Fontys University of Applied Sciences

Physiotherapy English Stream

Business Plan: Physign

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2. Introduction

Child development is characterized by biological, emotional and psychological changes which take place from the moment of birth until the end of adolescence (1). It is in many cases overlooked by parents; many are unaware of the "*developmental milestones". The developmental milestones* are a set of functional skills or age-specific tasks that the majority of children can accomplish at a certain age range. In the child's growing process, the different milestones set fundaments from which children have to learn and improve different tasks. These tasks can be fine and gross motor skills, but also include language and cognitive & social skills. For example, at the age of two, children have already the ability to jump and run and are also able to follow simple instructions. The development in a child at a specific age is, in most cases, different to that of a child that is older or younger. Therefore, parents and care-givers must be cautious to ensure the appropriate development of their children, by being aware of the milestones (2).

Tomporowski et al. (3), has shown that physical activity plays a vital role in improving the children' motor skills and cognitive function. Fundamental movement skills (FMS) are movement patterns that involve many body parts and offer the basis of physical literacy. FMS are essential in the physical development of a child to establish the base for participating in physical activities. FMS develop in childhood, if children do not get the opportunity to properly develop these basic motor skills they will later on experience difficulties or barriers, when being involve in sport experiences. In the FMS, three different kinds of skills can be found: locomotor skills which imply the ability to run, jump, roll and hop; the object control skill, implying, striking kicking throwing and watching; and finally the stability skills which consist of twisting, bending and rolling (4).

Many orthopedic conditions, can affect the children's quality of life. The most common orthopedics complaints encountered are in-toeing, out-toeing, genu valgum, genu varum and postural as well as stability problems (5). Vergara-Amador (6) described, that the prevalence of flat foot in childhood has been in an increase, and that one of the main risk factor of this condition is children overweight and suffering from obesity.

Unfortunately in our modern society, children have shown a decrease of physical activities. Physical inactivity starts already in young age (7) and has a big impact on the cognitive and the motor skills development. The reason for this is that, when children do not learn movement patterns, since they do not perform them, the cortex does not receive input from the proprioceptors, mechanoreceptors and nociceptors. This instead does not allow the children brain`s to have reflections on trial and error. Furthermore, sedentary lifestyle affects

not only adults but also children. A study investigated that, during the last few decades, children have a decreasing activity level, not only at home, but also at school (7,8).

Many studies have shown that exercises improve the cognitive and the motor skills of children. These researches have shown improvement not only on healthy children, but also in children suffering from down-syndrome, cerebral palsy, ADHD and autism (9-13).

“Physign”, is a product built by physical therapist and designers to stimulate the children activities, involving games and evidenced based exercises. The aim is to provide an manageable tool for therapists working with children, which facilitates their work and lets them focus on what is important: to ensure adequate treatment of the children’s condition. It will be in form of games on a carpet, which limits the area the children can play on and by this will keep their attentiveness high.

Children from the age of five until ten, do not have the same abstract thinking as adults. They learning is facilitated, through form of games and imaginary plays. Nowadays, many kindergartens offer the possibility to educate kids with games. At school, teachers also apply games to keep the children concentrated on their tasks, and to improve their memory skills. The idea is now to introduce games in children therapy. From now on, Physign will offer an exciting and effective therapy section, from which both the therapist and the kids will contribute from.

3. Market research

3.1 Current market

Nowadays, many children are suffering from gait abnormalities or postural problems. This includes children suffering from cerebral palsy(8), children with attention deficit/hyperactivity disorder (ADHD)(9) or simply children with orthopedic conditions such as flat feet, club foot, valgus and varus knees. Since, children with several sort of motor dysfunction have troubles sustaining postural stability and because preservation of postural stability is a fundamental part of every movements, physical therapist are an essential part of the correct development of these children(10).

Children have the tendency to get attention deficit while exercising with their therapist, therefore working with them as a therapist can be challenging. Some children do not want to repeatedly do the same exercises; hence it is necessary to find a different approach to make the therapy session fun, while still achieving your goals. The goals are to develop coordination of children, build strength, improve their balance, maintain flexibility, optimize physical functioning levels and maximize their independence.

