A Work Project presented as part of the requirements for the Award of a Master's degree in Impact Entrepreneurship and Innovation from the Nova School of Business and Economics.

PSARI

Building Entrepreneurial Ventures with Impact: Reducing Waste by Upcycling Wetsuits

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Abstract

PSARI, a project to collect old, worn-out wetsuits and transforms them into new products to reduce neoprene waste, started its ideation phase one semester prior to this paper. The work project followed The Lean Startup framework by Eric Rise to test and validate key dimensions of the business model. Although the production and selling of the new products made from old wetsuits were successfully validated, four of the five collection streams failed to reach the predetermined target. As a result, PSARI will pivot the way the material will be collected while continuing to test and develop its sales channels.

Keywords: Recycling, Upcycling, Wetsuits, Waste Reduction, Circular Economy, SDG 12, Sustainable Consumption and Production

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1. Introduction to the project

Within the course “Entrepreneurial Project - Startup Mastery” of the second semester, the project PSARI was born. It became PSARI’s mission to contribute to a more sustainable water sports industry. The goal is to reduce as much neoprene waste as possible by collecting old, worn-out wetsuits and recycling them into new products.

Business Model

The latest Business Model Canvas before the start of the work project can be found in Appendix A. It was derived from a previous canvas that was created with all the insights collected from surveys and interviews with stakeholders such as potential donors, potential customers, surf schools, institutions, and companies. Information from those external sources was allocated to the according section of the canvas and then logically linked to form learnings. This canvas can be found in Appendix B.

The initial Business model of PSARI was based solely on a yoga mat and relied on a variety of untested assumptions. Its strategy was to develop and produce the final product and sell it in online and offline channels across the country. The following sections of the canvas highlight some of the key factors and fundamental assumptions that have been made:

- Value Proposition: The main value proposition is the yoga mat as a physical product as well as the connected impact values.

- Customer Segments: Donors and environmentally driven buyers were defined to be the two customer segments. Those groups were assumed to be the people to who PSARI is delivering value.

- Key Activities: Communication, collection of the wetsuits, processing/production, and selling were stated as key activities.

- Key Resources: Besides financial funding, communication infrastructure and others, the donations of wetsuits were listed as one of the assets that are indispensable for the business model.

According to the sections described above, the correlated costs were listed and the revenue was assumed to be generated equally by online and offline sales, mainly to the end consumers (B2C).

In retrospect, the business model described was based on a variety of unclear assumptions and even personal intuition. The feedback received from customers was gathered via interviews and surveys and was related to the specific use case of a yoga mat. Many assumed dimensions such as the revenue streams or channels further depend almost solely on previous assumptions or respectively on the decision of the final product. The main focus was put on the general ideation as well as the development and production of the yoga mat, before validating the basic components of the business.

Goal of the work project

The goal of the work project is to validate the overall idea and to gather learnings as quickly and cost-efficient as possible. Before investing precious financial and human resources as well as time and energy in the final execution, the project for this paper aims to test out key assumptions and conditions.

It is the objective to be flexible and able to react to changes and learnings that will arise. This project intents to build a venture based on collected learnings and data-based decisions rather than intuition or personal feelings.

Therefore, PSARI will take the previous learnings into account and first test key dimensions of the business model as well as assumptions instead of executing a prior set business plan.

This pivot means that instead of setting the focus on the final product in the shape of a yoga mat, the overall concept will be tested first. To solve the problem of neoprene wetsuit waste, the aim is to collect those worn-out products at the end of the life cycle and to recycle them. One of the first decisions that have been made, was if PSARI wants to act as a collector who only collects the product and sells it to upcycling companies or a producer, managing the whole supply chain back to a final customer. It was decided to test the approach of being a producer because previous survey results have shown that individuals are more willing to donate their wetsuits if they already know what project they support with it and not just due to the fact of recycling. A study on clothing disposal behavior (Joung and Park-Poaps 2011) came to the result that donation behaviors are often explained by environmental concerns which could be advertised much more transparently as a producer than solely as a collector of the material. Hence, the final product to be sold is subject to changes and results of tests as well as customer feedback.

In general, PSARI tries to recycle as much of the collected material as possible by implementing two levels of recycling: First, new products will be formed by cutting and sewing parts of the wetsuits that can be reused directly. Second, all the leftovers and unusable material will then be gathered and further processed into new products. Examples of potential products on the first level are laptop sleeves, bucket hats, purses, or surf products like tail pads, fin bags, or boots. Further processed products on the second level could be flip flops, yoga mats, floor mats for gyms, or filling material for bean bags. For this work project, only the first level of recycling will be tested.

As PSARI moved from ideation to a more advanced, actionable phase, the lean startup approach described and developed by Eric Ries (2011) was chosen to achieve the goals mentioned above. The concept will provide the needed structure to test chosen dimensions of

the business model and measure prior set assumptions. Derived learnings and feedback will build the foundation for a scientific approach to decision-making.

The expected outcome for this work project is to have tested the previously set assumptions and depending on the results, form a data-based decision about the future of the project – to persevere or pivot the idea.

Previous journey and problem statement

The initial idea was to build a sustainable, plant-based wetsuit brand with modern designs for women, to support female participation as well as an eco-friendlier approach in the water sports industry. Research has shown that sustainable alternatives for women already exist in the market, even though they come with a premium price. Due to the lack of resources as well as the technical understanding, the team soon went back to the ideation phase starting with the initial problem: the negative impact of surf products on the environment. The result was a pivot from becoming a sustainable wetsuit brand to being an upcycling startup to tackle the existing waste of neoprene. Throughout the semester, the founding team planned to transform the old material into a yoga mat by first shredding and then press-molding the pieces together.

The recreational water sports industry is a thriving sector experiencing tremendous growth through increased equipment expenditures and growing numbers of practitioners over the past years (Lock 2022). Outstanding hereby is the growing demand for wetsuits mainly used in water activities like surfing, kite surfing, or diving: according to a Future Market Insight Report, the expected compound annual growth rate for the wetsuit market is 6.5% until 2031, reaching a global market volume of US$3.35 Bn (Future Market Insights, Inc. 2021). It is estimated that 380 tons of wetsuit waste land in landfills every year (Snapes 2019), with this number increasing as the industry grows.

The dominant material to produce those water suits is neoprene with its elastic and insulating properties making it ideal to overcome the harsh conditions water sports can bring (Holmström and Mattsson 2019). As neoprene material is mainly petroleum-based and recycling into its base components is hardly possible due to the complex production technique of a wetsuit, sustainability concerns have been gaining increasing importance for customers upon purchasing (Holmström and Mattsson 2019).

At the beginning of the project, the team did research to analyze and understand the problem more deeply and then formed a business model with external inputs from potential customers as well as key partners. A survey with more than 100 participants as well as many interviews with surf schools and individual water sports practitioners and potential customers was conducted to discover that many people do not know what to do with their old wetsuits after its lifetime.

