

NetFitness: Using Home Fitness Equipment as Interaction Devices

Željko Obrenovic

Abstract. Today's way of life requires that people pay more attention to their health, and to be more active. For example, U.S. Surgeon General's Report estimated that 60 percent of American adults are not regularly physically active, while 25 percent of all adults are not active at all. Although there are many programs that individuals can join in order to improve their health, such as various fitness programs, many users cannot afford enough spare time for it. Therefore, lots of them try to use some kind of home fitness equipment such as indoor cycles, treadmills, elliptical trainers, or stairclimbers. But it seems that this way of exercising is not very interesting as it further isolates people, and in Kalorama Information Market Intelligence 1999 report - The Market for Physical Fitness Equipment, it is estimated that 80 percent of home exercise equipment is not used after the first year. In this blue note we present the idea of NetFitness. The basic idea of our approach is to integrate existing home fitness equipment with personal computers, home entertainment equipment, and the Internet. In this way, we could connect people doing exercises using existing infrastructure. Home fitness equipment could also be used as a new type of sensors for reactive television systems such as Passepartout. Doing home fitness can be dull, while prolonged usage of computers is not very healthy due to physical inactivity. Therefore, our vision is to take best of the both worlds: lets fun be healthier, lets fitness be funnier.

1 Introduction

Nowadays, many households have a personal computer, and the Internet connection. On the other hand, according to Frost & Sullivan U.S. Fitness and Exercise Equipment Markets Report, just in the U.S.A. 45 million people exercised with fitness equipment, while just between 1987 and 1995, home gym exercise grew almost 100 percent [1]. Moreover, most of currently available home fitness equipment is computerized, having small onboard computers that analyse and present various device data, such as user speed, and physiological state, such as heart beat. With little adaptations, it is possible to connect them, opening space for various uses.

Most of existing solutions focused on training programs in specialized environments [2-6]. We primarily address the problem of social computing, enabling remote individuals to work together on improving their health and social activity. The basic idea of our proposal is to integrate existing home fitness equipment with personal computers and the Internet, making use of the existing infrastructure.

The main objective of the proposed project is to create the NetFitness framework that enable development of applications which:

- Allows online connecting of the people that use home fitness equipment, improving their social activity while they exercise;
- Extend application domain of home fitness equipment, introducing various medical and entertainment application.

3. NetFitness Framework

When fitness equipment is connected to a computer, various applications are possible. Firstly, it is possible to create various games directed with the home fitness equipment. For example, with your indoor bicycles and treadmills, you can go on virtual tours through various terrains and cities. In addition, individuals could use various medical programs. With Internet connections, different individuals could communicate and go on collaborative virtual tours or races. In similar ways it is possible to integrate and connect fitness clubs. Also, the users could connect with their doctor that could follow their progress and correct their exercise programs.

