Fitbit interval training app SRD V1

# 0. TODO

* Specify name for the app.
* Main domain concepts are going to be added at a later stage once the basic app has been developed.
* User requirements will initially be based purely on my own requirements.

# 1. Purpose of the SRD document

The purpose of this document is to specify the system requirements for the [Fitbit interval training] app. The [Fitbit interval training app] is intended to be used by users of Fitbit devices, namely the devices that are compatible with Fitbit OS 5: Ionic, Versa, Versa 2, Versa lite, Versa 3 and Sense. In particular Fitbit users that perform interval training in running and cycling. However the intent of developing this app is mainly fuelled by the desire to improve interval training with the Fitbit for myself. The basic app should have options for interval training in running and cycling. Interval training for other sports can be added after the basic version of this app is up and running.

# 2. Introduction and business goals

I acquired the Fitbit Versa 3 on February 27. The main use case for me was to assist me in my running and cycling workouts. Interval training is a fundamental part of those workouts. After going through tutorials and online resources, I was disappointed to find out that interval training by distance is not supported by Fitbit devices. In online forums I found that many other Fitbit users shared this disappointment. Since at least 2018 this has been a highly requested feature on the Fitbit forums. Yet to this date no news regarding this feature has been published by Fitbit. Then I came across the Fitbit API and this got me optimistic again about the possibilities of Fitbit devices. It made sense to create my own version of an interval training app in order to integrate the feature of interval training by distance and perhaps interval training on the Fitbit can be further improved.

Since the development app is first and foremost driven by personal desire, it does not have a goal of generating income. The app is going to be free forever and open source. There is another personal drive in developing this app. I hope that it will improve my chances of employment as a software/electronics engineer in the future. Keeping the source code open source allows me to show my work and skill sets.

# 3. Main domain concepts

Describe compare products, intended users and other stakeholders.

# 4. User requirements (use cases, scenarios)

Specific “use cases” per user group and stakeholders can be written here. Use cases are stories and views on how different user groups (as defined in chapter 3) may use the system. When building a new car e.g. one can think on use cases of the drivers, passengers, garage service men, sales, leasing companies, etc. Use case stories: describe the stakeholders and how they will use the product; normally this is done after interviewing these stakeholders. In this way, you will get additional information and above all, that is why these stories are so important, one will find additional requirements by looking at the product from different views on the use of the product. Track the requirements by the use group in the requirements table below!

My use cases:

* Interval training by distance and time for running. E.G. Running for 200 m, 30 seconds rest. Then running for 400 m, 30 seconds rest. The workout can be programmed in advance. When performing the workout, there does not need to be any concern about reaching the targets. When a target is achieved you receive a notification in the form of sound or vibration.
* Interval training by distance and time for cycling. This is exactly the same as for running.

# 5. Functional requirements

The following user requirements are all specified for my own use cases in the previous section.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Version** | **Requirement** | **Source** | **Rationale** | **Priority** | **Status** |
| F1 | 1 | Track distance with GPS sensor. | Lesley | This is a necessity for interval training by distance. | Must | proposed |
| F2 | 1 | Track time with a timer. | Lesley | This is a necessity for interval training by time. | Must | proposed |
| F3 | 1 | The ability to set up an interval workout in advance. | Lesley | Interval training is usually programmed in advance. | Must | proposed |
| F4 | 1 | Ability to combine interval training by time and distance. | Lesley | This is a form of training that is used in many programs. | Must | proposed |
| F5 | 1 | Notification by sound or by vibration when an interval is completed, TBD. Maybe can be adjusted for personal preference. | Lesley | It should be completely clear to the athlete when an interval is completed. He should not need to worry. | Must | proposed |
| F6 | 1 | Ability to save a workout plan. | Lesley | If the athlete wants to repeat the same workout, he can chose it from the list of saved workouts. | Must | proposed |
| F7 | 1 | Ability to save a completed workout. | Lesley | Athletes want to share a workout, analyse their workouts and track their progress. | Must | proposed |
| F8 | 1 | Categorise workouts by type: running or cycling. | Lesley | I want to be able to differentiate between running and cycling workouts. | Must | proposed |
| F9 | 1 | Easily share a workout with a share button. | Lesley | Personally not super important, but a lot of people want to share their progress. | Preferred | proposed |
| F10 | 1 | Track heart rate during the workout. | Lesley | It is nice to use the heart rate metric in order to analyse the workout. Perhaps interval training by heart rate is possible. | Preferred | proposed |
| F11 | 1 | Export historical workout data. | Lesley | This is done for better workout analysis. Research has to be done on how to import workout data in different popular workout apps. | Preferred | proposed |
| F12 | 1 | Create companion android app that allows for easier creation and better analysis of workouts. | Lesley | This is possibly a must requirement. It depends on how difficult it is to create a workout on a smartwatch app. | Preferred | proposed |

# 6. Non-functional requirements

Quality requirements, properties. No non-functional requirements have been specified yet.