Currently on the market, no games are available for kids to complete their daily exercises. Some physical therapists uses audio or their imagination to implement fun in the treatment; however no real product has been created for the diversity of fun exercises into the treatments.

This product “Physign” will therefore be implementing fun and games into the children’s daily treatment.

3.2 Choice of location

The idea is to sale the product internationally; however we will first start with Europe before targeting far countries, as the shipping cost will considerably increase. After introducing our prototype to pediatrics’ facilities, the product will be advertised through a website and a Facebook page. The website will be made mainly in English with a possible choice of language to be chosen, such as: French, Italian, Dutch, Hungarian languages.

The first targeting country for “Physign” will be the Netherlands, as is it within this country that the first sample will be made. Further on, the product will be produced in a country where the workforce and material are cheaper.

4. Product

4.1 Introduction

"Physign" is a game designed on a carpet which will be implemented in children's treatment. It will be used as a tool to entertain the children while they are exercising as well as making an optimal atmosphere for both the therapist and the kids. Children are known to lose interest easily when it comes to serious tasks. The product will be targeting the main problems most children encountered, their gait and postural problems. The therapy aim to:

- Overcoming their physical limitations
- Expanding range of joint motion
- Building and maintaining muscle tone
- Increasing recreational capabilities
- Identifying alternate ways to perform everyday tasks
- Fostering independence
- Increasing fitness
- Increasing flexibility
- Minimizing pain and discomfort
- Improving posture and gait :
    - Decreasing genu valgus, varus
    - Decreasing pes planus
    - Decreasing dropped feet, equinus feet

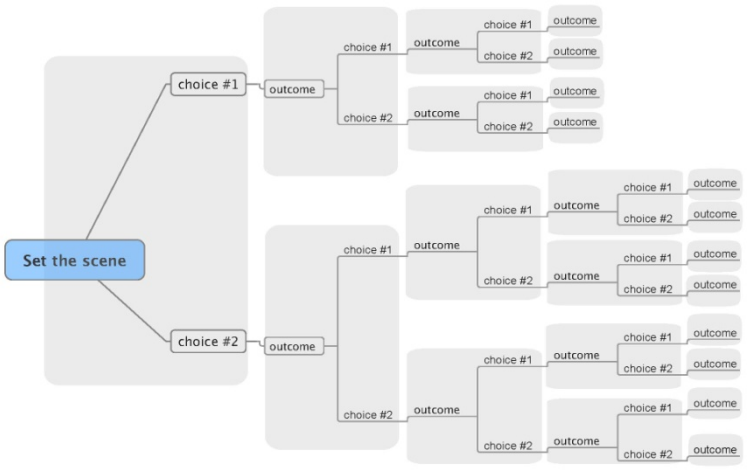

Figure 1: Nonlinear narrative

The product consist of a carpet (fig.2) with 6 unfixed stations. The storyline will be exploring nonlinear narrative (fig.1), meaning that the children will have the possibility to choose "choice1" or "choice2" giving different outcomes. Therefore, the children will have the possibility of having 40 different outcomes within 1 story. This will be made with the use of "Twine" software creating video games scenario.

The first kit of “Physign” will consist of a carpet. With the help of the website which describes precisely how to place the stations, the therapist will be able to set the game before the treatment session. The kit of the product will also contain audio tapes, which will tell the story. In the background of the story teller, the children will hear sounds reproducing the environment of the story. In each station the kid will have to perform physical exercises with fun and creativity. Each exercise will be chosen accordingly to evidence-based gait and postural training for children. During the game, the physical therapist can determine if orthotic equipment, adaptive or assistive technologies is required. Orthotic equipment can include braces that stabilize the ankles, knees, legs, torso, upper arms, lower arms, elbows or hands.

During the treatment, the therapist can tape the children and assess his progress over weeks. Throughout the progression of the children, the equipment aids can be removed and the game can still be performed. The physical therapist can choose to add different tools during the game, including dumbbells, bouncy balls, rope …

To conclude, the aim of “Physign” is to create an optimal treatment therapy for both the physician and the children by making it fun.

4.2 Stories and audio

Each story will be told by the therapist. The script is on the website that also shows how to assemble the carpet and how to put each treatment tool on it. Background sounds of the current environment of the story will be implemented in the website.

