

Business Plan SmartTap

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Product: SmartTap

Project Squad: Physical and Social Rehabilitation

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Introduction

The SmartTap is designed with regards to the perspective of visually impaired swimmers when it comes to training. Individuality during training is something that has been absent since the dawn of Paralympic swimming, with the main problem being the need of an alert when the swimmer is approaching the edge of the pool. Paralympic swimmers train abroad for a large part of the year, so any solution would have to be easy to move and set-up. To fix this, we needed something with the ability to communicate with the swimmer, that worked and connected automatically. Our solution, after rigorous research, is a modular infrared module that detects and sends a radiofrequency signal to the swimmer, who hears a bone conducted tone to notify him/her that the edge of the pool is approaching.

Value Proposition

Which differentiates the SmartTap from similar products, for example the Samsung Blind Cap¹, is the mobility of the device, the simplicity of the device, the independence of the swimmer and the usability.

The installation of the SmartTap is easy to displace when the swimmer is going to train abroad, which he or she does approximately eighteen weeks year. The installation is light weighted and connected with the use of suction cups in the water.

The SmartTap is focused on one function, it gives a signal when the swimmer has to turn. This is what the swimmers asked for and what they really need. There are no buttons or switches on the device for other functions.

The SmartTap is easy to use for the swimmer, the swimmer only has to place the receiver under his or her swimming cap and can start swimming. When the swimmers finished the training, the device can be placed on the wireless charger and can be used the next training again.

Other values which are important for the customer, is the independency when he or she wants to train, and thus the possibility to train more often. Another aspect which is an important value is the reliability and accuracy of the signal. After a long period working together with the same tapper, the tapper approximately taps on the right time, but when the swimmer is going to train abroad, the tappers are not always able to go with them together, so they do not have the same tappers when training abroad. The installation of the SmartTap can be placed on a distance toward the border of the pool, which the swimmer prefers. The swimmer knows that he or she will always have the signal on the same distance, which gives them confidence and a possibility to improve the results.

Customer Segments

The SmartTap is designed for visually impaired swimmers. It is especially designed for competitive swimmers, because they want to train a lot to become better. There are six visually impaired competitive swimmers in the Netherlands. If they want to train, they need three other persons; one coach and two persons who are tapping on the head of the visually impaired swimmers when he or she is almost at the border of the swimming pool and needs to turn. The swimmers are not able to train as much as they want to do, because they always are dependent on the tappers. The SmartTap

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is a device which enables them to practice their sport more independently, it is a replacement of the tappers.

Other eventual customers are high level valid swimmers and possibly disabled swimmers without arms. They can use it as a training instrument. Valid swimmers are often injuring themselves when knocking with their hands to the border of the swimming pool, because they are swimming too fast because they are not aware of the border of the swimming pool. The same goes for the disabled swimmers without arms, they are knocking to the border of the swimming pool with their head. The SmartTap can be used to warn them that they are almost at the border of the pool and prevent them for making more speed. Furthermore the device can motivate visually impaired people to go swimming, because the product lowers the barrier due to the fact that they can train more independently.

Customer Relationships

To really design for the customer and to improve the customer relationship, meetings with Liesette Bruinsma, Paralympic swimmer of the year, were planned when developing the SmartTap. Liesette and her coach encountered the problem that they were not able to train as much as they would like, and asked Libra for a solution. They gave insights to the designers for the functionalities of the design. The values Liesette wanted to be implemented in the device, are described in 'value proposition'. Furthermore different frequencies were tested with her to see which one she preferred to have as signal when she has to turn. The coach of Liesette also gave us new information, she is the contact person of Liesette.

During the further development, this way communication with Liesette and her coach will be continued and more tests will be done. The goal is to give them the product which solves their encountered problem.

Revenue Streams

To develop the SmartTap on a way that Liesette Bruinsma is able to use it, Libra will develop the product together with the TU/e Students. To finance this development they will ask for a subsidy. In their network they have various options for subsidies from funds. For example 'Het Revalidatiefonds', this funds will fit for the SmartTap. One of the goals of 'Het Revalidatiefonds' is enabling people to live as independently as possibleⁱⁱ, which is the goal of the SmartTap as well.

When the product is available for Liesette, the product can be produced for a larger target group. Libra will show the device in their network, interested companies can invest in the project, to produce it for other swimmers as well. The company can sell the final product to the swimmers.

- For this project Libra is not focused on making money, their value of realizing the product is finding a solution for the swimmers and using the product for other revalidating swimmers in their own swimming pool.
- The TU/e students are focused on realizing their product and the experience of developing an idea until it is able to produce on the market. They can show this experience in their portfolio.
- The value of the product for the swimmers, the customer, is the independence when swimming.

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- Companies can be interested because they can make money out of the product.
- Funds can be interested because they have the same goals as the goals of the SmartTap and they are convinced about the advantages of the SmartTap.

Channels

The company who is going to invest in the SmartTap has to reach the customers. To promote the product to the swimmers, swimmers can be informed through the following channels; the newsletters of the KNZBⁱⁱⁱ, the swimmers magazine 'Keerpunt'^{iv}, or the site zwemwinkel.nl^v.

Key Resources

For a company, among others the following specialized people are needed;

- Specialists for the development of the design of the SmartTap;
- User focused specialists, for the client contact and the feedback of the users;
- Technicians for repairing services if something breaks down;
- Technicians for the construction of the whole design;
- Marketing specialists for making the best prices and cooperation's for the production of the SmartTap;
- Web designers for the site of the SmartTap;
- Administrators for the registration of the costs and earns.

