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SELF-MANAGEMENT OF PHYSICAL AND MENTAL FITNESS OF OLDER WORKERS

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Project coordinator: Poznań Supercomputing and Networking Center, ul. Jana Pawła II 10, 61-139 Poznań, Poland, email: fit4work@fit4work-aal.eu

User gateway applications

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1   Introduction

The Fit4Work project aims at delivering an innovative system capable of detecting, monitoring and countering physical and psychological stress related to professional occupation of older adults. To this end the project will build on top of a combination of state-of-the-art ICT, including such advanced technologies as 3D motion sensing, wearable wellness sensors, ambient sensors, mobile devices, AAL middleware and cloud services. These off-the-shelf technologies will be extended with specialized components able to collect, store and analyze physical and mental fitness related information in order to provide personalized recommendations and exercises through intuitive user applications. From the point of view of end users, the resulting product is a light-weight coupling of non-distracting devices with a smartphone equipped with a 3D motion sensor and a watch-like wellness sensor forming the core of the personal wellness network.

The service provided this way makes it possible to continuously monitor oneself at work and manage one's own fitness thanks to highly motivating training participation scheme. As a result, Fit4Work supports increase in quality of life for end users and their health-related fitness, thus making them more eager to actively participate in their work. High quality of the proposed service model is ensured through collective expertise of the project consortium and through the fact that Fit4Work developments are driven by end user participation at all stages of project implementation. In Fit4Work end users define initial requirements, continuously support technological teams with their expert knowledge on ICT usability for older adults, validate the system prototypes in two pilot trials and provide input for the market analysis leading to elaboration of a detailed business model. These users act as representatives of the target group of Fit4Work solution users, which includes most persons aged 55 and more, actively occupied in paid and voluntary settings.

User gateway applications within Fit4Work are applications deployed on user devices (called gateways). Within the scope of the project, two such applications have been developed – a Mobile Application and a Desktop Application.

The Mobile Application is a primary user application designed to deliver all crucial Fit4Work functionality concerning physical activity, mental stress levels and ambient comfort to the user and relay sensor information (except for the Ambient Sensor data) to Fit4Work system components for processing. This application has been developed for the Android platform and deployed on an Android smartphone (Google, 2017).

The Desktop Application is a secondary user application designed to deliver additional and optional statistical information to the user about their physical activity. This application has been developed as a cross-platform web application running in a browser.

Both of those applications require Fit4Work and 3rd party cloud services for functionalities like long term data storage and processing, or user authentication (see Figure 1.1).

> *Note:* *More detailed Fit4Work system architecture diagram has been presented below and in Deliverable 5.1 System Architecture Definition* (Carjan, C., et al, 2016) *and Deliverable 5.4.1/5.4.2 Prototype of the Fit4Work system* (Bogdański, M., et al, 2017).