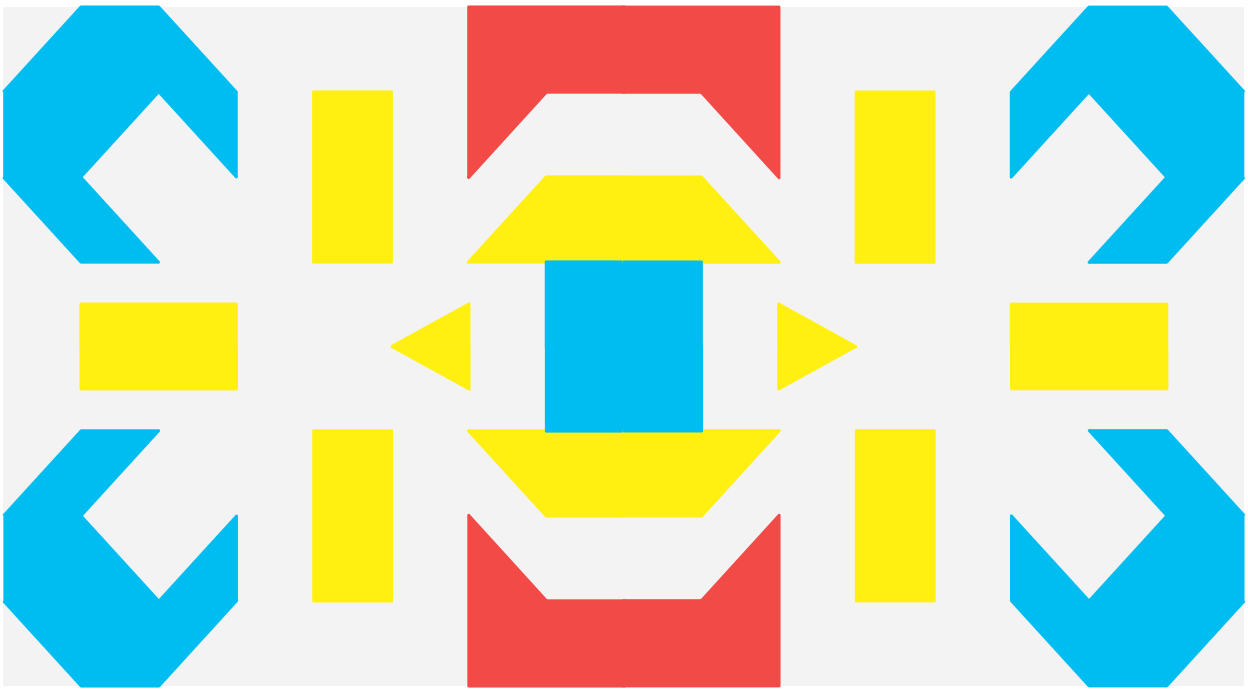

Figure 2: Design

The blue parts are the exercise stations. The grey background is where the children can walk on; therefore from one station to another he can choose his path. In each station the children will have to perform an exercise (see below). When the children is required to change station, a different gait will be used for instance : (Station 1 to station 2 →Walking with one foot in front of the other one ; from station 3 to 4 → Walk on four limbs…etc.)

The main goal being to improve their gait and posture while having fun!

Examples of possible exercises:

1. **Balance**
   - Stand on one foot , jump on one foot , close eyes and stay on one foot

➔ *Stay on one foot for 20 seconds, then jump from one station to the other with one foot, then close your eyes while staying on the same foot)*

   - Clock exercises on one foot

➔ *Kids stand on one foot and with the other leg perform a clock pointing with his big toe toward 12oclock, 3oclock, 6ocloc. Repeat 3x*

   - Get something from the floor on one foot

➔ *Squat down and grab something from the floor , Repeat 2x*

   - Different gait pattern

➔ *Walk with one foot in front of the other one*

➔ *Walk from one station to the other one*

➔ *Walk backwards … from one station to the other one*

➔ *Walk on tip toes*

➔ *Walk on heels*

➔ *Side stepping from one station to the other one and back*

2. **Coordination**
   - Catch a object, with closed eye and open eye
   - With one hand

3. **Strength**
   - Squats

➔ *Squat down to grab something from the floor, 3x*

   - Lunges

   - One leg squat

➔ *Repeat 3 times*

   - Bridge

- ➔ *Hold the bridge position for as long as you can (max 30s…then repeat)*
  - Superman
- ➔ *Kids laying on the floor with tummy touching the floor, lift the arms and legs up then can fake like he is swimming without arms/legs touching the floor*
  - Planking
- ➔ *Hold 20s and combine with mountain climbers.*
  - Walking on four limbs
- ➔ *With legs and elbow extended walk from one station to the other one* ,

4. **Endurance exercises:**
   - Jumping
   - Hulahoop

     → make 10circle to the right and 10 to the left.

