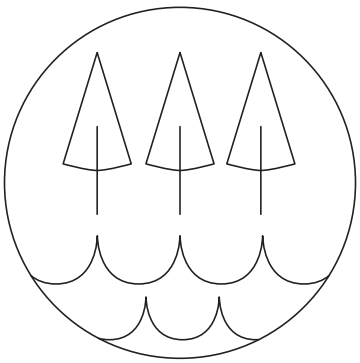

Creating drinking water awareness
at Into the Great Wide Open

“Eau, tu n’as ni goût, ni couleur, ni arôme, on ne peut pas te définir, on te goûte, sans te connaître. Tu n’es pas nécessaire à la vie : tu es la vie. Tu nous pénètres d’un plaisir qui ne s’explique point par les sens.

Water has no taste, no color, no odor; it cannot be defined, art relished while ever mysterious. Not necessary to life, but rather life itself. It fills us with a gratification that exceeds the delight of the senses.

Antoine de Saint-Exupéry - *Terre des hommes* (1939) ”

This is a graduation report written as the culmination of the master degree Strategic Product Design at *Delft University of Technology* of the student Marta Axpe. The graduation project was carried out together with the music festival *Into the Great Wide Open* and the support of *NHL Hogeschool*.

The topic of the project was how to create water awareness in a festival context by delivering a new drinking experience with a sustainable approach.

Delft University of Technology
Industrial Design Faculty
Strategic Product Design

Graduation thesis
Marta Axpe Martinez de Murguía - 4063694

Supervisory Team
Chair: Prof. dr. Ir. J.C. Brezet
Mentor: MSc Joost van Hoevelaak
Company mentor: Arnout de la Houssaye

Contact
www.martaaxpe.com
martaaxpe@gmail.com

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To my brother, Pablo, for the always neat and detailed pictures. To the models, Patricia and Ignacio, for being so patient and beautiful.

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EXECUTIVE SUMMARY

This master thesis is focused on delivering a new drinking water experience, with the aim of creating pro-environmental awareness at Into the Great Wide Open (ITGWO), a music festival based in Vlieland.
Water is essential for life, and there are many problems related to it that have to be solved in order to ensure drinking water to the future generations. The project aims to solve a part of the problem and giving a solution for tap water users at the festival. This report illustrates the solution found that has followed a combination of creative and sustainability methods.

The report is structured based on Peter Joore's Multilevel Design Model, in which 4 phases can be found and the problem and solutions are described from the product to the societal level. First, a reflection on the problem is portrayed, from general water pollution problems, to the specific problem of bottled water and how it affects the quality of the water bodies. Also, behaviour theories are studied, in order to create a higher sustainable sensitivity in people.

Second, internal and external analyses were endured. It was important to understand ITGWO's values and micro-experiences that make the audience come back year after year. The audience was also analyzed, finding out two main Personas that became the target group of the concept. For the creative process, Vision in Product Design was used, allowing the designer to explore different qualities at different levels for the new product.

Third, the concept choice and development is explained. It consists of a foldable cup with embedded seeds and a smartphone application. The user utilized the cup to drink water from the different tap points at the festival and instead of disposing it to the rubbish bin, the cup can be planted. This new disposable experience is designed in order to make people more aware of all the waste that is generated. Also, the cup remains personal, as it can be kept flat in the pocket or bag and reused during the event.

Fourth, part of this concept was implemented in this year's ITGWO edition. The product, without the disposable experience, was available to all the people that wanted to drink from the tap. This gave the designer the opportunity of analyzing the usability and likeability of the cup by the audience. Many conclusions were drawn, and the insights gathered were applied in the final concept. However, further research and development needs to be done so a complete and proven can be delivered in a future scenario.

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1 | REFLECTION

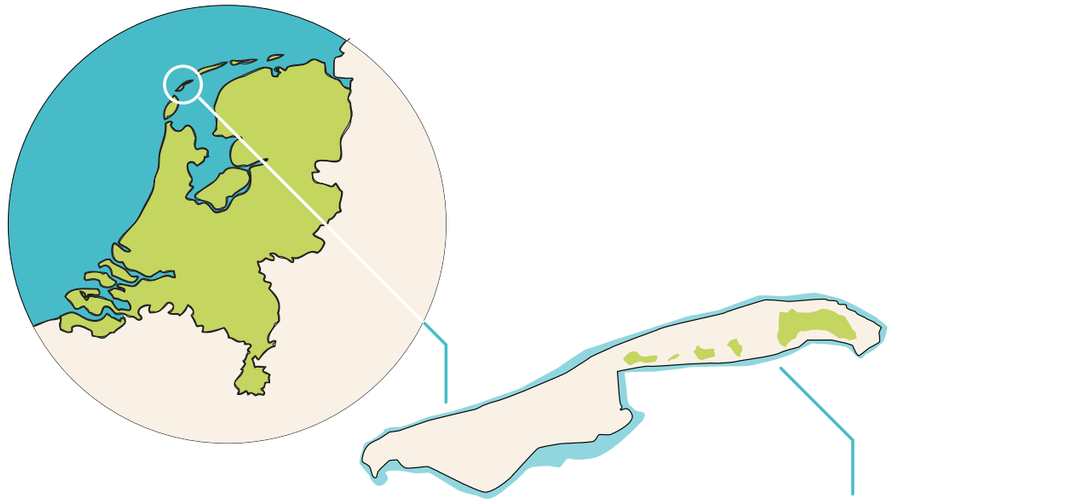
- 1.1. INTO THE GREAT WIDE OPEN -

Into The Great Wide Open (ITGWO) started in 2007, as an initiative from Ferry Roseboom, Marlies Timmermans and Arnout de la Houssaye, among others. The main objective of this group of friends was to enjoy good music, visual arts and include children activities in their program. All surrounded by a beautiful and natural environment that is what makes ITGWO different from other festivals.

The location of the festival is the island of Vlieland (Image 1), in northern Netherlands and it is held during early September.

The context of the festival is very important for its value and spirit, as it is located in one of the most pleasing natural landmarks of the country. Everybody is welcome, three generations are gathered to share many experiences related not only to music and not forgetting to rest and to enjoy the food.
Relatively small scaled, the festival invades positively the island for few days. Stages are all over the island, in the forest or in the beach, and ephemeral installations made out of local materials guide the path to the visitants.

Besides, Into The Great Wide Open is taking sustainable actions, such as water management and more efficient energy stages, in order to preserve the natural environment and keep the island happy.



IMG_1: Map of the Netherlands and Vlielands` location

- 1.2. ASSIGNMENT -

Together with the Province of Friesland and in collaboration with WeTapWater and Water Alliance, ITGWO has a new goal: no longer sell bottled water in the main field of the festival [1]. This is compensated by providing re-tap faucet points and selling durable bottles supplied by KRNWTR [2] (Image 2). Artists are also encouraged to join the experience, giving a good example to the audience in order to increase tap water consumption.

IMG_2: KRNWTR bottles held by part of the audience

So that the festival's organization would be able to stop offering bottled water, initiatives to deliver tap water have been conducted successfully. This project is a complementary action for this purpose. It aims to create drinking tap water awareness and this will be achieved delivering a new drinking experience with a sustainable approach.

- 1.3. GRADUATION NETWORK -

The following diagram (Figure 1) provides an overview of the different organizations involved in the project and how they are connected. Also, their influence such as knowledge or implementation is stated next to them.

Being ITGWO and TU Delft the main stakeholders of this project, the first one for the implementation of the outcome of the project and the second one as the main source of design theories and knowledge on sustainability. NHL Hogeschool, has a secondary role but with great influence in the overall research and its structure, due to the implementation of the Multilevel Design Model (see section 2.1.1.), present through the entire process. Last but not least, De Werkplaats in Vlieland influences this project indirectly, seen as a potential stakeholder for future water innovations focused on the Province of Friesland.

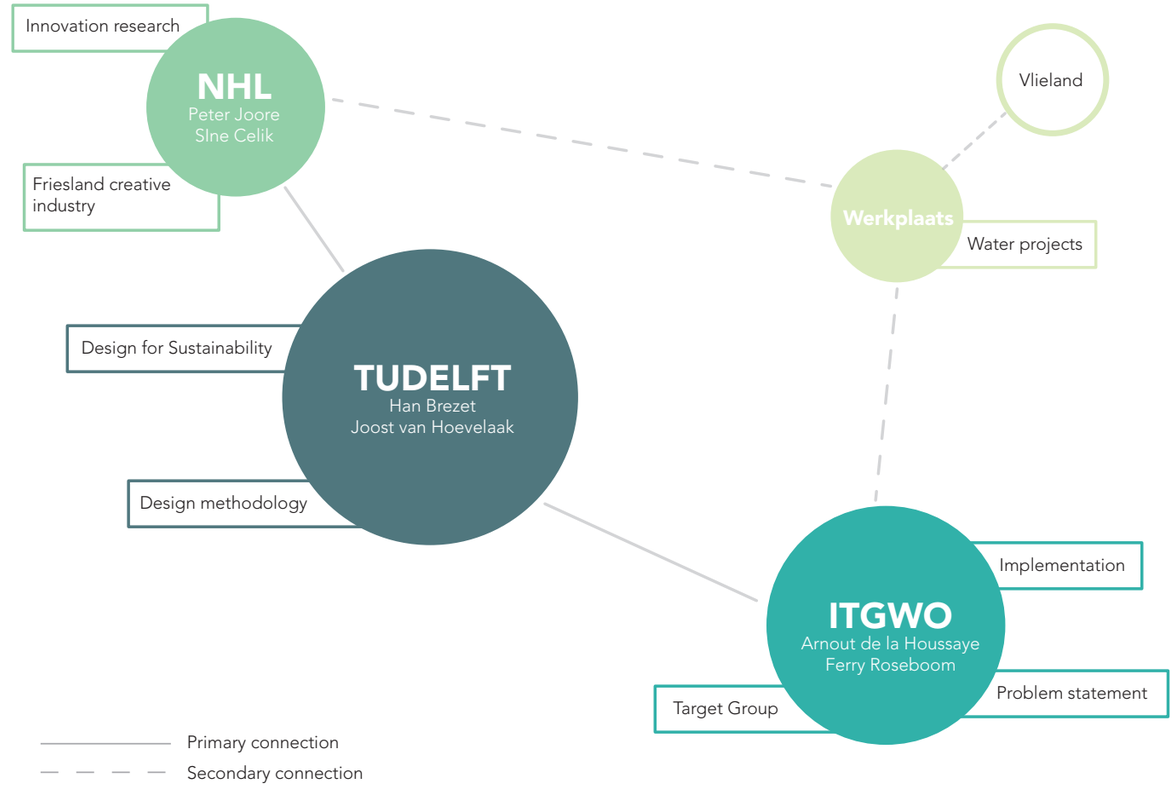


FIG_1: Stakeholder Network and supervisory teams

- 1.4. OBJECTIVE -

Explore the possible solutions to a new drinking experience that would create water awareness and enhance a more sustainable "on-the-go" drinking action. All this in the context of the festival ITGWO that already encourages tap water consumption. Moreover, seek how it could contribute to the island of Vlieland.

1.4.1.- Specific objectives

Company (ITGWO): Deliver an alternative tap water experience to the audience, strong enough to make people not feel the need of buying a bottle of water. Together with a revenue stream that would replace the income generated by selling bottled water.

NHL Hogeschool: Apply the Multilevel Design Model for the water pollution problem, and use this project as a case study for a research in the creative industries in Friesland (Sine Celik)

Audience: Receive easy access to water of good quality in a sustainable way that accompanies the mood generated by the festival's environment.

Municipality of Vlieland (& Province of Friesland): Give the water for free to the audience, supporting a more conscious tap water consumption. Preserve Vlieland's natural environment. Have a sustainable image that could attract more tourists.

- 1.5. SCOPE -

The new drinking experience will be developed to a concept level, detailed enough for further implementation. The best-case scenario would be to introduce it in the next ITGWO festival (5,6,7 September) taking in account time constrains, feasibility and costs. It is also important to note that the outcome of this project will be based on the research, creative process and the evaluation of the designer and not so much on the demands and ideas of the festival's organization.

- 1.6. PROBLEM DEFINITION -

There are indeed many water related problems that could be researched, but due to the enormous quantity of water information, projects and obstacles to overcome, a focus had to be given. As a start to tackle the problem, an overview of the different issues that are related to bottled water and water plastic pollution are described in the following section.

1.6.1.- Bottled water vs. Tap water

At the end of the 80's decade, big companies such as Nestlé and Coca-Cola were observing how their market share in soft drinks was decreasing. Thanks to the introduction of Perrier some years earlier and together with the technology achievement that made possible to produce transparent and lightweight plastic bottles (PET); these companies introduced bottled water to the mass market. High marketing efforts were made from their part in order to convince people that bottled water is healthier than tap water. It has overcome soft drinks, coffee, juice and beer in the beverage market. [3]

Today, it is the icon for healthy beverages because it looks and tastes clean in convenient single bottles, family sizes and bigger cans. The taste difference is mainly due to the contrast in treatment municipal water industries and bottled water companies normally apply. This differs a lot between countries and even regions inside them and in some cases this difference in taste is even unnoticeable [4]. To avoid the growth of microorganisms, traditionally tap water industries use chlorine disinfection, which gives a peculiar taste to the water, although new technologies are recently being applied that decreases significantly this taste [5]. On the other hand, bottled water companies use ozone to disinfect that is more expensive but also odourless and tasteless. [6]

The introduction of this new commodity has a big environmental impact (Figure 2). First, due to the production of the bottles, transport and end of life. Second, the impact it has in the sources of fresh water, where bottled water companies pump the "raw material" in order to sell it. [7]

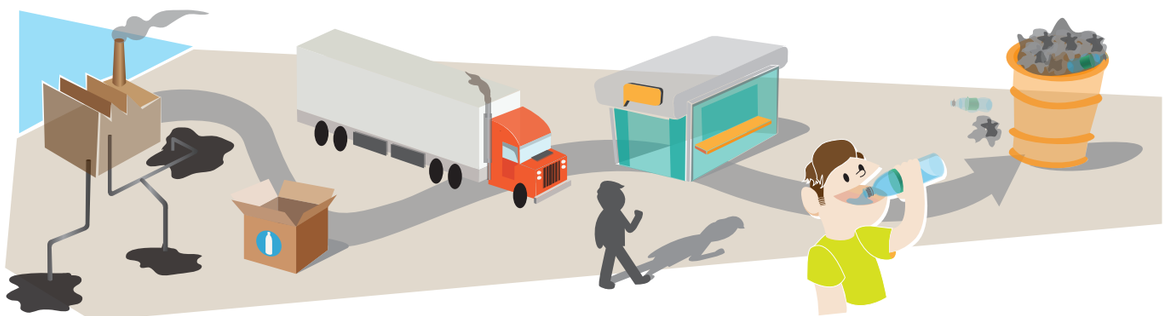


FIG_2: Simplified bottled water life cycle

1.6.2.- Environmental impact

As it is broadly known, the average lifestyle in developed countries is generating a gigantic amount of waste. Mainly, this waste comes from all the general product and commodities packaging [8]. The increasingly consumption of bottled water in these countries does contribute to the waste generation and usage of oil based plastics, that is normally PET [9].

Besides the oil consumed for the production, using the Virtual Water Tool [10] we can also predict the water needed to produce those bottles. The virtual water used for the production of one PET bottle is somewhere between 3 and 5 litres, depending on size and design of the bottle itself.
Once the bottle is produced and filled with the water, the distribution takes place. These bottles have to be shipped from the factory to the store, consuming more oil and sending out greenhouse gases.

According to the Sierra Club, an environmental NGO, the water pumped by bottled water companies has a big damaging impact on underground aquifers and may cause drought in many communities. This also leads to the misleading concept that makes consumers think the bottled water comes from a pure spring, when 70% is drawn from municipal sources [3] [11].

Pressure from environmental organizations (e.g. Natural Resources Defence Council) have led to sustainable new products (image 3) and label the source of the water:

"In designing DASANI to be the best tasting water, we start with the local water supply, which is then filtered by reverse osmosis to remove impurities. The purified water is then enhanced with a special blend of minerals for the pure, crisp, fresh taste that's delightfully DASANI."
(http://www.dasani.com/)

Once the consumer has drunk the water from the bottled, it's either down-cycled or thrown in a landfill, but most likely, not recycled [3]. It is equally non-degradable as any other PET packaging, but in this case it is of a higher trouble as the good that is packaged is equally safe in most of the faucet's of western countries. In the case of the Netherlands, almost 62% of the plastic waste is not recycled [12] [13], taking in account that bottled water is mainly a "on-the-go" product, we can assume that this amount or less is recycled, due to the probably unavailable recycling bin once the water is drunk.

IMG_3: Dasani`s Twist Bottle.

1.6.3.- Health risks

Thanks to the initiatives taken by many policymakers and activists, such as the European Commission [14], or Greenpeace [15] we know more about the risks that the usage of plastic packaging can endure to human's health, from both durable and disposable bottles. One-use PET bottles, as mentioned before, are manufactured out of virgin petroleum that contains benzene (a human carcinogen) among others [16]. These chemicals tend to leach in a greater amount when exposed to high temperatures, for example when bottles are not stored in a cool place. Moreover, PET is a porous plastic [17], allowing the host of bacteria after multiple usages.

Tap water campaigns have taken the opportunity to deliver reusable containers that is a progress towards sustainable packaging as reducing and reusing are on top of waste hierarchy [18]. These containers are mainly made from aluminium and polycarbonate plastic. The latter can contain BPA (Bisphenol A) a component related to heart and reproductive problems [19]. In order to distribute safer durable bottles, some companies, like Aquatina (image 4) are announcing "BPA-free" re-tap durable bottles [20].

IMG_4: Aquatina, collapsible BPA-free durable bottle.

Just as disposable bottles, refilling the durable containers without cleaning them between uses can provoke bacterial contamination. In order to have a safe drinking experience, maintenance of the containers is important. Washing the interior of the bottles with soap and warm water reduces drastically this odd, or even in cleaning them in the dishwasher works. [21]

1.6.4.- Water Pollution

Water pollution takes place when substances or energy are released in rivers, oceans or any kind of water body causing harmful effects. These mainly alter the balance of the biological communities, animals and plants but also when it reaches the point that is not suitable for human use. It is the number one cause for diseases and causes of infant deaths in developing countries, where access to treated water in widely limited. But developed countries have also problems related to water pollution [22]. During the industrialization, it was thought that the vast amount of water in earth would be able to absorb all the contaminants, but the consequences are normally shown in a long-term. It is hard to provide general data for water pollution around the globe, because it is very dependable on the local industries and policies.

There are different sources that cause water pollution. The so-called "Point sources" come from a known and independent source, such as pipes from sewage treatment plants or industrial wastewater [23]. These point sources are meant to be regulated by laws, where industries need to fulfil a minimum of requirements in order to dump their wastewater to water bodies. The economic and knowledge costs make some of the pollutant industries to illegally discharge the contaminants, mainly oil, from ships to the North Sea, as the Volkskrant published last March. [24]

The ones named "Non-point sources" are widespread and its source cannot be known, as it's a sum of different gathered contaminants. Examples for this pollution source can be agricultural additives that leak to the groundwater, or the water run-offs in the cities that end up the sewage system. Even though there is a distinction in management of contaminants for the different water bodies, this is not very accurate because the water sources are connected. For instance, how the surface water goes to the groundwater by infiltration. [25]

In the Netherlands, pollution comes from the industry and agricultural sector, besides the households'. A recent study endured by Rijkswaterstaat [26], shows that the North Sea contains more polluting microscopic plastic than expected. The origin of these particles is mainly cleaning products, such as shower gel, toothpaste and washing powder. Normally, they would stay in one of the sewage system filters, but more than expected reached the sea and can be found in plankton and algae, entering the food chain. Also, as the plastic contamination in seas and oceans is reaching almost every part of the world, pollutants can arrive to the Netherlands, from far away, transported by ocean streams and rivers. The physical plastic waste, that is not microscopic by source, such as bottles, in combination with the water environment and the sun, decomposes the plastic objects in smaller parts. This makes the cleaning of water bodies more difficult, not taking in account the chemicals leaching from the plastic to the water.[26]

The harm of bottled water

As it was explained before, in the general description of the bottled water industry, it has many effects in the environment, such as the oil usage, greenhouse gas emissions by distribution and low recycling rates. The implications of low recycling rates and proper waste management are that this waste can end up in water bodies, normally by non-point sources of contamination. What does this imply for the water ecosystem? There is a lot of concern about marine pollution, for example, cardboard takes 2 weeks to degrade while plastic takes 400 years [27]. Moreover, plastic accounts for more than 60% of the marine trash [28]

Food containers and packaging are the largest component of the municipal solid waste stream [8]. This is the reason why this problem is been chosen to create awareness regarding the quality of the water. From all the problems related to water, only some of them can have a positive contribution from the average population. This means that these actions can be accomplished by anyone regardless their occupation, knowledge, age or gender. These problems would be water stress by overconsumption and water pollution. Problems such as treatment, policies and technology can only be solved by a reduced sector of the population. Even though popular pressure could trigger changes in these areas.

1.6.5.- Conclusion

Since bottled water was introduced in the market there has been a shift from drinking water from public sources, such as drinking fountains, to the disposable drinking experience. This relatively new and convenient experience, although delivering security to consumers is creating many problems.

Due to the approach of the project and its future implementation context, water pollution by waste is chosen as a focus, and more in depth its consequences on the future of water quality. Because households are able to reduce the amount of plastic waste, starting from bottles of water in ITGWO. The reduction of this plastic waste won't solve the water pollution problem in its whole, but the contribution can be significant if there is enough impact on people's environmental behaviour. [29]

There is now a window of opportunity to take back the tap water culture, in order to avoid plastic waste arriving to water bodies, prevent health issues and preserve the quality of water sources (Figure 3).

FIG_3: Contribution of plastic waste in water pollution

- 2.1. STRATEGIC LEVEL -

To realize the project and fulfil its goal, to create water awareness by delivering a new drinking tap water experience in a festival context, there are different approaches depending on the levels of the project. Below, can be found the different methods and theoretical background applied, clustered in strategic and design level.

The following approaches and design theories are used during the project to have a strategic focus, first to explore the problem and second to put boundaries and give guidelines to the conceptualization and implementation. These methods were chosen for its potential contribution to the project.

2.1.1- Multilevel Design Model

The Multilevel Design Model (MDM) is a design process to aid designers not to lose the entire picture of the project they are working on. This means that topics such as policies and infrastructures that normally are out of reach to the designer are defined in the process. The goal of the MDM is a better implementation of sustainable projects and makes clear the connection between the designer's product and its impact at a societal level. [30]

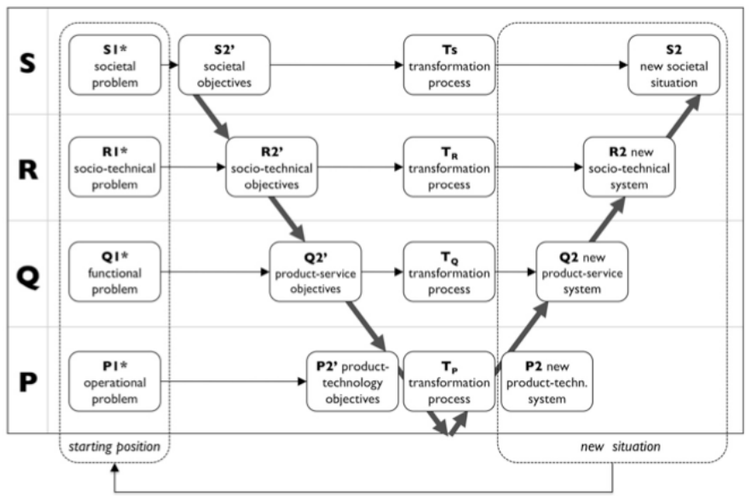


FIG_4: Multilevel Design Model process diagram

In this diagram (Figure 4), all the different phases of the design process and the different levels are described. It is shown how the problem is defined in the different levels as a starting point, and moves towards a future solution also defined in every level.