This document describes initial and final prototypes of the above applications that have been designed and developed within the project, focusing on presenting their functionality from the user point of view. More detailed technical description of individual application components, system processes and communication has been presented in Deliverable 5.4.1, 5.4.2 Prototype of the Fit4Work system (Bogdański, M., et al, 2017).
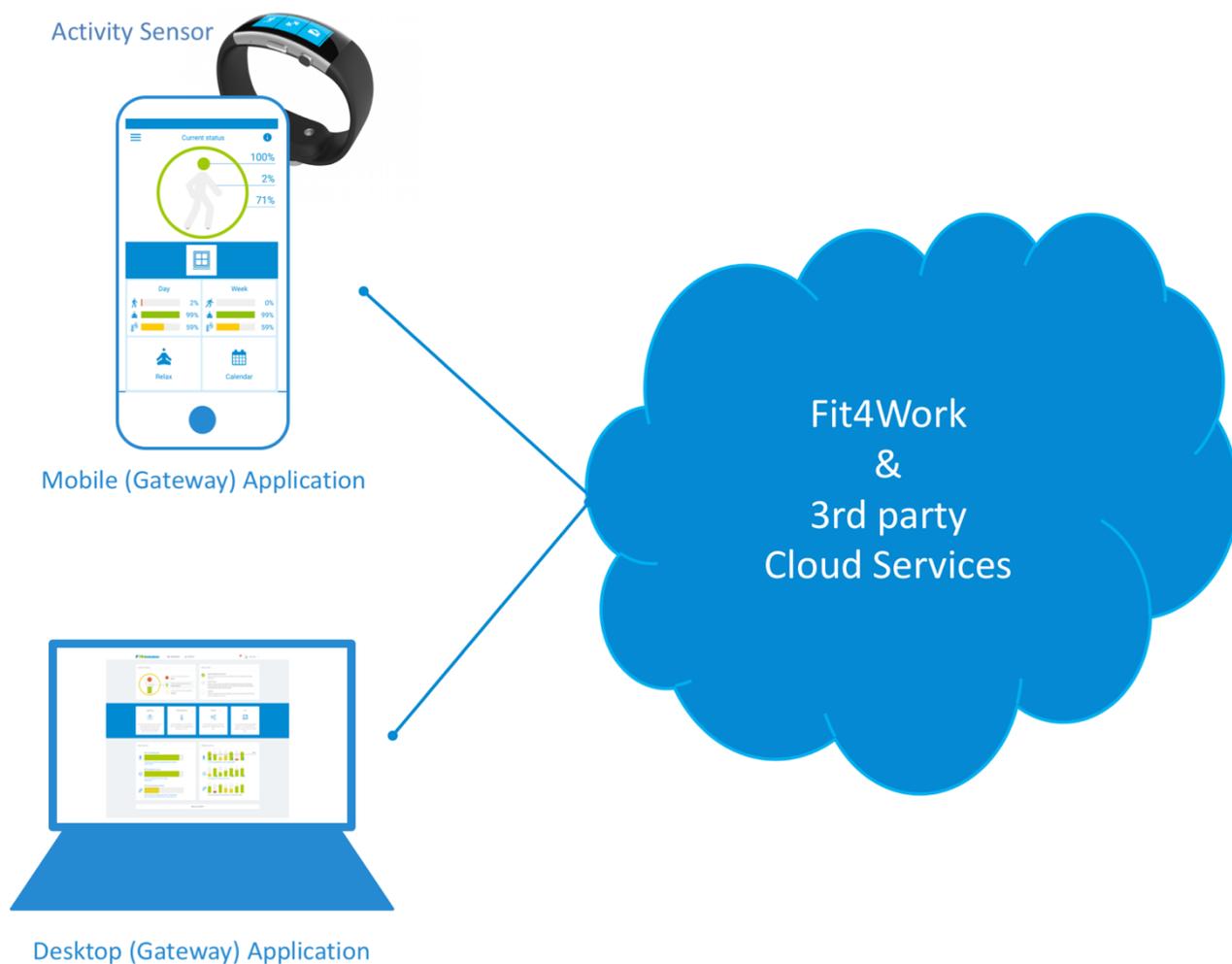
Figure 1.1 Fit4Work gateway applications within Fit4Work

The current document presents details concerning the two releases of the user gateway applications as per the project work plan. The indicated differences between the concepts and designs of the initial and final prototypes of those applications were primarily fostered by feedback from target end user representatives. Other changes and updates are developments related to enriching functionality or integrating capabilities of more advanced functions of the underlying components, such as those developed within WP3. Section 2 discusses the initial prototype of the user gateway applications (deliverable D4.2.1) and section 3 concerns the final prototype (D4.2.2).

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2   Initial prototype

The early application prototypes focused on developing initial overall application design and functionality. The main idea behind Fit4Work applications, and especially the Mobile Application, is to present three aspects of user's life, monitored by Fit4Work, as three well-being factors (physical, mental and environmental) that can be scored from 0% to 100% and have a low, medium and high range. The aim behind this approach was to simplify a complex process of calculating optimal parameters for user's physical activity, mental stress and ambient comfort, into essentially a three-value feedback that would allow the user to assess their overall well-being at a glance and be easy to understand.

2.1   Mobile Application

This section describes the Mobile Application prototype deployed on user's mobile gateway (Android smartphone). While the design of the initial prototype has been developed for all Fit4Work aspects (monitoring user's physical activity, mental stress and ambient conditions), the initial working prototype implementation focused only on monitoring user's physical activity.

2.1.1   General functionality

The following list includes high level user-facing system features of the initial prototype:

- **Monitoring user physical activity** - based on two activity sensors – mobile phone and wearable wrist band, Microsoft Band 2 (Microsoft, 2017)
- **Viewing current, daily, weekly and monthly results for physical activity** based on pre-set daily and weekly physical activity goals
- **Receiving instant recommendations** – calculated against physical activity level compared to pre-set goals based on WHO recommendations
- **Receiving long term recommendations** - calculated against physical activity level compared to pre-set goals based on WHO recommendations
- **Signing in into Fit4Work**
- **Creating a Fit4Work profile**

Figure 2.1 shows a general view of the initial Mobile Application prototype within the early Fit4Work system prototype. For more details about the components presented in this diagram, please refer to *Deliverable 5.4.1, 5.4.2 Prototypes of the Fit4Work system* (Bogdański, M., et al, 2017) and *5.1 System Architecture Definition* (Carjan, C., et al, 2016).

The following paragraphs describe the application functionality based on individual screens or views.