To gain more knowledge in the industry and to start the implementation, online meetings with wetsuit companies, upcycling projects, and production firms were held. CITEVE, the "Technological Centre for the Textile and Clothing Industries of Portugal", received a sample to analyze the chemical possibilities to recycle the neoprene material by separation of its initial component, unfortunately, without any success. With the help of REISSWOLF, tests of shredding old wetsuits were conducted.

The PSARI Team participated in the Nova Battle4Change Challenge hosted by the Nova Tech Club and won first place. The prize money of 2500€ is currently being used for the development of the venture.

The team constellation changed throughout the summer months and the members started a new ideation phase during a pre-accelerator program with GAIA Academy in Lisbon. With the beginning of the Fall Semester of 2022, PSARI was the topic of this work project as part of the

masters of Impact Entrepreneurship and Innovation Field Lab. Within the first week of the project, the German Startup and main competitor Land-and-Sea announced the ending of their project due to a lack of financial resources and many technical complications with the production. They have been working on recycling wetsuits into yoga mats in the German market for almost two years. In an online meeting with the founders their main learnings, failures, and feedback had been shared with the PSARI's founders to support the common mission of reducing the waste of neoprene wetsuits. At this point, it was clear that a lean and especially fast approach to the first MVP was needed.

2. Methodology

This work project follows a lean approach as described in the book "The Lean Startup" by Eric Ries. A startup in this context is defined as a human institution designed to create a new product or service under conditions of extreme uncertainty. A product is anything that the customers experience from their interaction with the company. In the case of PSARI, this means that the product starts with the communication of mutual values and the collection of wetsuits and not just with the sale of a finished physical product. First, a vision is set and provides the overall guidance. To achieve this vision the company must employ a strategy that includes the business model. The product of a startup is then only the result of the company's strategy, as depicted in the following diagram. With a goal in mind, clear hypotheses that make predictions about what is supposed to happen must be predefined.

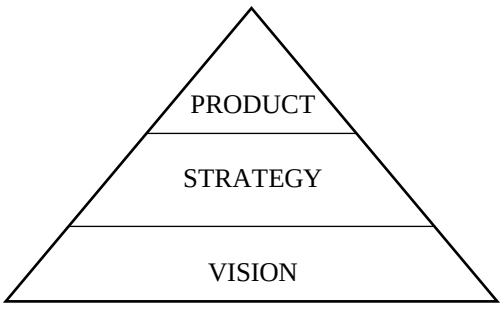

Figure 1: Vision, Strategy, Product pyramid

The book follows the feedback loop of iteration, called the build-measure-learn principle. First,

the company should build a minimum viable product (MVP) that only includes the very basic and essential features to attract early customers. It is being used to obtain feedback as fast and cheaply as possible. In the second step, measuring components of the feedback loop, the hypotheses will be empirically tested and measured. To do so, initial customers for the minimal viable product will be secured. It is the objective to find out what customers want by watching their behavior and collecting feedback on the minimum viable product. Often customers do not know what they want but instead reveal the truth through their actions or inaction. Third, the learnings gathered from the experiments and customer feedback will be collected to then change and adjust the product. The aim is to apply validated learning, which is "the process of demonstrating empirically that a team has discovered valuable truths about a startup's present and future business prospect" (Ries 2011, 38). This leads to more accurate and faster results than market forecasting or classical business planning. The outcomes of this circular process will be used to improve or adapt the current product. To increase the efficiency of learning, the total time spent in each iteration of the loop should be minimized, as depicted in Appendix C.

3. Vision and strategy

From the beginning, the vision of the project was the following:

Make the water sports industry environmentally more sustainable.

The form this may take can vary from building more consciousness and awareness in the industry, to changing consumer behavior, to technical upcycling solutions of existing products.

Working towards this goal more precisely, the aim was to create an impact by reducing the amount of waste of wetsuits in Portugal. PSARI's strategy is to execute this by collecting and recycling the products at the end of the life cycle into new products that can again add value.

Besides the waste reduction, a secondary impact the project plans to accomplish is to build

general awareness of sustainability throughout the surf industry.

As mentioned in the section “Goal of the work project”, the overall concept or strategy will be tested and validated. The final form of the product or service is subject to changes and depends on learnings and feedback along the way.

4. Hypotheses and Assumptions

To approach the process of validation analytically, hypotheses and assumptions will be defined. Sean Murphy describes the difference between a hypothesis and an assumption as the first being explicitly tested whereas the latter is tested implicitly (Murphy 2014). A Hypothesis is something believed to be true but not yet proven, which explains a theory or a natural phenomenon. An assumption on the other hand is rather something also believed to be true but instead of being subject to explicit testing, is taken for granted.

In this paper, hypotheses will be tested to be accepted or declined whereas the assumptions will be stated and potentially proven or dismissed but not particularly tested. Following the lean startup framework, value hypotheses will help to analyze if PSARI can create and deliver value for its customers, whereas the growth hypotheses help to evaluate how donations of old wetsuits can be collected.

Value hypotheses

h1: *It is possible to produce products made of old wetsuits.*

h2: *People buy products recycled from old wetsuits.*

Growth hypotheses

h3: *Visitors of water sports events will bring and donate old wetsuits if promoted in advance.*

h4: *Customers of surf shops will donate their old wetsuits when buying new products directly at the shop.*

h5: *Students will donate their old wetsuits at a drop-off location within their university.*

h6: *Surf schools will donate their old wetsuits in bulk to the project.*

h7: *Followers on social media channels will reach out to donate their old wetsuits.*

Table 1: Thresholds of hypotheses

Hypothesis	Threshold for validation
h1	Successfully created at least one prototype
h2	A minimum of two sales per week
h3	A minimum of two collections per event
h4	A minimum of one collection per week
h5	A minimum of one collection per two weeks
h6	A minimum of one out of four surf schools donating
h7	A minimum of one collection per two weeks

The mentioned thresholds were chosen according to the expected outcomes of each test at this stage of the project.

Assumptions

a1: *Water sports practitioners have old wetsuits at home that are not being used anymore.*

a2: *Some of the collected material is in a condition good enough to directly sew new products.*

5. Validation of the business model

In this section, the predetermined hypotheses will be tested to validate the mentioned dimensions of the business model.

h1 – Creating a product

The first value hypothesis aims to verify if it is possible to use the material from old wetsuits to produce a product that creates value.

Besides wetsuits, many other products are made with neoprene material on the market. Examples include neoprene lunch bags, bottle sleeves, surf accessories, and all sorts of covers for products like power banks, e-bike batteries, or laptops. The material is being used in different areas other than the water sports sector, ranging from accessories and fashion to the medical and construction industry.

The big variety of use cases is due to the diversity of characteristics of neoprene. As a synthetic rubber from polymerized chloroprene made mostly from petroleum, neoprene has good insulation, shock-absorbent (protection) as well as water and chemical-repellent properties.