For this project, it first contributed to choose a core problem and define it from the product-technology system to the societal system. These following topics related to each of the levels of the MDM, will aid to maintain focus as long as the project goes on in each of its phases.

> *Product-Technical System*: Focus on the material of the product that aids the act of drinking
>
> *Product-Service System*: Focus on the experience of drinking water
>
> *Societal-Technical System*: Focus in the waste management system
>
> *Societal System:* Focus in the quality of the water and its effect on the food chain, flora, crops…

Note: This project is structured in 4 different phases, based on the MDM process. As the report goes on at the end of each phase, the different levels described in the MDM will be described as visualized, as a summary of the chapter. The final visualization of the project based on the MDM can be found at Chapter 4. Section 10.

2.1.2.- Product-Service Systems

Human needs are changing and there has been a shift from mass-produced products to a more individualistic and customized consumption. This has opened an opportunity to broaden the fields where designers can contribute. One of these design directions is Product-Service Systems (PSS), as its own name states, it's a combination of a product and a service. But inside PSS, there are also different approaches: one more market oriented, where companies seek competitive advantage by delivering more than a product to consumers, and another one that seeks sustainable innovations. Although, these approaches can be inclusive, reaching market potential by encouraging pro-environmental attitudes.

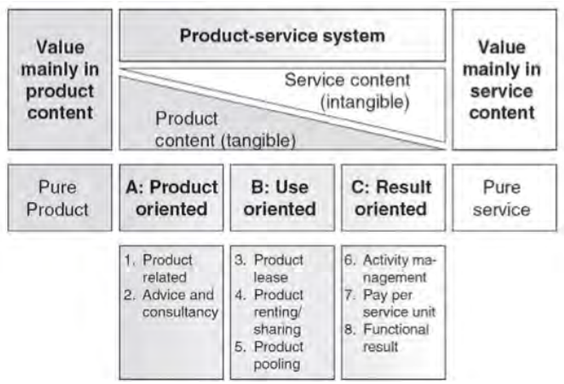


FIG_5: Eight types of PSS (Tucker, 2004)

'Tangible products and intangible services designed and combined so that they jointly are capable of fulfilling specific customer needs' (Tischner et al., 2002).[31]

The reason why PSS can drive sustainable solutions is that gives product-oriented companies a transition opportunity to a more service oriented approach, minimizing material and energy flows that are related to products.
For a more general knowledge on PSS, it is worth to mention Tukker's [31] classification of the different types of PSS. From these classification it has been assessed which of these types contribute more to an environmental improvement. In Figure 5 the classification for the different types of PSS is shown, together with their sustainable impact [32].

On the other hand, Vezzoli et al. [33] focus on how to create new market opportunities with PSS. First, because if a radical sustainable solution has to be found, the traditional incremental design framework does not fit. That is why, for instance, the manufacturing and consumption systems also need a radical change. The authors also list which would be the benefits for a company that switches to PSS:

- find new markets opportunities and revenue streams
- survive in rapidly changing markets
- increase efficiency and reduce resource consumption
- comply with environmental and labour regulations, or meet environmental and labour standards
- generate value and social quality, while decreasing total negative environmental and social impact

Besides, companies with more efficient systems that reduce their environmental footprint, can have an better position in the market at the consumers' eyes. PSS also triggers stronger bonds with customers, enhancing their loyalty. Therefore, being in touch with them allows rapid changes, fulfilling faster their needs. All together, leads to conclude that PSS is a good strategy to create value and competitiveness and be implemented in this project. Moreover, it helps to build a business model and its economic value can be assessed with Tukker's theory [31].

Depending on the position of the PSS in Tukker's table, a rough assessment on the economic value of the outcome of the project can be done. Nevertheless, an extensive study should be done, but it is out of the scope of the project.

PSS Tools

As mentioned before, PSS escapes a bit from the traditional design approach. This is the reason why many different ways of visualizing and describing a PSS project have been tailored for this purpose. The tools that will be used for the process and outcome of the project will be:

- *Stakeholder mapping*, describing the actors involved and the flows between them.

- *PSS map* with opportunities and problems. Also stating the sustainable guidelines according to Tischner (Appendix A1)

- *Storyboards* describing the sequence of interactions from the different stakeholders.

- *3 radars* for evaluation (environmental, socio-ethical and economical comparing bottled water to new PSS)

These tools will be used to clarify the functioning of the concept, complemented with other visualizations.

- 2.2. DESIGN LEVEL -

In order to accomplish the project, also creative processes were considered. As the project has a quite open brief, traditional iterative methods were discarded. In order to create an innovative drinking experience, a more inspirational design method was chosen: Vision in Product Design. Also, as the core part of the project is to create awareness, several theories about environmental behaviour have been researched to gain theoretical background. This behavioural theory will be applied in the design with the goal of creating higher awareness.

2.2.1- Vision in Product Design

Vision in Product Design [33] guides the designer though an exploration that goes from a deconstruction of the present situation, stating a vision statement until the creation of the experience qualities. All this leads to the design of the product, service or PSS. It gives a higher freedom of exploration resulting in meaningful projects to the user. For this project, the creative process will start after the Internal and External analysis. The method is divided in 2 phases: the deconstruction phase and the actual design phase (Figure 6).

The deconstruction (right side) represents the current solutions that might fulfil the problem statement. To better understand the current situation, 3 levels are analyzed or deconstructed. Starting with the product level, following with the interaction and finishing with the context level. In this way, the designer can understand in which context was that product designed and why, leading to the second phase of the method, the design process itself. As times passes by, people's needs and societal norms change, leaving obsolete products that were designed for another context. Contrary to the deconstruction phase, the design phase starts by defining the context where the new product will be used. Then, the designer defines which interaction qualities the product has to achieve, and finally, the new product is designed and detailed.

This method gives the opportunity to the designer to take responsibility of the final design and delivering future oriented products that will fulfil needs that the user may not even think of.

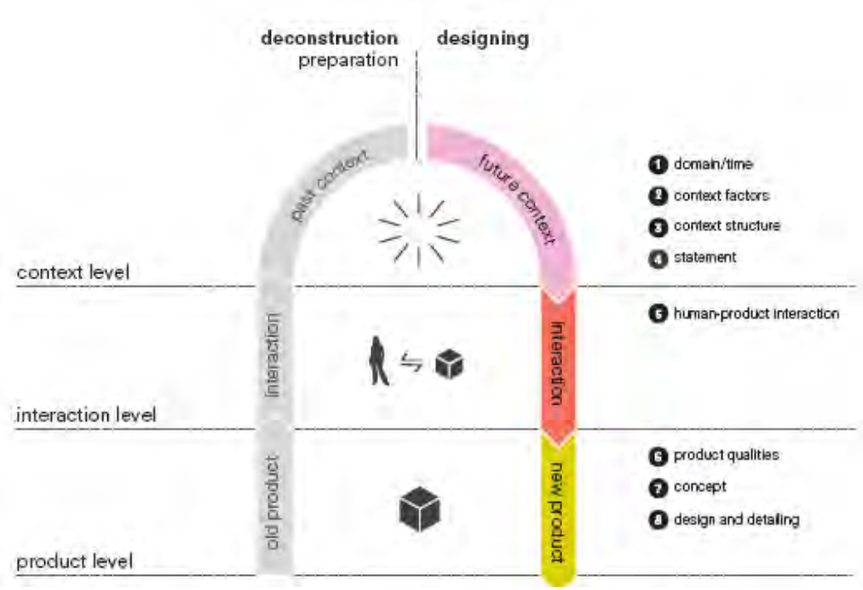


FIG_6: Visualization of the ViP process

2.2.2- Pro-environmental behaviour theory

Altruism, Empathy and Pro-social Behaviour Models. [27]

These models base the degree of behaviour have a more psychological approach. Pro-social behaviour is defined as an intentional behaviour that benefits for another and the motive may be unspecified and here is where altruism plays an important role. On the one hand, persons with a strong selfish and competitive orientation are less likely to act ecologically. On the other hand, people that are satisfied with their personal needs are more likely to act ecologically. These personal needs are related to time, money and energy to care about pro-environmentally issues and it's based on Maslow's hierarchy of human needs [34]

Also, researchers in these models claim that altruism is needed, or at least it supports, to act pro-environmentally. Geller stated that in order to achieve this, individuals have to be concerned about the entire community, instead of only themselves. Also, the need for self-esteem, personal control, sense of belonging and optimism has to be fulfilled.
More in depth, there are different levels of caring [35]. These levels help to understand more in depth the motivation to act in an environmentally responsible behaviour (Figure 7). It is dependable on the personal orientation, and can be classified as follows:

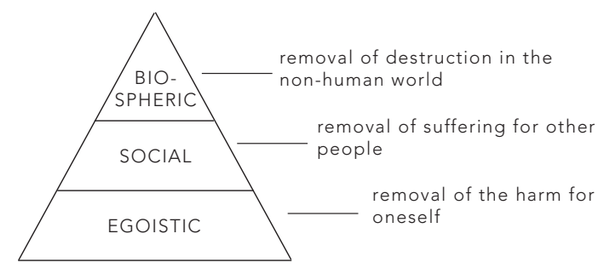


FIG_7: 3 Leves of caring.

Variables

Hines, Hungerford and Tomera (1986) [36] listed the variables that are responsible for a positive environmental behaviour, the person…

- has to be familiar with the environmental problems and its causes (knowledge)
- has to have an Internal Locus of Control. This mean that the person is aware that his or her small changes are significant and can contribute to solve bigger environmental problems.
- with greater sense of personal responsibility are more likely to have an environmentally responsible behaviour.

First, there is need for an environmental knowledge, then, we would be able to find an environmental attitude that is influenced by many factors, such as Internal or external factors. The internal factors are the ones related to the person's sense of responsibility and own beliefs. The external factors are related to infrastructure (e.g. if the municipality offers a practical recycling system where the person lives) and social norms. This will lead to an "Intention to act", nevertheless all the personal factors lead to awareness about the problem, but it does not mean that the person will act environmentally. Moreover, factors such as comfort or economic constrains, will at the end be decisive to the pro-environmental behaviour. These variables will be taken in account, but the power of influence in these, is very limited. However, the personal variable of Locus of control is further treated as a barrier.

Barriers

Blake (1999) [37] identifies 3 barriers to pro-environmental behaviour: Individuality, responsibility and practicality. These barriers go from an individual level to the social and institutional level. This means that the lack of ecological action is due to the low personal motivation but also to the resources provided by the institutions (recycling points). The list of all the different influential factors that can act as barriers is very extent (Appendix A2). For this project the focus will be on two of the individual barriers: Locus of Control and the influence of the Non-immediacy of ecological problems. This decision is taken because the context where the product will be used in not variable (festival) and people at the festival and in the Netherlands (see 4.1.1. Personas) are generally aware and have knowledge about environmental issues. Moreover, from the institutional and social side, acting pro-environmentally is supported and is seen as a value. Thus, the internal and external variables are not accounted as a barrier.

- *Non-immediacy of ecological problems*: environmental degradation is not immediately tangible; we only perceive them when human impact has already caused damages. Environmental problems are immensely complex and people tend to simplify them. This prevents people from a deeper understanding of the consequences of a low pro-environmental behaviour. There is a cognitive barrier that makes perceiving drastic changes easy, but unable to perceive slow, incremental changes.

- *Locus of Control*: It is a psychological factor and it can be found as external or internal. It represents an individual's perception of whether he or she has the ability to bring change through his or her own behaviour. Having an external locus of control means that people do not perceive their actions as an influence in the overall system.

This theory will be taken in account during the process, specifically in the concept development, where a focus on overcoming barriers will be given. As motivation and attitudes come in a longer term, it will be difficult to assess if the concept reached that goal. This is the reason why a workshop has been programmed during the festival at De Werkplaats, in order to get immediate insights about the influence of these barriers in the audience and test the outcome of the project.

As a conclusion for the Pro-environmental behaviour theories researched for the project, Figure 8, shows the process to reach the desired behaviour and which elements from the theory will be tackled.

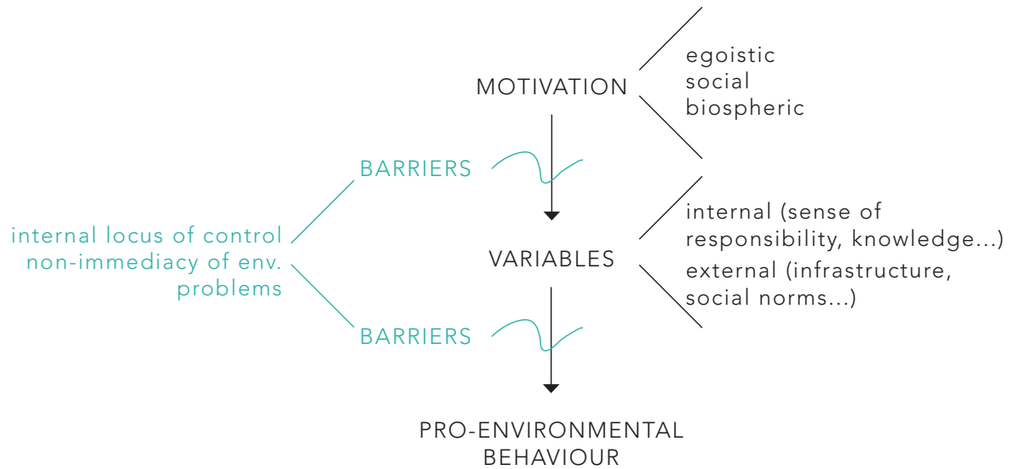


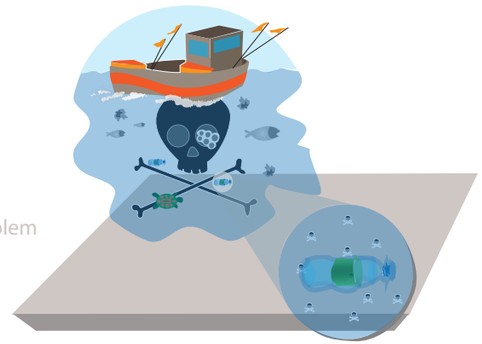
FIG_8: Pro-environmental behaviour framework.

- 2.3. CONCLUSION -

The Multilevel Design Model helps to keep present the overall pictures of the problem in the different levels, but also creates a goal. Hence, this combines with the creative process of ViP, and both will share the same vision, although at different levels (MDM: societal, ViP: product). PSS aids to generate value and social quality, while decreasing negative environmental and social impact. Moreover, its tools are very result and communication oriented. The theory on pro-environmental behaviour contributes to the will of generating awareness with this project.

CONCLUSION REFLECTION

S1: Societal Problem



Water is polluted (partly) by plastic: It is most likely that bottles of water that are not recycled, end up in a water body. Degrading into smaller pieces, leaching chemicals and entering the water and food cycles. Bottled water compromises the future quality of drinking water.

R1: System Deficiency

Low recycling rates: 68% of the plastic waste is not recycled in the Netherlands. The quick obsolescence of products is the cause for the unmanageable waste, contributing as a factor to climate change. Also, the variety of types of waste and the unclear rules of recycling makes this task not so evident for users.

Q1: Funtional Problem

Lack of attachment and increasing demand for on-the-go products: In a rushed and speeded up lifestyle, convenient products are created for it. Bottled water is one of them, giving the freedom of drinking single portions that can be eaten anywhere, give a convenient freedom to consumers.

P1: Operational Problem

Bottled water consumption: Disposable plastic bottles of water are creating a large amount of waste (oil-based, non-degradable)

- 3.1.STAKEHOLDER MAP -

The stakeholder map (Figure 10) is a way to visualize the actors and social groups that are related to the project, directly or indirectly. Some of these actors have a certain influence during the process of the process or could be involved in the future, depending on the outcome of the project.

The map is structured bi-dimensionally: 3 levels of involvement (Project promoters, project stakeholders and social context) and then clustered by different domains (customers, research, industry, policy…)

The icons represent the type of organization (public institutions, universities, companies…). If the icon is coloured, it means that they are directly involved in the project. If the icon is grey, it means that the stakeholder may have an influence (direct or indirect) along the project.

The flows (arrows) show the connection between the different stakeholders, depending on the type of flow (information, material, economic…). This map will aid to keep an overview of the network of stakeholders during the project.

To better understand their role and interest on the project, a description is provided for each of them, together with their level of involvement and contribution (Appendix E). Based on Ceschin's PSS Tool Box [42]

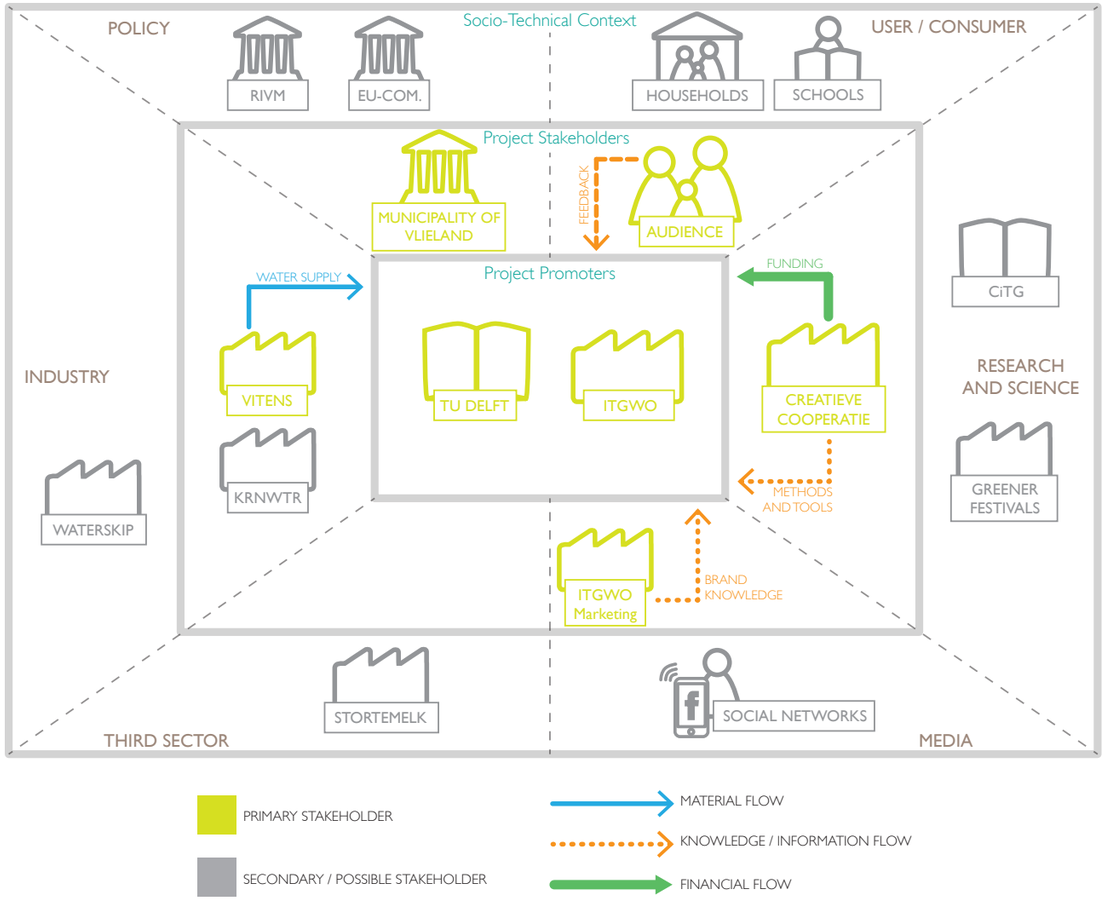


FIG_10: Stakeholder Map

- 3.2. ITGWO AS A BRAND -

3.2.1. Brand experience

To make an analysis of the brand, observation during the event, research and discussion with the organization staff has been done. The aim of this analysis is to better understand the values, motivations and assets of the festival's brand. This will be used in the creative process and in the conceptualization phases, to deliver an outcome that fits.

IMG_5: ITGWO`s logo

First, it is important to know what is transmitted consciously from the organization. This extract is taken from the "about" of the festival's website [43]. It makes clear how important is the environment and which activities they are offering.
"Into The Great Wide Open is a gathering in Vlieland. Music is central, but it's the context that makes our own festival. Surrounded by nature and perhaps the most beautiful island of the Netherlands. Surprising edge programming, visual arts, film, challenging children and plenty of rest and space to make the most of to enjoy."

Here we can sense how the organization wants to state all the activities they offer and how important the context is. It can be said that this statement is centred in the tangible experience of the festival and not so much in the feeling the organization also wants to deliver to its audience. In order to know more about the festival's experience, the summary video from the 2012 edition [44] has been analyzed. Images are more expressive, but also this video has been used as a promotion tool, therefore the experience of going to the festival will be well represented. A mind map (Figure 11) was created along the visualization of the video. In this case, the first impressions were written down, and connected between them.

As we can see, the experience represented in the video is much more rich than the previous statement and gives a more accurate vision of the festival. Although, all the elements mentioned in the statement are present in the video, it is important to note that the mentioned "film" in the statement is the only element that is not represented in the video.

IMG_6: Screenshot of the promotional video 2012

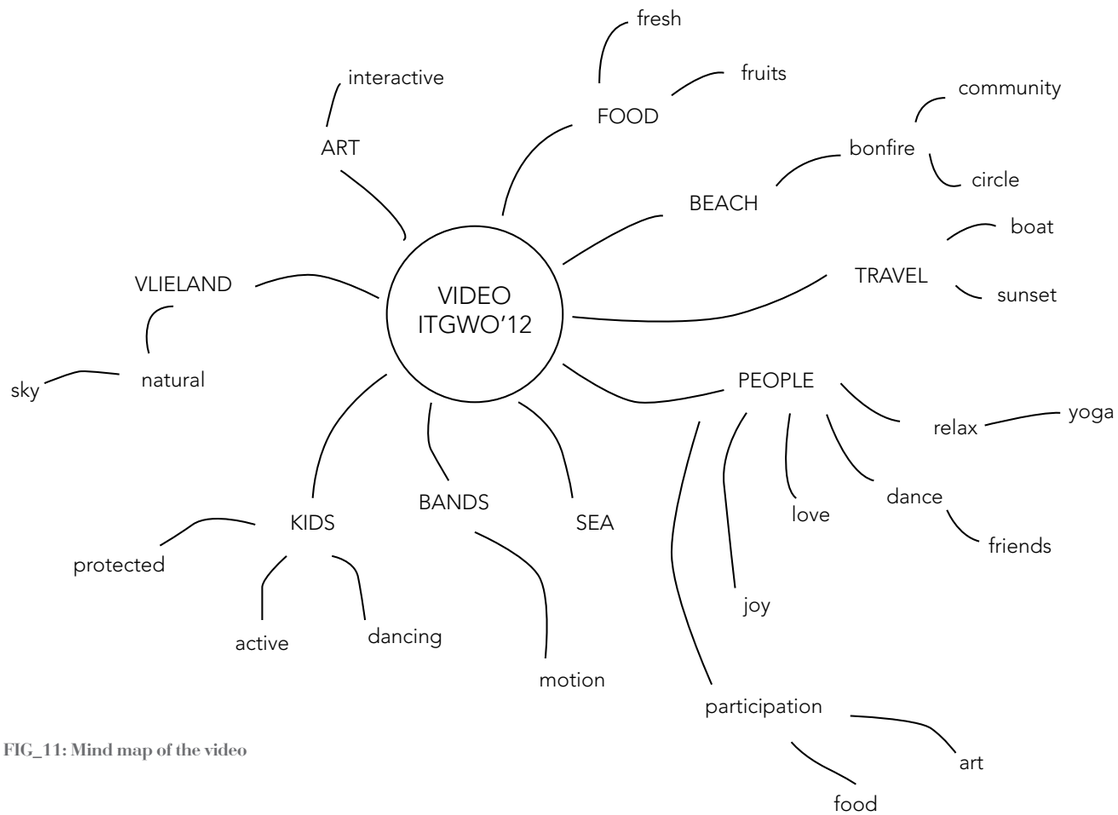


FIG_11: Mind map of the video

The mind map created shows more abstract terms but gives a general feeling of all the micro-experiences the audience can have during the event. These micro-experiences are very significant for the overall project and have to be kept in mind at the conceptualization phase.