> **Note:** *Because some of the application elements had not been yet implemented in the initial prototype, they have been grayed-out in the user interface and the values they might be showing are just placeholder values.*
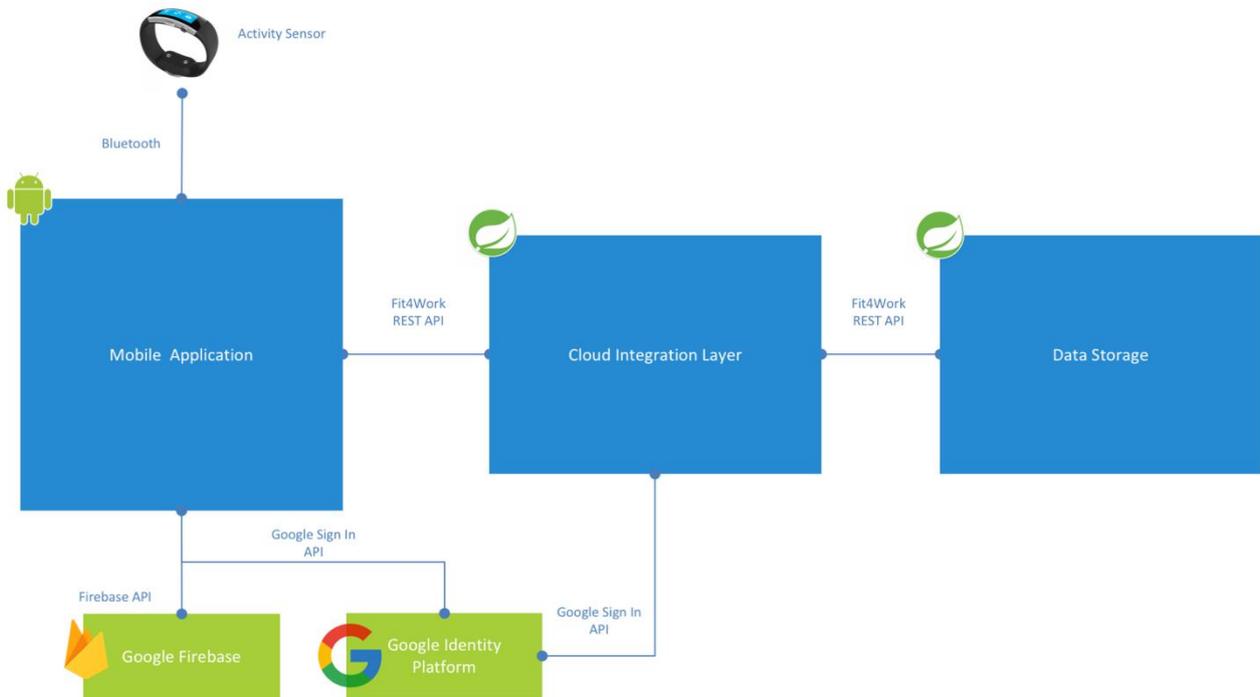
Figure 2.1. Mobile Application (Mobile Gateway application) within the initial Fit4Work system prototype architecture implementation

2.1.2 Main screen

The main application screen has been designed to deliver the most important information to the user at a glance (Figure 2.2). It has been divided into 3 main parts:

- Current status widget at the top
- Instant recommendations bar in the middle
- Navigation buttons (with the top row being dynamic content navigation buttons)

Current status widget

This element shows current user status, in terms of their physical activity, mental stress level and ambient comfort, and is represented by a human figure within a circle. The figure's body represents the level of physical activity (changing color from red, through yellow to green as the level of activity rises throughout the day and the fill level of the body goes up). The head represents current relaxation level (green means the user is relaxed; yellow, the user's stress is at a medium level; red, the user's stress is high). The circle around the human figure represents ambient conditions (again, changing from green – optimal, through yellow for medium, to red for poorest conditions). For visual representations of the stress and ambient levels, please refer to the main screen of the final prototype in paragraph 3.1.2.