# 7. System specifications

System specifications are formulated based on the functional and non-functional requirements of the system in the tables above. All system specifications are specific and measurable. Indicators are defined that will serve as input for the tests in the test plan.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Version** | **Requirement** | **Source** | **System specification** | **Indicator** | **Deviation** |
| F1 | 1 | Track distance with GPS sensor. | Lesley | Get coordinates from GPS sensor with the Fibit OS API and calculate distance with those coordinates. Total running or cycling distance is optionally displayed during the workout and after the workout. | Total distance on display | distance +/- 5 % |
| F2 | 1 | Track time with a timer. | Lesley | Track time with Fibit OS API. The workout time is displayed during the workout and after the workout. | Workout time on display | time +/- 5 s |
| F3 | 1 | The ability to set up an interval workout in advance. | Lesley | Ability to set up an interval workout in advance via a Fitbit companion app. Adjust type of workout, number of repetitions, distance or time of an interval, etc. The workout plan data is sent to the Fitbit OS app when a button is clicked. After the workout is done the workout data is sent back to the Fitbit OS app. | Workout data corresponds to the workout plan | None |
| F4 | 1 | Ability to combine interval training by time and distance. | Lesley | Intervals can be individually selected by time or distance. There are no limitations except for the maximum number of intervals. | Individually adjustable intervals | None |
| F5 | 1 | Notification by sound or by vibration when an interval is completed, TBD. Maybe can be adjusted for personal preference. | Lesley | Vibrate the Fitbit device when an interval is completed. Vibrate three times when a workout is finished. | Vibration | None |
| F6 | 1 | Ability to save a workout plan. | Lesley | Save workout plans in the database of the Fitbit OS companion app on an Android device. | List of workout plans | None |
| F7 | 1 | Ability to save a completed workout. | Lesley | Save workouts in the database of the Fitbit OS companion app on an Android device. | Completed workout with data | None |
| F8 | 1 | Categorise workouts by type: running or cycling. | Lesley | Include a distinction between two workout types in workout plans and in the analysis of workouts: cyling and running. | Adjustable workout type | None |
| F9 | 1 | Easily share a workout with a share button. | Lesley | Share a workout with the standard share button API in android. Workout data is automatically transferred to the Fitbit companion app when the workout is completed. | Shared workout on Whatsapp | None |
| F10 | 1 | Track heart rate during the workout. | Lesley | Make use of the heart rate API from Fitbit OS to track heart rate. Optionally display heart rate during workout. Display heart rate graph in the workout analysis. | Heart rate on display | None |
| F11 | 1 | Export historical workout data. | Lesley | Export workout data from the companion app as a CSV file. | CSV file of workout data | None |
| F12 | 1 | Create companion android app that allows for easier creation and better analysis of workouts. | Lesley | Make use of the Fitbit OS companion app API to easily create a companion app for Android devices. | Companion android app | None |

# 8. Constraints

The Fitbit OS platform brings with it some hardware/software constraints. It is a challenge to operate within these constraints due to the small size of the smartwatches.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Version** | **Constraint** | **Source** | **Rationale** | **Priority** | **Status** | **Link to use case** |
| C1 | 1 | The heap size used by the application is limited to 128 kB for Fitbit OS 5.0. | Fitbit OS | Heap size limit by Fitbit OS 5.0. | Must | Proposed | Any use cases |
| C2 | 1 | The maximum size of an app at installation time is 10 MB. | Fitbit OS | App size limit by Fitbit OS. | Must | Proposed | Any use cases |
| C3 | 1 | The total file system space used by an installed app is limited to 15 MB. | Fitbit OS | File system size limit by Fitbit OS. | Must | Proposed | Any use cases |

# 9. Test plan

For each user requirement, there is a test defined to check whether the requirement is fulfilled.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Version** | **System specification** | **Indicator** | **Deviation** |
| F1 | 1 | Get coordinates from GPS sensor with the Fibit OS API and calculate distance with those coordinates. Total running or cycling distance is optionally displayed during the workout and after the workout. | Total distance on display | distance +/- 5 % |
| F2 | 1 | Track time with Fibit OS API. The workout time is displayed during the workout and after the workout. | Workout time on display | time +/- 5 s |
| F3 | 1 | Ability to set up an interval workout in advance via a Fitbit companion app. Adjust type of workout, number of repetitions, distance or time of an interval, etc. The workout plan data is sent to the Fitbit OS app when a button is clicked. After the workout is done the workout data is sent back to the Fitbit OS app. | Workout data corresponds to the workout plan | None |
| F4 | 1 | Intervals can be individually selected by time or distance. There are no limitations except for the maximum number of intervals. | Individually adjustable intervals | None |
| F5 | 1 | Vibrate the Fitbit device when an interval is completed. Vibrate three times when a workout is finished. | Vibration | None |
| F6 | 1 | Save workout plans in the database of the Fitbit OS companion app on an Android device. | List of workout plans | None |
| F7 | 1 | Save workouts in the database of the Fitbit OS companion app on an Android device. | Completed workout with data | None |
| F8 | 1 | Include a distinction between two workout types in workout plans and in the analysis of workouts: cyling and running. | Adjustable workout type | None |
| F9 | 1 | Share a workout with the standard share button API in android. Workout data is automatically transferred to the Fitbit companion app when the workout is completed. | Shared workout on Whatsapp | None |
| F10 | 1 | Make use of the heart rate API from Fitbit OS to track heart rate. Optionally display heart rate during workout. Display heart rate graph in the workout analysis. | Heart rate on display | None |
| F11 | 1 | Export workout data from the companion app as a CSV file. | CSV file of workout data | None |
| F12 | 1 | Make use of the Fitbit OS companion app API to easily create a companion app for Android devices. | Companion android app | None |

# 10. References

References.

# 11. Appendices

Appendices.