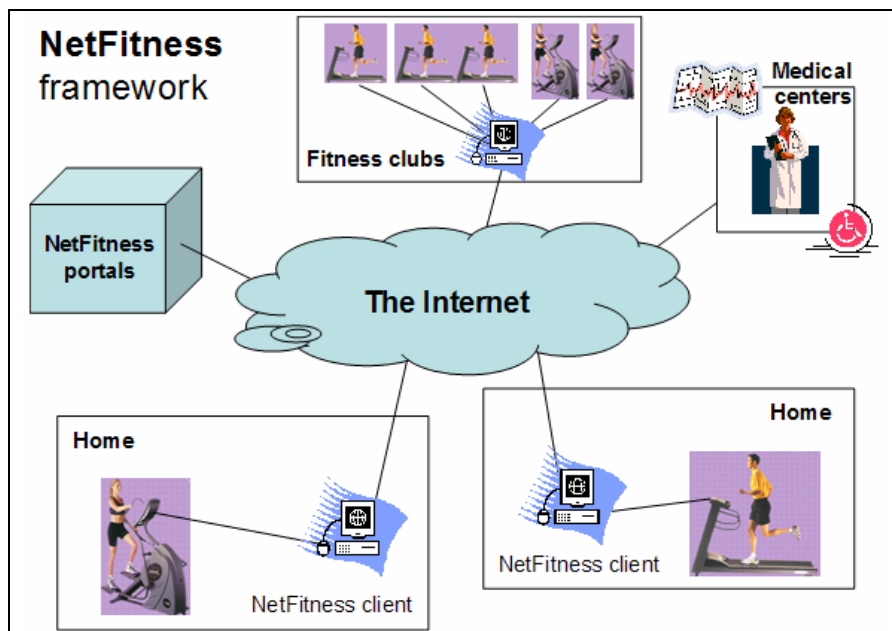


Fig. 1. The basic idea of the NetFitness framework is to connect the users of home fitness equipment, medical centers, and specialized fitness clubs, so that they can communicate and collaborate during exercises. Users at home would install NetFitness clients, similar to MSN Messenger or ICQ clients that would enable them to connect to NetFitness portals and medical centers, and to communicate with other users.

Proposed solutions could be potentially useful for various user groups. Individual users would be motivated to exercise more, as this activity would be more interesting, and they would not be isolated. Home fitness equipment industry would have more motivated market for their products. Various software developers, such as game industry and portal providers could adapt their products for usage with proposed equipment. Fitness clubs could also benefit, as they could provide an environment for this way of exercising, similar to Internet cafes.

4. Architecture

Here we discuss how using existing technologies can create mediated communication that helps people improve their health and social activity. The basic idea of our proposal is to connect existing home fitness equipment with personal computers and with the Internet. In this way, we can make use of existing widespread infrastructure. Moreover, most of currently available home fitness equipment is computerized, having small onboard computers that analyse and present various data, such as user speed, and physiological state, such as heart beat. With little adaptations, it is possible to connect them, and results of this adaptation could affect millions of people who use this equipment.

When fitness equipment is connected to a personal computer, various applications are possible. Firstly, it is possible to create various games that are directed with the fitness equipment. For example, user may go on virtual tours through various terrains and cities. By connecting to the Internet, different individuals could go on collaborative virtual tours or races, and chat together. In similar ways it is possible to connect fitness clubs. Furthermore, individuals could use various medical programs, and they could connect with their doctor and medical centers that could follow their progress and correct their exercise programs. Groups can be organized so that one of the users is a professional leader that can lead guided tours. In this way, home fitness equipment could also be used as a new type of sensors for reactive television systems such as Passepartout [7].

NetFitness applications would generally have three aspects:

- Social interaction aspect, which enables users to communicate and collaborate in various ways.
- Entertainment aspect, making exercising more interesting and rewarding.
- Medical aspects, enabling users to controls their medical state while they exercise, or to program their exercises according to their physical shape. Users could also connect to specialized medical centers or medical portals that would update their medical records, and connect them with specialized personnel.

For developing NetFitness applications we propose multilayered architecture, consisting of the following:

- Fitness equipment layer, taking parameters from the equipment, controlling the equipment from the computer;
- Physical interface, connecting fitness equipment with a computer using cable connected or wireless interface;
- Device-driver layer, providing API for reading data from the equipment;
- Network communication layer, enabling applications to communicate with other applications and servers;
- User interface layer, enabling flexible presentation of data;
- Application specific layer, which uses other layers to create a specific application.

5. Social and Cultural Relevance

Proposed ideas could potentially be useful for many users, and different user groups:

- Individual users would be motivated to exercise more, as this activity would be funnier, and they would not be isolated.
- Handicap users could additionally benefit from these solutions as their social life is even more limited, and they also need to exercise regularly according to special programs which in this way could be controlled over the Internet.
- Home fitness equipment producers would get more motivated market for their products. They could provide adaptation of existing equipment, and introduce new types of equipment.
- Game developers could provide new types of fitness games, and they could adapt their existing software.
- Portal providers could provide new type of service for NetFitness users.
- Fitness clubs could also benefit, as they could provide an environment for this way of exercising, similar to Internet cafés.

Therefore, it opens possibilities for broad collaboration of different practitioners and researchers from all of these fields.

This project introduces original ideas, not available in the open literature, which could potentially be interesting for different industry branches:

- Home fitness equipment producers;
- Game developers;
- Portal providers;
- Operating systems developers, which could offer support fitness devices.

References

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