

Exploration for a more sustainable waste separation and recycling system in Amsterdam

Wahbe Rezek

Industrial Design Engineering, University of Twente
Enschede, The Netherlands
w.rezek@student.utwente.nl

ABSTRACT

This research tries to investigate the current situation of waste separation and recycling in Amsterdam. In-depth conversations are held with professionals in the field of waste and the inhabitants of Amsterdam, in order to get an overview of advantages and disadvantages of the current system and finished and current projects concerning waste.

Then, different behaviour change approaches are explored to come to a sufficient toolkit that might help to design a new waste separation and recycling system that is sustainable, and in which the users are better involved and educated.

Author Keywords

waste separation; behaviour change; design with intent

INTRODUCTION

Sustainability has become a popular term in the past decade, mostly due to the increasing visibility of the worldwide pollution and the greenhouse effect. It has become a part of people's lives worldwide, because many companies and governments are working on decreasing pollution and promoting renewable energy [1-3]. Sustainability is now a broad term that enfolds everything with the purpose to contribute to a cleaner world with less greenhouse gasses and a world that is not dependent on fossil fuels any more.

It is now generally acknowledged that, within sustainability, recycling is a major factor that should be taken into consideration. In the past years, it became obvious that even though recycling might need high investments in the beginning, it is financially very attractive on the long run. Therefore, both in the sense of sustainability and financial benefits, the municipality of Amsterdam started to focus more on waste recycling. In 2015, the municipality was able to separate and recycle 27% of its yearly waste produced by the inhabitants. But in the newly presented plans, Amsterdam wants to separate and recycle at least 65% of its waste by 2020[4]. In order to achieve this, the city is working on a new waste collection, separation and recycling system.

Waste separation

In Amsterdam, one person produces an average of 271.6 kg unseparated waste every year. This is about 73% of the total waste production per person. The other 27% (99.7 kg) is offered in separated materials [5].

This separated stream consists of bulky waste (46%), paper and cardboard (23.5%), glass (18.5%) and metals, textiles, plastic and chemical waste. Those materials are easy to separate and most of them have own containers in every neighbourhood. However, those same materials and products can be found in the unseparated waste stream as well: 110.9 kg of the 271.6 kg unseparated stream consist of bulky waste, paper and cardboard, glass, metals, textiles, plastic and chemical waste [5]. This means that a lot of the easy to separate materials are still not separated by the people of Amsterdam and that the percentage of separated waste can be doubled relatively easy.

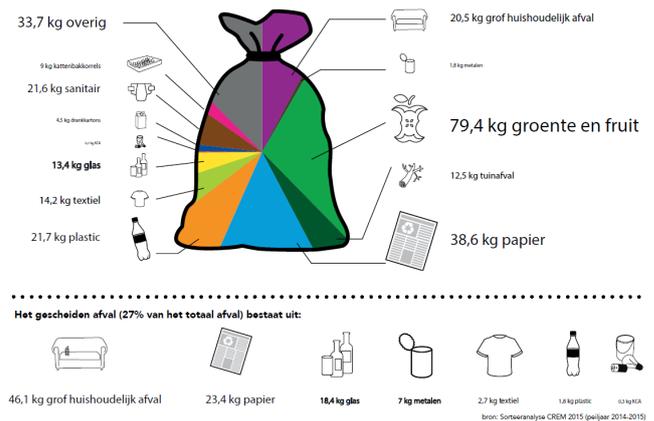


Figure 2. Average waste materials in Amsterdam

Even though there are special containers for paper, glass and textiles, and bulky waste can be brought to one of the 6 recyclecenters in Amsterdam, people still often offer all the different waste materials together, which makes it difficult to separate and recycle afterwards. The reasons why those people don't participate in the waste separation system, are still unclear and may be caused by different factors. However, it is very likely that the lack of knowledge and the ease the people are used to, are playing a major role.

Small recyclecenter

In order to motivate people to separate and recycle their waste more, but also to educate them on the advantages of waste recycling and the sustainability benefits of it, the municipality has created the concept of the small recyclecenters in the neighbourhood.