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All three well-being factors also have percentage scores assigned to them and shown to the right of the widget.
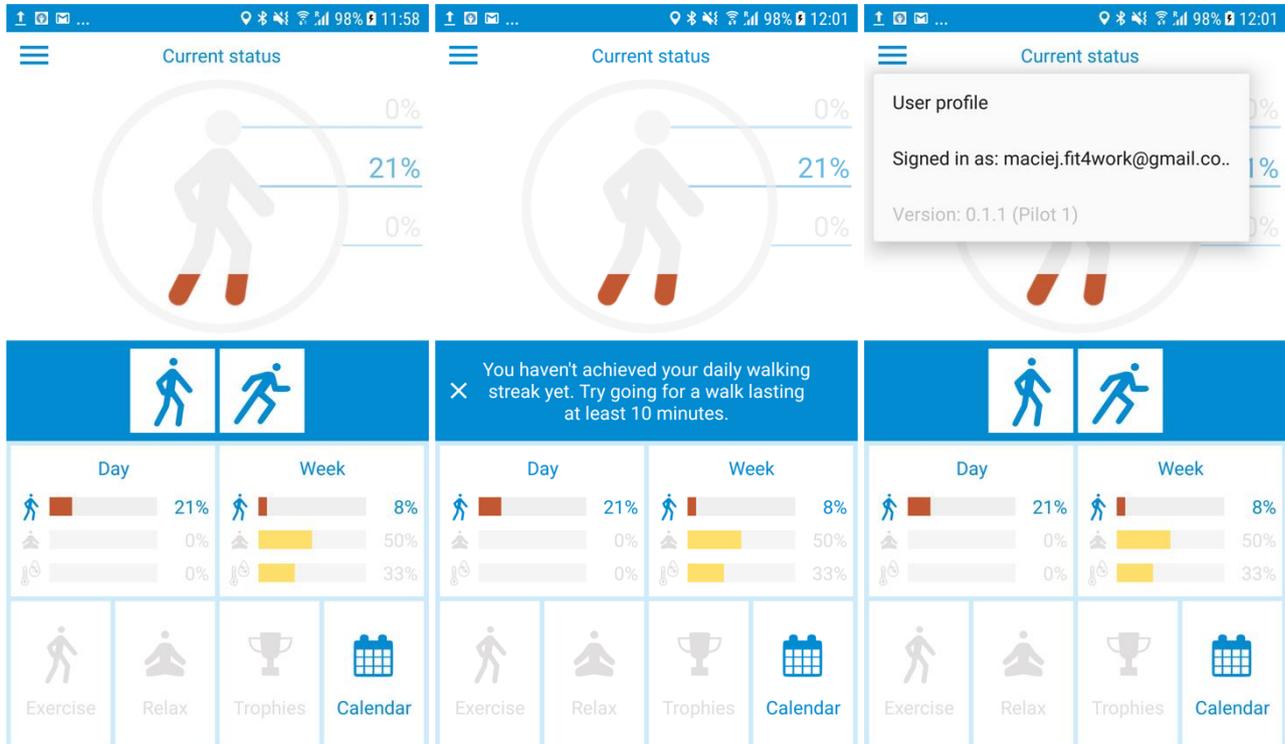
Figure 2.2. Mobile Application initial prototype - main screen (default view, with a recommendation text expanded and with application menu expanded).

In the top left corner of the screen, the application menu is accessible – allowing for user profile management and signing in and out of the system.

> *Note: Stress level vs relaxation level: Even though the project reports have mostly referred to measuring user's stress levels, a decision has been made to show user's relaxation level in the application instead - in order to stay positive, as far as an overall message delivered by the application. Nonetheless, data analysis components still measure actual user's mental stress, but the score presented to the user is "inverted" and shown as a relaxation score (i.e. low stress = high relaxation, high stress = low relaxation).*

Instant recommendation bar

The middle of the screen contains the instant recommendations bar showing real-time recommendations generated by the system. Each recommendation is represented by an icon and shows a short text after it is tapped by the user. The recommendations automatically appear and disappear as conditions for them are met or not.

Navigation buttons

The bottom of the screen contains navigation buttons. The "Day" and "Week" buttons dynamically show well-being factor scores for physical activity, relaxation level and ambient conditions for the current day

and week, respectively. These three aspects are represented by percentage well-being score bars, additionally color coded – red for low scores, yellow for medium and green for high.

2.1.3 Day, week and calendar screens

Day, week and calendar screens show more details about user's physical activity, relaxation levels and ambient conditions by including long term recommendations generated for a specific day or week and allowing the user to navigate between days, weeks and months of historic data (see Figure 2.3).

The day screen shows user's physical activity level ("Activity") against the daily physical activity goal (which in this application version has been pre-set to 200 kcal, based on WHO recommendations) and average relaxation level ("Relaxation") and ambient conditions ("Environment") scores - calculated against optimal stress and environment conditions levels for humans. The week view shows scores for each day of the week in those well-being factors, and additionally shows a physical activity level against the pre-set weekly goal (75 minutes of vigorous physical activity, again based on WHO recommendations). The calendar view shows well-being factor scores for each day in a month.