To create an MVP, two of the possible products mentioned in the section “Goal of the work project” were selected for testing: A bucket hat and a laptop sleeve. Those products were chosen because they are simple to make, used by a big group of people, and relatively small, so very little material is needed.

To test different conditions of the material, the first prototype was built with a very old, rather stiff but little-used wetsuit. It was turned into a laptop sleeve by cutting and then sewing the parts together on a leather sewing machine by the founder himself (Appendix D). For the second prototype, a bucket hat, the used material was not as old but more worn out (Appendix E). With the help of a local seamstress in Lisbon, the hat was sewed in a unisex size on a textile sewing machine.

The difficulties faced with this test were mainly regarding the material. First, the quality and age of the wetsuit differed among the collections, with some being dirty, brittle, sandy, or ripped. Overall, damages often only occurred on very small areas of the wetsuits, mainly the elbow and knee sections. Second, the thickness of the wetsuits varied even within a single unit. To deal with these issues, the seamstress needs to choose only undamaged and washed material and assess the best fit for each part within the product. Third, the elasticity can cause difficulties

for inexperienced seamstresses when sewing neoprene onto non-flexible materials like the zipper.

The results of those tests clearly showed that it is possible to recycle old wetsuits by creating new products. Some of the later created minimum viable products (MVPs) can be found in Appendix F. The concept was validated and hypothesis h1 can be accepted.

h2 – Selling the product

Testing if people are willing to buy products made from recycled wetsuits is of utmost importance to validate the project. Within the framework of the lean startup, the riskiest elements of a startup's plan are called the leap-of-faith assumptions. As PSARI's business model relies on sales of the upcycled products and the results therefore determine the project's future, the following tests of this leap-of-faith assumption were followed with extra curiosity and a little bit of nervous tension.

On the 25th of November 2022, the first three MVPs were ready to be sold. As the team consists of perfectionists, the initial feeling of trying to sell a product that is not yet in its final and perfect form, was rather hesitant. Nevertheless, following the lean startup approach, it is the fastest and cheapest way to gain useful insights, so they kept following the plan. After showing the products around at Nova SBE university, the feelings changed as the feedback received was fantastic. Within the day of the release, all three units were sold without any serious marketing and communication efforts. Even in the days that followed people continued to ask for more laptop sleeves.

The minimum viable products were sold at 25€ per unit. This price was mainly focused on comparable market prices of non-recycled neoprene laptop sleeves ranging from around 18€ to 40€. With production costs of 15€ per piece (12,50€ labor costs + 1€ zipper + 1,5€ vies tape) and a VAT of 23%, the product was still sold with a profit of 5,30€ per piece or a margin of

21,2%, disregarding the work and time input of the founders. At a more mature level with higher quantities, the projected financial structure based on unit economics displayed in the following figure, shows a similar margin at the same sales price, due to the reduced production costs arising from economies of scale.

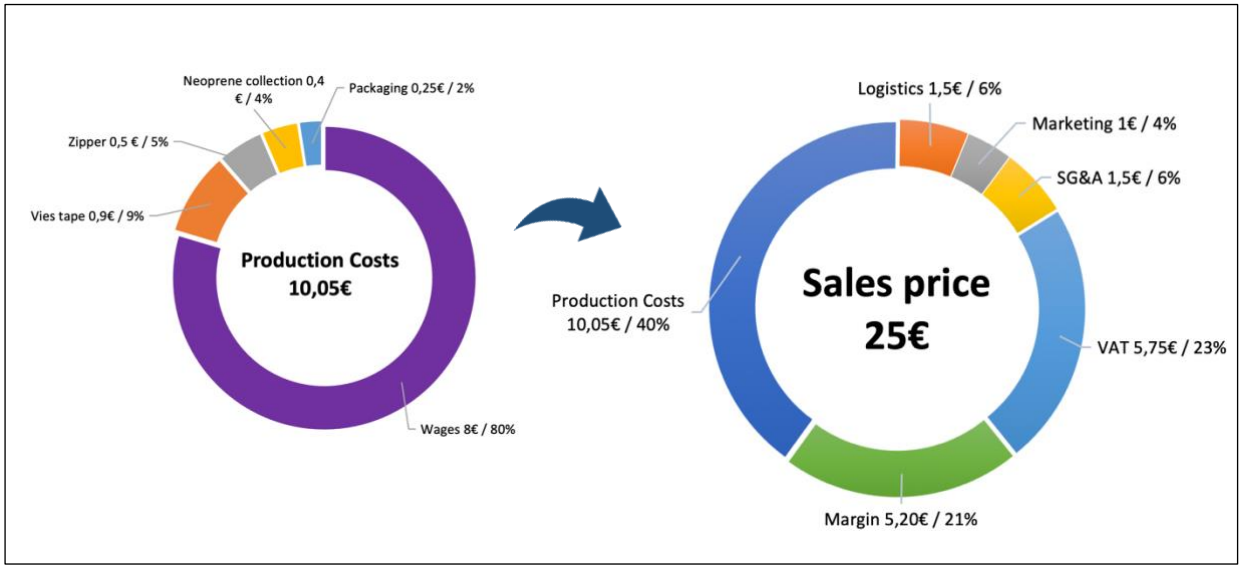

Figure 2: Financial structure of laptop sleeve based on unit economics

Unfortunately, the tests could only be done with the three available units limiting statistical power and therefore the validity of the result. Nevertheless, given the successful sales and the remaining demand, the concept can be validated as the hypothesis was accepted.

h3 – Collecting at events

The first growth hypothesis that was tested was the possibility to collect worn-out wetsuits at surf events. With the surf festival of the Nova Surf Club, the team saw the perfect opportunity to promote the collection of wetsuits. Besides the surf competition itself, the event features a volleyball competition, workout sessions, a skate ramp, a beach market, tattoo artists, yoga sessions, live music, and DJ sets from early morning till late at night. It took place on the 8th of October 2022 at Nova Praia, Costa da Caparica with the support of around 20 sponsors and partners and a few hundred contestants and visitors.

To prepare for the event, PSARI had to build a box to collect the wetsuits and prepare communication material to promote the project as well as the collection location. The materials to build the wooden collection container were bought at Leroy Merlin, a hardware store that already cut the wood according to the design draft. Fortunately, all the tools to build the box were lent to the team by the teaching assistant Tomé Salgueiro as well as a friendly neighbor. The 100 x 62 x 60 cm wooden box was then built in the living room of the founder's student apartment (Appendix G). For the promotion of PSARI's collection point, the team created an Instagram channel and suitable content to notify and update visitors about the event. The announcements were also shared and reposted by the Instagram page of the nova surf club (IG: novasurfclub, >2.600 followers) and the nova surf festival (IG: novasurfestival, >600 followers), which were the main communication channels for this event. Pictures of the collection box and screenshots of the communication posts can be found in Appendix H.