This concept is inspired by the Retourette in Rotterdam, 'a

place in the neighbourhood where you can bring all your reusable materials and products' [6]. The Retourette has multiple locations, but is always placed nearby a supermarket or other central points. There, one can offer old batteries, paper and cardboard, cans, small electronic devices and many other clean and reusable products and materials. The main rules are that it is small enough to fit in the available wooden boxes and every product or material is put in the right box. When a box is full, it is later transported to a different location where that content can be disassembled, separated and recycled. Both the ease and the location make the Retourette an efficient and accessible concept.

However, the small recyclecenter in Amsterdam should offer more than this. Besides small products and materials, the recyclecenter should also be able to take in bulky waste. In addition, the recyclecenter should be able to educate people, bring people together and above all, motivate people to separate and recycle their waste and become aware of its advantages. If possible, the recyclecenter should also give the opportunity to repair broken products so they can be reused instead of recycled. But how to achieve all this?

METHOD A

In order to fully understand the situation and people's needs, both professionals and the people themselves are approached. This research's purpose is to understand whether a small recyclecenter in the neighbourhood is what is needed to 'solve the problem'.

First, in depth conversations are held with employees and managers of the waste collection, separation and recycling team of the municipality of Amsterdam. The purpose here was to understand the current situation, the developments on waste in the past years and to get an overview of advantages and disadvantages of finished and current projects concerning waste collection and separation.

Second, 7 in depth interviews are held with random people on the streets in Amsterdam. Those people were between 25 and 55 years old. The purpose was to get an insight in people's behaviour, experiences and opinion of the current system. An extra feature here was getting people's advices on how they would improve the system.

RESULTS A

Conversations with professionals

From the conversations with 'the professionals' it became clear that both the municipality and young entrepreneurs

have tried several project pilots in the past 5 years. What is learned from those pilots can be summarised shortly:

- People in Amsterdam are used to a very easy way of offering waste. For years, they were able to offer their waste on their own streets, without separation and with as little effort as possible. Asking them to change this causes incomprehension and resistance.
- More and more people in Amsterdam are becoming aware of the advantages of sustainability and the necessity of waste recycling. However, the majority has still to be provided with information and further educated on this subject.
- Besides education, people can be motivated by financial benefits. Mostly financial benefits for the community seem to be a helpful. Think of saving money for the local soccer team with your waste.

Conversations with people

The in-depth conversations with people on the street started with a brief introduction about the short research and its purpose. The people were asked to tell about their opinion and experiences with waste separation and recycling and the 6 existing recyclecenters in Amsterdam. Finally they were asked to give their advices for a better system. Here are the most important outcomes of those conversation. The number at the end of every outcome refers to the amount of people that stated it:

- Nobody in the streets abide by the rules of the bulky waste collection system. Therefore the street has always a messy and dirty appearance - 7
- More and better information about waste separation and recycling will very likely cause people to be more motivated and willing to participate in it - 6
- The existing 6 recyclecenters are known, but they are reach-less for most people since they are far and one needs a car. In Amsterdam, not many people have cars - 5
- Enforcement can help to change people's behaviour, finally causing people to offer their waste in a more sustainable way - 5

METHOD B

The outcomes of the conversations may show whether the small recyclecenters in the environment may cause more waste to be separated and recycled. However, in case they do, it is important to explore how they might achieve it.

What is needed from a design point of view to encourage people to use those recyclecenters? How to make people have fun when they use them? An exploration is executed in

order to find useful scientific methodologies and models that help to design for behaviour change and motivation.

RESULTS B

For years, there has been a strong distinction between individual cognition (mind, individualistic rational models) and the context (environment, social structuralism theories) when it comes to behaviour change models. Both Clark [7] and Simon [8] illustrated this. However, there should be a space that is a middle ground, where models might combine elements from the individual and contextual spaces, as shown in the ‘Agency divide’ below [9].

