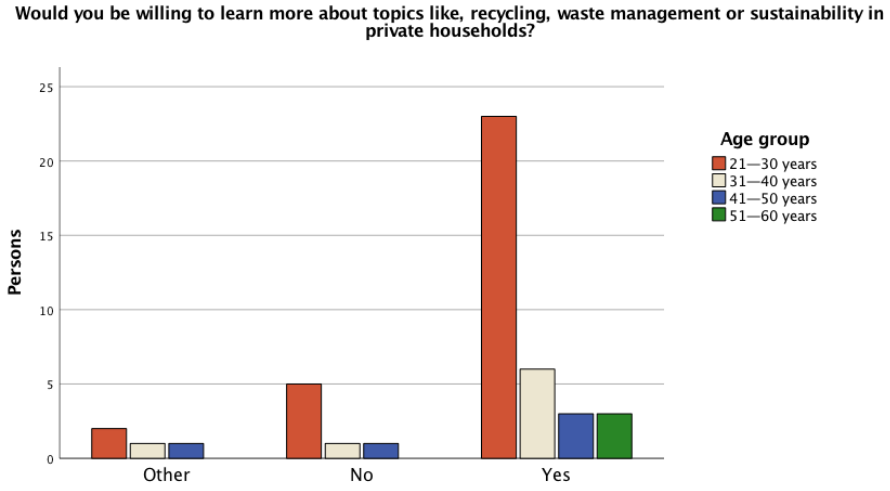
Lack of information about what materials are in the product (3)

Unaware how to handle waste before sorting (2)

Uncertainty about what materials can be recycled (1)

Would you be willing to learn more about topics like recycling, waste management or sustainability in private households?

Willingness to learn more about topics like recycling, waste management or sustainability in private households was stronger than not wanting to learn more about the given subjects throughout the age groups.



On which of the following topics would you like to be more educated?

Regarding the topics responders wanted to learn more about, the following was found:

- 50 % of the responders wanted to learn more about correct separation of waste
- 47,8 % of the responders wanted know locations close by where they can recycle old or broken products
- 37 % of the responders wanted get tips for waste avoidance
- 30,4 % of the responders wanted to know what materials a product itself contains
- 39,1 % of the responders wanted to know what materials product packaging contains
- 45,7 % of the responders wanted to learn more about the recycling process
- 15,2 % of the responders wanted to learn more ways to participate in sustainability projects in their surrounding areas
- 39,1 % of the responders wanted to know more about alternative packaging options
- 54,3 % wanted to know more about the impact of wrong waste separation
- 26,1 % wanted to know more about local and legal regulations
- 39,1 % wanted to learn more about the hazardous and special waste

- 4,3 % wanted to learn about other subjects that remained unnamed

What would be an incentive for you to pay more attention to recycling and proper disposal of old / broken products?

Things that could encourage waste sorting and proper disposal of old/broken products:

Information on the impact of recycling / not recycling (11)

Cashback / vouchers / points / coupons (5)

Fun and interesting information and marketing (e.g., gamification) (4)

Easier recycling (e.g closer locations of sorting points) (4)

Feedback / scores (3)

Challenges with family/friends (1)

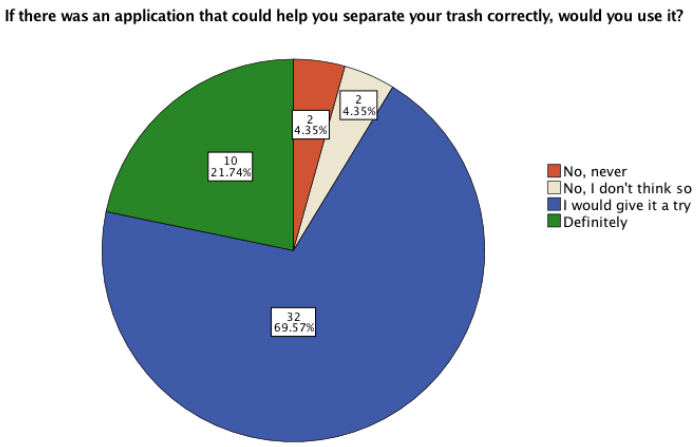
An easy way to check whether the product is recyclable / how product should be recycled (1)

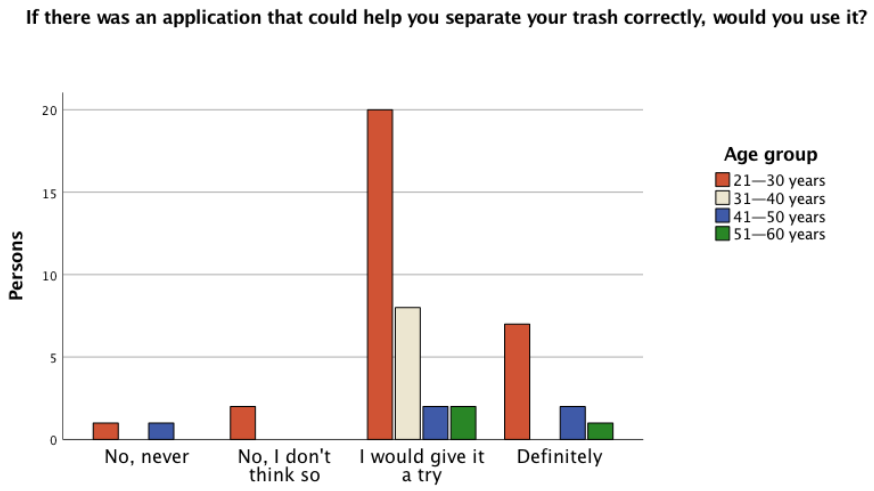
Easier / faster access to information (1)

Information about product materials (1)

If there was an application that could help you separate your trash correctly, would you use it?

Regarding an application that would help separating trash correctly, nearly 70 % of the responders said they would give it a try and nearly 22 % of the responders said that they would 'definitely use' such an application.





What would you want from that application?

Application expectations:

Information about:

- How to recycle and separate the waste correctly (10)
- Location of (nearest) trash station / recycling point (4)
- How to recycle a particular piece of product/package (2)
- What is the type of waste for a particular product / waste categories (2)
- What materials/products can be recycled (1)
- Which materials the product is made of (1)
- How to reuse products (1)
- How to reduce waste (1)
- Local legislation (1)
- Impact of recycling (1)

Functionality / features:

- Easy to use / user-friendly (8)
- Getting information by scanning the product (5)
- User can gain points / rewards by actions (5)
- Quick access information (4)
- Gamification / fun / challenges (4)

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- Pictures / animations / videos (3)
- Good / clear / simply design (3)
- Picture identification (1)
- A tracker for the impact when user recycles products (1)
- Searching tool for products/materials (1)
- Networking / community (1)
- Level system (1)
- Progressive Web App (PWA) instead of mobile application (1)