The event itself took place on a sunny Saturday on the beach, with a lot of surfers and like-minded people with broad smiles. Next to the surf contest area, many visitors who did not compete took their boards to catch some waves themselves. The box was set up in the main area of the event, right in the middle of the many different activities. Some visitors came to ask about the project, many others curiously looked at the box and the printed posters. The feedback received was very positive but the result at the end of the day was unfortunately rather disappointing: not a single wetsuit was donated.

The learnings from the event were as follows. First, events do not seem to be a suitable option to collect old wetsuits, probably because the barrier to donating is too big. After hearing about the possibility, visitors need to actively pack, bring and look for the collection point on-site to donate their old wetsuits. The second learning of this event was, that although the project was promoted throughout the prior days of the event, most people on site did not know about it.

Just because communication channels have a certain reach of people does not mean that those people actively see and then also recognize the content. Last but not least, the event showed that besides the actual collection, it was a good way to connect to potential donors as well as the community and promote PSARI.

Even though valuable learnings, new connections, and awareness could be achieved with this event, the third hypothesis, h3, still had to be rejected as it did not reach the threshold.

h4 – Collecting at surf shops

To test whether customers of surf shops would donate their old wetsuits when shopping at a local surf store, PSARI looked at five shops around Carcavelos to partner up. Out of the shops that were approached, four were happy to support the project. What they had in common was that those were all small, local stores with owners who were convinced by the project and its values. The only shop that did not respond to the requests and finally declined the partnership was the Quicksilver Carcavelos, a store of a big and international surf brand whose manager did not have the authority to decide those partnerships directly.

The partnerships with Boardculture Store Carcavelos, Dr.Ding Surfboards Company, Jhonny Surf Store, and Brands Co Store were promoted via Instagram as well as by posters on site. The posters with information about the project and a request to donate, shown in Appendix H, were distributed to the locations on the 8th of November. Most partners hung up the posters a week after receiving them.

Within three weeks of testing, two wetsuits were collected among the four shops, meaning the threshold for this period to validate the hypothesis could not be reached and the hypothesis has to be rejected. Nevertheless, the feedback from the surf shop's owners was very promising: Many customers asked about the project and responses were positive as they finally found a solution to throw away their old wetsuits. As the customers first need to become aware of the

project and the drop-off location of the store before they can bring their old wetsuits on their next visit, we expect the donations in surf shops to increase.

h5 – Collecting at Nova SBE

With this hypothesis, it was tested if Nova SBE could operate as a useful collection point for the project. As students at the university, it was obvious to choose Nova SBE as a point to test the concept. Also, the community and staff within the institution are very supportive, especially with entrepreneurial ventures and the assumed percentage of surfers among the students is higher than in most other universities due to the proximity to the sea.

Generally, the idea was to set up the box previously used at the surf festival on the university's campus and promote the direct collection of old wetsuits. With the help of Tomé Salgueiro, PSARI reached out to Luis Veiga Martins, the Chief Sustainability Officer. With his contact, the help of the internal communications department as well as the Nova SBE Facilities & Services team, the box was set up on the 12th of October 2022 on campus in the so-called Main Deck, as shown in Appendix J.

The collection was promoted via Posters directly on and above the box as well as through Instagram channels.

Within five weeks, only one wetsuit was donated, making this test not successful. To learn more about the roots of this failure students were asked about the project and it turned out that on average 9 out of 10 students did not know about the project, whereas the rest had other reasons for not donating, mostly not having an old wetsuit available to donate.

From the 21st of November onwards, also a promotional video was displayed on various displays on campus (Appendix K). After displaying the promotional video on campus, one more wetsuit was donated within the following three weeks.

Even though two students donated a wetsuit at the Nova SBE campus, the test is seen as a failure as the threshold was set at a minimum of one collection per two weeks. Therefore, hypothesis h5 must be rejected.

h6 – Collecting at surf schools

As surf schools own bigger quantities of wetsuits, this collection stream could be of high importance for the project if validated. To test this hypothesis, the team first emailed but then visited four organizations and asked about their old, unusable wetsuits.

The overall feedback from the schools was very positive. All of them like the idea and were open to doing something about the issue of wetsuit waste. Unfortunately, the motivation to take action was rather low as they did not seem to gain a real benefit from donating. Whereas the surf shops benefited from the advertisement of their location as a collection point, the schools did not seem to attract new customers by supporting the cause of the project.

Still, after having difficulties finding and talking to the persons in charge, the results were satisfactory. Out of four companies approached, the SAL Surfing School and Carcavelos Surf School agreed to donate their old wetsuits to the project. Unfortunately, none of both currently had damaged wetsuits available. Wanted Surf School already donates its old wetsuits to a project that ships them to São Tomé and Príncipe in Africa and Angles Surf School resells them after 6 to 12 months of use to other surf schools.

With the tests conducted on this hypothesis, two main learnings arose: First, to collect the wetsuits, the surf school has to be contacted and reminded to keep the suits many times. But if they are donating at the end of a season, it will be in quantities of several units at once. Second, surf schools use their wetsuits for as long as possible, meaning each suit will be stitched and fixed many times before being thrown away. It is assumed that wetsuits gathered through this collection stream will be harder to recycle into new products than the ones of private donations.

Although two out of the four schools indicated their willingness to donate their old wetsuits when available, the hypothesis had to be rejected as the project has not received any wetsuits through this collection stream so far. A possible explanation would be the lack of incentive for the schools to donate.

h7 – Collecting through social media

Donating through social media platforms was initially not planned as a source of collection but happened to arise as an opportunity as donors reached out to the team directly. The channels used were various WhatsApp groups as well as the project's Instagram account. Both were initially only used for general information, announcements, and updates about the project, events, and drop-off partners.

In total, seven water sports-related WhatsApp groups with around 700 members and around 100 followers on Instagram were reached through those two channels. When the project was in urgent need of old wetsuits to be used for producing the first minimum viable products, the team posted again in some of the WhatsApp groups not to promote the general project but to specifically ask for donations in the form of old, unused wetsuits. The result was as impressive as surprising: within just one week the team was able to collect eleven wetsuits from three different people. The wetsuits were picked up either directly at the donor's address or a convenient meeting point.

This not just helped to secure the urgent need for materials but also provided valuable learnings for PSARI. Currently, it is assumed that this collection stream worked so well because of two reasons. First, people are addressed more directly and closer targeted via WhatsApp than they are by a poster, which caused them to react to the request to donate. Second, as the collection was picked up individually, the barrier to donating was much lower for the donors.

Consequently, hypothesis h7 can be validated.

6. Results and learnings

Both value hypotheses, and therefore one of the two main components of the project, were successfully validated. Using old wetsuits to sew and create new products worked very well, even though some difficulties regarding the processing of the material arose at first. The main learning was that the finished products with full functionality look used, depending on the condition of the donated wetsuits. As it is believed that this exact second-hand look makes it desirable to customers, there is also a fine line between a unique and attractive touch and an old and dirty product. Especially stains and sand make the product undesirable to customers and should be avoided by any means.

