INFT3970 Major Project Scope Document
Gamification of exercise using Fitbit data

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1 Project Scope Document

1.1 Introduction

The basic concept of this project would be to create a program that gamifies the use of devices such as the fitbit and promotes exercise while supplying useful datapoints to researchers for insight into habbits and trends common in individuals who partake in semi-regular or regular exercise.

1.2 Target Audience

The proposed target audience for this project is any individual whom is interested in using a fitbit while also exercising a level of casual to competitive nature in the sense of gaming or competing against fellow users of the device.

Further information will be required from Geoff as to the design required and limitations of the project, otherwise it is assumed that mostly free-reign over the project will be allowed.

1.3 Metrics

Proposed metrics to be monitored include:

- Step metrics, with a view to use;
  - Average step distance (subject to data available)
- Heart-beat metrics, with a view to use;
  - Lowest and Highest recorded BPM
  - Average BPM
- Both Step and Heartbeat to include;
  - Per Minute
  - Per Hour
  - Per Day
  - Per Week
  - Per Month
- Other metrics to include:
  - Continuous days played
  - Distance travelled (Cap to be discussed/determined)
  - Greatest North/South movement pattern
  - Greatest East/West movement pattern
  - Greatest Spread of location data recorded for various periods
  - Achievements via Country visit?

Further metrics could be measured, based on ability to access data such as geolocation, sleep data, activity of user social interactions and potentially more.

1.4 Project Infastructure

Proposed hardware for the project would require a number of fitbit, failing the ability to locate a number of fitbit, we could script data generation based on expected data ranges and a number of example data structures to mimic the API generated data.

The required framework to create the application in is Unity, this allows us to assume we can develop mostly on the Windows platform, use of the mono framework [2] would allow us to generate an application that could run natively on OSX/UNIX like systems also.
Back-end requirements would include a database to store data related to an account, this is proposed to be a single instance that would run global collection of the data and allow access only to data on a per user basis. This furthermore allows data-mining of the accounts used, allowing generation of both better services and benifit to service provider in the form of data for analytics.

1.5 Considerations of game genres

Game genres that the project could cover include a large number of potential candidate genres, however for simplicity of the project and to ease the issue of paradox of choice [1]
A suggested shortlist of game genres that would be well suited to this project include;

- Platformer
- RPG
- Racing
- Horror

1.5.1 Platformer

A platformer could include the above metrics leading to skewed drop rate of select items from "lootable" objects, decreased enemy count and increased control over player character.
A platformer would prove to be a safe game to go with, a "retro" themed approach would work well as we have no digital media majors within the group but are certain we could manage asset generation at a basic level.

1.5.2 RPG

An RPG could include all of the Platformer features and easily extend to include features such as;

- Extra lives
- Fast travel abilities
- Increased player power
- Daily rewards or randomised loot from select tiers of metrics.

1.5.3 Racing

A Racing game could include usable boots, bonuses and ability to unlock higher tiers of vehicle based on either overall progress in metrics or some alike mechanic.

1.5.4 Horror

A Horror game could avoid repeated user play requirements by instead requiring the user to wear the fitbit while participating in the game. Modifiers to the game could include increased level brightness for decreased heart-rate or a number of interesting mechanics that would be best scoped out after the project is locked into choice by all members.

1.6 Project Services

1.6.1 Database Service

A simple RESTful API, data collection on game time played, user choices, user data and all of the associated data that would be collected from the fitbit would be stored by this service.

1.6.2 User Management Service

A user management serice would be required to allow players to have repeatable or incrementally improvable interactions with the solution, data analytics would also be applicable against users who opt in/out of the service accordingly after some level of anonymization (or is it anonymisation?) of data.

1.6.3 Logging Service

The logging service would need to act as middleware between the devices and the database and potentially require some level of parsing of data and verification of data. Failing either of the parsing or authentication, the Logging service should push errors to the Error Management service.

Without errors occuring, the logging service should pass data required to the database service which would perform required tasks to store such data.

1.6.4 Error Handling Service

The Error handling service would log errors from either data pushed by end devices or the websystem itself, the logs would include stack-trace material, cause for logging, associated user data and timestamps.

1.6.5 Web Service

The web service should include all elements required to report a user-account's associated data for selected periods. This should also allow the update of an account, or deletion of an account. Included requiremets of this service will include but are not limited to:

- Adding or Removing a device from an account
- Visualisation of data associated with an account
- Login / Logout functionailty
- Downloadable payload of data associated with an account in various formats (XML/json/csv)?
- Game status of user

1.7 Arguements for this project

A number of arguements for this project include but are not limited to:

- Numerous potential metrics to measure that could prove to be interesting
- Interesting field for multiple team members
- Varied required services that would allow allocation of tasks to prove easy

1.8 Arguements against this project

A number of arguements against this project include but are not limited to:

- Potential scope creep to become hard to avoid
- Multiple required services to interface with such basic devices

- Requirements of the real world
  - Do people need / want / require this?
  - Could people implement this easily themselves?

References

[1] https://books.google.com/books?id=zutxr7rGc_QC&vq=barry+schwartz+paradox+contents

[2] https://www.mono-project.com/