
Super Starfish Mania: Fish for Friends

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Abstract

Sedentary lifestyles are becoming increasingly common in modern society. Living like this does however increase the risks on health problems and diseases. Although research on this topic has been done, it has been inconclusive. *Super Starfish Mania* is an *Android* application that attempts to increase the user's awareness of sedentary behavior through the use of *gamification*. By using notifications, games, rewards, collaboration and progression, we encourage the user to periodically take short – but active – breaks during their days. Consistently taking these breaks eventually leads to healthier habits and a better understanding of an otherwise sedentary lifestyle.

Author Keywords

Movement; Mobile; Collaborative; Gamification; Behavior; Sedentary

ACM Classification Keywords

H.4.m. Information systems applications:
Miscellaneous; H.5.m. Information interfaces and
presentation (e.g., HCI): Miscellaneous; K.8.0.
General: Games.



Figure 1. Example of a notification that reminds the user that a stroll is available.

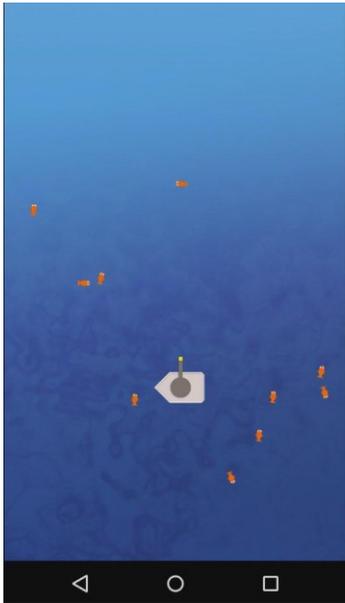


Figure 2. A multiplayer game: one user moves the boat while the other tries to catch the fish.

Introduction

Modern society has become increasingly sedentary. It occurs both at home, where entertainment is dominated by internet and television, as well as at work. Especially in office workplaces, which are known for their sedentary nature, there are increasing concerns for employees' health [1]. Most of the employees in an office spend almost two-thirds of their time sitting [2].

Excessive sitting can, however, lead to medical problems. Studies have shown that sitting for the majority of the day can lead to an increased risk factor for various medical problems. Some examples are obesity, cardiovascular disease, type 2 diabetes, premature mortality as well as several forms of cancer [3] [4].

It is important to note that this risk factor increases independently of how physically active this person is [5].

The amount of research done in HCI (Human Computer Interaction) that attempts for behavioral intervention is ever increasing. The number of available studies we initially found that focus specifically on *sedentary* behavior was limited, however. This encouraged us to create a product that could be capable of consistently improving users' behavior.

To create the application, we decided to go with the concept of *gamification*. Games have become an important form of entertainment. With smartphones becoming a lot more powerful and commonplace these years, the opportunities to create a portable

application, be it solely for entertainment or with beneficial goals, have also increased.

Zuckerman [6] explains many of the problems and design decisions that should be made when using gamification. Some of the tips that are given by Zuckerman have influenced the way in which *Super Starfish Mania* evolved.

Game concept

The objective set for the user in *Super Starfish Mania* is to expand a *collection* – a virtual aquarium. The user can obtain new collectibles – fishes – by completing *strolls*. These strolls are timed periods where the user is encouraged to walk. These periods occur once an hour and last for approximately five minutes.

During a stroll the user can – only if actually active – encounter *events*. These events are small games that the user has to complete within a given time. These events require the user to perform a certain physical activity. The exact objective differs for each event.

When the timer for the stroll has finished, or when the last event that started before the stroll finishes has ended, the user will receive a reward. These rewards consist of randomly generated fish that can vary in both shape and color. The combination of shapes and colors define the rarity of the collectibles.

It is also possible for multiple users to play together. Whenever two players are close to each other, they can agree to play a multiplayer-event. These events require the two players to work together and complete a cooperative goal. If they complete the task within the

An enjoyable game has to:

Not force the user:

Something that has a significant negative effect on users is enforcing something they do not appreciate.

Although the user receives hourly notifications that a new stroll is available, it is not enforced. The user is capable of delaying the stroll to a later moment.

Be diverse: This means that the user receives unseen collectibles even after playing the game for a while.

Enable collaborative elements: Working together with other people increases the motivation to achieve a common goal.

Have user progression: The user has to be able to see their progression after playing the game for a while. Without any tangible results, it is impossible for the user to reflect upon the performance delivered.

given time, they are given more rewards compared to a solo-event.

Finally, the user is capable of creating and joining shared collections. After becoming a member of a group with shared collectibles, the user is able to send his or her personal collectibles to that group.

These group collections can later be displayed on a separate device. This enables a user or group to display their progress as well as compete with other users and groups.

Product components

The product implementation consists of three major components: (1) the Android application, (2) a stand-alone server and (3) a stand-alone desktop application.

Android application

The Android application is the backbone of Super Starfish Mania. The application measures activity, enables games to be played, and issues reminders and notifications to the user.

Server

To prevent scalability and availability issues, a standalone server is provided. This enables users or groups to create their own private groups.

Desktop application

One important aspect of the game is the ability to display collections to other users or groups. The desktop application can be used to display for example an office department's collection. This creates social pressure for both the group's members as well as others that do not play the game.

How it works

The most important aspect of the game is to not *force* the user to play the game. Recent thinking in HCI also looks at the negative aspects of gamification [7]. To prevent the user from being negatively influenced, we attempt to focus on rewarding the user instead of punishing him or her. Users are rewarded more and rarer collectibles when they consistently take breaks and play the game. This bonus does not immediately disappear when the user skips a break.

Another important gameplay feature is the way in which events are spawned. As mentioned before, the user can take short five-minute breaks every hour. To encourage the user to actually become active, we keep track of the activity measured by the *accelerometer* in the smartphone. This activity is measured in four stages: *resting*, *walking*, *running* and *cheating*.

When the user is in a *resting* or *cheating* state, the chance of encountering an event – where the user can gain bonus rewards – becomes null. Only when walking or running will the user encounter events.

A final important feature in the game is ability to play with other users. This is not limited to gameplay during events, but also shared aquaria. A shared aquarium can be displayed on any desktop computer, and clicking on a fish within the application display information about the contributor.

Conclusion

In a world that has become ever more sedentary, *Super Starfish Mania* attempts to encourage its users to improve their lifestyle. The game can be played

individually as well as cooperatively. Through hourly reminders and fun and engaging gameplay the player is encouraged to be physically active. By briefly disturbing the user's sedentary lifestyle, their awareness in

sedentary behavior increases over time. At the same time, the game leverages rewards, progression and social pressure to keep the player continuously engaged.

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