4.3 Design

The design part of this project was planned and executed in collaboration with the Design Academy of Eindhoven. A master student in design and a post graduated master student in graphic design became part of our team at the end of November 2015.

They participate to the development of the project without receiving any financial remuneration. This new entry gave a positive added value to our group. Thanks to their knowledge in about possible materials for the construction and their proficiency in using software for improve the graphic of the product we achieved many steps forward. The use of a carpet instead of a foam decreased drastically the costs. The way the narration of the ferry tail was changed, in order to create an always changing story line based on the kid's choices by using a software was adopted. Also the general esthetic part of the model was changed and improved by our collaboration.

The product will consist of a carpet with printed abstract images designed by the Design Academy students (see point 4.2). Sizes of the carpet are going to be 2m by 4m. The material that faces the ground will be anti-slippery, so liability problems can be avoided.

4.4 Website

A website will be created in order to show and share our vision to the public. The main objective will be to transmit to our client our passion and our commitment to the well-being of children.

The website will contain information about the product and the partners. Furthermore, it will be gateway to get clients and arrange business by giving an easy and quick contact portal. Therefore, a webshop shall be made in the website for clients to be able to purchase the product with ease.

The website will also contain instructional videos on how to assemble the pieces on the carpet according to the story that is going to be told at that moment.

A blog shall be made for our clients and visitors to express their opinions and ideas on our product for us to improve our product and our business.

4.5 Future vision:

In the future, we will come up with new images and new stories, to keep the interest of our clients and to compete in the growing market. We want to be market leaders by providing new products and stories on a regular base. We will expand our company into the world to provide a simple tool for treatment for children in many countries across the world. In the future, we would like to make our product more in relation to the technological mainstream by an interactive projection of the image.

According to research, it has been found out many pediatric departments are working with their own fictional superhero/character. So in the future, we could tailor our product to the wishes of each client, for example adding the fictional superhero/character to the story.

5. Strategies and management:

5.1 9 Corner Stones of the Business Model Canvas

1. Customer segments:

Our business model focuses on a niche market for specialists in children rehabilitation, such as physiotherapists, pediatricians and podiatrists.

2. Value propositions:

What is of value to our clients is a treatment tool operating in the therapy for children, which makes the work of a therapist easier, since it does not require the therapist to come up with a

therapy circuit. Therefore, the therapist can focus more on assessing the movement in the child and does not have to think about setting up a circuit. Furthermore, the stories will give the children a motivating push to complete the exercises, since many times the children do not understand what the exercises they are doing are for. The objective is to give the exercises a purpose in the eyes of the children. Another added value is the adaptability of our product to new stories. Furthermore, the installation of the product does not require any technical expertise, since the product only needs to be rolled out and positioned on the floor. Moreover, the design was made by designers and is focused on abstract shapes that should let the children use their imagination, instead of using images that don't allow children to be creative.

3. Channels:

Channels to gain clients are a Website, a Facebook page, and a direct contact by E-mail or by flyers sent by mail to the therapeutic facilities. To convince our potential customers of the effectiveness of our product the website shall provide therapy sessions wherein our product was used. We want our product to satisfy our client's needs, so that in the future the client will spread the word to other potential clients, since person to person marketing is a good method to gain more clients. We want to focus more on direct sales to our customers, so we know which facilities buy our product, so that in the future we can expand.

4. Customer relationships:

The relation to our clients is therapist to therapist, since the partners are health care providers as well as entrepreneurs. The relationship will be maintained mainly on one to one contact in order to avoid misunderstanding between the parties. Furthermore, the blog will provide a community for the therapists to exchange ideas and to improve our product.