Acquiring the first customers, so-called early adopters, was surprisingly easy. Showing the product around at Nova university was enough to not just sell the first available units but to also take preorders for further products. Even though the increased demand due to the current Christmas time has surely contributed to the success of the testing, the purchases were not just used as presents but satisfied real demand for the customers themselves. The tests also helped to identify a customer persona, which also happened to be very present in the founder's university environment: 22 to 30 years old, upper-class students with high environmental awareness and willingness to have a positive impact.

The overall results of the collection were rather shocking: With a total of 15 collected wetsuits, only one of the anticipated five collection streams was successfully validated. Even though initially not planned, donations through social media turned out to be by far the most successful method. It is assumed that the very precise targeting of people as well as directly addressing the person led to those favorable results. Unfortunately, donating at events seems to require too much proactive and prior effort from the visitor but turned out to be a good place to build awareness and a network for PSARI. In general, advertising the project was an issue for

different collection channels. One of the key learnings was that printed posters, Instagram stories, posts on social media, or other communication efforts are simply overlooked by the majority. Realizing that despite the posters, messages in many groups, and social media advertisements, only 10 percent of Nova SBE students even noticed the box on campus after three weeks, was an important lesson to be learned. The small audience that was aware of the project, unfortunately, was not well targeted, meaning that many of the students did not practice watersports and therefore do not own a wetsuit.

Even though it could not be validated within the timeframe of the project, partnering with surf schools to collect wetsuits in bulk still seems like a promising channel for the collection as the suits will often be thrown into the garbage instead. Although the old suits are of no value to the surf schools, without an explicit benefit for their business, very little interest in cooperating is shown. Also, even though the partnerships with surf shops did not generate sufficient donations, the network to their customers and important surf figures are valuable for PSARI and promising for the future.

Table 2: Summarized results and learnings

Hypothesis/ Assumption	**Result**	**Learning**
h1	Validated. Successfully produced a bucket hat and a few laptop sleeves.	Difficulties with the condition of the collections may arise. Washing, careful selection, and expertise in sewing are needed.
h2	Validated. Sold all three available units within the first day.	Demand is available and customer segments were identified, but limitations due to low statistical power.
h3	Rejected. No wetsuits were collected.	Events are good for building awareness but unsuitable for collecting.
h4	Rejected. Two wetsuits were donated.	Not a successful collection stream but a useful network and connection to community
h5	Rejected. Two collections were received.	Wrong target audience, difficulties to promote such projects.
h6	Rejected. No donations were made.	Remains a promising collection channel but lacks benefits and incentives for schools.

h7	Validated. Eleven wetsuits were collected.	Addressing the donors directly and highly targeted leads to successful collections.
a1	True.	Many water sports practitioners have old wetsuits at home that are not being used anymore.
a2	True.	Most of the collected material is in a sufficient condition to directly sew new products.

Pivot

After building MVPs, conducting various tests, and measuring the collected results, many valuable learnings were collected. Although PSARI could achieve a modicum of success within a few months, reflecting on the project and its results implies a change of strategy. In the book "The Lean Startup" this is referred to as "getting stuck in the land of the living dead". It happens when a company has achieved just enough success to stay alive but is not living up to the expectations of its founders.

Applying the learnings of the BML cycle to the project, PSARI now needs to change the current collection system. As the direct collection points did not bring the anticipated results, the shift should be towards building an online network of the target audience to receive individual donations of wetsuits. Alternatively, a possible pivot could also be to eliminate the collection in general and to partner up with companies that already collect old wetsuits and only focus on upcycling the material to new products. On the other hand, the production and sales channels should be focused on and developed.

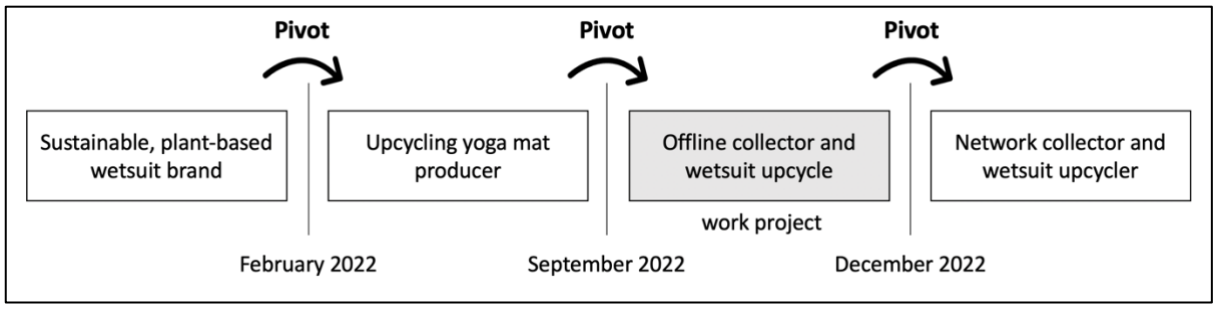

Figure 3: Timeline of the project with all pivots

As the overall concept of the project, turning old wetsuits into physical products, remains

unchanged, most dimensions of the business model will too. Some components could already be validated, whereas others need to be changed, eliminated, or still tested. Most prominent was the change of the value proposition which shifted the focus away from yoga mats to starting with simpler and already validated products like the laptop sleeve. Furthermore, the relationships with the donors will be primarily through online networks as opposed to offline collection points, as the results of the work project suggest. To build an online network of water sports practitioners, new key partners with shared interests in such a network will be needed, resulting in an updated business model that can be found in Appendix L.

7. Future Outlook

PSARI will face certain challenges and difficulties on its way to becoming a sustainably profitable startup. It will continue with the lean startup approach, starting new BML cycles to validate more dimensions of the business model and to learn as quickly and cost-efficiently as possible.

Building on the learnings, the main challenge, and next step will be to implement the pivot by building an online network of water sports practitioners as a communication channel for collecting old wetsuits. To approach this step, the reasons and motivations for the successful collection through social media channels should be analyzed and understood more deeply first. Building up such a network could also be done in cooperation with partners such as influencers in the Portuguese surf community, wetsuit producers, or other water sports-related projects. It was validated that individuals often have old wetsuits at home and are willing to donate, but the difficulty lies in motivating or incentivizing those people to do so.

Another challenge will be the scalability of the project. As the tests of creating a product out of old wetsuits have shown, the collected material differed in colors, thickness, and conditions

making it hard to automize the production of sewing and consequently challenging to scale. Therefore, the second level of recycling, shredding the neoprene and further processing it into new products, will have to be tested and developed in the future. Also, scalable sales channels need to be implemented to deal with higher product quantities.

Finally, the project needs to implement an efficient marketing strategy. The results of different tests of the project have shown that the marketing and communication efforts did not reach the target audience sufficiently. Different strategies of communication should be tested, analyzed, and adopted upon successful validation.

