

Games Keep You Forever Young in Mind and Body

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Abstract. In 2012, people aged 65 or above accounted for nearly one-fifth of the population of the European Union [1] and this figure is expected to reach 30 % by 2060 [2]. In other words, we are witnessing a demographic shift: the number of seniors who need support is growing whilst there is a decline in the percentage of the working population contributing to their support. This disproportion and the resulting tensions in the health and care system is one of the so-called “grand challenges [3]” that the EU is called to face. In this context, this speech will give an overview of several research approaches and studies, as well as design and development activities for games, including examples and lessons learned ranging from preventative healthcare in teen-agers through (home) rehabilitation and active ageing, to new emerging technology trends such as the oculus rift® and the omni virtuix®.

Keywords: Health games · Virtual reality · Rehabilitation · Active ageing

1 Introduction

The ageing society is a phenomenon created by a combination of factors which include improved living standards, better healthcare and efficient food manufacturing and distribution. The projected life expectancy in the developed world is steadily increasing but conditions related to old age such as dementia and mobility problems place an increased burden on welfare services. Even healthy elderly people in retirement create demands on society as their lifestyle is funded by pension schemes which are often based on shorter life expectancies.

The traditional sustainable society model in which a lifetime’s work and contribution to society was rewarded by a golden retirement has been challenged by the problems of longer lifespans, falling birth rates and youth unemployment, all of which create a situation in which a smaller active workforce is effectively financing a growing population of retired people. Eurostat’s projections by 2080 foresee the old-age dependency ratio to almost double from 28.1 % in 2014 to 51.0 %.

At the same time, today’s society is shaped by technology in unprecedented ways. We all face disruptive changes in our lives and new challenges which, paradoxically, can be both created and addressed by the various digital technologies that inform, empower and influence individual citizens on a massive scale. There has been no previous period in history where millions of ordinary citizens have been able to freely access knowledge and simultaneously share their lives and opinions with a global audience. For these

reasons, whilst the healthcare system is forced to face a huge reorganization and to find ways to reduce costs, including prevention programs that do not include active ageing (but that already start at a young age), we are also witnessing a shift in power, in which patients are increasingly directly managing their own health.

In this context, the speech describes how enabling technologies such as serious games and virtual reality, backed up with big data (e.g. coming from sensors) and other largely available technologies like analytics, have opened up a new opportunity space in the health market. But, in order to be considered an effective solution that can deliver the promised results in medical terms, and be engaging and usable by the target group for which it was developed, design has to follow specific rules and sound methodologies.

2 Serious Game Research

2.1 Physical and Cognitive Rehabilitation

Elderly people are a very special target group but, despite the fact that many people regard older people as scared or not inclined to use technology, the reality is that they are largely eager to experience virtual environments. Of course, games and digital solutions in general have to be designed to take their expectations and needs into serious consideration. Several solutions studied by imaginary in the course of many research projects will be presented, together with lessons learned whilst co-designing solutions with elderly people.

2.2 Active Ageing

Ideally, active ageing solutions should simultaneously take several aspects into consideration. This is what the EU project DOREMI [4] is doing by including cognitive and physical exercise together with socialization within the same gamified environment: thus every single exercise is a mini-game and all results are collected together in an integrated environment working with gamification mechanics.

2.3 Prevention in the Young Population

Whilst the ageing population is growing in number, the youth population is witnessing a progressive increase in phenomena which can result in severe pathologies (not necessarily only at an older age), such as obesity arising both from poor nutrition and sedentary lifestyles. Therefore, in order to fully address healthcare as a bigger picture, prevention programs have to be put in place targeting the youth population. This is what the EU project PEGASO [5] is dealing with, where a pervasive game is mixing actions in the real and virtual world to raise awareness in teens against obesity: whilst a bracelet is collecting inputs about physical movement, an energy bar is loaded in the virtual world. The serious game is then adapting to the available energy level: the more energy, the more fun the game.

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