Last but not least, an online research was undertaken in social media; in order to double-check the impressions taken from the video. The main goal is to complement the elements found in the video with another visual source, pictures. This will confirm that micro-experience by a secondary source, and finding a way of representation.
The result of this analysis is the diagram in the next pages: (Figure 12)

INTO THE GREAT WIDE OPEN

children

learning values

protected

active

art

integrated

participative

people

love

relaxation

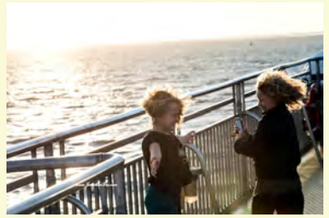
community

dance

joy

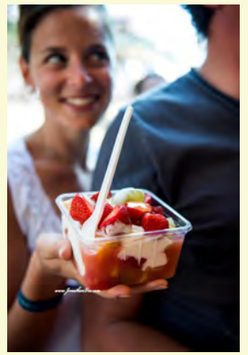
travel

out of ordinary



food

fresh



authentic

Vlieland

oysters

nature

sea

music

circle

emotional

motion

Note: All pictures by Jonathan Vos

FIG_12: Brand experience diagram

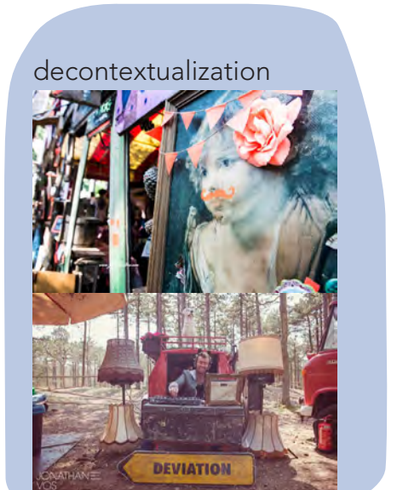
The words in black are the ones included in the statement from the organization. The words in white are additions made from the rest of the analysis. Then, by clusters, there are characteristics found in the video (words) and that were complemented with pictures (social media).

The result of this analysis is the clear understanding of how the audience experiences the festival but also how the organization transmits that experience through the activities and also by their design and aesthetic choice. Moreover, there are two qualities that also represent the festival that are more general and can be found in more than one cluster. The planned improvisation and decontextualization are present in the signs, counters and spaces created for the festival.

Planned Improvisation (Image 7) means that those elements have the appearance of being improvised with raw planks of wood, hand written words, placed crooked… although, keeping it quite simple. It delivers that feeling of temporality and being friendly with the environment very significant as one of the organization's goals is to keep the island happy. It also connects with the natural context, almost willing to camouflage their presence.

The decontextualization (image 8) is secondary and has another aim. It is more related to the Dutch culture, giving a sense of familiarity to the audience. It is easy to see people in the Netherlands bringing their couch on the street when it's sunny or even the entire living room.

IMG_7: Images for planned improvistation



IMG_8: Images fordecontextualization

3.2.2. Brand personality

As a conclusion for the brand analysis of ITGWO, the theory of Brand Personality from A. Aaker [38] is used. The reason why this theory was chosen is due to need of a deeper understanding from the consumer behaviour side. Moreover, the brand personality dimension framework delivers practical implications depending on the symbolic dimensions of the brand.

Giving personality to a brand allows the consumer to self reflect with the own personality or their aspirations, and steps aside from the product attributes that are related to functionality or aesthetics. From the five dimensions defined by the author in her research, two of them are found at the ITGWO brand: Sincerity and Excitement. This is assessed by confirming that most of the traits belonging to a dimension are present in a symbolic manner in the brand.

Sincerity: Through the activities offered by the festival we can state that it is family oriented and friendly. This shows the interest of the festival's organization bringing the 3 generations as the audience. The visitors can enjoy the original music as an emotional experience while being surrounded by a honest natural environment.

Excitement: As any of the big music festival, the biggest amount of visitors are from the Generation Y. This is the reason why the level of excitement has to fulfil the needs of these people. It should be contemporary, trendy and cool. On the other hand, it dares the visitor to spend some days in an Island, wake up in the dunes for a new day of music adventures.

FIG_13: Brand Personality Dimension

3.2.3. Joint ventures

Moreover, ITGWO is a brand-less festival. This means they don't promote any product or corporation for exposure. On the other hand, there is a tendency to collaborate with other Dutch brands to deliver meaningful products and experiences to the festival audience. These are 3 examples:

KRNWTR (image 9 and 10): This collaboration is the most important initiative towards drinking tap water. KRNWTR is a company that was founded with the idea of leaving aside the disposable culture and they contribute positively to the environment promoting tap water consumption. They offer durable solution for water containers, such as aluminium retap bottles, that are sold the festival (2011 and 2012) and glass carafs that restaurants and bars can acquire as a statement for their tap water support.

TICHELAAR (image 11): At ITGWO 2012, Erlend Oye's live concert was recorded and later on manufactured in clay by Koninklijke Tichelaar, a Dutch ceramics company with a great tradition. The records were exclusively manufactured and a small batch was sold only under pre-order. This example is very significant as it shows Koninklijke Tichelaar's will to make innovative and unexpected projects and ITGWO's search for authentic and out of context products.

ONTOUR (image 12 and 13): At ITGWO 2013 there will be a new joint venture with ONTOUR clothing company, probably with a collection designed for the festival that will be included in the merchandising. This fashion company has a clear mission, every collection is based upon a journey. The collection Spring/Summer 2013 is called "Gardeners united" and is insipired in the garden guerrillas that have been arising in many cities.

- 3.3. VLIELAND AND WATER -

Vlieland is the smallest inhabited (1.100 inhabitants approximately) island of the West Frisian Islands. Its nature is the reason that attracts 155.000 visitors per year. Surrounded by dunes, pine forests and beaches, tourists are not allowed to enter the island with their cars that they have to leave in Harlingen. This is one of the actions that have been taken in the island in order to preserve its fauna and flora.

Due to its geology and topography, providing water from the island to all the visitors can be a hard task. The dunes filter the water easily and it goes directly to the sea without being stored. Also, the forests' trees take most of the water because they are mainly pine trees. This means that perennial trees, as they keep the vegetation all year, they don't allow the water to go down to the soil, and at the end it evaporates. Another consequence of this attributes, is the lack of surface water. This has caused many droughts in Vlieland due to the increasing demand during high seasonal periods, up to 200,000 cubic meters in 2003 [39].

Initiatives were taken in order to avoid such problem, but the latest incorporation to deliver drinking water has been the new Vitens' extraction point. This station, in the highest part of the island, near de lighthouse, called Vuurboetsduin, where several wells are located. This is the where a bubble of fresh water is created from infiltration, between the soil and the seawater. Installed in September 2011, the new station has replaced 6 buildings that needed to be renewed [40]. It compiles with all the sustainability requirements, built with durable materials, and partly powered with solar energy. It has brought many benefits to the quality and appearance of Vlieland's tap water. (Image 14).

The technology used to treat the water is the following. There are 2 streams of water that are mixed at the end of the process to deliver high quality water. One of the streams is filtered twice and disinfected with UV lights. The other stream is purified through membrane filtration. The station can pump 190.000 cubic meter approximately per year at a 15 to 25 meters depth.[41]

Thanks to the new filtering technologies applied, Vitens succeeded to reduce the hardness of the water from more than 10DH to 7 DH (German Hardness unit). This has many benefits, mainly for the maintenance of domestic appliances, such as water heaters, washing machines and coffee makers. For the appearance of the water, the usage of membrane filtration provides a more colourless liquid that before had a yellowish taint.

It has to taken in account that the water demand depends a lot on the number of tourists in the island, and that also the groundwater has to be extracted at a certain pace in order to allow it to recover. Also, nature needs its portion of water, not to reach drought times or desertification. This is the reason why also water supply is pumped from the mainland.

IMG_14: New Vlieland`s treatment plant

- 3.4. CONCLUSION -

There are many stakeholders involved that saw an opportunity in the project. To the original promoters (TU Delft and ITGWO), other stakeholders decided to join the project to obtain different benefits, such as visibility, environmental preservation or better water consumption. From one side, this would make more difficult to find a solution that can satisfy all the requirements of the stakeholders. At the same time, it makes the project richer because of all the input received from them and because it makes it somehow more challenging. Nevertheless, the interests of ITGWO and TU Delft are put first.

As a conclusion of the brand experience analysis, "Planned Improvisation" is taken as the core element of the experience. The reason for this is that this characteristic is present almost in any element of the festival. It makes the event consistent in all the different activities, merging all of them in one single experience.

Vlieland is a special water scenario in the Netherlands. First, because its geology (dunes and pines) makes hard to store groundwater naturally. Second, because during the non-vacation season, only the inhabitants need water to be provided. But during summer, the population in the island grows 10 times, make water access precious. Although, water can be brought from the mainland, it is necessary to make the inhabitants and tourists aware of their water consumption and how they can contribute to a more balanced usage.

- 4.1. THE AUDIENCE -

The audience description in this section is based on observation at ITGWO 2012 and interviews conducted at HCTS 2013. Although the focus of the interviews was on their drinking water habits, some conclusions about their personalities and motivations could be drawn.
The visualization of the persona has two goals. In the down part general beliefs and motivations to go to the festival are described. In the upper part, their approach to water is characterized

4.1.1.- Personas

Two persona types could be defined from the interviews and observation. Persona 1 is composed by a family that enjoy the festival together. And Persona 2 is based in a young professional girl passionate by music. These 2 personas will be the target group of the project, being the audience mainly composed by them.

Persona 1 – Van der Bosch Family (Figure 14)
Rinze and Marieke are in their mid-thirties; they live in Utrecht at have 2 children, a boy and a girl. They enjoy going to the festival because of it's a good occasion to have cultural activities in a natural environment. Also, they are sure their children are not going to be bored, with all the activities the festival has prepared. Meanwhile, Rinze and Marieke can yearn for their early youth while drinking a beer and listening to an acoustic band. They trust the festival organization on the music choice, as it is not their main motivation to go to the festival. They are sensitive to environmental problems and they like ITGWO's approach to a different kind of festival. Moreover, they expect this experience to be valuable for their children, hoping to build good values in them.

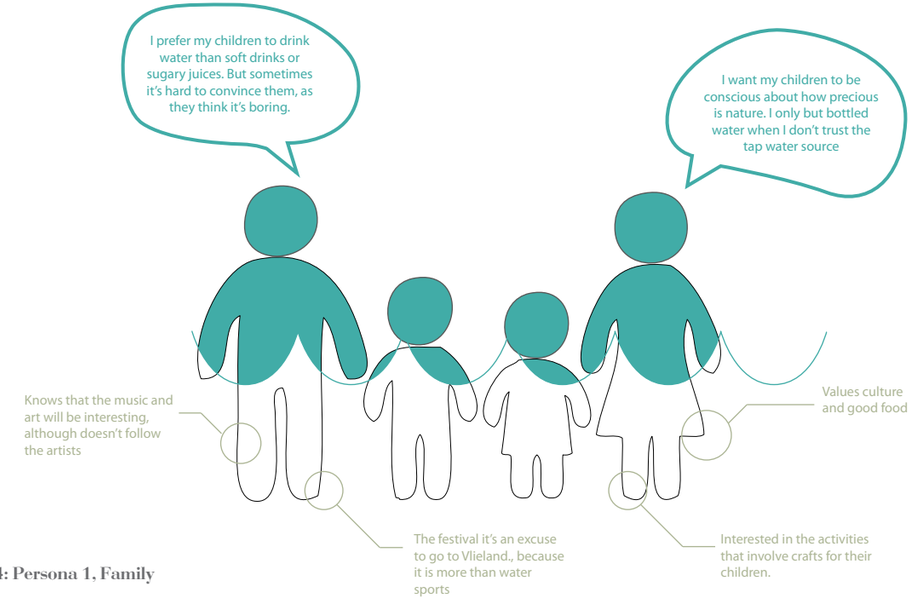


FIG_14: Persona 1, Family

Persona 2 – Caroline (2/) (Figure 15)
Her main reason to assist the festival is the music. She's a huge follower of indie and underground bands and she's always open to listen to something new. For her, the music quality more important than the genre, as it contributes to her cultural knowledge. She also goes to other festivals in mainland cities, but she thinks going to the island makes the entire music experience more special. Caroline goes to Vlieland with a group of friends, where they camp, experiment with food and enjoy the beach. She is conscious about environmental problems and she tries to take action on them until it unbalances her life quality.

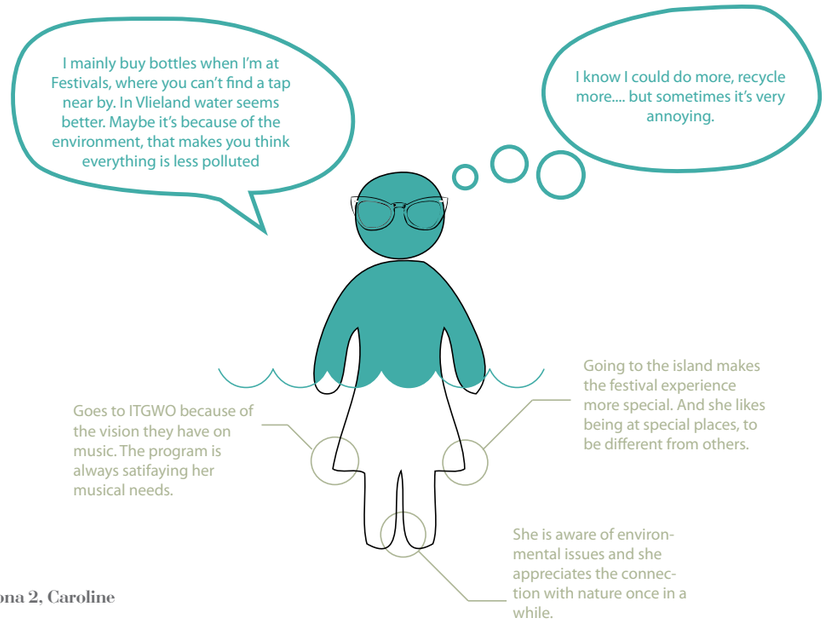


FIG_15: Persona 2, Caroline

4.1.2.- Here comes the summer: approach to water

There is no scientific proof that people prefer tap water better than bottled water. Having the big picture between the global water consumption situation and the behaviour of Dutch citizen, I was eager to know if the audience of ITGWO had the same approach towards water.

For this purpose I conducted a qualitative research during the festival HCTS, also in Vlieland with the same organization but with a smaller audience than ITGWO. This was a unique opportunity to meet a sample of the audience, therefore the target group of this project. The respondents were asked to test the organoleptics (taste, odour and sight) of two samples of water. One, taken from the tap of Vlieland's municipality and the other, from Sourcy, the bottled water sold during the festival. (for the entire interview Appendix B1)

13 respondents, 8 males and 5 females, aged from 20 to 43 years old, 12 Dutch and 1 Greek.
These are some highlights that can draw a general picture of the audience's approach towards bottled water and tap water.

IMG_15: Some of the participants

Female / 28: *"This (tap water) is more bright!" / "I mainly buy bottles when I'm at Festivals, where you can't find a tap near by"*
Male / 21: *"I guess it depends where you drink from. I guess in Vlieland water should be better than in Utrecht, but I really don't know. Maybe it's because of the environment, that makes you think everything is less polluted"*
Male / 27 / Greek (2 years living in NL): *"I have never bought a single bottle in the Netherlands. In Greece bottled water is very cheap, but tap water is also very good. Everywhere you go, a coffee place, restaurant, they give you tap water by default"*
Male / 32: *"I only buy it when I need the bottle"*
Female / 43: *"Now that I tried both of them, I can taste chlorine in this one (tap water). I cannot believe I chose the bottle one… I've been against it!"*
Male / 36: *"I don't consider myself environmentally friendly"*
Female / 21: *"I only buy bottles when I cannot find a faucet, while travelling"*

Conclusion

As a conclusion, there is a difference between the global water consumption in developed countries and the Netherlands. Campaigns against bottled water argue that bottled water is not better than tap water. I can state that Dutch citizen are aware of this lack of difference and are mainly consuming bottled water in cases where tap is not available. This matter is very culture specific; for example, we don't find advertising campaigns for mineral water in the Netherlands. Nonetheless, corporations need to add value to their water based beverages, such as flavours or vitamins.

Even though, Dutch population is highly aware of the benefits of their tap, bottled water keeps on increasing, producing more plastic waste. This also keeps population unaware of the water contamination, in this case provoked by the usage of plastic packaging.

To fulfil the wish of ITGWO and taking in account the factors mentioned before in this report, such as water consumption, how to enhance pro-environmental behaviour and the context in which the project is held, the next step is to look into the different existing solutions.

- 4.2. BEST PRACTICES -

In this section, best practices for water awareness projects and new on-the-go drinking water experiences are addressed. The purpose of this case study is to observe what other organizations are working on regarding water issues. Besides the cases mentioned in this report, there are many successful project ongoing, mainly in areas where safe drinking water is not available. Also, many informative campaigns in developed countries are having some impact and growing its visibility.

But for this project, the products described were chosen due to its closeness to the target group or relevant innovation related to the project.

4.2.1.- Water awareness

As the main goal of the project is to create water awareness at ITGWO, two projects that are having a relatively high impact are used as a reference.

Join the Pipe

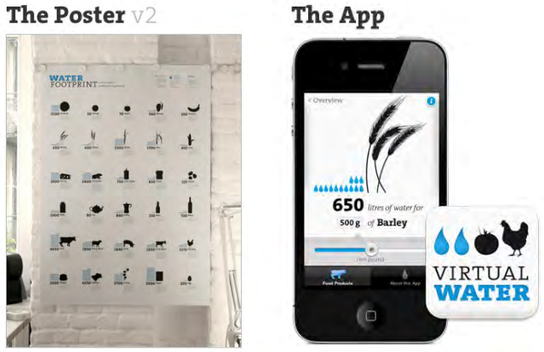
This Dutch company [45], founded in 2010, aims to make people in developed countries aware of the lack of access to water millions of people have in emerging countries. It works this way: buying their re-tap bottle (Image 16) customers fund one of the organization's projects. These projects aim to deliver a safe water pipes to different communities around the world. The customer can choose in the website, to which project he or she wants the money to go to. The product delivered to the customer has the symbolic form of a pipe, and there are different parts of the pipe to choose.

Although, it has no functionality, the re-tap bottles can be assembled together and create a "real" pipe. This business model despite being quite simple, achieves a double goal. Creates water awareness by telling the story to the customer that feels doing the "right thing" buying the product and funding water projects abroad. The customer not only buys the re-tap bottle and consequently reduces the bottled water consumption, but also gets the good feeling of helping.

IMG_16: Join the Pipe series of bottles

Virtual Water

In this case, there is not a physical object related to drinking water. Virtual water [46] has a different approach to water awareness; it aims to inform people about the real amount of fresh water they are consuming in their daily lives. Because water is hidden in the production of almost every product and we are not aware of it. Consuming less products with a high level of virtual water, will aid to relieve the water sources from depletion but also change consumption habits. Virtual Water is basically a database of the water that we consume but we do not literally see in our products. This information is transmitted to the consumer by two means: a phone application and a poster. The application allows the user, for example, to enter the type of food and amount of a meal, and the output of the application returns the virtual water on that meal. The poster contains the same information, related to food and also the water footprint of different countries. Moreover, the good graphic design will attract people, although the content can be unusual to be found in a living room. With surprising results, it is a very easy tool to use and really can change routines.



IMG_17: Virtual Water products

4.2.2.- On the go drinking water experience

Besides water awareness, the second goal of this project is to create a product that substitutes bottled water, with the help of tap water points. This is the reason of looking for innovative on-the-go drinking water solutions.

Disposable bottle from "Las gaviotas"

"Las gaviotas" [47] is an experimental centre in a rural region in Colombia that aims to research and build sustainable communities. One of their project it's a disposable bottle of water with a special shape that gives the bottle a second use. Despite the plastic is oil-based, the design of the bottle allows to build walls once the bottle is empty, so the material is not wasted. Once the water is drunk, it can be filled with sand in order to gain weight. The bottle has a "Lego" type shape that gets complemented with another bottle allowing solid constructions. Some of the houses at "Las Gaviotas" are constructed with these bottles. The second use of the bottles is an interesting approach to reduce plastic waste and also stimulates house construction in rural communities.

IMG_18: Bottle from Las Gaviotas

Boxed water

This project started with the idea of creating a bottle of water that is more environmentally friendly [48], finding out at the end that a box could solve this problem. Besides the tempting design, the company wants to communicate their sustainable approach in the product itself. They state that 76% of the product is manufactured with renewable sources and how they reduce the CO2 footprint compared to plastic bottles. Besides, they donate 10% of the benefits to water foundations and another 10% to reforestation programs. This new water container can start a precedent for new types of packaging, more sustainable, giving the consumer another choice.

IMG_19: Boxed Water is Better

- 4.3. CONCLUSION -

To conclude about the external analysis, some opportunities and strengths will be portrayed. From the audience side, it can be said that the barriers described in the pro-environmental behaviour theory are preventing them of acting sustainably, special in Persona 2: Caroline. Both of the Personas have knowledge on ecological problems. The barriers on Persona 1: Family, are not so strong due to the importance of their children education. Parents feel responsible of showing a good behaviour to their children. However, Persona 2 is also conscious and has the same knowledge but her locus of control is much more external. In some situations, she does not want to sacrifice her comfort for higher pro-environmentally behaviour. Although, she is aware she could do more about this matter.

For a successful water awareness project it is important to know which relevant information has to be transmitted to the user in order to create impact and a significant attachment to this information. Also, a long-term attachment is preferred in these cases, for example, if someone acquires the habit of using the Virtual Water application in a daily basis.

Nowadays, it is very difficult to switch from a consumerist disposable way of life, to a daily routine surrounded by durable products. As routines (commuting, eating fast…) are less likely to change, it is necessary to re-think the disposable materials used in the packaged products. Or a second use could be given to them. Although, Boxed Water is not really the best solution, because tap water is still better than a new packaging.

Besides stimulating tap water consumption as Join the Pipe does, facilitating free access to water tap points in public spaces (e.g. installing new tap points in Amsterdam), the end of life of the product is an opportunity to innovate on.

5. VISION IN PRODUCT DESIGN

PART ONE

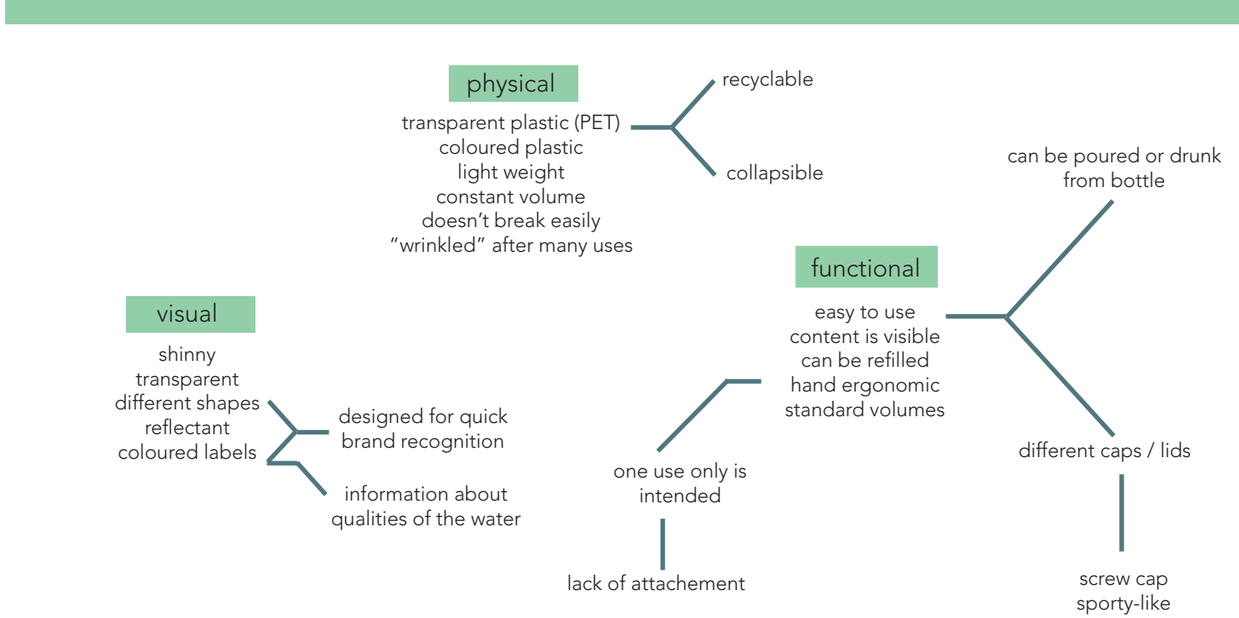
As Vision in Product Design is divided in two different phases, deconstruction and design, the first one will be part of the analysis in this report; bridging from the research phase to the conceptualization phase.