For a better visual representation of relaxation level and environmental comfort, please see paragraph 3.1.3.
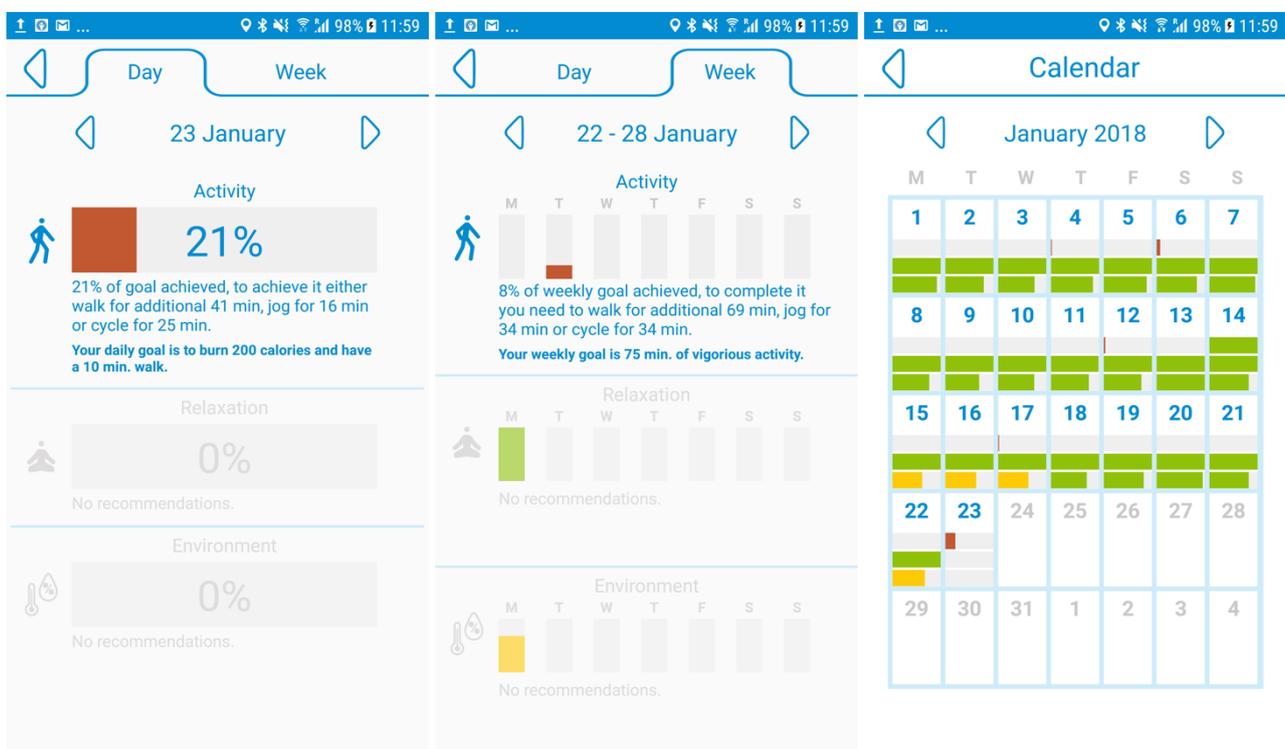
Figure 2.3. Mobile Application initial prototype – day, week and calendar screens.

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2.1.4   Sign in screen

The Fit4Work system requires its users to be authenticated in order to properly store and analyze data, as well as to generate proper recommendations and give access to this data to the users. The sign in screen allows users to sign into the system using their pre-existing Google accounts. This approach streamlines the sign in process for the user and simplifies user authentication from the point of view of the system (see Figure 2.4).

When the Mobile Application is run for the first time, it prompts the user to sign in. After choosing the "Sign in" option, built-in Android mechanisms are used to present the user with selection of Google accounts existing in the system (if none exist, the option to create a Google account is presented). The user selects a desired account and is automatically signed in into the Fit4Work system.

The user can later sign out of the system by choosing an appropriate option from the application menu on the main screen.
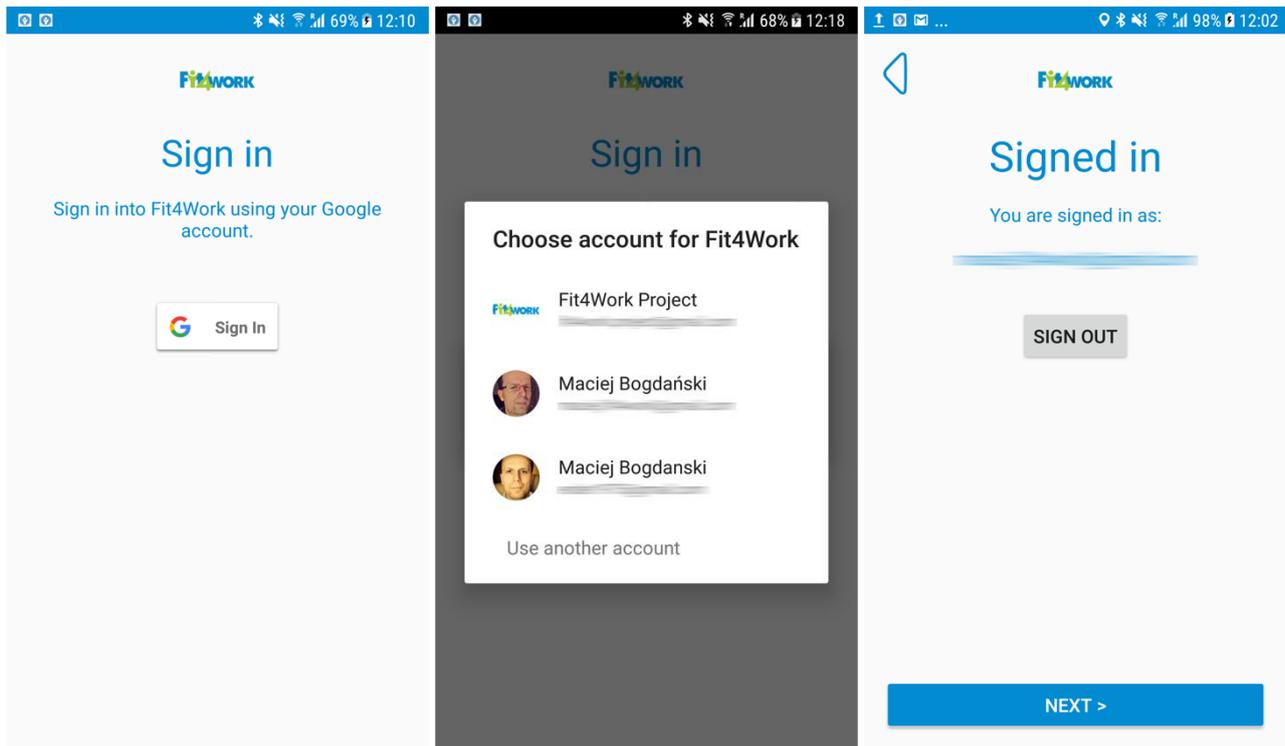
Figure 2.4. Mobile Application initial prototype - sign in screens - before signing in, choosing account to sign in with, after signing in.