5. Revenue streams:

Our business model will use recurring revenues resulting in on-going payments to deliver new scenarios, stories and therapeutic objectives. First an asset sale of the initial product will be done, and afterwards a usage fee is required to gain access to the new products.

6. Key resources:

For the production of our value proposition we require physical resources such as the mats or carpets where we are printing on. Furthermore we need human resources of the graphic design of the images we are going to print on the carpets/mats. Moreover, we need intellectual resources to create the stories and the technological attachments.

7. Key activities:

Our key activities are the designing, making and delivering of the product of superior quality and in the future, in substantial qualities. Furthermore, problem solving is an important key activity, since by providing the necessary customer service our clients will continue to use our product.

8. Key sponsors:

In the beginning the product will be developed and financed by the start-up partners.

In the future, key investors will be searched to increase our target area and to finance the large scale production. Key partnerships will be sought with printing companies and/or companies that produce rehabilitation tools.

9. Cost structure:

Our business plan will be more value-driven to give a premium value proposition to our customers. Furthermore, we will have fixed costs that not depend on the current economic state, such as costs in manufacturing, salaries, rents and customer service.

5.2 SWOT analysis

Strengths:	Weaknesses:
Functional, as children learn a lot by playing, the product provides the normal pattern for the cognitive learning Entertaining, because the kid gets immersed in the story and at those ages they are interested in fairytales Motivating, because it is a game Inspirational, since it encourages the patients to do the exercises at home Practical, exercises are useful for the children's posture or gait Flexible, since it can be stored away easily and the images can be interchanged Affordable, because the price is below that of a play rug Expandable, since new pieces can be added to the game itself and new products are following the original version	Material degradation, since we have no experience on the product's durability Non-virtual, this can be a strength or a weakness, since it might bring back the children to simply play without technology. But it might also be a weakness, since it is not up to date to the demand of technological devices
Opportunities:	Threats:
Increasing prevalence of overweight children, which leads to more musculoskeletal complaints, which instead leads to more patients Unique product, which can be expanded	Financing of our product, because we don't have a investing capital to start from Easily reproduced without the copyrights Technology, because the fast developing culture of virtual reality interaction might be more appealing for therapy than our product

5.3 Financial plan:

Start-up manufacturing costs/expenses per product:

Description	**Costs**
Carpet	€ 50,-
Printing on carpet	€ 20,-
Anti-slippery material	€ 10,-
Transportation and consultation	€ 10,-
Manual (Information Guide) Printing	€ 5,-
Packaging of the product	€ 5,-
Total	**€ 100,-**

The price of the product including stories, manual, audio and registration fees for the website will be € 500,-.

Set-up costs		
Setting up the business		
Accountant's fees	€	500,00
Business registration	€	100,00
Domain name registration	€	200,00
Licences	€	1.000,00
Plant and equipment		
Computers and software	€	100,00
Starting operations		
Advertising and promotion	€	100,00
Raw materials and supplies	€	200,00
Start-up capital		
Equity investment	€	1.000,00
Borrowings	€	2.000,00
Total	**€**	**3.000,00**
The result		
Total set-up costs	**€**	**2.200,00**
Surplus funds	**€**	**800,00**

Profit and loss forecast in the first year	
	Totals
Sales	
Sales (invoiced) (30 items)	**€ 15.000,00**
Usage fee (€ 25 per month)	**€ 9.000,00**
Cost of goods sold	**€ 3.000,00**
Gross profit	**€ 21.000,00**
Expenses	
Accounting fees	€ 1.200,00
Advertising	€ 650,00
Bank interest	€ 240,00
Legal fees	€ 1.300,00
Postage, telephone and fax	€ 360,00
Transport/courier costs	€ 150,00
Wages	€ 2.000,00
Workers compensation	€ 2.000,00
Total	**€ 7.900,00**
Result	
Net profit	**€ 13.100,00**
Gross profit margin	**€ 1,40**
Net profit margin	**€ 0,87**

Break-even analysis	
Average selling price per unit	€ 500,00
Average cost of each unit	€ 100,00
Gross profit margin	80%
Fixed costs	€ 7.900,00
Sales to break even	€ 9.875,00
Number of unit sales to break even	20

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