- 5.1. DECONSTRUCTION -

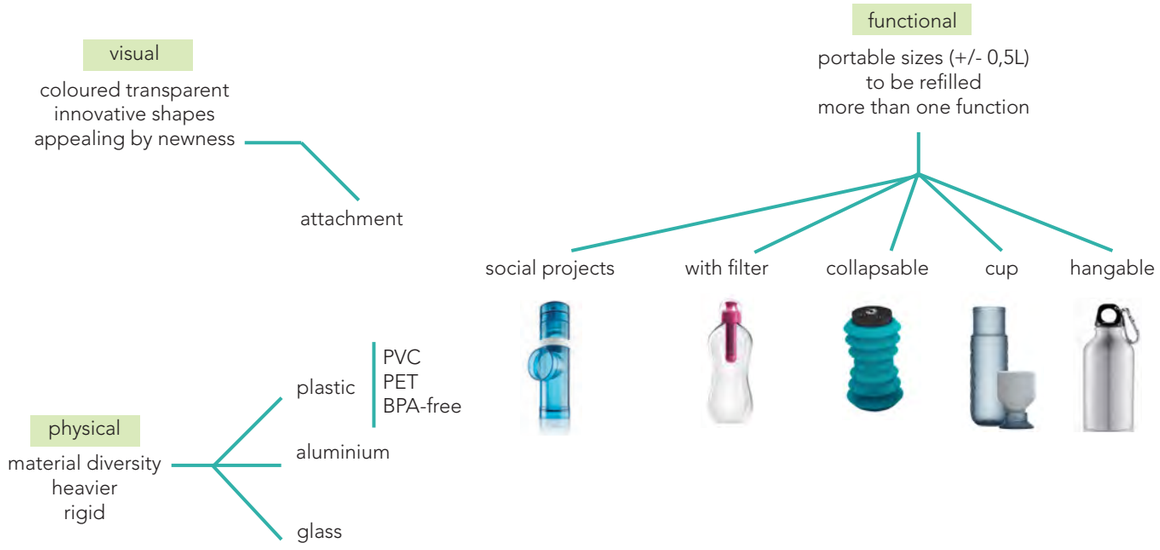
The deconstruction phase starts defining a domain that in this project will be *"on-the-go drinking water solutions"*. From this point on, a current product that fulfils this domain will be analyzed in the levels of product, interaction and context. For this project, 2 products were chosen to be deconstructed, disposable bottled water and re-tap bottles.

5.1.1.- Product level

The purpose of this level is to get a deeper understanding of why product are the way they are. Only the features related to the physical product and its qualities are described in this section.



RE-TAP BOTTLE



Bottled water is designed for quick recognition in the shelf. Although, most of the bottled water brands have the same product appearance. The value of this product is its content, the water itself. Regular brand customers do not care about the bottle shape but they appreciate the properties of the water.

On the hand, companies producing re-tap bottles pay more attention to the design of the product in order to stand out among other brands. They also aim to include functional properties (filter, cup...) within the bottle for a more complete purchase.

5.1.2.- Interaction level

But products do not self-exist; they go on together with people. This is the reason why the interaction between the product and the user is also deconstructed. For this, the characteristics of this interaction are defined also for both products.

BOTTLED WATER

convenient freedom

The action of buying a disposable bottle of water is characterized by its immediacy and lack of attachement.
Feeling thirsty, buying the bottle, drinking it and throwing it whenever you want. Hands are free and no extra weight.

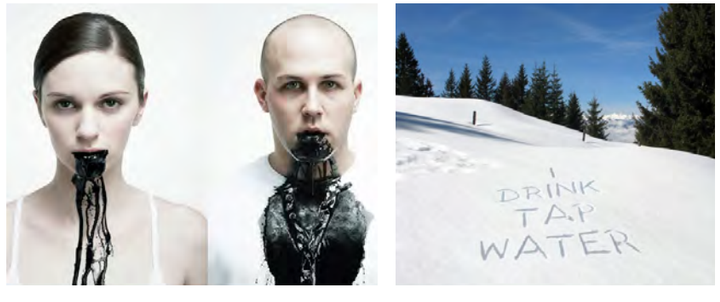
purchasing water qualities

On the other hand, people buy the product by its properties (minerals) depending in its necessities. It could be translated in a blind trust that benefits the person's diet. In this case, there is brand attachement. Informed consumers are the ones with this interaction quality.

RE-TAP BOTTLE

(money) saving responsible burden

People take in account several variables while considering to by a re-tap bottle (visual appeal, functionality and the story behind). It's a product that is present in the daily routine and replaceable if forgotten. It also engages the consumer in the mantainance of the bottle, giving another thing to think about... Or the faucet found to refill the bottle is not really clean.The burden is compensated by the economic and sustainable advantage.



5.1.3.- Context level

As a final step, the deconstruction of the context helps to understand why those products were designed that way. This is achieved by looking at the context back in time when the product was first introduced in the market.

BOTTLED WATER

At the end of the 80's decade, big companies such as Nestlé and Coca-Cola were observing how their market share in soft drinks was decreasing. Thanks to the technology achievement that made possible to produce transparent and lightweight plastic bottles (PET); these companies introduced bottled water to the mass market. It became the icon for healthy beverages because it looks and tastes clean in convenient single bottles, family sizes and bigger cans. Another factor that made the product so successful was the feeling people had about tap water not being safe. An economic boom, consumerism establishment and a more rushed lifestyle led people to consume "to-go" products, as food and beverages, saving valuable time.

People want a healthy alternative to soft drinks

People need to drink while rushing in a urban lifestyle

People need lightweight containers they can carry along the dsy

People want to be independent and not get attached (to objects)

People want to choose and decide which product is more benefital to them

People want products that are designed for them at a mass-produced price

People want convenience, in terms of time, money and safety

People living in small or single households look for unit sizes

People want pleasure while using products

RE-TAP BOTTLE

There have been durable portable bottles in the market since "canteens bottles". Although, they were targeted to climbers, hikers, campers or soldiers and designed to be re-sistant in extreme situations. These type of water containers, mainly manufactured in metal, did not reach the mass market mainly because there wasn't a demand for it. But it wasn't until circa 2000 when re-tap bottles were re-designed and targeted to the urban adult, there are many reasons for it. First, the success of campaigns against the abuse of bottled water companies, for price and exhaustion of local resources. Second, an increase of concerns such as water accessibility in developing countries and environmental decay. Drinking tap water is considered an act of awareness. It attracts people to contribute to develop water systems in BoP get a benefit themselves, the bottle. There is a positive feeling while using it, as thinking, "I'm doing the right, I like my bottle, it shows to the others that I care". On the other hand, there is also an economic side, as bottled water can seem expensive to a part of the population, they decide to invest in a re-tap bottle and get water for free just by filling it.

People don't want to feel guilt and responsible for others' suffering (charity)

People want to feel they are part of a community or shared understanding

People are incresingly questioning unsustainable actions

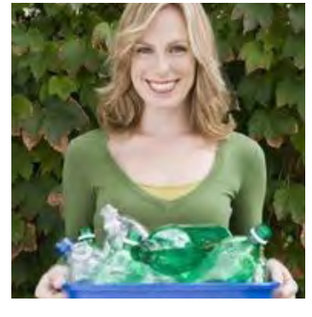
People look for products that make communiting more comfortable

People demand high quality products

People want to keep on learning and discovering

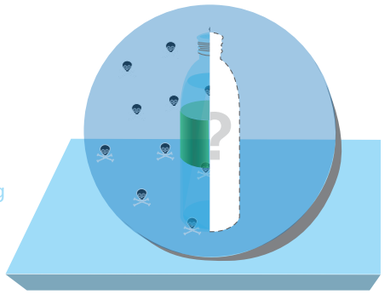
People want to be informed of the happenings in their environment at real time

People want to keep their family and friends away of any threat



CONCLUSION ANALYSIS

S2: Preferences Regarding Societal Order



Preserve the future water quality: Although there are other sources of water pollution, households can contribute positively to preserve the water quality if their waste impact is reduced. It is important that households are aware of how their behaviour has a positive result in a long term. Preserving their environment, and the future generations.

R2: Dominant Imperative Framework

Make recycling unnecessary or reduce the amount of waste to be recycled: Alternative ways of disposing packaging can be investigated, reducing the amount of packaging that enters the waste management system. Durable items, reusable products, eatable packaging…

Q2: Functional Requirements

Stimulate tap water consumption: Facilitate access to safe tap water in public spaces, getting back the habit of drinking water from the tap. Also, bring back water as a right for the communities (like roads, parks…)

P2: Program of Demands

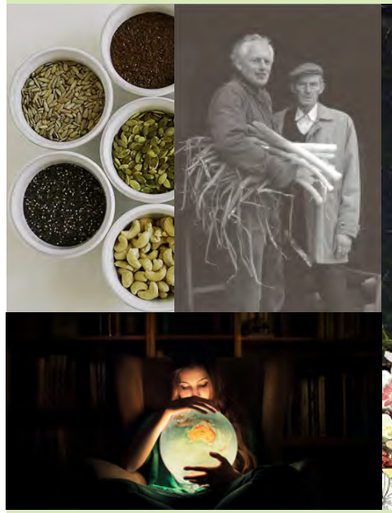
Reduce the negative impact of disposable packaging: Alternative disposable materials are being created in order to reduce the negative impact of single use packaging.

6. VISION IN PRODUCT DESIGN
PART TWO

- 6.1. DESIGNING -

Future Context

In order to start the design phase, the future scenario of the to-be-designed product has to be defined. This depends on the time spam of the project, if it is more future oriented or not. The future context research reveals changes in people's needs and investigates trends that could be relevant for that time. For this project, the context is present oriented.



Search for Authenticity

People seek for less treated food and simple healthy dishes. The key is in the **quality of the raw ingredients.** Food is meant to be **100% organic,** there is an increasing interest for **local food and nature**. There is a **rediscovery of our closest environment**, leaving aside the overseas ethnic attraction, as a **back to the roots trend.**

The Happiness Movement Against Uncertainty

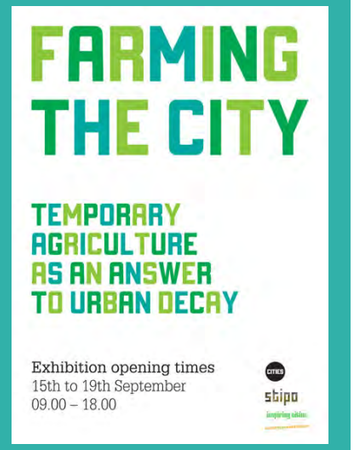
Polluted air, contaminated water and tainted food arouses **consumers with doubt and uncertainty**.
Better look for **happiness vs. materialism** what really matters to me?
Allowing us to **positive daydreaming and selfreflection. Giving it's the new key to happiness.**

Rediscovering Freedom

Digital diets: managing on and off digital time. People want to manage technology in their lives. A **festival** environment is a way to make people **socialize and interact without pressure.** They feel more **audacious and unrestrained**. Festivals eliminate the burriness between work and pleasure. People at festivals don't want extra responsabilities, they want to be **agenda-less**, make **spontaneous decisions**. They expect to discover new music, art and food.

Water Supply

Access to drinking water is limited in public spaces. The free access to water in public spaces will contribute to an overconsumtion. Municipalities are promoting a healthier lifestyle by installing **new public drinking water points. Water is a local sustainable resource.** The water embedded in products is not taken in account by consumers (virtual water). Agriculture withdraws the 90% of the fresh water supply. **In the future there will be partnerships between farmers and cities.**



Health Security

Due to **the presence of medication remains in the water system**, people in developed countries are getting **immune to anti-biotics.**
The **plastic particles polluting water** bodies, entering the food chain because of being mistaken by food from animals. **Ageing water infrastructure** in the cities, it's not possible to ensure water safety everywhere.

Drinking Water Experience

Some people find drinking water **boring** and **tasteless.** Parents look for **solutions (like games)** to make their children drink more water. **Thirsty is too late!**

There will be a resilient feeling from the citizen to use the drinking fountains due to uncertainty of how clean the faucet is. Drinking water is essential for a healthy life.

New Ways of Litter Management
Recycling is not very effective, let's try **Upcycling**. Research in really **short term biodegradable materials. Zero waste programs** in cities and communities.
Craft rediscovery with waste. Crowdsourcing and open source products.

Vision Statement

A design vision is created to guide the design process and to narrow down the scope of the project. It can also be used as an inspiration for the idea generation phase and it relies on the personal designer's intuition.

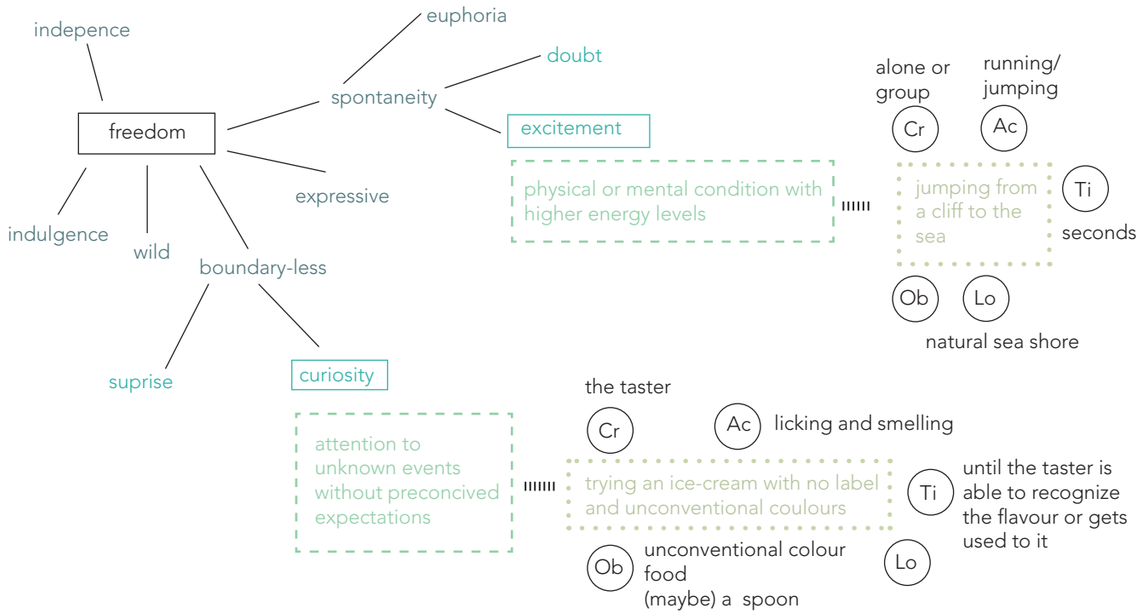
"I want people (at ITGWO and Vlieland) to rediscover their freedom of spirit by having an honest and respectful drinking tap water experience that will appraise nature."

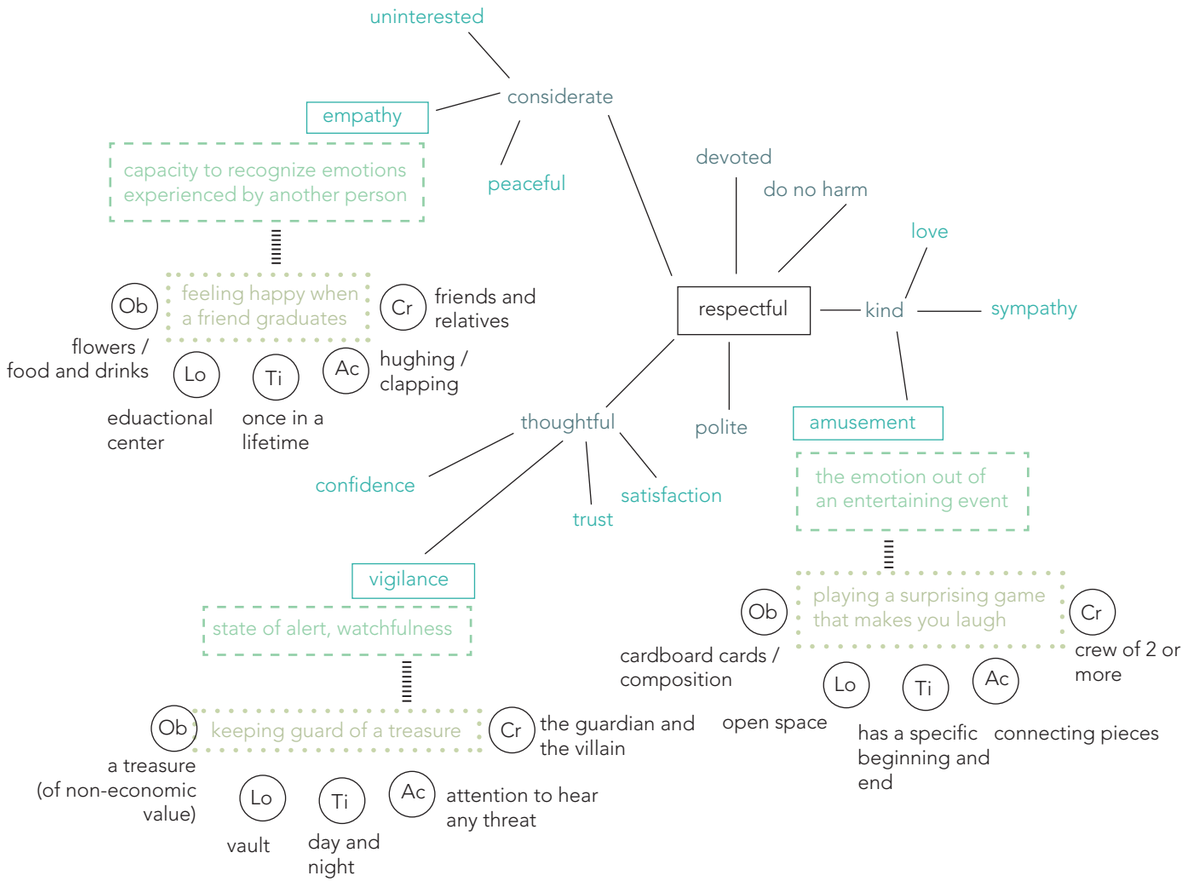
Semantic Network of Product Experience

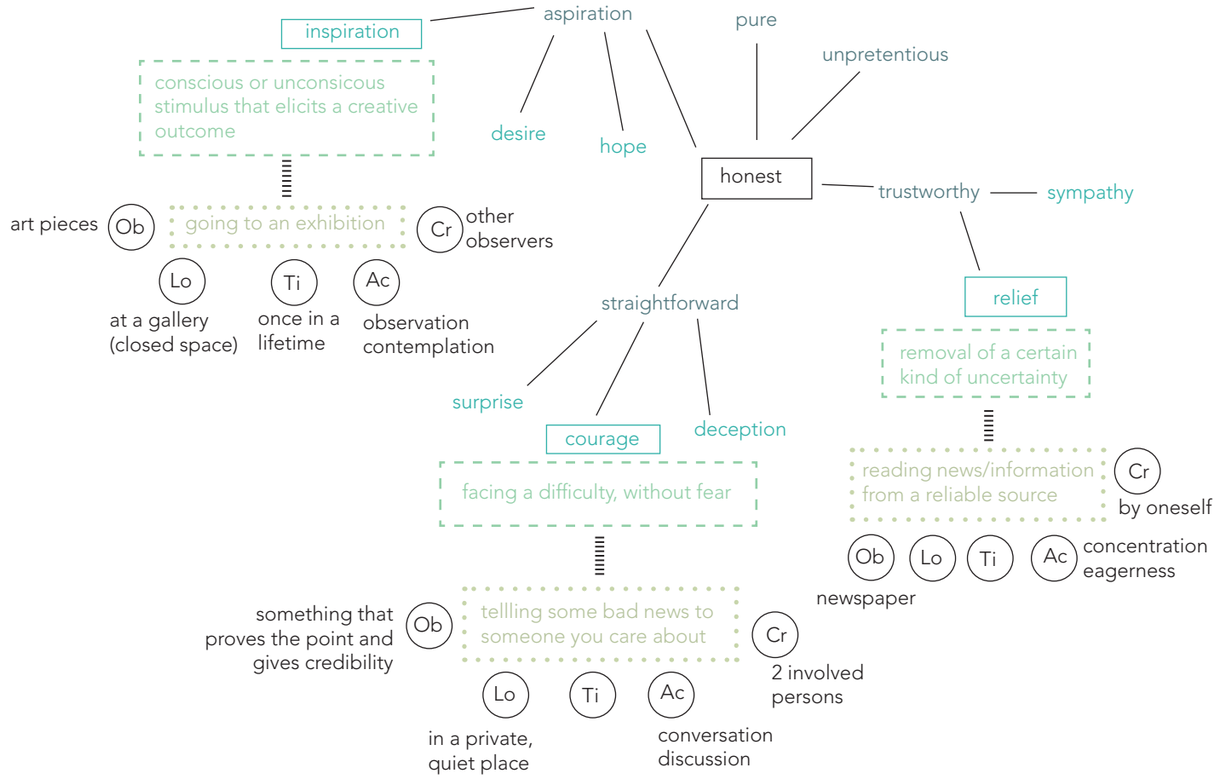
This exercice has been done in order to get a deeper understanding of the statement and illustrate the possibilities it delivers for the further steps of the ViP. The objective of the semantic network is to deconstruct an experience in order to find its physical components that will be included in the product qualities [49].

The chosen concepts to explore are: freedom, respectful and honest.

It starts with the main concept that is desired to be found in the product. From that point, there are different stages:




respectful
kind
love
sympathy
devoted
do no harm
polite
thoughtful
confidence
trust
satisfaction
considerate
uninterested
empathy
capacity to recognize emotions experienced by another person
peaceful
Ob
feeling happy when a friend graduates
Cr
friends and relatives
flowers / food and drinks
Lo
eduactional center
Ti
once in a lifetime
Ac
hughing / clapping
vigilance
state of alert, watchfulness
Ob
keeping guard of a treasure
Cr
the guardian and the villain
a treasure (of non-economic value)
Lo
vault
Ti
day and night
Ac
attention to hear any threat
amusement
the emotion out of an entertaining event
Ob
playing a surprising game that makes you laugh
Cr
crew of 2 or more
cardboard cards / composition
Lo
open space
Ti
has a specific beginning and end
Ac
connecting pieces


honest
trustworthy
sympathy
aspiration
pure
unpretentious
inspiration
conscious or unconscious stimulus that elicits a creative outcome
desire
hope
straightforward
surprise
courage
deception
facing a difficulty, without fear
relief
removal of a certain kind of uncertainty
Ob
going to an exhibition
Cr
other observers
art pieces
Lo
at a gallery (closed space)
Ti
once in a lifetime
Ac
observation contemplation
Ob
reading news/information from a reliable source
Cr
by oneself
newspaper
Lo
Ti
Ac
concentration eagerness
Ob
tellling some bad news to someone you care about
Cr
2 involved persons
something that proves the point and gives credibility
Lo
in a private, quiet place
Ti
Ac
conversation discussion

Future Interaction

The purpose of this level is to get a deeper understanding of why product are the way they are. Only the features related to the physical product its qualities are described.

unveiled / unknown senses

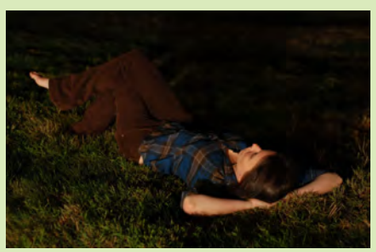
Curiosity is triggered by the impossibility of recalling how an instrument sounds, how a new dish smells or which of the texture of an unsulau product. This makes people concentrate and therefore pay attention to the senses in order to retain the sensiorial information. Emotionally, people's reaction can be unexpected, such as repulsion, familiarity, surprise, attonishment...

informative eagerness

We are surrounded by large amounts of information, but only a few times we are waiting for a sort of it. The will to know more is a part also from the curiosity but in this case we can expect bad news, e.g. reading the grade for an exam or the result of a medical test. (willing to continue reading a nvovel)

gentle abstraction

In a moment of relaxation, surrounded by a beautiful environment we tend to observe more or less unconsciously the little details. Details that in our daily routine we are unable to stop and see or because we cannot find such things. In this case it's not about knowing more, it's just about observing a relaxing and pleasant event.



energetic motion

feeling freedom gives us energy to perform courageous activities. Keep on moving is part of a healthy life, and generates endofines to maintain us happy, mens sana in corpore sano.
Just as water, that it constantly flow, grasping minerals to reach a high quality level.




effusive affinity

Belonging to a community is a wish inherent in our genes, since prehistoric times. We are always looking for similarities and differences so we can identify ourseleves in another being. The finding of a similarity in another person creates empathy. This is stronger when we feel alienated, e.g. in a foreign country.


cautious care

When something is valuable to us, we treate it looking out not to break it. This makes us be very alert and watch out every of our movement and our surroundings.