8. Personal entrepreneurial reflections

This section will provide a personal reflection on the entrepreneurial competences gained throughout the project. The following attributes and skills will be described in the first-person point of view, as this will enable a smoother reading of the personal insights mentioned.

Proactivity

The need to be proactive when starting a venture is something I found to be indispensable already in the early beginnings of PSARI. Countless unanswered emails and broken promises of employees claiming to reach out after talking to their bosses have led to wasted days or even weeks of waiting. Adopting a more proactive approach by visiting stakeholders on site and whenever possible not postponing the issue at hand helped me to prevent waiting for replies that are out of my control.

Courage to decide

A characteristic that has soon also helped me in my personal life is having the courage to take decisions. Being afraid of change or admitting failure can make it hard to adapt to one's path, even if very clear signs and measurements suggest so. At PSARI, realizing that many

assumptions I believed to be true did not turn out as expected, it was clear to change at least parts of the current strategy and opt for a pivot. Even though the tests showed clear results, a voice in my head kept finding excuses for pursuing the current strategy. Having put energy, hard work, and creative craftsmanship into the project, this simple step of admitting failure in some areas and deciding to act on it, was very hard but also much needed to enable the venture to develop further.

Partnerships

No one can do everything alone, there will always be a lack of important competences, knowledge, financial or human assets. Especially in the early stage of a venture, those resources are scarce, so it is important to build partnerships. An important factor I have learned during this project is that those partnerships need to be mutually beneficial for both parties. Working together with surf shops for example was uncomplicated as soon as the owners understood their promotional benefit. Surf schools on the other hand would benefit less from our social media promotion as their customers mostly do not own wetsuits themselves and therefore do not feel as connected to the problem of its waste. This led to lower interest in a partnership and more reluctant communication. Networking, building, and cultivating partnerships have opened many doors. Only with the help of external team members, advisors, surf shop owners, and many others, I was able to collect material to build and then sell upcycled products.

Besides the competences mentioned above, I have learned a variety of additional entrepreneurial skills with PSARI. This project has helped me to develop my authenticity and resilience and showed me the importance of having clear values, all of which I adopted and benefitted from in my personal life as well.

9. Conclusion

In the spring semester of 2022, when PSARI started with a team of three, the project was mainly

in the ideation phase, spreading out in all directions before finally settling for a promising business model. With the following spring semester and the start of this solo work project, the action and validation phase has started. As soon as the scope and the guiding framework were decided upon, the work become much more focused, analytical, and metrics based, leading to weekly meetings with the academic advisors filled with progress updates and contact requests. Within a few months, 15 wetsuits were collected, and 9 products were produced.

Some key aspects could be validated, and others failed but provided learnings and opportunities to improve. Overall, the concept of PSARI still looks promising, even though with the pivot some major challenges and many more questions arose: Is it possible to build an online network of surfers to receive donations at a bigger scale? Will PSARI manage to further process the unusable material to products like yoga mats or flip flops? Can the production be current production be scaled? Those questions are still unclear and await validation.

PSARI started as a university project of the new master's program "Impact Entrepreneurship and Innovation" at Nova SBE. Even if the future of the venture remains unclear, the most important goal has been achieved successfully: Learning - but not just on paper. Learning how to start a venture, working in a team, facing challenges, dealing with failure, adopting an entrepreneurial mindset, and constantly changing according to the given circumstances. Without the usually substantial risks and personal dependency connected to such projects, PSARI was developed in a safe environment with the support of the community of Portugal's highest-ranked business school.

In conclusion, PSARI will continue to develop in order to reduce as much waste as possible. As the build-measure-learn cycles continue, the adaption of the project does too.

"There is nothing permanent except change."

(Heraclitus of Ephesus ca. 500 BCE)

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11. Appendices

Appendix A: Business Model Canvas at the start of the work project

Key Partners

donors:
- individuals
- customers (segment water sports)
- surfschools
- wetsuit manufacturer

producer
- shredding company
- yoga mat producer
- (sewing partner?)

logistical partners
- collection
- distribution
- surfschools

investors

government
- collection bins at public beaches

Key Activities
- communication (especially of values)
- collection/procurement of wetsuits
- processing (cooperating with partners)
- selling online (webshop)
- selling offline (sales team)

Key Resources
- financial fundings for production and logistics
- communication infrastructure and knowhow
- supply chain
- donations/wetsuits
- distribution channel

Value Propositions

creating value mainly by providing a useful product (yoga mat) with the combination of impact values.

- turning waste into life
- open value
- emotional connection (as a donor)
- purchase gives a good feeling about oneself
- social status (as upcycler)
- unique design (structure of neoprene)

Customer Relationships

close and very informal communication via email (newsletter), website (progress update) and social media.

different content sections (according to segments):
- surfer: follow up on donation & production
- environmentally: updates on emissions, impact, etc.

Channels

local offline channels:
- surfshops, surfschool
- yoga shops, sport store

online
- own onlinestore
- social media (instagram) updates on company
- newsletter

Customer Segments

donors:
surfers, divers and other wetsuit owners who have an interest in watersports and improving the industy
#sports #fit

environmentally driven:
people who are interested in the products but care much more about their consumption and impact on the environment then on the actual functionality of the products. they also want to present their actions (purchase) in society and build up their status
#conscious #mindful

Cost Structure

collection incentive: offering discounts, products or money in return for wetsuit donations
collection network: setting up collection bins and collection points, collecting the donations
production: shredding and production costs
distribution: of sold products (online as well as offline)
selling: sales commission, onlineshop setup,..
communication: marketing, media, photos, email-newsletter, etc

Revenue Streams
- 50% online sales (own webshop, hosted e.g. via shopify)
payment: creditcards, vouchers, paypal, banktransfer
- 50% offline sales (eighter directly to endcustomer via surfshops, sportsstores, etc. how display and sell our products on commision (B2C) or in „bulk“ to those stores who then resell them (B2B))
payment: cash, banktransfers, creditcards,

