

## Health Game project experiences

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### Abstract

When we combined concepts of own motivation and addictivity of digital games, the Health ProPeli (Health ProGame) program was born! Aim of the program is to study the use of gaming technologies, digital- and physical innovations and gamification in health care, functional capacity and rehabilitation. Game mechanics could help people to get motivation for preventive healthcare, managing their own treatment and getting better results in general. The study is conducted on 6 different 'playfields'. Six different playfields have mapped user scenarios and operating conditions. Students have been in main role, while enterprises and experts are guiding work. Based on the different game concepts, demos and prototypes have been produced for different environments. Some of the demo versions have already been used in tests. The concept of playfields is proved to be promising environments enabling fast prototyping and testing and allowing patients, students and experts from different sectors to straightforward co-creation. More than one hundred students, fifty users and 20 experts from health care, design, technology and business sectors have been involved and participated. Along the development process four joint Game Jams were organized.

**Keywords:** functional capacity, rehabilitation, prevention, digital games, playfields

## **Can public health be improved by playing digital games? Can you rehabilitate yourself with mobile phone?**

When it comes to big folk deceases, like diabetes, it is question how person himself is motivated and enabled to change his life styles and to take care about himself. The motivation is the key also with rehabilitation and functional capacity. Finally, the question is about own motivation to support professional care. When we combined concepts of own motivation and addictivity of digital games, the Health ProPeli (Health ProGame) program was born! Aim of the Health ProGame-program is to study the use of gaming technologies, digital- and physical innovations and gamification in health care, functional capacity and rehabilitation. The program is part of the Tekes Skene Program.

The same mechanics that keep gamers glued to screens can be translated to compelling tools for prevention, treatment management and more holistic care. The study models new motivating and effect methods with digital media, design, health care top companies as well as other organizations. By combining health, product development and business research the study promotes user-driven Games for Health product development and international business.

### **Aim is to make the change**

Game mechanics could help people to get motivation for preventive healthcare, managing their own treatment and getting better results in general.

In Kuopio we don't have strong digital game industry, only few enterprises. But what we have is the strong health sector research and capability. Our main aim is to find key mechanisms in making the change, based on scientific knowledge on health.

The second aim is to widen the business opportunities of the mobile game concepts developed. Entertaining games with healthy benefits will be created through collaboration of health, gaming and academic professionals. Development of the Games for Health Finland

creates new motivated consortiums and projects. Playfield operating model means that individual teams are faster to respond to the changing needs on the playfield. Shared responsibility leads to greater results through intrinsic motivation.

Gaming competences is coming from, for example, Rovio Ltd and Weego Ltd from Kuopio and several game experts from elsewhere of Finland. Project's home base is in Savonia UAS, from where we get design, business and wide expertise in health care sector. Kuopion Rouvasväen Yhdistys ('Ladies registered association') and Kuopio Design Academy brings in expertise in product development and design. Professor Jussi Kauhanen from University of Eastern, Finland Public Health and Clinical Nutrition, is leading a parallel project focusing on motivation mechanisms and public health issues.

### **Environments for testing and prototyping**

The study is conducted on 6 different 'playfields': Kuopio University Hospital, Rehabilitation Service Unit, The Finnish Brain Research and Rehabilitation Center Neuron, Huoltoliitto registered association/Spa Hotel Kunnonpaikka, Learning and Consulting centre Mäntykangas/Mäntykangas School, Wellness center Hytke and Rehabilitation and Education Clinic Premius Ltd. They consists of rehabilitation centers, a hospital, a school for children with special needs and many others, almost all located in Kuopio area.

Six different playfields have mapped user scenarios and operating conditions. Students have been in main role, while enterprises and experts are guiding work. Based on the different game concepts, demos and prototypes have been produced for different environments. Some of the demo versions have already been used in tests.

The playfields are different. For example Kunnonpaikka is focusing on nutrition issues, how to motivate people to more healthy nutrition. General problem is that those people motivated to take care about their health they are also interested about what they eat. However, those people who are not interested to take care about their own health, they do not usually follow health

nutrition principles. Although there exist several types of applications based on counting calories, but those do not usually motivate the main target group. For this need Kunnonpaikka has developed a simple game demo, which shows the effects of nutrition choices in a funny way.

Kuopio University Hospital is targeting for Complex Regional Pain Syndrome (CPRS) patients. State of pain (the pain experience) will arise as a result of an injury or a scratch in either the upper or lower limbs. The treatment is based on the co-operation of a pain doctor, a physiotherapist, an occupational therapist and a psychologist. Psychological methods are used to help the patient manage the pain better. Treatments are painful limb posture exercises and identification of mirror therapy, where a painful and poorly functioning limb is used to support the pursuit of a healthy limb mirror image. An existing game-like solution has been a crude digital translation of a set of cards displaying hands in different postures.

An important point of view is also how to utilize motion sensors and other type of sensors. The technology already existing in mobile phones and tablets are enabling for almost everyone those things which previously were possible only with very costly medical equipment. Nowadays, it is possible to for example to measure motion repetitions with just ordinary mobile phone. In addition to, technology also provides connections and social aspects. One identified problem area is how to continue the rehabilitation plan when going back home after institutional phase. Nowadays, facilitated by ordinary mobile phone or tablet with suitable applications, the rehabilitation can be continued from home and in connection with same social group.

## Results

Altogether twelve different prototypes have been produced and preliminary tested during the development process. In general, the experiences indicate, that users like to play digital games and that might motivate them to do the exercises. However, it is too early to make any conclusions about the impacts.

The concept of playfields is proved to be promising environments enabling fast prototyping and testing and allowing patients, students and experts from different sectors to straightforward co-creation. More than one hundred students, fifty users and twenty experts from health care, design, technology and business sectors have been involved and participated. Along the development process four joint Game Jams were organized.

The business point of view is very challenging in between two so different areas as health and digital games are. However, the business model designs were started from the very beginning of planning processes. Three different types of earning logics were identified, namely user pays, organizations pays directly to its own health care customers and organizations pays indirectly. All those business models are different and necessitate different formulation of products. During the process some spin-off products and enterprises were born and are now moving on real business.

### ***In general, the following lessons learnt can be mentioned:***

- Health impacts and user experience matters! Then the money follows the users!
- Data tracking and user friendly analysis!
- Co-creation with students! Game Jams! It can be fun!
- Use business model design tools from the very beginning and put the created models in fast reality test!





Games For Health Finland and ProGame –projects have together organized several Game Jam-sessions.

Students, academic professionals and entrepreneurs have created through collaboration different game concepts, demos and prototypes for different environments.

Some of the demo versions have already been used in tests.

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