Product Qualities

These qualities are gathered from the exploration of the vision statement by the semantic network of product experience. Here just the desired physical properties are defined before the actual product design.

honest

deliver information

In order to overcome external locus of control, people need to receive information that can ensure them that their positive contribution is significant.

respectful

surprising

the product should create a moment of surprise, amusing the user by an unexpected situation, reaction or behaviour.

keeping the product safe

the product should be designed in a way that the user can easily have control on it and keep it as a treasure. In order to have a respectful relation with the environment, giving this treasure value to the product creates attachment.

freedom

special forms

the product should be unconvetional enough to trigger the curiosity of the people that do not own it yet. This could start a mouth-to-mouth propaganda.

motion stimulation

the product should make people active besides the movement provoked by the music.

- 6.2. CONCEPT EVALUATION -

6.2.1.- Idea Generation

In order to trigger the first ideas a creative session with other design students was prepared at IDE. There were 6 participants and it lasted a bit more than an hour. The participants were informed of the subject of the project and the outcome of the ViP process (statement, interaction and product qualities) was used as a trigger for the session. The pictures that illustrate the ViP outcome were displayed on the wall in order to inspire the participants. Techniques from the Creative Facilitation [50] course were applied for this session. It was conducted as it follows: A short warm-up (15mins) to introduce the participants creating a quick collage about their ideal water situation. For the generative session, each participant had one picture assigned as inspirational trigger, to start with an idea. After 3 minutes, the paper has to be passed to the participant to the left. The session continues this way until all the participants have drawn in every piece of paper. To summarize, the ideas are exposed and commented. From these ideas of the ideation session the most relevant were gathered for possible further development (Appendix C1)

6.2.2.- Criteria Definition

The aim of the evaluation is to objectively narrow down the ideas in order to develop a concept. For this purpose a list of criteria has been created, based on the different important aspects and stakeholder involvement in the project. The criteria touch different aspects a new product development has to fulfill, such as technical feasibility and company fit.
The score goes from ++, achieved completely to -- totally non-achieved. Together with the score a short statement is given that justifies the score.
In the following pages, only a set on the concepts with higher scores are described, together with an argumentation related to the criteria.

The criteria are defined from the perspective of:

DESIGNER: As the ViP process is mostly a personal perspective on the problem, the own vision of the designer has to be taken in account. Fot this, two questions will be answered

To what extent are the vision and interaction fulfilled?
Does the concept deliver a meaninful drinking tap water experience?

ITGWO: From the company's side, it is important that the outcome of the project can be implemented in the edition of 2013. Moreover, it has to fit the festival experiece and have the brand personality traits.

Is it feasible, in terms of construction / manufacturing and regulations?
Does it fit the festival experience and the brand personality?

THE USER: In this case, the probable impact on the sustainable behaviour of the users will be assessed. On the one hand, the concept as to stimulate the motivation (as stated in section 2.2.2.) of the user to act pro-environmentally. On the other hand, it aims to overcome the metioned barriers.

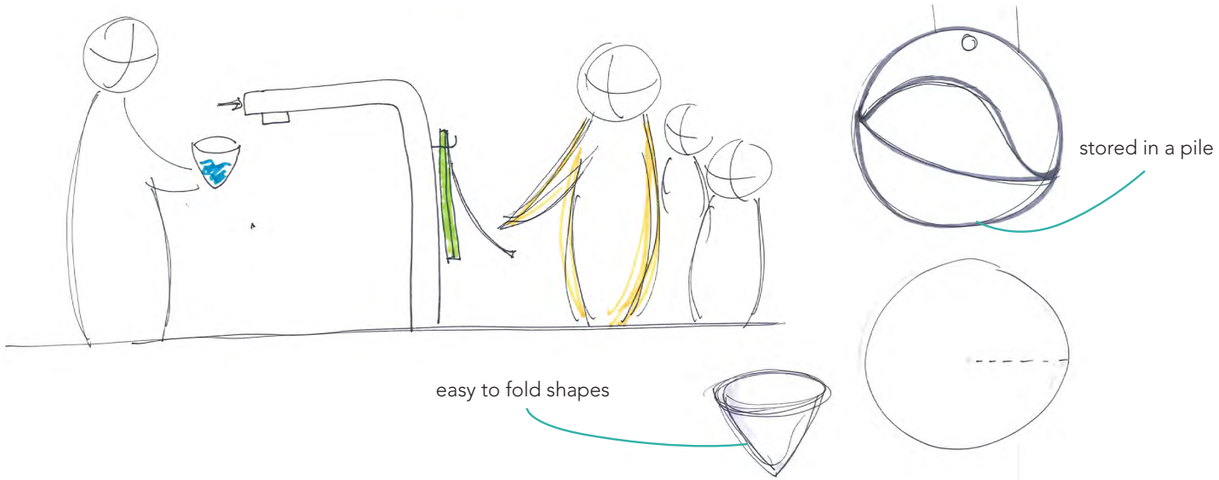
Does it stimulate a pro-environmental behaviour?
Does it have the potential to change non-sustainable habits?

FUTURE STRATEGY: Vlieland's presence in the outcome is also important, as one of the wills of the company is to stand out among other islands in relation to environmental solutions.

Is it valuable for Vlieland? Does it give a differentiative advantage to the island?
Is it scalable to other contexts?

6.2.3. Evaluated ideas

DISPOSABLE FOLDABLE CUP



A disposable foldable cup which aims to help people drink from the drinking fountain. It can be disposable or durable and it is easily stored. It also aims to avoid touching the source of the water.

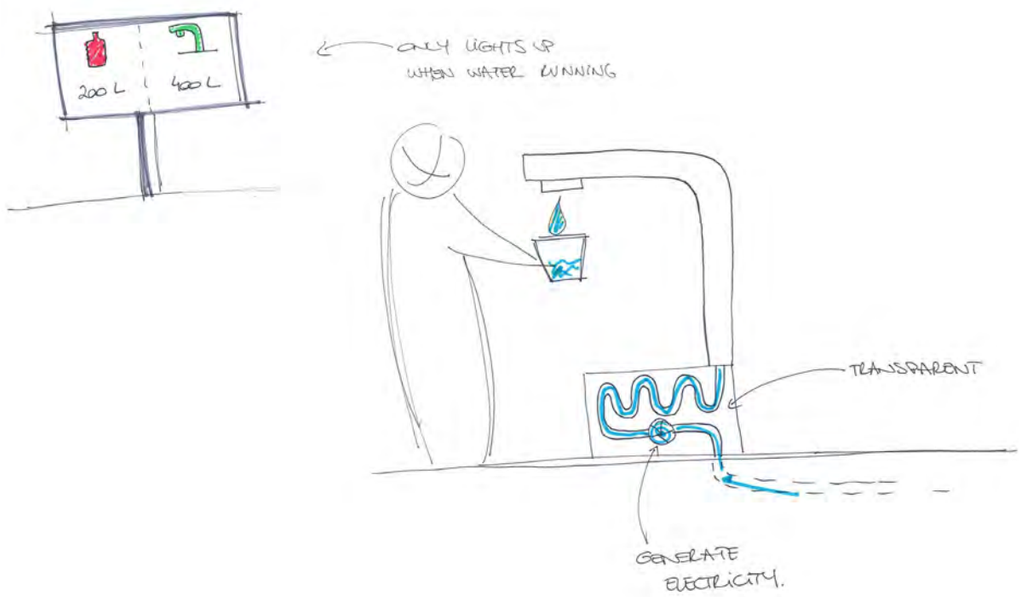
\+ \+ It's a different way of drinking water that leaves some freedom to the user. Many shapes that fulfil the functionality can be explored, resulting in a surprsing cup.

\+ It's feasible and doesn't imply lot of costs. Can be easily designed with the brand vision and can be easily modified for future events.

\+ Curiosity is triggered and ways of drinking might be explored, leaving aside the bottles that are more obstructive. It minimizes the space of the product while not being used.

\+ Can be scaled to any event that provides tap water but cannot be used outside a network of tap points, as the water cannot be stored.

WATCH THE WATER STRENGH



A way of being aware the energy water can generate and also making the drinking water experience a bit more special. This can be achieved by creating a mechanism visible to the eyes of the users while pouring water.

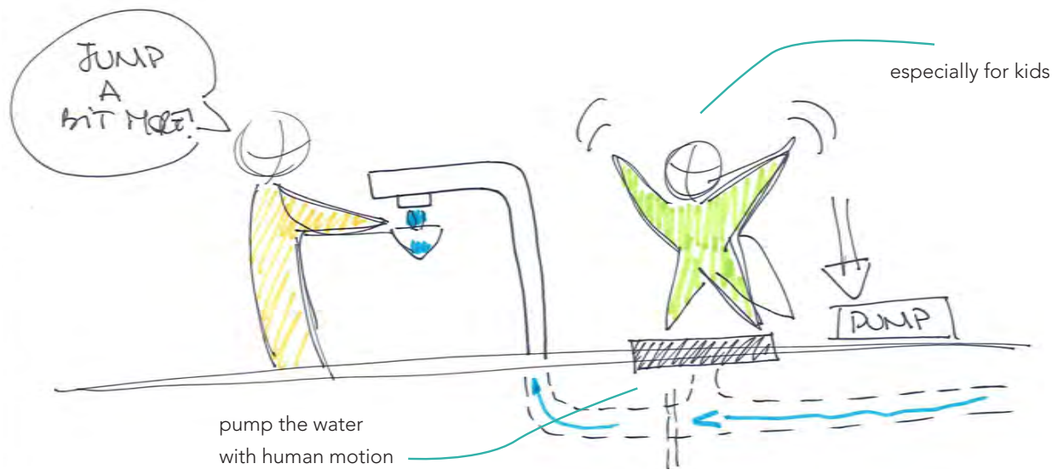
\+ \+ Observing running water is desired because the movement can catch the user's attention. Gives information about the amount of tap water used, creating information awareness.

\+ Might be complicated to construct and costs can be high (screen, construction...). Although, it has a low-tech feeling with the generator that matches the festival.

\+ \+ Gives an idea of the water force, something that normally we do not give importance to. It also allows users to pre-determine the water quantity before it arrives outside.

\+ Comparing bottled water and tap water usage could be done at any public space, not depending on events. It would require a complex counting system.

JUMP AND DRINK



In order to obtain the water, collaboration it needed between 2 persons. An energetic option that makes people pump the water, creating awareness about the effort it can cost and also a fun way for kids to drink more water.

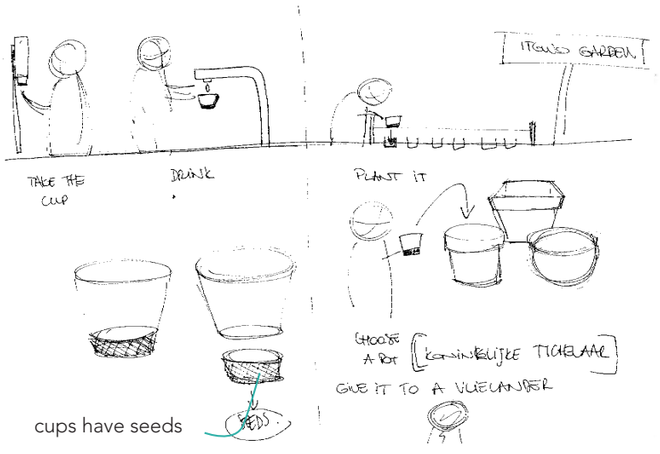
\+ \+ Requires motion and care in order to fill the water container. There is engineering complexity in designing the pump that would do the job.

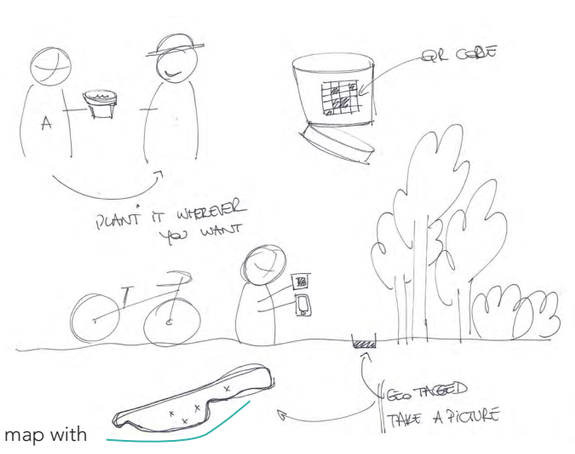
\+ Similar to the previous idea but this one has a bigger flexibility. Although it can be very complex because a single person cannot obtain water alone.

\+ Giving effort in exchange of water is already a behavioural change. The likeability of a product like this needs to be tested, because it requires a lot of interaction to drink water.

\+ Could be installed at any event in Vlieland that delivers tap water. Or could be installed in areas where children are present (schools, parks, sports centers)

PLANTS FOR "VLIE"





The end of life of a product is one of the biggest problems nowadays. Delivering something positive to nature and not generating more waste is the goal of this idea. There can be different ways of planting a cup. Pottery can be designed, a garden can be prepared or can be planted anywhere in Vlieland.

\+ \+ Seeds appraise nature, for instance delivering flowers for the bees not to get extinct. It is very interesting how people's disposable behaviour can change positively.

\+ \+ Plantable paper is available and could be customized to ITGWO's brand vision. Many different designs could be done to fulfil the festival's image.

\+ \+ Creates a sense of community between the users with a pro-environmental behaviour. Also, an emotional part can be emphazised due to the flower's participation.

\+ Planting seeds should be approved by Vlieland's municipality and the seeds embedded in the paper have to be autoctonous, not to unbalance the eco-system

- 6.3. FINAL CONCEPT -

After the idea generation session and the criteria evaluation, a conclusion is drawn. There are 3 main clusters of ideas that fulfilled the interaction and product qualities. There was not an intention for this clustering at the beginning of the creative process, but the evidence shows the importance of it. The 3 clusters found in the ideas are: Product, interaction with the tap and disposable experience. These can be very useful for the final concept generation, using them as building blocks and are defined as it follows:

DRINKING WATER AID

A product that helps the consumer to drink the water from the tap point. People don't want to have bigger responsibilities therefore the container has to be disposable. This product should fulfil the Interaction Vision and Product Qualities defined in ViP.

DRINKING EXPERIENCE

In order to make drinking water more exciting and attract people, different interactions with the audience and the drinking fountain were created. This element of the overall concept is dependant on the drinking fountain installed by Vitens. Moreover, people using other cups or bottles should also able to use the drinking fountain. But the users with the concept cup will be granted with the new drinking experience.

DISPOSABLE EXPERIENCE

Getting together the disposable importance and the will of appraising nature, different ways of disposing the product are an important part of the overall experience. An important insight taken from the Future Context is fulfilled with this disposable experience is: "Giving it's the new key to happiness". Also, this aims to create a sense of community and a long-term connection within the audience, the island and Vlielanders.

In order to come up with the best solution for the project, different combinations of ideas from these building blocks were combined. For this purpose, a "concept variation tool" was created to help the task of combining the different possibilities (Appendix C2). As an outcome of an evaluation meeting with the supervisory team from TU Delft and the organization of ITGWO, a decision was made. The final concept chosen was the combination of these:

Leaving aside the design of the building block "Drinking Experience" was a group decision due to its complexity and because works on the tap points were already done. This is the reason why there will be an emphasis on the product and the disposable experience, that go together with any tap point at the festival.

ORIGAMI FOLDABLE CUP

This simple cup can be easily constructed, instrusction of the cup itself will be provided. Once folded and the water drunk, it stays flat and the user can keep the cup in a pocket or in a bag, without the burden of the unused volume when not used. The material will be a semi-rigid cardboard, suitable for food and beverages. The manufacturing is as simple as a die stamp process, with minimal costs.

GEOTAG & PLANT

In order to give the maximum freedom to the audience and let serendipity do the work, a phone app is ideated. Each cup will have a QR code, containing the information of the seeds. The QR code will directly launch the app and will Geo-tag the place where the cup is going to be planted. All the app users will be able to see every spot, and if some are going back to Vlieland, they will be able to visit the spots.

7. CONCEPT DEVELOPMENT

The final concept consists of a foldable cup with embedded seeds and a phone application. It encourages the audience of the festival to drink more tap water by this new drinking and disposable experience. Whenever the user has decided to dispose the cup, instead of throwing into the rubbish bin, it can be planted in the soil of the island. The user scans the QR code on the cup to download the application that allows him/her to mark the position of the planted cup. Besides, the user can see where other from audience has planted their own cups. This combination of product and service, is created to:

1. reduce the amount of plastic waste, in order to preserve the quality of the water (MDM)
deliver information about water issues that influence Vlieland

2. fulfil the vision and goals generated from the creative process of ViP

3. fit in the festival context complemented with a future sight in changing needs and trends

4. test the influence of a new drinking experience on the locus of control, aiming for a higher awareness of the personal contribution to reduce the environmental impact.

It is important to note that all the seeds in the cups are Vlieland friendly, not willing to unbalance its ecosystem.
In this chapter, the development of the final design is described.

IMG_20: Pouring water in the cup

IMG_21: Home screen of the smartphone application

IMG_22: Sprouts from the paper seed of the cup

- 7.1. PRODUCT-SERVICE SYSTEM -

The core of the system map is composed by the main stakeholders (Audience, ITGWO and De Werkplaats). Outside this area, secondary stakeholders generally related to manufacturing companies or institutions are found. The relations between the different actors are represented by the different flows.

The idea of the system is that in the first place, there is a closed cycle of the usage of paper. ideally, the governmental institution (Province of Friesland) delivers to the raw material, recyclable paper to the seed paper manufacturer. This would be a start to re-think the local waste management system and giving a second life to the paper waste (e.g. of Vlielanders). This paper with embedded seeds goes to the packaging company that stamps the cup. Although the waste management system is different nowadays, this new cycle of paper has to be studied for efficiency. ITGWO is in charge of selling the cup to the audience and also they take care of promoting the new drinking experience. On the other hand, De Werkplaats is in charge of developing the application. The involvement of De Werkplaats in this system is mainly due to the willingness of the organization to create innovation projects in Vlieland. Being a start-up project, the application can give the organization a lot of information about water habits. Moreover, it is a communication means from De Werkplaats to the cup users; they can be informed about the water projects or future projects held in Vlieland. The partnership between ITGWO and De Werkplaats makes possible this new drinking experience, with a focus in the end-of-life of the product, while both of the parties benefit from it.

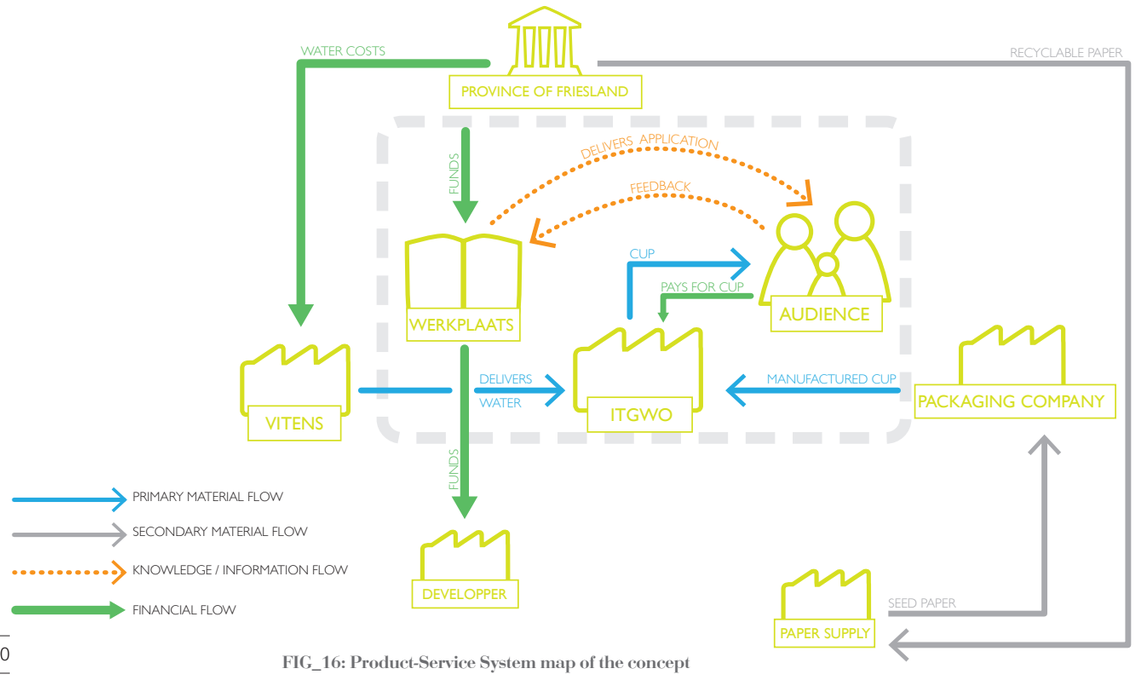


FIG_16: Product-Service System map of the concept

- 7.2. THE PRODUCT -

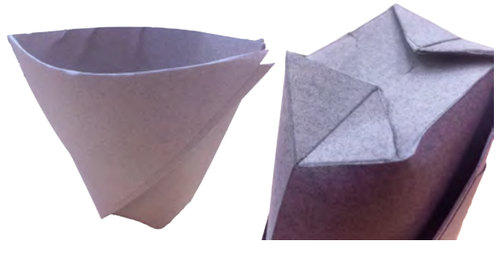
At ITGWO water tap points are available for the audience in the central area of the festival and other stages areas (Bolder, Sportveld, Naar Buiten, Tokkelbaan). There is a will from the organization's part to expand these tap points to every stage area in the island, not needing bottled water at all. The drinking water aid that has been designed in aggregation to this evolving water system is based on a traditional origami cup (image 23). This has several benefits, such as room for communication on the product itself, ease of use and that can be produced with different materials (paper, cardboard, plastic…).

Based on the traditional origami cup, modifications have been done from in order to make the cup standing, creating a foldable base (Image 24). This will allow people sitting on tables have their glass of water with them while chatting with friends. It also allows containing a bigger amount of water as the walls of the cup are more separated. A flat sheet of cardboard is given (Image 25) to the user. With the help of the instructions printed on it the user can fold the cup easily and drink from the faucet. When the cup is not used to drink, it folds flat and can be kept in a pocket. For technical drawings and production specification of the concept cup see Appendix D1.