2.1.5   Profile screen

After the user has signed in, they are prompted to create a simple Fit4Work profile in order for the system to provide them with better and more accurate recommendations (see Figure 2.5). The profile contains user's date of birth, height, weight, gender and physical activity level related to their work.

The user can always change the profile by selecting an appropriate option in the application menu on the main screen.

Figure 2.5. Profile creation screen

2.2 Desktop Application

The following section describes the Desktop Application prototype, which was developed as a web application for browsers. The initial prototype focused on offering a similar experience to that of the Mobile Application. Consequently, most of the functionalities and the design decisions present in the Desktop Application followed those of the Mobile Application prototype. It is important to note that the initial prototype was produced to test design ideas and was not integrated into the rest of Fit4Work system.

2.2.1 General functionality

The following list includes high level user-facing system features of the initial prototype:

- Monitoring current user physical activity, mental stress and environmental conditions
- Viewing daily and weekly results for physical activity, mental stress and environmental conditions
- Receiving instant recommendations
- Receiving long term recommendations

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The origin of the data used by the features of the initial prototype of the Desktop Application in the context of the Fit2Work system is similar to the origin of the data used by the Mobile Application (please see paragraph 2.1.1 for details).

2.2.2 Main screen

All the information provided by the Desktop Application prototype is contained in a single, main screen (see Figure 2.6). It is divided into three main parts:

- Current status - at the top left part
- Instant and general recommendations - in the middle and in the top right parts
- Daily and weekly breakdowns – in the bottom part

Figure 2.6. Desktop Application initial prototype - main screen.

Current status

The current status visualization presents the current levels of physical activity, mental stress and environmental conditions for the user. The visualization is a pictogram of person and its graphical interpretation is similar to the widget used by the Mobile Application (Figure 2.7):

- The color of the head of the figure represents the mental stress
- The color and fill degree of the body represent the physical stress
- The color of the outside circle represents the environmental conditions

In the case of the colors for all three elements, red represents a low level (bad), yellow represents a medium level (average) and green represents high level (good). The status for each of the three factors is also explicitly stated to the right of the figure.
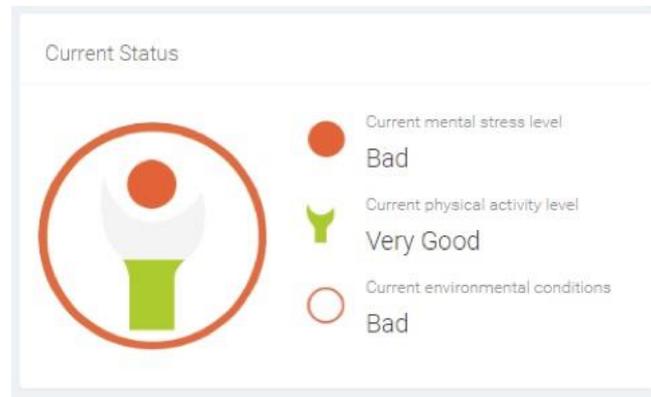
Figure 2.7. Desktop Application initial prototype - user's current status

Instant and general recommendations

The user's recommendations are split in two: instant recommendations (Figure 2.8) and general, or long term, recommendations (Figure 2.9).