Furthermore a location is needed for constructing the SmartTap, for the storage and the workspace. Also, a company for the shipment for the distribution has to be approached.

Key Activities

The SmartTap is really designed for the user and with the user. To stay focused on this aspect during the development period, the product will be further developed together with Liesette Bruinsma. To maintain the customer relationship, a company that is willing to invest should have customer experts. These need to stay in contact with the customer, to ask them for feedback and to test the product with them. Also, when the product will be developed for valid swimmer or other target groups.

Partners

Libra has locations in five places in Brabant and Limburg. The SmartTap is designed in cooperation with Libra Eindhoven. The product is also promoted at Libra in Tilburg. For the development of the product, Libra has to contact the different locations, to define if they have potential users in their own centers. Furthermore they have contact with other sport centers, for example with InnoSportLab^{vi}. But also other contact like revalidation patients, NOC*NSF^{vii}, the KNZB^{viii} and revalidation centers in different provinces of the Netherlands. They have to contact their own network to promote the product and to find interested clients, funds and companies.

Development plan

For the development of the SmartTap the following steps should be taken:

- The SmartTap will be developed by the students, the funds will finance the development and product costs. The product will be available for Liesette Bruinsma.
- If the final developed product can be used by Liesette, the product can be produced on the market. An investment is needed to produce the product. The company who is willing to invest could be a design company which is able to put together all different components and repairs the product when something breaks down, or the company should work together with another company who is able to do this work.

Different parts of the product should be developed before the product can be used by the swimmers:

The hanging system:

The hanging system is made of wooden sticks, to develop the product, the design should be made out of a waterproof material. Wood can be used for a short period, but when wood is in the water for a long time, it will be damaged. Instead of wood, light weight waterproof material should be used, for example plastic sticks. The plastic sticks should have the same diameter in thickness, this way it would fit in the same suction cups.

The casing:

Both cases, the case of the bone-conduction device and the case of the motion-sensor should be improved. The bone-conduction case should be totally waterproof. This case does not need an option to open it if the electronics are improved (see below). This could be made out of rubber. Rubber is a soft waterproof material, which fits well under the swimming cap. To make the casing seamless, the rubber should be 3D printed. The price of the printing depends on the number of prints. This has to be researched during the development.

The case of the motion sensor does not have to be totally waterproof, because it does not need to go in the water. If it is made out of plastic, it will be water resistance. Furthermore the model of the casing for the motion-sensor should have two boards on both sides. This way the direction of the sensor will be restricted in one line. This case could be 3D printed as well. For one final prototype, the students will be able to print this by themselves. For a larger number of product, a company which invests in the project can choose to contact a company that is specialized in 3D printing, for example the company linked to the 3D-prints in the 'cost structure'.

The electronics:

It will be easy for the visually impaired swimmers if the bone-conduction device will be charged wireless. This way, the device does not need to be opened and the case can be totally closed and waterproof. This is called inductive charging. The electronics therefore should be connected to the receiver, and a casing should be made for the transmitter plate, on which the receiver can be put if it need to be charged.

To make the electronics for in the cap and in the sensor smaller, two PCB's should be designed and produced. When the PCB's are made, the Arduinos are not needed anymore. The students are able to design two PCB's. For larger production, the PCB's could be produced by a specialized company.

Cost Structure

Total product costs for a developed product:

Product	Price €	Amount	Total price €
433 RF receiver and transmitter ^{ix}	2,10	1	2,10
Piezo buzzer ^x	0,50	1	0,50
Pushbutton ^{xi}	0,15	1	0,15
Lipo accu ^{xii}	10,95	1	10,95
IR PIR motion sensor ^{xiii}	5,95	1	5,95
Powerbank ^{xiv}	8,99	1	8,99
Switch ^{xv}	0,20	1	0,20
Tin ^{xvi}	2,00	1	2,00
Electronic wiring ^{xvii}	5,00	1	5,00
Suction cup ^{xviii}	7,99	2	15,98
Wiring ^{xix}	3,19	1	3,19
Plastic sticks ^{xx}	1,63	4	6,52
Inductive charging ^{xxi}	9,95	1	9,95
PCB ^{xxii}	30,00	2	60,00
Rubber casing ^{xxiii}	30,00	1	30,00
Plastic casing ^{xxiv}	20,00	2	40,00

* For specific prices of the PCB, and the 3D-printed cases, the accurate designs should be made. This are indications of the price.

Total: €201,48

The students who are going to develop the product, already finished their project. They are willing to develop the product but should be paid in hours. The subsidy should be used to pay the developers and the costs for the developed product. A company is needed to produce a larger quantity of products, so that the product would be available for more swimmers.

Indication costs design students per hour: €55,00

Two students are going to work on this development. They will need approximately 40 hours, including tests with the users.

40 hours x 2 design students x €55,00 per hour = €4400,00

Total price for a developed product:

Developers costs	€4400,00
Product costs	€ 201,48
Total costs:	€4601,48

When a company is going to develop the product, they can lower the material costs, when ordering a larger amount. Furthermore, they do not need to do the research, but they need to pay the partners for building the products. The price will be lowered because the quantity of product is higher. But they need to spend money on the distribution channels and promotion.

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