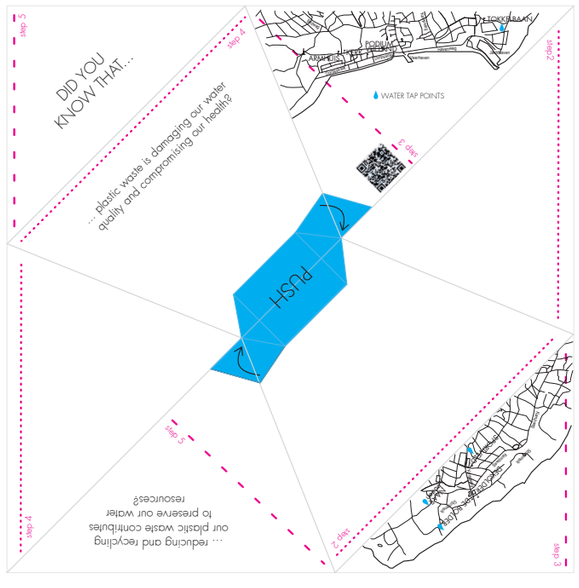
BEFORE

IMG_23: Traditional Origami Cup. Non Standing

AFTER



IMG_24: Standing cup with foldable base



IMG_25: Flat sheet (Inside part) with folding lines

In the following images show how the cup is folded, step by step:

Step0: flat sheet delivered to the user.

Step1: Fold in half by the square's diagonal.

Step2: Take the right corner and fold it towards the opposite side

Step3: Turn the cup and repeat with the left corner.

Step3: Take the upper flap and fold it down

Step3: Turn the cup and repeat with the other flap.

Step3: Push the bottom towards the inside of the cup

Step3: Fold both resulting corners towards the inside too.

IMG_26: View of the cup, standing

IMG_27: View of the inside of the cup.

Several ways of giving the instructions were ideated and tested. (Appendix D2) In the end, the "matching lines" option was chosen because it permits to continue folding without a fixed place for the instructions. As mentioned before, it also gives room to place information about water and brand communication. However, the final user test was undertaken during the festival, and the gathered insights were used to improve the final concept. The outcome of the user test at the festival is further explained in Section 9.2.2.

As a summary, the changes done related to the test before the festival are: the order of the steps are indicated and the instructions are in a different colour from the rest of the cup. The festival's insights were used to improve the final concept.

IMG_28: Final product design and home screen of the application

IMG_29: A user drinking from the cup produced for ITGWO

IMG_32: Logo designed for Vlieland and De Werkplaats

Another part of the design that had to be taken into account was the information displayed in the cup. First, information about the damage that plastic waste is doing to the water quality is given in the form of "Did you know that…" "… Plastic waste is damaging our water quality and compromising our health?" "…Reducing and recycling our plastic waste contributes to preserve our water quality?" This aims to the part of the environmental awareness that information can deliver. Besides, it also gives a deeper meaning to the cup and the project itself the eyes of the user. It is a foldable cup with a mission.

Second, a map of the main area of Vlieland is also printed (Image 30). It takes the complete form once the cup in almost entirely folded, and the user can consult it whenever he or she wants to find a tap point at the festival.

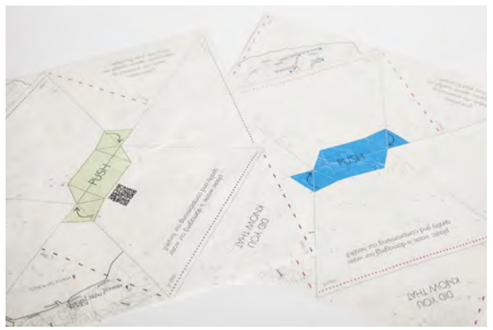
IMG_30: Part of the cup with the map of Vlieland

Third, displaying their logos shows the contribution of ITGWO and Vitens (Image 31), together with the sentence "We support drinking tap water". Moreover, Vitens has a baseline that is used in these occasions: Kraanwater Graag, that can be seen inside the cup when the user is drinking.

IMG_31: Logos of ITGWO and Vitens, with the statement

Fourth, a logo was designed with the idea of representing Vlieland, with the trees and the sea (Image 32), that is the essence of the island. But also, this logo represents the influence De Werkplaats and the will to give an image also to this new innovation hub.

Two different colour groups were tried for the printing of the cup (Image 33). One is black, cyan and magenta and the other one has more mixed colours in an earthy colour palette. For the concept development, that includes the cup and the application, the second palette was chosen (Figure XX). The reason of this decision was merely due to the bigger fit of this colour with the tone of the seed paper, the festival's image and the context, Vlieland's nature.



IMG_33: Both colour palettes tested on the paper

7.2.1.- Material

Plantable paper is a relatively new material that has been promoted by green companies to give value to the paper waste and reuse it in a different way. It has been widely used to add value to communication pieces, giving them a second use. (Image 34 and 35)

In this case the function of the paper is different, as it has to be used to drink from it, regulations regarding health and food have to be taken in account.

There are different processes to produce it that differ in the resulting properties of the paper. One is shredding and making new paper pulp out of the recycled paper. In the same pulp the seeds are mixed. Then, the drying process starts spreading the mixture in a framed colander. The outcome of this method is a thick paper, more resembling to cardboard as it has almost the same properties. It can be cut, printed, scored or drilled. Although, it is a craft oriented process for small-scaled productions. The first mock-ups of the cups for the project were made with this method.

For the final concept, another method was chosen. This process is the one used by the provider of the seed paper: the company Growing Paper, based in The Netherlands [51]. They produce first thin layers of paper and then they put the seeds in between two of these layers, creating one sheet of paper with the embedded seeds. This process is more secure in terms of scalability and regulations.

In order to make the cup more durable, a thin layer of PLA (Polilactic Acid) will be adhered in both sides of the cup. PLA is the most developed bioplastic and that resembles the most to traditional plastic, which facilitates the embodiment of the product (Appendix D1).

IMG_34: Communication piece with seed paper

IMG_35: Compostable plant pots.

7.2.2.- Seeds

According to a forest guard working in Vlieland, there could be several seeds that could be planted in the island. After talking about different species, mainly middle height bushes, he mentioned that there is a rose that grows very well in sandy soils. It is called Rosa Pimpinellifolia, or as it Dutch common name states "Duinroos" (rose of the dune). This is the plant chosen for the concept of the project, as it is a native specie and is very distinctive due to its fruits (Image 37) and flower (Image 38).

The ideal time to plant it should be the same time the seeds get mature from the plant and fall to the ground. This period is from June to September. It is in flower in spring, for a short period of time, between May and June. It stands low temperatures (-15°C) with no trouble and shady sandy moisten soils are preferred for its growth. This makes the plant ideal in the coastal areas in The Netherlands as it tolerates maritime exposure.

It is a very rough plant, reaching normally 1,5m and is also used as a hedge, due to its solid stems full with thorns. Its white flowers are hermaphrodite and are pollinated by bees, flies and day or night butterflies. The fruit and seeds are edible and have properties related to health, such as vitamins (A, C and E) and minerals.

The germination period is long, almost 2 years, as the seed needs periods of cold and warm weather in order to release the layer covering the seed. Nevertheless, there are some gardening tricks to make the seeds germinate faster, but it is not the case for this project. [52] [53]

IMG_36: Botanic illustration of the Duinroos

IMG_37: Duinroos` fruits

IMG_38: Duinroos` 5 petal white flower.

- 7.3. PHONE APPLICATION -

7.3.1.- Navigation map

The goal of the phone application is to emphasize the freedom of spirit stated in the vision of the creative process (Section 5: ViP).
The application has two goals: Give information to the user about the available tap points and map the users plantations.

The user scans the QR code in the cup, and the application is launched, unveiling the mystery of "what is this QR code for?". With a short introduction it tells the user what does he/she wants to do: Look for tap points or plant the cup. Also it informs about which seeds are embedded in his/her cup, and proceed to plantation geo-tagging where the user is, and recording the place inside the application. It also creates a sense of community between the cup users, being able to see other's plantations.

After completing the main task, it gives information about water projects held at the Werkplaats and other water issues in Vlieland. It also has expansion possibilities, using the map to give information to visitors about events related to water around the island. Also, if the users come back to the island, the place where they have planted the cup can be revisited to check how the plants are growing. In the next page the main screenshots of the application are provided. The full navigation map can be found in page 90 (Image 40)

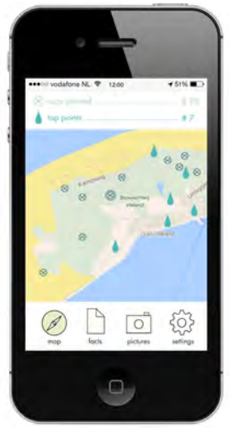
IMG_39: QR code of the cup being scanned

HOME SCREEN

The application has two main functions:
/ show to the user the tap points in the surroundings
/ give instructions about the planting process and register the user's cup in the map

An always visible menu allows the user to navigate easily to any of the possible actions inside the application

GENERAL MAP



Both views of the cups and the tap points.

GEO-LOCALIZATION

When the user wants to plant the cup, the app shows the localization.

INFO ABOUT TAP

Tapping on the drops, information about the water point is shown (address, type, quality)

WATER FACTS

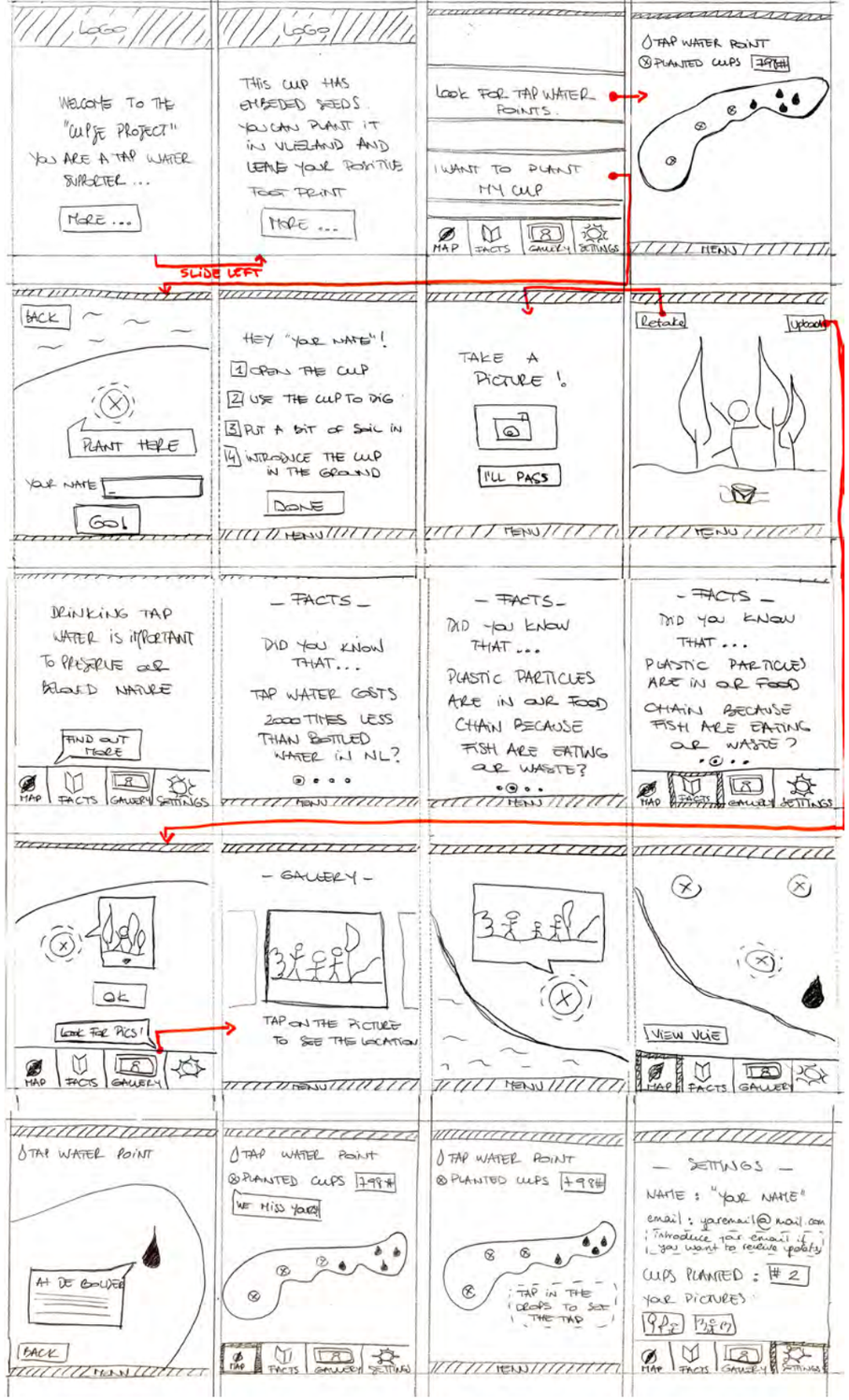
Several facts about water are available for the user's knowledge.

USERS' PICTURES

Pictures from other cup users can be seen and check its location on the map.

SETTINGS

General information about the user, social media and De Werkplaats.



IMG_40:Navigation flow diagram

7.3.2.- Wireframe

Willing to minimize the struggle the user can go through when opening a new unknown interface, the level of usability is a major criteria for this project. The effort the user has to make while understanding the output and handing over their input has to be even lighter in the festival context, where people want to enjoy and not get more responsibilities. Also, the application will be used in 2 specific moments (See storyboard - Figure 17) during the festival, and maybe afterwards whenever the user wants to. If the usability is at an enough low level, this will bring satisfaction to the user, leaving a positive feeling. There are 2 important principles to achieve this:

- ideally there should be only one way to complete a task
- commands should work the same way in different contexts

Every mobile device has different design rules; in this case Human Interface Guidelines for iOS [54] will be used to develop the application. Within the guidelines visual design rules (icon sizes or window style and aesthetics) are described but also gives advice in order to develop the interface in a more intuitive and consistent way (e.g. how the input mechanisms work)

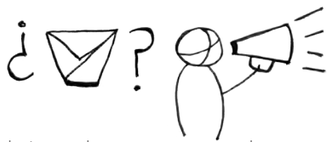
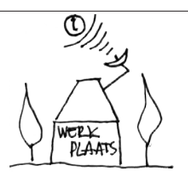
Some definitions:
Input: any information the user introduces in the device. Can be typed or a free-form drawing.
Output: the information delivered to the user by the device, using senses (sound, visual, vibration)
Modality: the way the user and the device communicate. It works both way (input and output) and can be text, visual, or by gesture.

A first draft wireframe has been done and tested with the POP application. This application allows to quickly create buttons on images. This first test was created with the Navigation Flow drawings.

Some errors were found by the users, such as the difficulty to go back to the first screen and the impossibility of sharing in social media. These user feedback are applied in the final prototype. The final wireframe is prototyped for iPhone with Justinmind Prototyper. The wireframe can be used as a realistic version of the application.

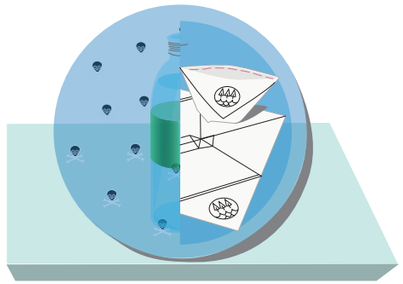
- 7.4. STORYBOARD -

The following storyboard (Figure 17) describes the different phases the concept has. In each of these phases the involvement of the main stakeholders is visualized. This tool can also be seen as an experience map from the user point of view. It also useful to find out the details of the concept in each phase and to evaluate it, following which phase is weaker than another. As we can see, ITGWO is more involved at the beginning of the interaction, while De Werkplaats is more present at the end. In this way both partners get control of the experience in different stages, sharing out the responsibility. Nevertheless, one part cannot work without the other.

	SET UP	DRINK AND REPEAT	DISPOSABLE EXPERIENCE	AFTER FESTIVAL
AUDIENCE	 pre-purchase: evaluate the possibilities of drinking tap water. purchase: the volunteer explains a bit about the reduction of plastic waste folding the cup: the user looks at the instructions. Folds it. Is satisfied with the result.	 interaction with fountain: the user goes to the tap point to fill the cup. Drinks from it. enjoy the festival: keeps the cup in the back pocket of the pants. He is able to dance freely. Goes to the workshop. repeat: gets thirsty again and goes back to the tap point to drink with the cup.	 app download: scans the QR code to download the app. Gets surpirsed. locate spot: goes around the island with friends, looking around where to plant the cup. Finds the place. plant it: They look at the instructions from the app. Put the cup in the ground and take a picture. the festival is over, time to go home. Leaving his/her positive footprint is also significant to this feeling.	 the user is more conscious about water usage after the festival. Drink water from the tap. app notification: at work, there is a cupje notification. Werkplaats is carrying a new water project. check map: in the train, going back home, the user checks how the map is evolving.
ITGWO	 design and manufacture of the cup. promote the new product around the audience	 provide tap water points: installed temporary water tap point at the festival's location and a permanent new one.		 newsletter: send a new letter to the subscribers about the waste reduced.
DE WERKPLAATS	 app development and workshop preparation	 workshop: the audience participates in the workshop about environmental behaviour giving input for future projects to the werkplaats	 information received: from the app, wishes for water from the user are stored in a data base.	 plan new projects for water innovations in vlieland. communicate with app users: sends notifications (email) to the app users about the planned projects update app: introduce new facts and tap water points..

CONCLUSION SYNTHESIS

Ts: VIsion Development

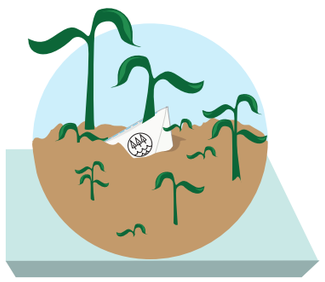


Cleaner water: Water bodies (lakes, rivers, shores) are less polluted from physical plastic items.

Tr: System Design Process

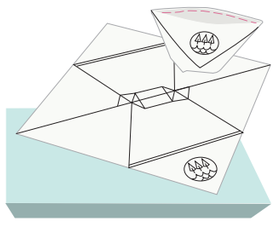
Waste reduction: the amount of plastic is reduced in the surroundings of the system. Seeds are native and can give a benefit depending on the natural local problem. In the cities, gardening areas can be installed, making cities greener.

Tq: Product-Service Design



New drinking experience, with tap water and disposable experience (app): Using the cup together with a network of tap water points that can be found in the app. Then, once the user wants to get rid of the cup, it can be planted.

Tp: Product Design



Biodegradable water cup: A foldable cup that can easily be kept and avoids the burden of taking a heavy bottle of water. It has embedded seeds and a QR code.

8. IMPLEMENTATION

During 6,7 and 8 of September, Into the Great Wide Open 2013 takes place. To implement the concept during the festival was the best-case scenario for the scope of this project.

Due to the complexity of the concept, as it includes product manufacturing and application programming, the decision to narrow it down was made together with the festival's organization. This is the reason why only the cup was present in Vlieland during those days. Leaving aside the disposable experience implies that the cup users will get rid of it as any other disposable product. Nevertheless, it was important to bring at least part of the concept to the audience and test the usability and likeability of the product. In the following sections, all the information related to the implementation at the festival can be found.

- 8.1. PRODUCTION ADJUSTMENTS -

In order to deliver the cup to the festival's audience, some changes from the original concept were made. This was mainly due to the short manufacturing time spam available. After some budgeting issues, Vitens took the lead and funded the production of the cup. The overall cost for 2000 units was around 1400 euros, including the stamp, material, artwork print and delivery. Regarding the changes: First, the cup would be produced with an average packaging white cardboard of 235gr/m2, laminated with PET. Secondly, the colours of the graphics would be narrowed down to two, black and cyan. Third, the model of the cup would remain as the original origami cup, as known as non-standing. In Figure 18 the design for the production these changes can be noticed, related to the concept cup (Appendix D1).

The modifications did not substantially affect to the general idea of the product, as its essence was preserved. The user could still fold it and then keep it flat in the pocket or bag (Images 41)

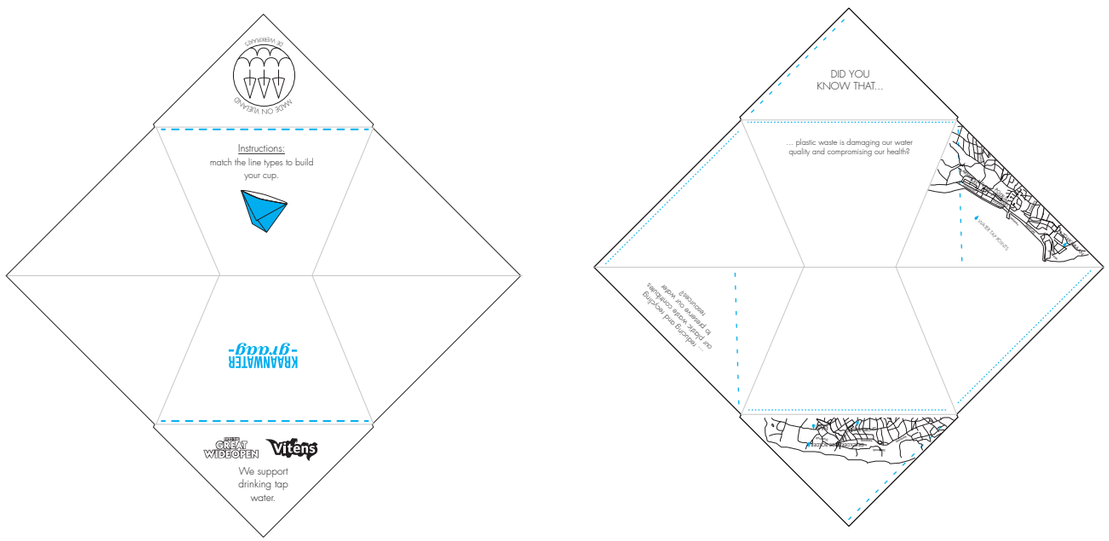


FIG_18: Flat representatio of the cup for ITGWO. Inner part (left) Outer part (right)

IMG_41: Different actions undertaken with the cup at the festival

- 8.2. AT ITGWO -

8.2.1.- In situ work

The idea of the festival's organization was to give away the cups for free, as a pilot project for the new drinking water experience at the event. We decided to place the cups near by the water tap points, mainly in the Sportveld (main area), at the entrance of the Sportveld, where the Join the Pipe tap was installed and Naar Buiten (forest stage). In the pictures can be seen the set up of the cups (Images 42). From the first users that were using the product for the first time (Image 43), it was seen that some support was needed in order make the instructions more clear. It was decided that next to the box containing the cups, steps by step instructions would be hung (image 42). Another determination had to be taken: how to distribute the amount of cups during the 3 days of the festival. Due to the durability and the reusable feature of the cup, it was chosen to distribute 1000 units on the first day (Friday) and check which spots had a larger influx of users. Then, the rest of the days (Saturday and Sunday) the boxes would be filled when needed.

During the 3 days, the spots were watched in order to observe people without interfering in the interaction and also some users were approached to ask them some questions (see questionnaire in Appendix B2)

IMG_42: The location of the cups at the Sportveld area

IMG_43: First user test, just after the cups arrived

8.2.2.- User test and Interviews

The audience was receptive at first, being curious about the "Gratis vouwbare water bekers". The first approach was of uncertainty, not really understanding at first how that sheet of paper could become a cup. They took it, looked at it, read the information on it and then, look at the surroundings. Anticipating the unclear instructions for some people, the instructions that were placed near the box, helped most of the user to fold their cups with no problem (Image 44).

IMG_44: A user consulting the instructions

The ones struggling the most were approached and the concept was explained to them, also as an excuse to talk to some more users and understand the pitfalls of the product. Some of them were surprised when showing them how the cup takes form in 4 steps and they easily understood the following functionality (Image 45) "Ahhh! And then I can put it in my pocket" From the interviews with the users some other insights were gathered. Some of the questions from the interview were: "what do you like from it?" "In which other situation would you use it?" and "would you recommend to your friends or family to use it"
Also, there were some actions that were unexpected; these were general enough to be taken in account (next pages)

IMG_45: A couple of interviewees at the tap point

IMG_46: Two young girls with the cup

Some reactions of the users:

"I could use it for parties at home" Female (37)
"It does not leak?" Male (29)
"But it's going to make my pocket wet" Male (30)
"I think it's very handy for my daughters, it amuses them." Female (45)
"Can I put beer in it?" Male (41)

The user, after drinking water with the cup, throws it to the rubbish bin. This mainly happened at the entrance of the Sportveld, where a container was placed just by the tap point.