Appendix B: Business Model Customer Insights

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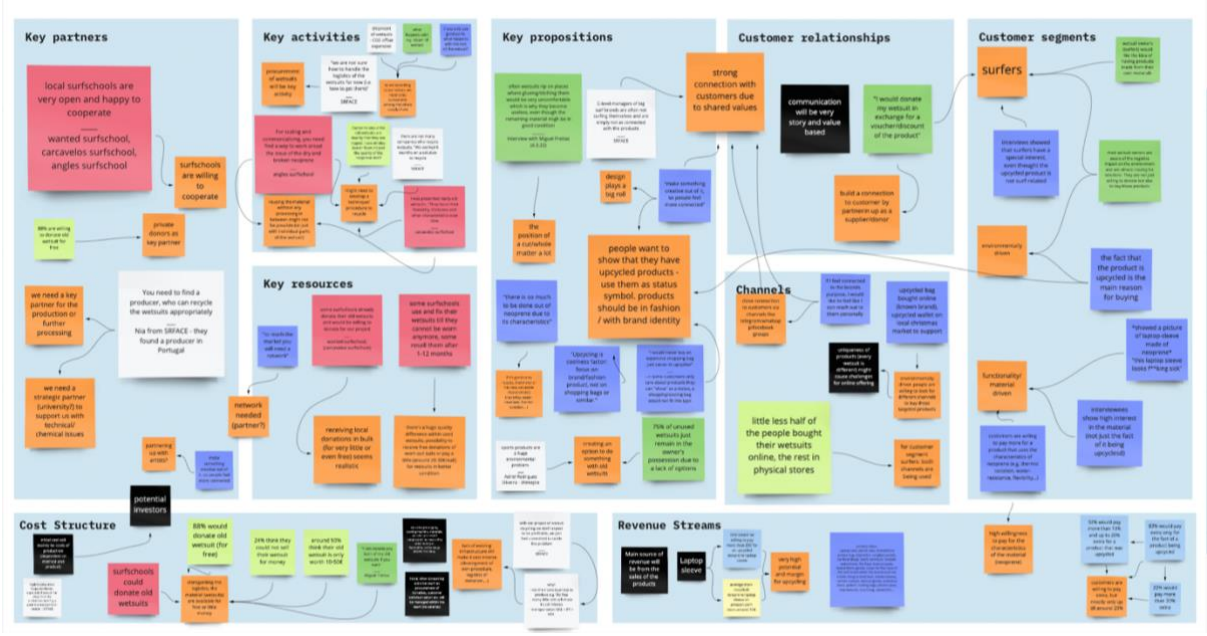
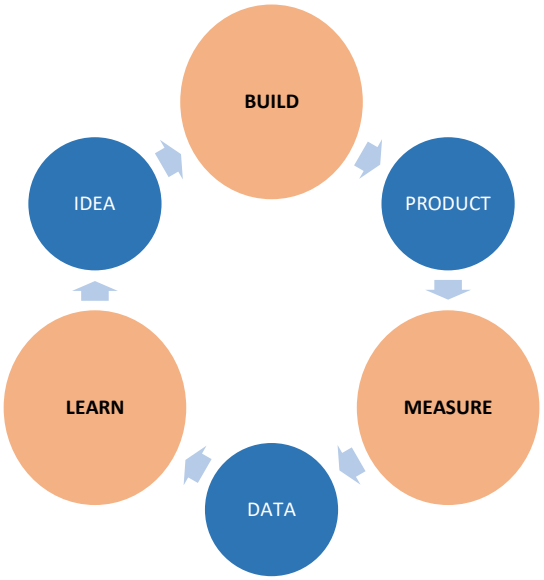