The instant recommendations are shown on the bar in the middle part of the screen. Each recommendation has a title (which represents the recommendation type), an icon and a small text, which contains the actual recommendation given by the application. When the system provides a new instant recommendation, a pop-up containing the recommendation appears in the browser.
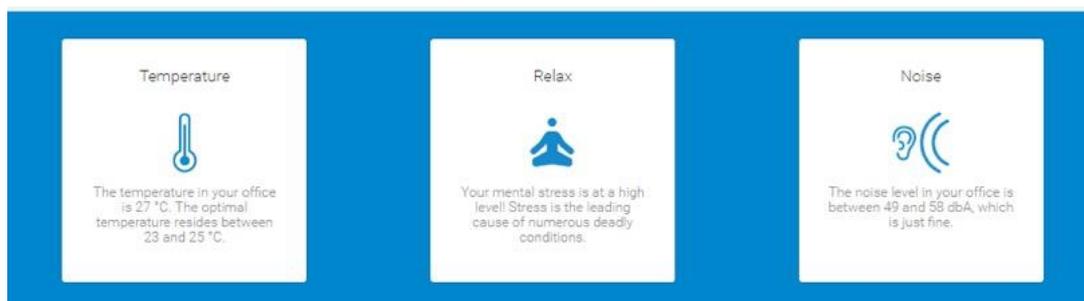
Figure 2.8. Desktop Application initial prototype - instant recommendations

The general recommendations are shown in the top right part of the application. They contain a type and text, but also have an associated check box. If the user accomplishes and checks one of them, it is then cut out and disappears after a few seconds.

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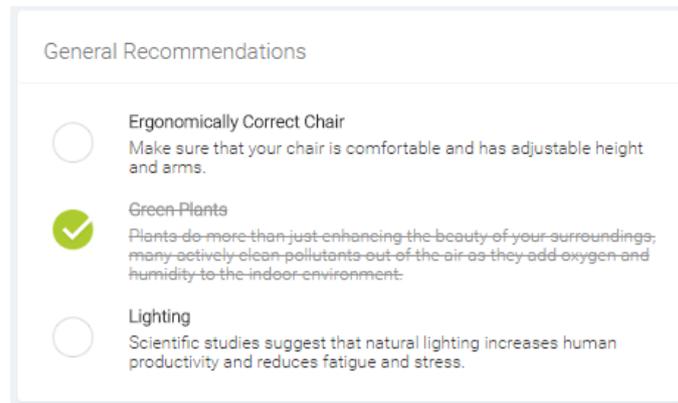
Figure 2.9. Desktop Application initial prototype - long-term recommendations (with one of the recommendations checked)

Daily and weekly breakdowns

The user's activity, relaxation and environmental comfort can also by visualized by day or week. The daily visualization is composed of three bars, each representing the level for one of the factors by using color and fill degree. The levels are also shown as percentages above the bars. The weekly visualization is also composed of a chart for each of the three factors. The charts are separated into bars for each day of the week and the daily goal for a factor is represented as a line on the chart. The views of these application sections are presented in Figure 2.10.

Figure 2.10. Desktop Application initial prototype - daily and weekly breakdown

The prototype for the Desktop Application was built with the data of a user hard-coded into it, so no *Sign In* or *User Profile* functionalities were present.

3 Final prototypes

The final application prototypes implement all three main aspects of the Fit4Work system - physical activity monitoring, stress monitoring and ambient monitoring. Their general functionalities are presented below.