It is clear that the cup is disposable but not so evident that can be kept and reused along the festival.

It created a social interaction between the users gathered around the tap point. They explain each other how it works. Some people were bringing friends to the location so they could grab a cup.

The discussion generated about how to fold the cup was accidental.

The cup can be folded correctly on both sides, being equally functional for the main task: drinking water.

It leaves aside the graphical information in a second plane or it does not have an enough distinction between the inner and the outer part.

The young part of the audience also found other ways of exploiting the cup, such as playing games (Who can drink the biggest amount of water from the cups) or painting on them.

It could give a second life to the product, making it more personal and creative.

It was widely accepted by children and their parents (Persona 1 Section4.1) compared to the part of the audience belonging to Generation Y (Persona 2 Section 4.1).

This shows the interest of Persona 1 for the extra activities that the festival delivers besides music.

Cups were stacked once they were used and left near the box.

Interesting behaviour of the users disposing the cups as close as possible to the tap. It can remind to the way traditional disposable cups are placed in other contexts (e.g. water coolers at working places)

These behaviours have been analyzed and taken in account, on the one hand for the improvement of the concept development (Section 7) and on the other hand, for further recommendations (Section 13).

It was very difficult to assess the influence of the product on the locus of control of the user during the festival, willing to understand if it creates a higher awareness of the personal contribution to reduce the environmental impact. Although being the cup a very important part of the concept, the disposable experience is the part that most influences the environmental behaviour of the users.

This is the reason why during the festival, the cup was tested by functionality, fulfilment of the vision and fit at ITGWO. Nevertheless, information about what concerns the audience regarding water was gathered in another way (see next page).

However, the overall concept should be tested at least once and then evaluate the influence the concept has on the locus of control.

8.2.3.- Workshops

Besides the testing of the product, other information about water and environmental behaviour was meant to be gathered. Two posters were placed strategically with two clear messages and people could write down their impressions about it. The first poster had an emotional aspect and was placed in "De Kolder" (Image 47), the area with activities for children. People could write down their water wishes in a water drop and stick it to the poster.

The second poster was placed near the tap point at the entrance of the Sportveld (Image 48) and had a more practical approach about the water in Vlieland.

The posters were placed in the locations for 3 days, and collected at the end of the festival. The information gathered from them is summarized, although strong conclusions cannot be drawn from them at this moment due to the scope of the project, it can be used in the future for other water projects.

IMG_47: Water wishes board

IMG_48: Water in Vlieland board

"That is not clouded" ("Dat het niet vertroebeld")
"Covered in sailing boats"
"More drinking fountains"
"Clean skies, clean earth, clean water"
"That it jumps everywhere and doesn't flow"
("Dat het springt en overal door geen stroomt")
"Clean water for octopus"

"Blessed it" ("Zalig is")
"Because it is good" ("Omdat het lekker is")
"Because water is Vlieland" (Omdat Vlielands water is")
"It should be looked" ("Het hoort zag")
"Because it is good for skin and hangover" ("Omdat het goed voor huid en hangover is!")
"I can be thirsty" ("dat ik het kan doen dorst")

- *8.3. FESTIVALS AS INCUBATORS* -

It is also important to address how music festivals can be an engine for innovation, both social and technological or for the creative industries. Focused on the experience at ITGWO in this chapter pros and cons about this starting experience are described. My vision about how festivals can contribute to creative industries and innovations are more centred for small businesses than in the artists displaying their work, something very abundant at ITGWO. In my own experience at the festival I could see that it is very workshop focused, delivering an active experience that enhances dialogue. It is also different from university or government-based incubators, giving a lot of freedom for the work; there are not specific restrictions, although it should indeed fit the festival's experience.

PROS

- Offers support for small businesses and creative professionals by allowing them to expose and test their ideas during the festival. It helps them to get visibility and check their entrepreneurial potential.
- Lot of people are available in a very short period of time, having a lot of users at once.
- The audience is in a very good mood because they are relaxed and they are open minded to learn new things.
- Some projects can be easily tested with a low cost due to the short period of time, although intensive (e.g. Konstantinos' smart grid project)
- It inspires creative professionals for new ideas because being out of the routine context makes people more curious and behave differently.
- This way it also shows how important culture is for human development and economic growth
- It's a safe place where creative ideas that are not yet fully prepared to get into the market can be real for a few days.
- It helpe start-ups to understand how important is nurturing at an early stage.

CONS

- Lacks of business development support, characteristic for any type of incubator. Although it is not the festival's field it would be interesting to be able to reach this kind of support easily.
- The different artists or entrepreneurs that share the same platform don't know each other before the festival. Knowing in advance what is going to happen with other entrepreneurs might help to get a more consistent offer to the audience. Or even create a network for possible future collaborations.

- 8.4. CONCLUSION -

About the experience at the festival

During the festival many happenings took place and not everything planned in advanced could be realized. The workshops had to be reduced from the ones that were planned before the festival to the boards placed, where the audience could express their impressions about water freely. This was mainly due to the importance of paying a lot of attention to the placement of the cups and the time needed to observe and talk to the users. Also, it was very difficult to gather participants for a closed session at De Werkplaats during the festival. This was a burden mainly for the testing of the pro-environmental behaviour theories, where the conclusions drawn were not very strong. Although, this misfortune granted more time for the cup testing, being this more important inside the project.

About the product

Kids are most likely to use it because they don't want to carry anything that could bother them. They are more active and can go easily more tapas from their location to the tap point if they're thirsty. Parents are glad they can teach values to their children in a fun way.

As it has been shown during the tests, parents and their children are much more attracted to the product than the part of the audience belonging to Generation Y. This could grant the designer to narrow down the product's target group and deliver a much more specific product.

For Generation Y, as their main activity is to assist to as many shows as possible, there should be more effort in catching their attention or another way of introducing to them.

The product is much more open to interpretation than expected. First, because of its duality while being folded, it does not need to have a defined inside or outside part. Second, because of the possibility of drawing or colouring on it, it could be customizable.

The initial idea was to create a sense of community with the phone application. Nevertheless, the cup itself appeared to stimulate such interaction.

Another element to conclude on, is the fulfilment of the requirements and vision of the concept. Regarding the vision statement, interaction and product qualities defined at the ViP process, it can be said that the vision is accomplished and most of the qualities can be found: gentle abstraction, effusive affinity or information eagerness. It also fits the festival's experience and context by tackling the "planned improvisation" (the user has the freedom of disposing the cup, under a certain amount of control) and "decontextualization" (the cup it is not a cup until it is folded).

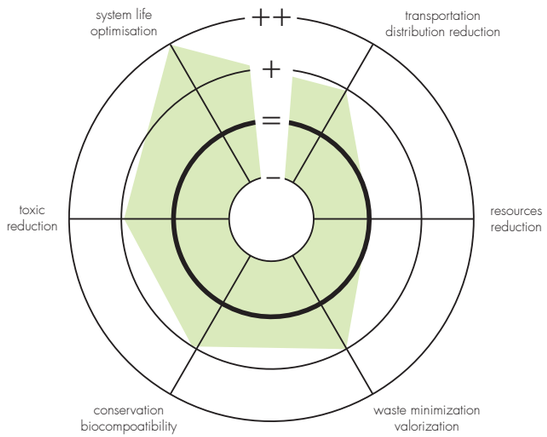
About the scalability

It was also relevant for the project to assess the scalability of the concept to Vlieland or other islands. There are two requirements that the context should fulfil in order to be able to implement the concept. First, it is very dependable on the network of tap points available to the user. Second, ground with soil is needed. This can be provided by nature itself, planting the cups anywhere in the environment. However, this can trigger a small obstacle, as not any seed is suitable for any kind of environment. On the other hand, external (to the environment) or temporary plant pots or "jardinières" can be placed in the context, letting the users to plant their cups. In the case of Vlieland, it would be hard to use the cups in a daily basis, as there are no public drinking fountains.

In the Section 13: Recommendation, ideas can be found in order to bridge the gap of these conclusions and possible improvements of the concept.

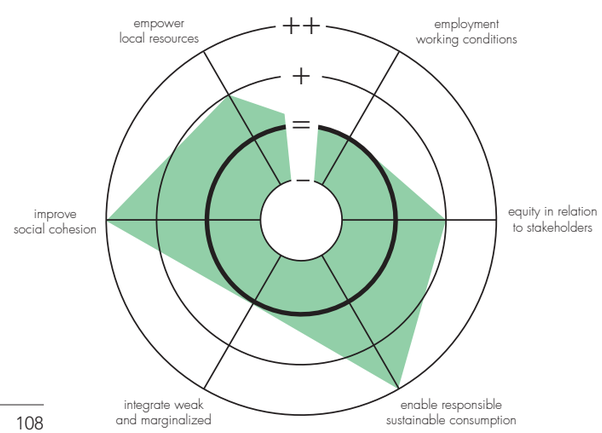
An important part to conclude is to assess to which extent the concept in sustainable. This assessment is done using Tischner's [55] 3 radars tool, which evaluates the concept in the 3 sustainability dimensions: environmental, socio-ethical and economical. Each of the dimensions has 6 criteria that are described together with the graph visualization. (Note: not all the criteria are applicable for the concept and all have the same weight)

- 9.1. ENVIRONMENTAL -



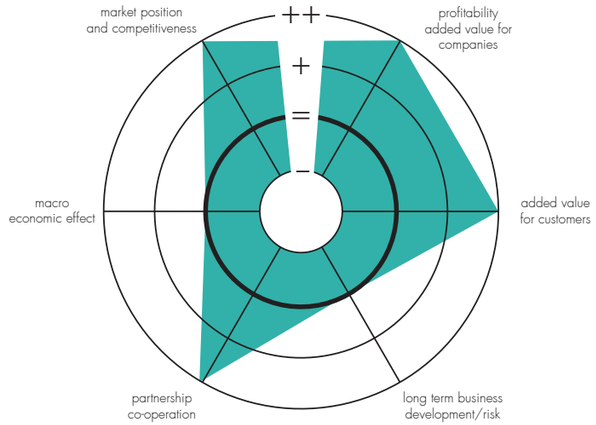
System life optimisation: It offers a better disposable product that is more suitable to the future needs (reduce waste)
Toxic Reduction: Oil-based components are eliminated from the product, compared to bottled water.
Conservation Biocompatibility: the usage of recycled paper gives a second life to this type of waste. Using less new resources.
Waste Minimization: It reduces disposable packaging plastic waste.
Transportation Reduction: Compared to bottled water, it is lighter and its volume is minimum while distributed.

- 9.2. SOCIO-ETHICAL -



Stakeholder equity: There is more than one party getting benefits from the concept (ITGWO, Vitens, Werkplaats, Audience…)
Enable responsible sustainable consumption: It increases the awareness of the audience in the topics of water and waste reduction. Also, from the word of mouth that was generated during the event, there is an increase in responsible consumption.
Improve social-cohesion: As it was sought in the festival, it is a social experience, first by folding the cup and afterwards by planting and sharing with the application. It triggers people to help each other and having a sense of community.
Empower local resources: It is taken in account that tap water is a local resource. Competes with transporting bottled water from a far location.

- 9.3. ECONOMICAL -



Market position and competitiveness: There are few products that have the same mission (stimulate tap water consumption) but there is not one with the same form and functionality. It creates competition to bottled water, giving profit to the water provider and the manufacturer.

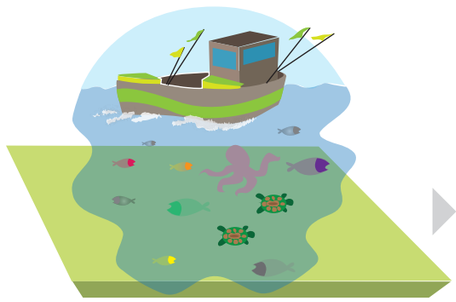
Added value for companies: It positions both the festival and Vitens as contributors to drinking water solutions. It offers a new business opportunity that can grow over time with different solutions depending on the target group.

Added value for customers: It is cheaper than a re-tap bottler or bottled water, delivering other benefits others than transporting water. It is enjoyable and helps parents to make children drinking healthier.

Partnership, Co-operation: It involves different parties, making the concept a game changer for those organizations. There can be future alliances with manufacturing companies or recycling organizations for a better optimization of the system.

Conclusion
There are many factors that have to be further investigated in order to draw a consistent conclusion for all the criteria. However, this can give a bigger picture, mainly in terms of the environmental and social impact. It is also important to take in account the business part of the concept, as it was given for free during the festival, there is no assessment related to the price-added value the user would give to the product. In this case, the partnerships created on behalf of the project can be beneficial also for future collaborations.

S2: New Societal Situation



Improve the future water quality: Preventing water pollution by plastic bottles will lead to restrictions to other sources of pollution.

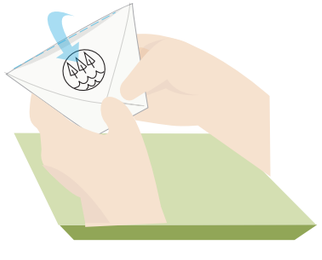
R2: New Socio-Technical System

Make recycling unnecessary: Making people have a closer contact with nature gives a bigger sense of the waste that is generated. The amount of bottles is reduced, and nature is appraised.

Q2: New Product-Service System

Increase social interaction with the disposable experience: The act of disposing becomes active and attracts the interest of the users. There is a higher interaction between users when adopting the cups.

P2: New Product



Stimulate tap water use: It creates a moment of concentration while folding the cup before drinking water that makes the user focus on the task and reflect on it. Rethink materials for other packaging products.

After the first real experience at ITGWO, some recommendations can be done as a conclusion for this project. These are rough ideas of what could be applied to correct and boost the concept in a future scenario. They are based on the conclusions drawn after the analysis at the festival, trying to get solution for the encountered problems.

The first recommendation would be to narrow down the target group of the product. Meaning that it could be much more specific to the Personas described in this report, having variations for each of them. For Persona 1, the family type that visits the festival, the product could be much more proactive. Taking into account the affinity ITGWO has with workshop activities, a "make your own cup" exercise could be appreciated by parents and children. The cup would be more open to interpretation, leaving a white canvas to let the children express themselves. Or even, they could design the form of the cup itself. This activity would also be suitable as an event for Leeuwarden's cultural capital in 2018. Water education could also be introduced in this case, due to the important position of the city in terms of water innovation.

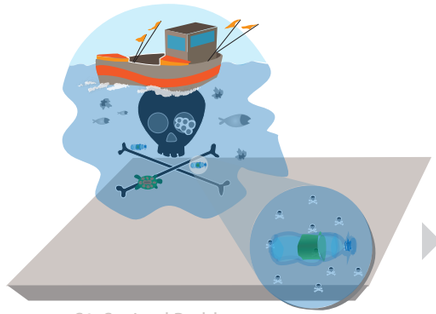
Regarding Persona 2, or Generation Y, new ideas should be gathered to attract their attention. While being at the festival, they are more focused on the core activity: the music. It is harder to get them interested in peripheral things, so the product should be more outstanding and demand less effort from their part. Also, it would be important to give them a sense of property that would enhance the reusability aspect of the product. Giving them space to write their name down, for instance, being the own cup easily recognizable and provoking and extra will to keep it along the festival. The graphic design would also be more stylish and trendy. An option for this would be to partner with one or several illustration artists and make a series of cups with different drawings or themes.

In reference to Vlieland, as it has been mentioned before, the concept as it is at the moment, it is very dependant of the network of tap points. As Vlieland does not have a public network of this kind, the concept could have some variation in order to fit a daily routine in the island. First, a durable option for the cup could be designed and used in bars and restaurants where tap water is served. In this case, is a matter of what the cup represents, because the functionality would be the same as any other water glass. It could be a statement that the business shows to the customers, as an icon for the water care the island wants to transmit. Second, together with the disposable experience, the cup could be used in special events (besides the festival) occurring in the island. For instance, it could be used during sport events or in school plays. Having each of these places their own small piece of garden where the cups from those events could be planted. This way, a commitment from the students is given to nature and they can take care of the garden. Besides, it is a good way of educating children about staying healthy with water and learning on waste or pollution.

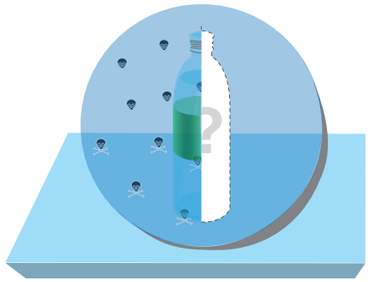
It can be noticed that most of the recommendations are related to the product of the concept, the folding cup. It is not surprising due to its intensive pilot test during the festival. However, the disposable experience and the application are not forgotten. It is true that for Vlieland's context would be suitable to have such experience, as it has a large amount of soil and the scale of the festival it is not too big. This leads to a balanced proportion for the disposable experience. But what would happen at a larger scale with a lower control on preserving the balance of the ecosystem? Independent plant pots could be installed in communities, villages or cities, being able to have a larger diversity on plants. And even urban vegetable patches.

12. MULTILEVEL DESIGN MODEL

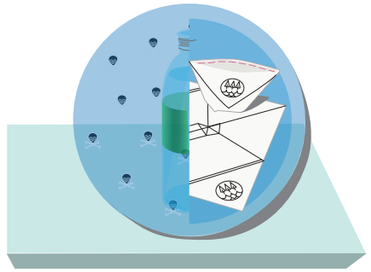
REFLECTION | ANALYSIS | SYNTHESIS | EXPERIENCE



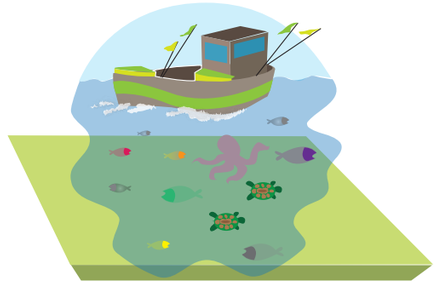
S1: Societal Problem



S2: Preferences Regarding Societal Order



Ts: VIsion Development



S2: New Societal Situation

SOCIETAL SYSTEM

R1: System Deficiency

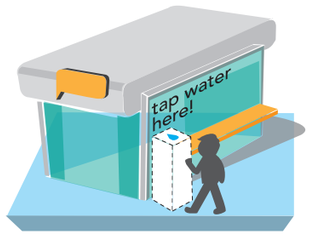
R2: Dominant Imperative Framework

Tr: System Design Process

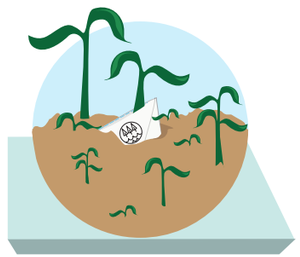
R2: New Socio-Technical System

SOCIO-TECHNICAL SYSTEM

Q1: Funtional Problem



Q2: Functional Requirements

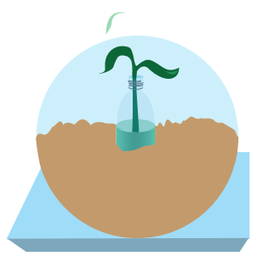


Tq: Product-Service Design

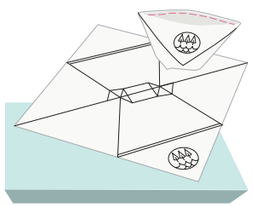
Q2: New Product-Service System

PRODUCT-SERVICE SYSTEM

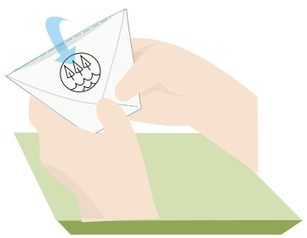
P1: Operational Problem



P2: Program of Demands



Tp: Product Design



P2: New Product

PRODUCT-TECHNOLOGY SYSTEM

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- APPENDIX A1 -

Tischner's Sustainable Guidelines

A1. system life optimisation	Priority	H	M	L	N
Guidelines Level 1					
Can you offer services for shared use of products/infrastructures?					
Can you add to product/infrastructure offer, services for their **maintenance, reparability, substitution?**					
Can you add to product/infrastructure offer, services for their **technological up-gradeability?**					
Can you add to product/infrastructure offer, services for their **aesthetic/cultural up-gradeability?**					
Can you add to product/infrastructure offer, services for their **adaptation to new contexts (sight of use)?**					

B1. Enable the customer to consume socially more responsible (sufficiency)	Priority	H	M	L	N
Guidelines Level 1					
Can you increase your customer's awareness about Sustainability by new PSS?					
Can you offer more individual ways of fulfilling needs in a more sustainable way, by new PSS?					
Can you enhance the transparency of your offer and how it contributes to Sustainability?					
Can you avoid possible social rebound effects of your offer?					
Can you create enabling platforms/ increase the capacity of your customers through new PSS, e.g. let them participate in the design and production process...					
Increase customer's satisfaction, participation/ involvement, motivation and awareness.					
Can you add to product/infrastructure offer, services for their adaptation to new contexts (sight of use)?					

C.1 Market position and Competitiveness	Priority	H	M	L	N
Guidelines Level 1					
Can you improve/secure your market situation by a new PSS offer?					
Can you develop PSS that are better than the offers of your competitors, e.g.,. lower prices, better quality, meet customers demands better...?					
Can you fulfil demands of your customers that have not yet been fulfilled?					
Can you gain new customers by offering a PSS?					
If you look at the trends and how the market is developing which PSS will be needed over the long run? Can you offer them already today?					
Can you profit from diversification through a new PSS offer, make business in a new field with new partners, get more flexible, (especially important in saturated markets).					
Can you improve your position in the value chain through new PSS?					
Can you improve your image by offering innovative PSS?					

- APPENDIX A2 -

Blake's factors that can act as barriers for pro-environmental behaviour

1. Demographic Factors: Gender and years of education. It has been found that women have less environmental knowledge than men, but are more emotionally engaged, so are more willing to change. Also, the longer the education the more extensive the knowledge, even though that does not imply a higher behaviour.

2. External factors:

a. Institutional: Pro-environmental behaviour can only take place is the necessary infrastructure is provided.

b. Economic: Have a strong influence on people's decisions and behaviour. These are also intertwined with social, infrastructural and psychological factors.

c. Social and cultural: Play a very important role in shaping people's behaviour.

3. Internal Factors:

a. Motivation: is shaped by intensity and direction and motives for behaviour can be conscious or unconscious.

b. Environmental Knowledge: The more knowledge does not imply a better environmental behaviour.

c. Values: Are responsible of shaping much of our intrinsic motivation. The values are influenced by the Microsystem (Family, peers), the Exosystem (Media and Political Parties) and the Macrosystem (cultural context). Having a strong emotional connection to the natural environment seems to increase the environmental concern.

d. Attitudes: are the negative or positives feelings about a person, object or issue. We assume people live according to their values, but regarding pro-environmental behaviour, it is determined by its cost (Diekmann and Preisendoerfer, 1992). Cost defined not only economically, but also includes the time and effort needed to act ecologically.

e. Environmental Awareness: knowing the impact of human behaviour on the environment

i. Non-immediacy of ecological problems: environmental degradation is not immediately tangible; we only perceive them when human impact has already caused damages. This damage as to be translated into understandable, perceivable information.

ii. Slow and gradual destruction: Cognitive barrier that makes perceiving drastic changes easy, but unable to perceive slow, incremental changes.

iii. Complex systems: Environmental problems are intricate and immensely complex. Humans tend to simplify them and think linearly. This prevents us from a deeper understanding of the consequences. It also compromises our emotional engagement and willingness to act.

f. Environmental Involvement: the extent to which we have an affective relationship to the natural world. It helps to shape our beliefs, values and attitudes. The stronger the involvement the more likely the pro-environmental behaviour.

i. Emotional non-involvement: Because the non-immediacy of the ecological destruction, emotional involvement requires a certain degree of environmental knowledge. This doesn't mean that only providing knowledge, involvement will be triggered. On the other hand we tend to avoid the information that contradicts our beliefs or quality of life (feelings of denial, rational distancing or apathy)

ii. Locus of Control: Represents an individual's perception of whether he or she has the ability to bring change through his or her own behaviour. (Newhouse, 1991)

iii. Responsibility and priorities: When pro-environmental behaviour is aligned with our personal priorities, the motivation to do them increases.