Appendix C: Build-Measure-Learn Cycle

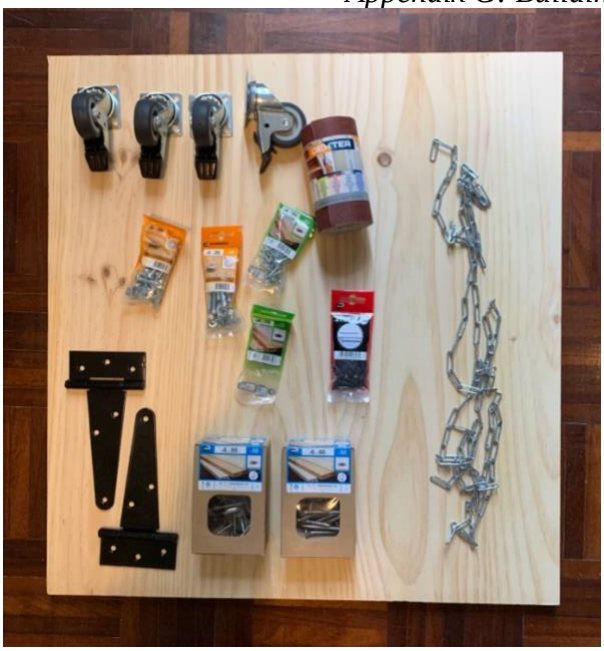


Appendix D: First prototype of laptop sleeve

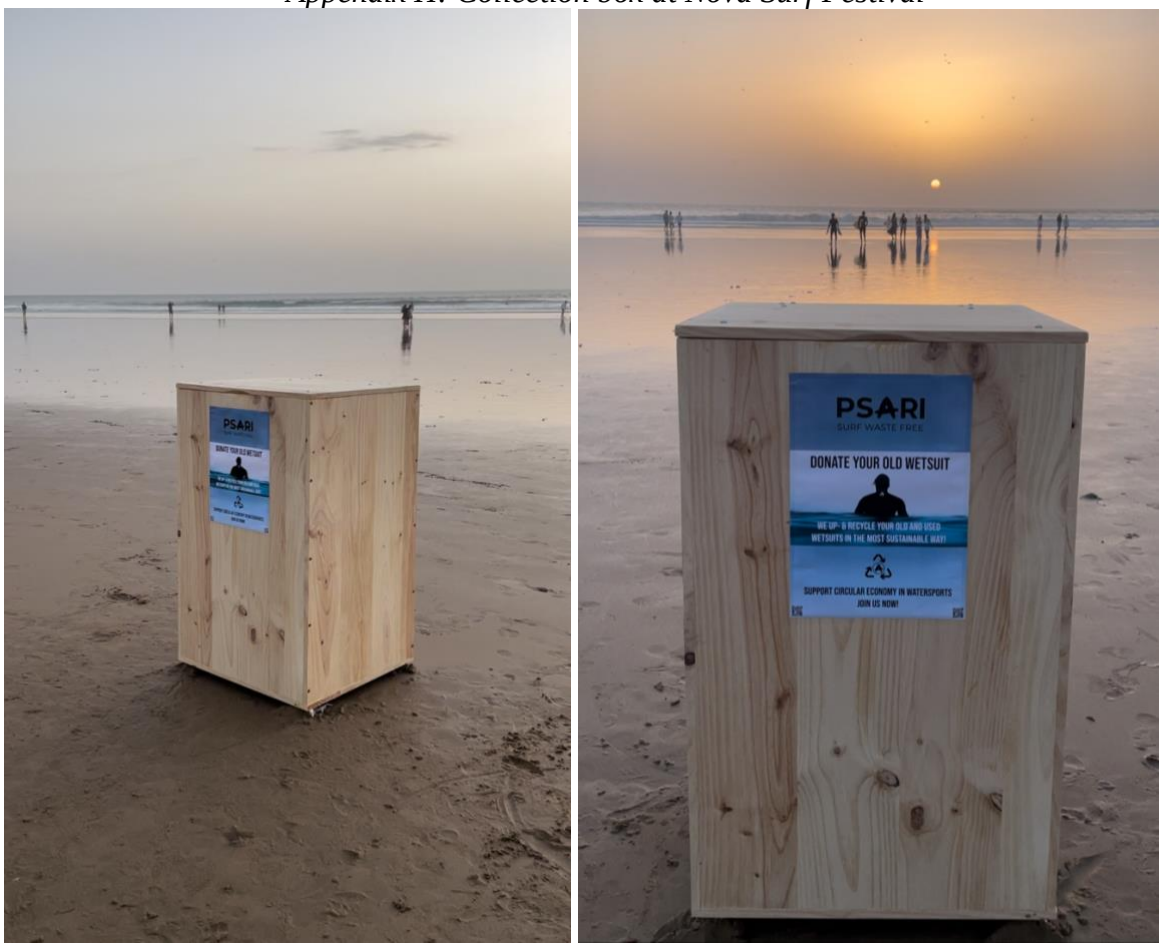
Appendix E: Prototype of bucket hat

Appendix F: First set of MVPs

Appendix G: Building the collection box



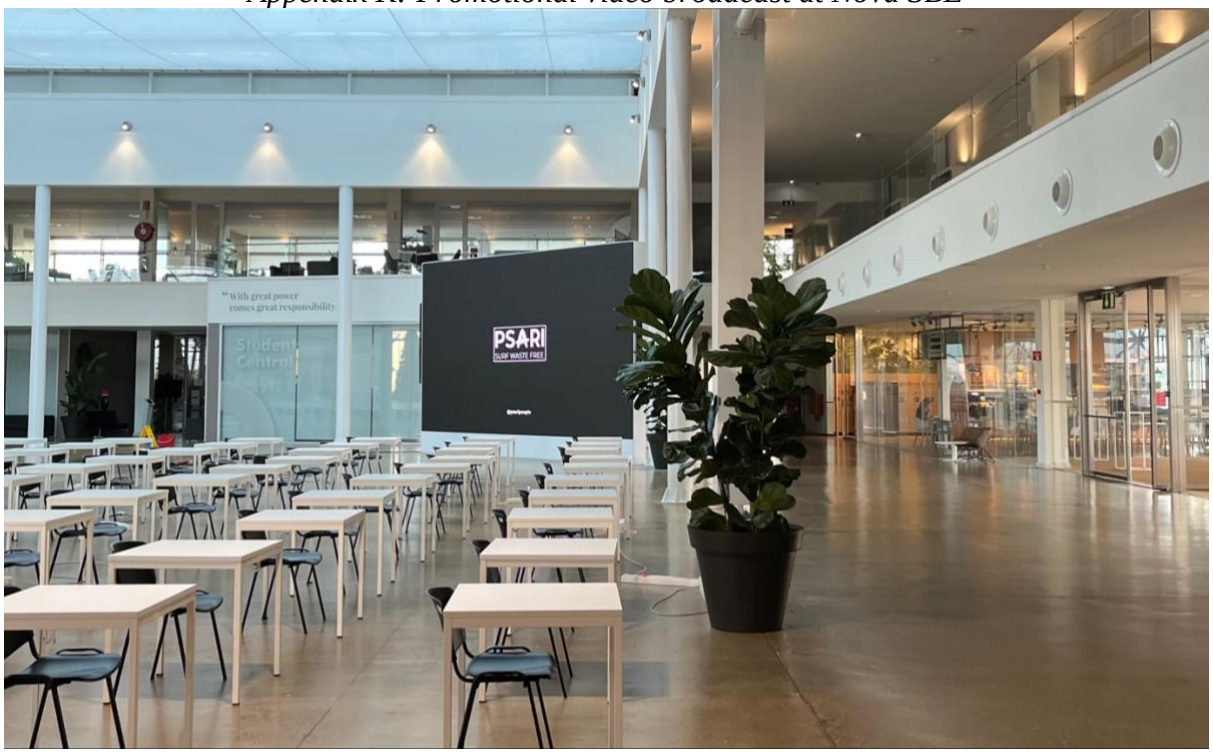
Appendix H: Collection box at Nova Surf Festival

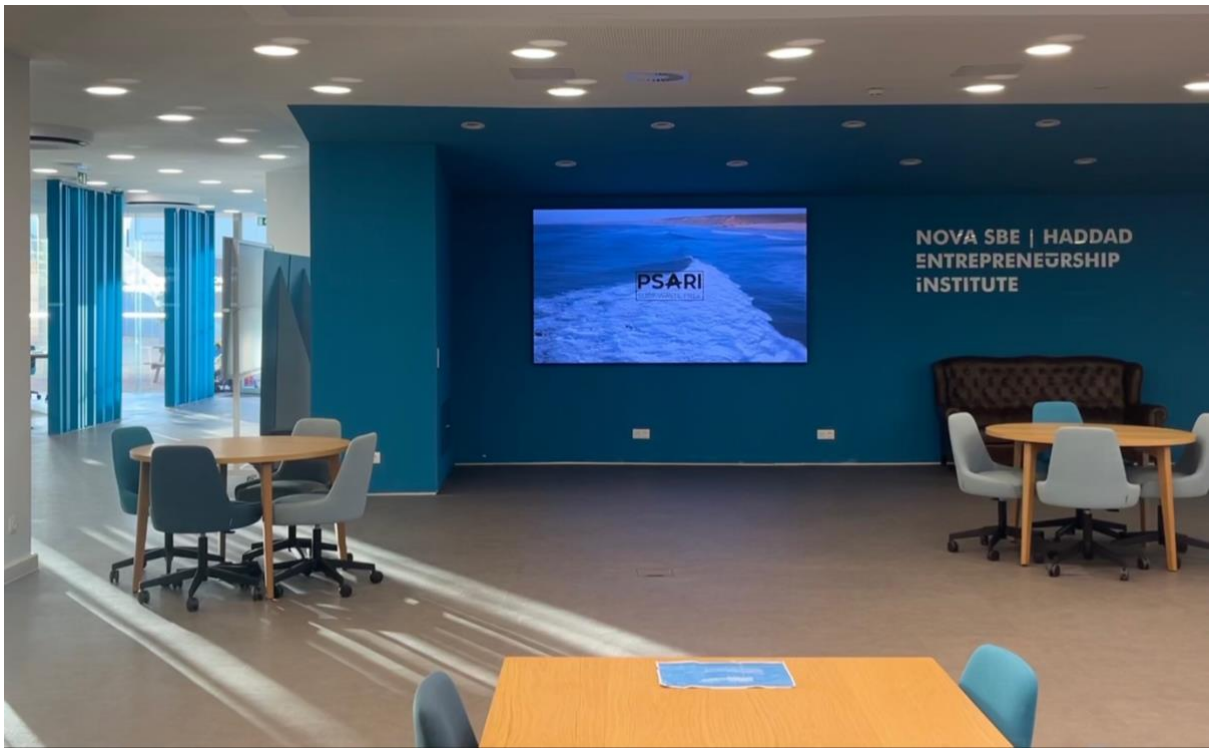


Appendix I: Surf shop partners

Appendix J: Collection box at Nova SBE

Appendix K: Promotional video broadcast at Nova SBE





Appendix L: Business Model Canvas at the end of the work project