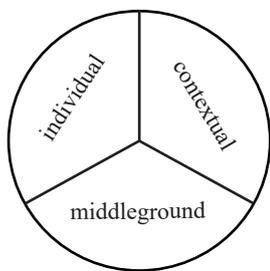


Figure 2. Agency divide

For the concept of the small recyclecenters in the neighbourhood, it is interesting to study mainly the approaches and models that tread the middle ground. This is due to the fact that not only a new location (context) will be introduced, but it is either obvious that the individual behaviour of people have to be changed.

Design for behaviour change approaches

These kind of approaches tend to influence the behaviour of people with either the purpose to get them *to do something*, or to get them *not to do something* [10][11]. This leads to four basic approaches:

1. Making it easier to achieve a desired behaviour
2. Making it harder to achieve an undesired behaviour
3. Make the user want to perform a desired behaviour
4. Make the user don't want to perform an undesired behaviour

However, 1 and 3 lean towards a positive approach and 2 and 4 lean towards a more ‘negative’ approach. In order to make the recyclecenters a fine experience, it might be smarter to make use of the positive approaches, number 1 and 3.

Design with intent

This design approach by Lockton [11] provides the designer with multiple tools to enable, motivate or constrain the user, by both influencing individual behaviour and the context:

- **Enabling behaviour:** Making desirable behaviour easier than the alternatives

- **Motivating behaviour:** Motivating to change behaviour by education, incentives and changing attitudes
- **Constraining behaviour:** Making alternatives of desirable behaviour difficult or impossible

Although constraining behaviours seems to be a negative approaches, and that is something we don't want, it is part of a greater positive approach as a unit. Besides, it might be necessary to make undesirable behaviour more difficult or impossible in order to enlarge the difference in attractiveness between a desired and undesired behaviour.

Placed beside other design for behaviour change approaches in the middleground, the *Design with intent* approach seems to be the most positive and the most complete approach regarding both the individual and contextual ground.

DISCUSSION

From the conversations with both professionals in the field of waste management and the users of the system (inhabitants of Amsterdam), it has become clear that the current system has to be changed. Not only is it unsustainable, but the users' living environments are negatively affected by it directly and the users find it disgusting. It means that everyone wants it to change.

Finished projects have shown that financial benefits are the best reward to motivate users to participate in waste separation and recycling. However, the possible financial rewards are very small and it raises the question whether one should rely on a reward system instead of a change in behaviour and tradition. The users themselves suggest that it is indeed a tradition and behaviour problem and that only better education and information will lead to more participation. Though, executed projects have shown that education helps to get more people aware of the benefits of a sustainable waste separation and recycling system, but it is not a solution for everybody. In addition, even though people want to participate, the system's context design is not inviting for everybody. For example, the 6 existing recyclecenters in Amsterdam are not only very far away (sometimes 10 km), but they are also inaccessible for most people, since many people in Amsterdam don't have a car.

This means that both the behaviour of people and the context design of the system have to change in order to stimulate waste separation and recycling in Amsterdam. In the behaviour change sciences, middle ground approaches

might provide the toolkits for a solution. Those middle ground approaches tend to take both the individual and contextual areas of behaviour change into account. Unfortunately, most middle ground approaches lean towards a negative approach in which mainly restrictions and negative effects of undesirable behaviours play a major role. However, the *Design with intent* model by Lockton focusses more on positive approaches in which enabling an motivating desirable behaviour are the main keys of the approach. The model provides a structured toolkit that may help with finding a sufficient way for a new sustainable waste separation and recycling system in Amsterdam, in which the users are better informed and involved.

CONCLUSION

This research has shown that the current system of waste separation and recycling in Amsterdam, is not sufficient anymore, both for the municipality and the inhabitants of the city. It's unsustainable and the inhabitants suffer from dirty streets. It's obvious that change is needed and that the solution lies in more information and education and in a more accessible system, like the small recyclecenters in the neighbourhood.

Since both the individual behaviour and the context design of the system are the key factors to a successful solution design, behaviour change approaches in the middleground are studied. This middleground takes both the individual and contextual areas into account. The *Design with intent* approach seems to be the most positive and motivational approach and therefore it might lead to a sufficient solution for a more sustainable waste separation and recycling system in which the users are better involved.

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