- APPENDIX B1 -

Interview at Here Comes the Summer 2013

Gender M / F Age From
Occupation Other Festivals

What do you prefer: BOTTLED WATER / TAP WATER

Blind Test SOURCY / TAP WATER

How often do you drink tap water?
Always Never
1 2 3 4 5

How good do you think tap water is?
Very Good Very Bad
1 2 3 4 5

In which occasions do you drink bottled water?
Commuting / Travelling / Exercising / During Illness / Eating / Other _____

Where do you drink bottled water?
At work / At Home / In a foreign country / At a restaurant / Other _____

How environmentally friendly do you think you are?
Highly Friendly Not Friendly at all
1 2 3 4 5

- APPENDIX B2 -

Interview guidelines for ITGWO 2013

Do you know what this is?

What do you think it is for?

(Explain the concept)

What do you like from it?

Do you understand how it works?

Do you think it's useful?

In which other situation would you use it? At home / at work / camping / vacation / other

Would you recommend it to your friends or family?

- *APPENDIX C1* -

Generated Ideas

SHOWER AFTER SEA BATH

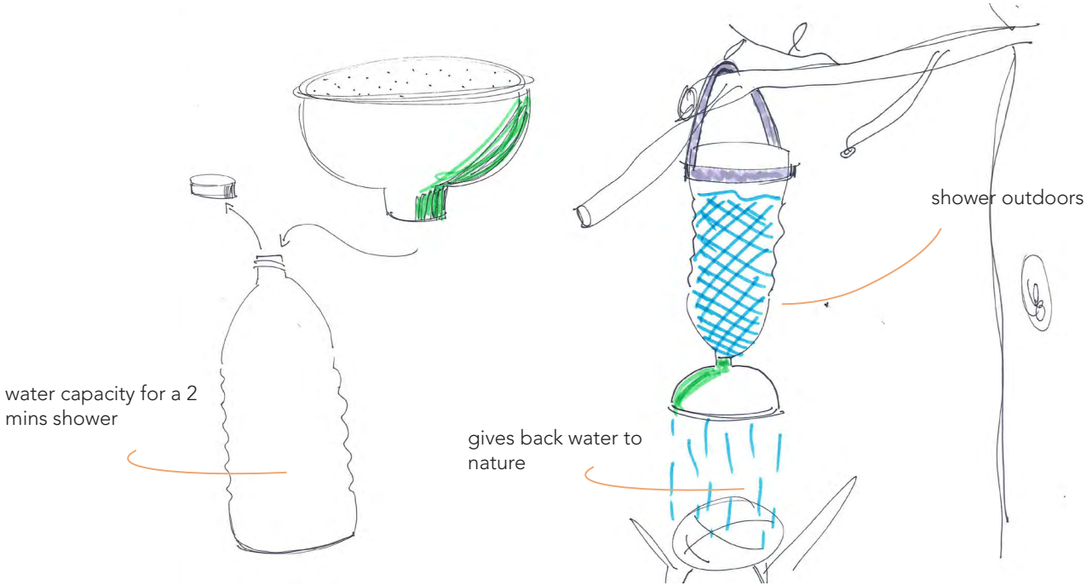
It's an add-on to an average bottle of water, changing its lid for this,, users will be able to shower anywhere in nature.

\+ It fulfills the statement, except it's not a drinking experience

\-- Requires an extensive engineering work for the plastic molding. Not feasible by now

\+ It's a very little amount of water that goes back into the soil. But doesn't change behaviour.

\- Could be positioned as "designed in Vlieland" and sold in other islands



COLLAPSABLE WATER BOX

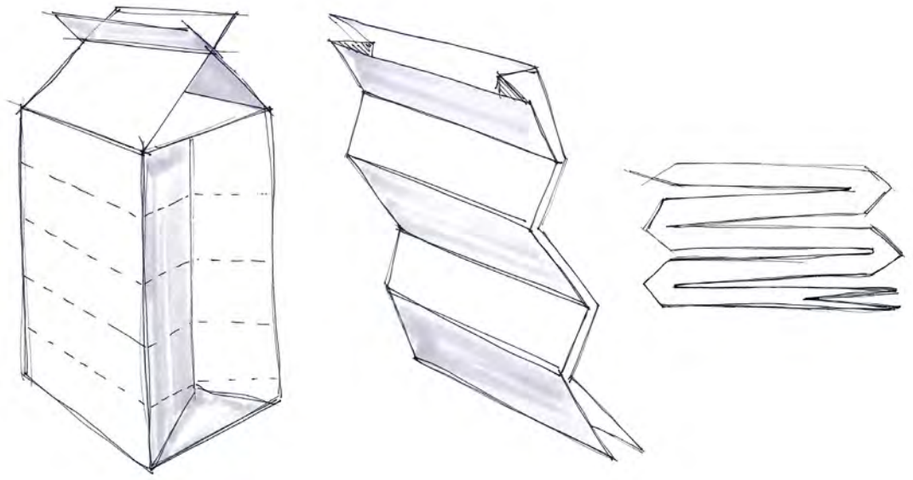
A new type of water container, that can keep the water while not being used.

\- It's just another water container, while the experience is still the same

\+ It enhances drinking tap water, and no extra volume is needed when it's not used.

\- Can be very complicated to manufacture. Several tests would be needed

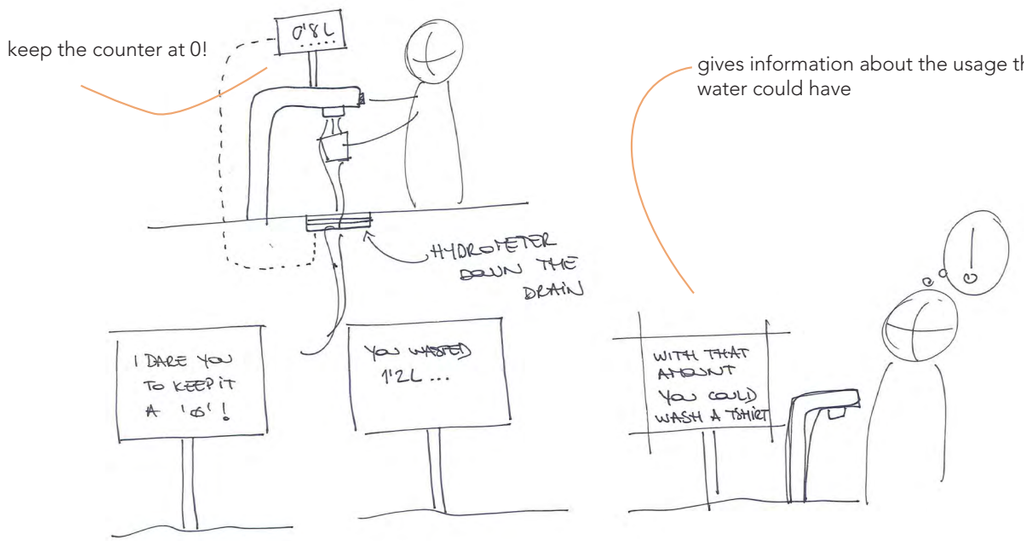
\-- Not really scalable, not related to a bigger system.



HOW MUCH WATER .... ?

In order to create awareness about waste water, a hydrometer is placed to count how much water is spilled.

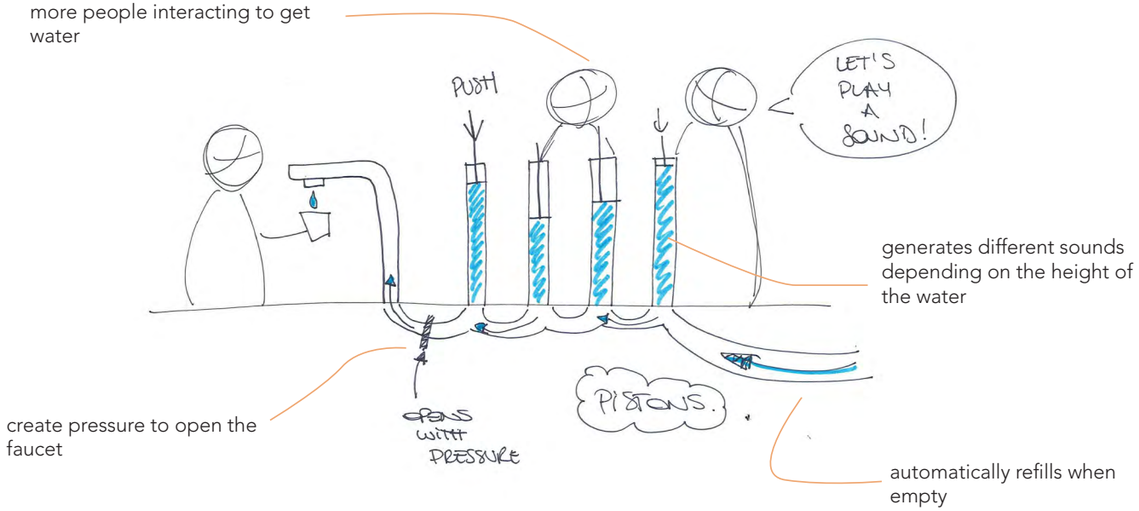
- The drinking experience itself it's not very innovative.
- ++ It really makes aware of how significant are one's actions. Will provoke change.
- \+ Feasibilty dependant on Vitens. Gives the festival a higher water awareness position
- \+ Could be installed at any faucet in public spaces.



SOUND AND WATER

People can try out different sounds depending on the water contained inside the transparent tubes

- \+ Very playful and random, but this can imply an overusage of water
- \- There is not any sustainable approach. However, it brings people together
- \- Complex construction and may need some supervision from the stuff
- \+ With more research and design could be an element that would identify Vlieland



KEEP WATER HAPPY

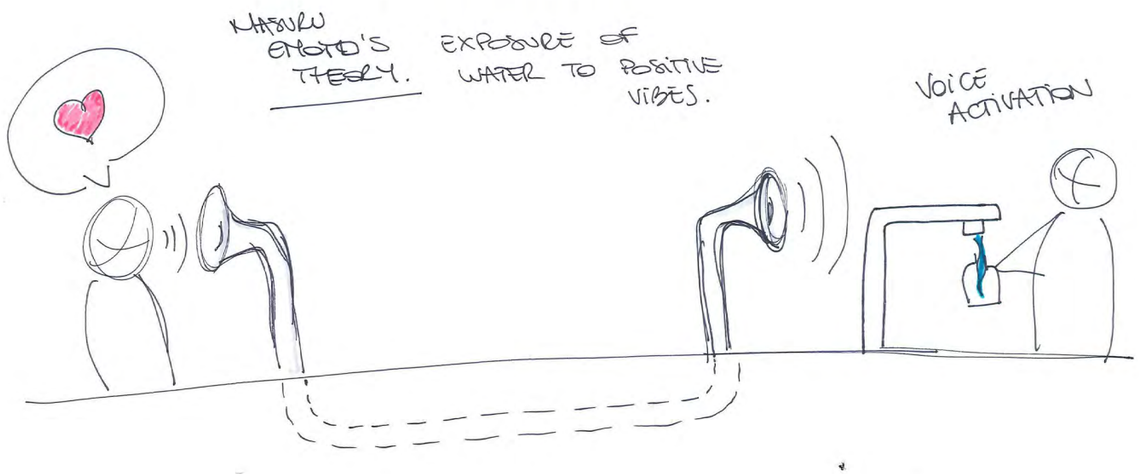
Based on Masuro Emoto's theory on positive messages to water, this aims to have a better water quality

\+ Respecting water is essential and gives thought to the feelings towards water.

\- Creates a bond between the 2 persons. Not really focus on sustainable behaviour.

\+ Digging is needed. However, could be very related to the positive music and vibes.

\+ As it is kind of poetic, could easily have different approaches in different contexts.



- *APPENDIX C2* -

Concept Variation Tool

PROJECT GOAL
The raison d'être of this project is to create water awareness in terms of sustainability and health. This will be achieved by delivering a new drinking water experience in a festival environment.

VISION
"I want people (at ITGWO and Vlieland) to rediscover their freedom of spirit by having a honest and respectful drinking tap water experience that will appraise nature."

WHAT IT IS
This tool aims to visualize the different possibilities for the new drinking experience at ITGWO, as part of the water project.

HOW IT WORKS
Each of the colours represent a different element for the final concept. Turning the flaps of each of them, all the variations can be seen in a fast glance.

ORIGAMI FOLDABLE CUP

This simple cup can be easily constructed, instrusction of the cup itself will be provided. Once folded and the water drunk, it stays flat and the user can keep the cup in a pocket or in a bag, without the burden of the unused volume when not used.

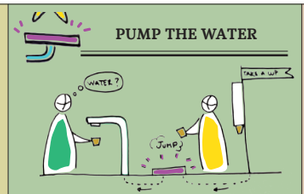
figure of the cup unfolded
—— inside fold
- - - - outside fold

The material will be a semi-rigid cardboard, suitable for food and beverages.

The manufacturing is as simple as a die stamp process, with minimal costs.

A stack of them can be created, to place them near the drinking fountain.

PUMP THE WATER



1 - The place where you take the cup and the jumping area are connected.
2 - Take the cup
3 - The jumping area lights up
4 - Start jumping on it to pump the water out of the fountain.
5 - Collect the water with the cup.

VLIELAND POTTERY / GARDEN

Disposing the cup with which the audience has been drinking water is also an experience.
Together with Koningklijke Tichelaar, special pottery can be sold, where the cups can be planted. This pots can be kept as a memory of the festival or offered. Otherwise, a piece of terrein can be disposed to people to plant their cups, creating an ITGWO garden that can be later on enjoyed by Vlielanders.

DRINKING WATER AID

From the research conducted in the first phase of this project, there are several insights that have been taken in account in order to design a new container for water that complements the drinking fountains_

→ People don't want to have bigger responsabilities therefore the container has to be disposable.

→ People want to rediscover their closest environment, bringing back local products into their lives and take care of it.

Two cardboard disposable cups have been designed for it. In case of connecting this product to the disposable experience, seeds will be incorporated. The design has to fullfil health regulations.

DRINKING EXPERIENCE

In order to make drinking water more exciting and attract people, different interactions with the audience and the drinking fountain were created. They are based on the Future Interaction of ViP (see booklet)

This element of the overall concept is dependant on the drinking fountain installed by Vitens. An important criteria for the evaluation was the hacking feasibility and not to compromise the further running of the system after the festival.

Moreover, people using other cups or bottles should also able to use the drinking fountain. But the users with the concept cup will be granted with the new drinking experience.

DISPOSABLE EXPERIENCE

Getting together the disposable importance and the will of appraising nature, different ways of disposing the plantable cups have been developped.

An important insight taken from the Future Context is fullfiled with this disposable experience_

→ Giving it's the new key to happiness

Different levels of interaction and compromise from the audience are proposed. Also, this aims to create a sense of community and a long term connection within the audience, the island and Vlielanders.

CUP + SEED CAPSULE

This idea is focused on feasibility and safety. It is composed by two elements:

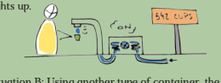
→ already existing compostable cups
→ paper seed on the bottom

The paper seed can easily attached to the bottom of the cup and instructions to dispose it can be printed

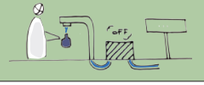
The downside of this product is that this type of cups are pretty common, and there it would be difficult for users to keep it and might be disposed in the rubbish bin.

ON / OFF TRANSPARENCY

Situation A: Users drink water with the cup. A sensor recognizes it and uncovers the polirized box with the mechanism where the water is running, and the couter lights up.



Situation B: Using another type of container, the mechanism stays opaque and doesn't show the counter.



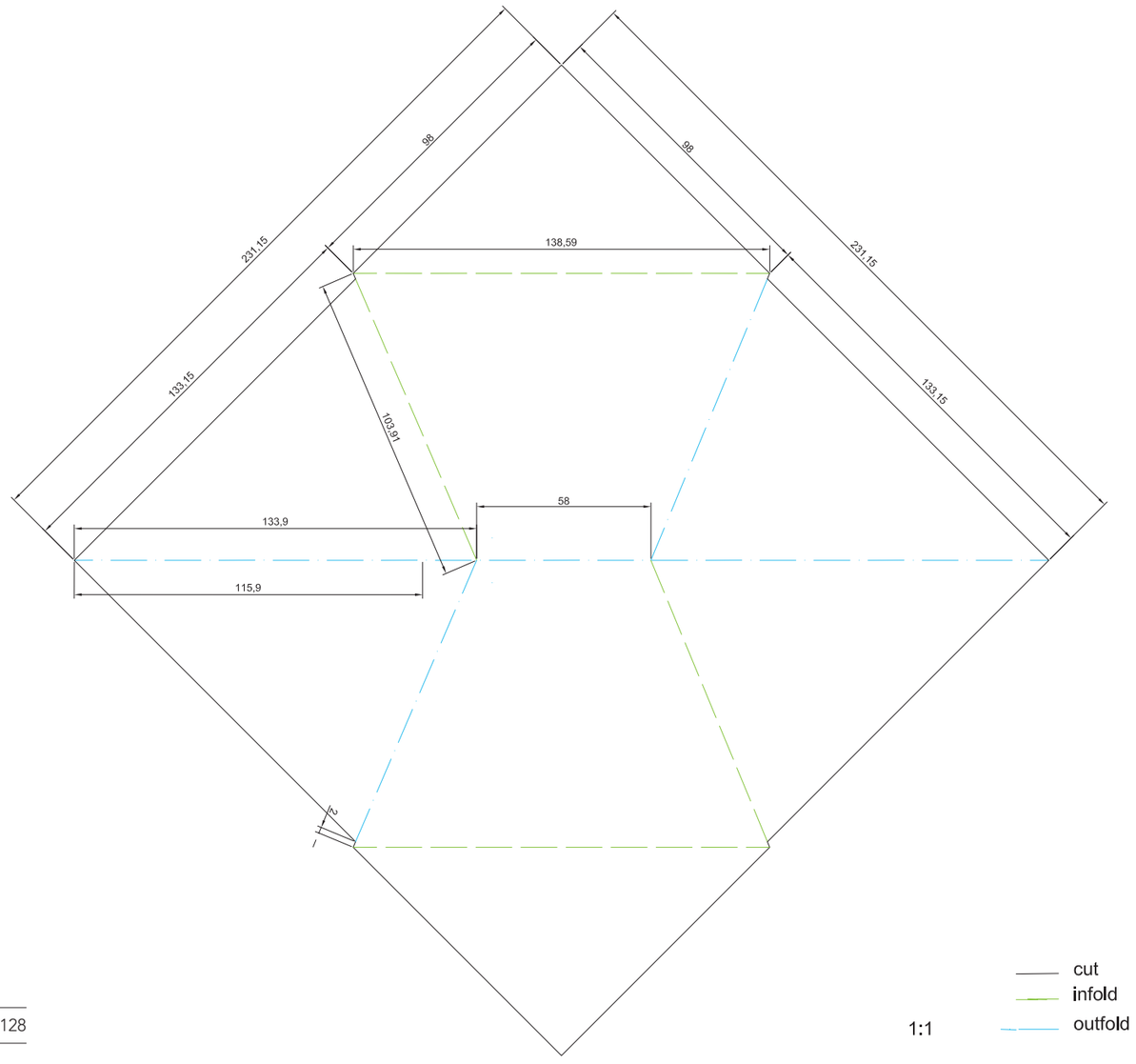
GEOTAG & PLANT

In order to give the maximum freedom to the audience and let serendipity do the work, a phone app is ideated. Each cup will have a QR code, containing the information of the seeds. Once the spot is chosen, the user scans the QR code on its cup. This will directly launch the app and will Geo-tag the place where the cup is going to be planted.
Also, a picture of the place can be taken and uploaded.

All the app users will be able to see every spot, and if some are going back to Vlieland, they will be able to visit the spots.

- APPENDIX D1 -

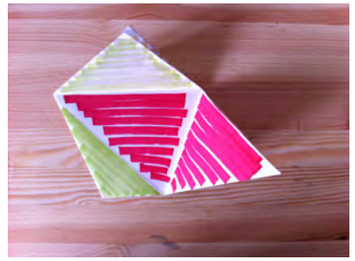
Technical Drawings



- APPENDIX D2 -

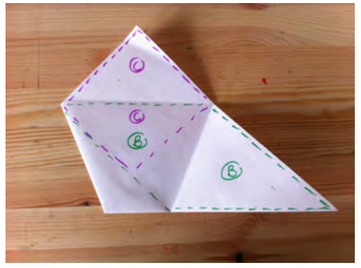
Different solutions for the instruction tested

Hereby can be found the 5 types of instructions that were proposed and tested with 6 participants to decide which of them was more suitable for the implementation of the cup.



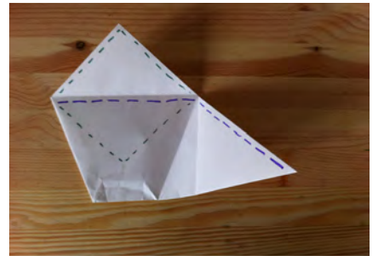
Option 1: Different colour bodies for each of the parts that need to be folded and "matched". Too much ink needed and it conditiones too much the artwork.

Option 2: Traditional origami type instructions. The location can vary, but in any case they are not visible during the entire folding process.



Option 3: Letters (or a code) is assigned to the different parts folded, with different colours. It creates confusion.

Option 4: Arrows guide the user during the process, marking which corners have to be matched in order to fold the cup.



Option 5: Different line types are assigned for each of the parts to be folded. Also, In different colours.

Stakeholder description Table

Type of stakeholder	1.- Identification	2.- Role in the Project	3.-Interest and Power		
	Name		Expectations or concerns: Motivation to Participate	Resources that the actors control	Influence on the project
Project promoters	TU Delft	> Project Management > Knowledge basis > Responsible for the design and prototyping	> Graduate as MSc > Innovation in water projects > Acquire knowledge on tools and design methods > Visibility	> Management of the project > Conceptualization > Design methods and tools	> Project Manager
	ITGWO	> Project Promoter > Responsible for the implementation	> Visibility > Reduction of plastic waste > Promote Sustainable behaviour	> Contact with other stakeholders > Knowledge of the festival context > Audience behaviour knowledge	> Client
	NHL	> Promoter of up-scale of the project > Sponsorship	> Application of the MDM for drinking water > Use of the project for a bigger case study	> Design methods and tools	> Responsible for possible up-scaling
Customers/Users	ITGWO Audience	> Final Users	> Increase their quality of life. > Environment / Health concern	-	> Feedback givers
	Households in Vieland	> Possible Potential Users / Beneftiaries	> Increase their quality of life. > Preserve Vieland's natural environment	-	-
Research centres	Schools / Ed. Centres	> Possible Users / Beneftiaries	> Provide a better water education	-	-
	De Wekplaats	> Provide research support in loco	> Create an innovation hub in Vieland	> Contact with water experts	-
Private Sector	Vitens	> Water Provider > Water management in Vieland	> Promotion of tap water > Visibility	> Water management knowledge	> Provide safe water
	Stortemelk	> Possible contributor /Customer / Promoter	> Sustainable attitude promoter	-	-
Public Sector	KRNWTR	> Knowledge about tap water in ITGWO	> Possible new product / business	-	-
	Municipality of Vlieland	> Management support	> Improved water consumption	> Up-scaling of the project feasibility	-
	Province of Friesland	> Regulation provider	> Preserve Vieland's natural environment > Better water consumption	-	> Regulations and norms
Media	ITGWO Marketing	> Brand knowledge applicable in the concept	> Outstand among other festivals	> Project fit inside ITGWO	-

Marta Axpe Martinez de Murguia
Delft University of Technology
Into the Great Wide Open
October 2013