It is important to note that aside from planned functionality, the Mobile Application prototype also includes changes based on user feedback collected during the test of the early prototype in Pilot 1. The Desktop Application, on the other hand, has changed its role from presenting a copy of the information contained in the Mobile Application to being a statistical information source, all the while remaining a secondary and optional user application.
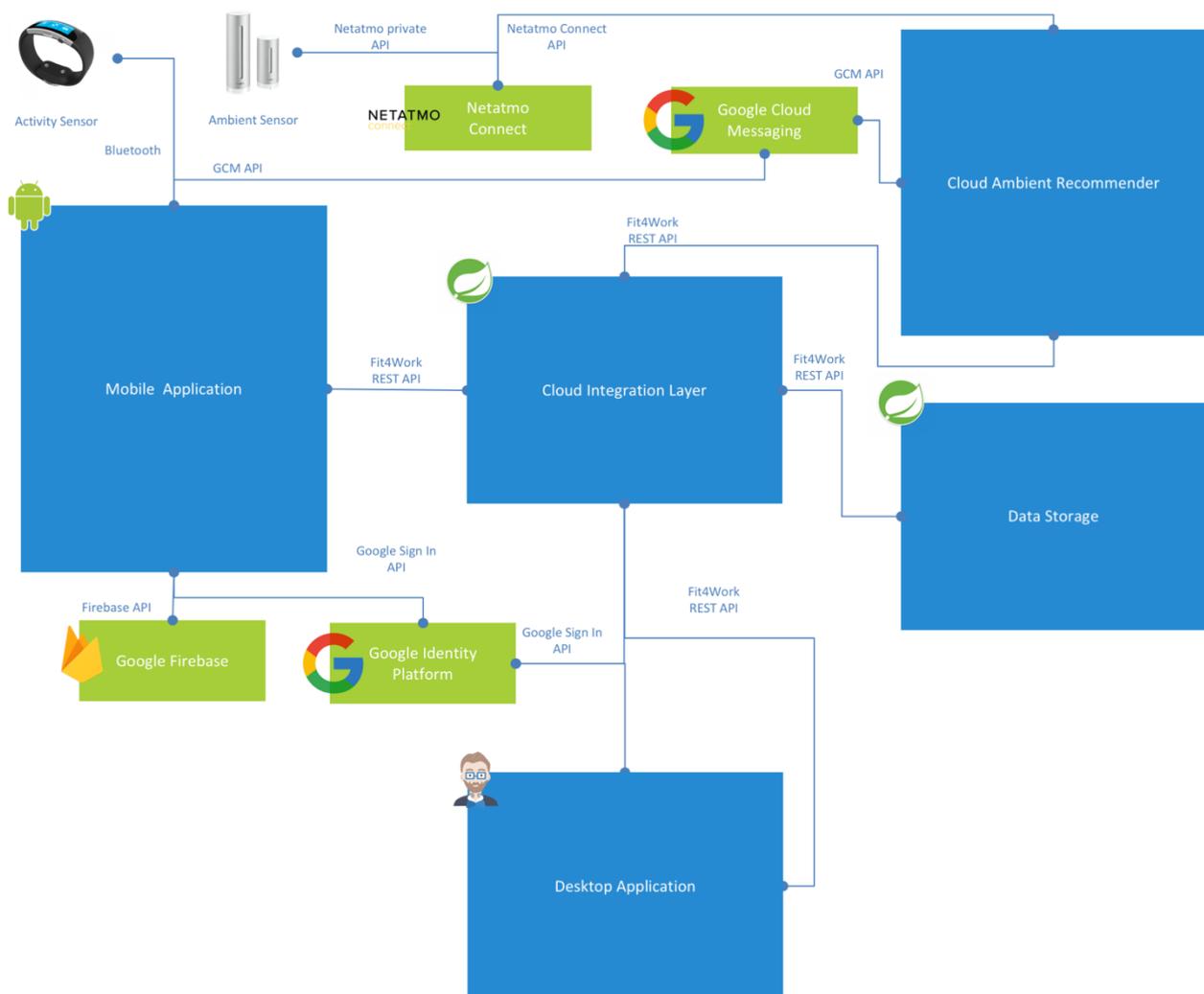
Figure 3.1. Mobile and Desktop Gateway Applications within the final Fit4Work system prototype

The final prototypes description below focuses on changes and additions made compared to the initial prototypes. Figure 3.1 shows user applications within the context of the final Fit4Work system prototype. For more details about the components presented in this diagram, please refer to *Deliverable 5.4.1/5.4.2*

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Prototype of the Fit4Work system (Bogdański, M., et al, 2017) and *Deliverable 5.1 System Architecture Definition* (Carjan, C., et al, 2016).

3.1 Mobile Application

3.1.1 General functionality

The following list presents high level user-facing system features of the final prototype:

- Monitoring user physical activity based on two activity sensors – mobile phone and wearable wrist band (Activity Sensor)
- Monitoring user mental stress - based on sensors in the wearable wrist band (Activity Sensor)
- Monitoring user ambient conditions - based on a standalone ambient sensor located at the user's workplace (Netatmo, 2017)
- Setting custom physical activity goals
- Viewing current, daily, weekly and monthly results for:
    - users' physical activity,
    - mental stress,
    - and ambient conditions
- Receiving instant recommendations related to:
    - user's physical activity,
    - mental stress levels
    - and ambient conditions
- Instant recommendations made smarter - presented to the user at more appropriate times to minimize distractions
- Receiving long term recommendations based on:
    - user's physical activity levels,
    - mental stress levels
    - ambient conditions
- Performing guided stress relief exercises
- Manually logging physical activities that were not monitored by Fit4Work
- Signing in into Fit4Work
- Creating a Fit4Work profile
- Receiving contextual help within the Mobile Application

3.1.2 Main screen

For general description of the main screen features please see paragraph 2.1.2.

In the final prototype version, the following changes have been made (see Figure 3.2 and 3.3):

- relaxation level and ambient monitoring have been enabled, in addition to physical activity monitoring
- contextual help/onboarding views have been added (shown automatically on first application run and later after tapping the (i) icon in the top right corner of the screen)

- new options have been added to the application menu ("Activity goals", "Add activity" and "Recommendation preferences")
- unimplemented options have been removed (instead of being greyed-out)
- widget, instant recommendation bar components and icons have been re-implemented to minimize memory consumption (by using vector images)
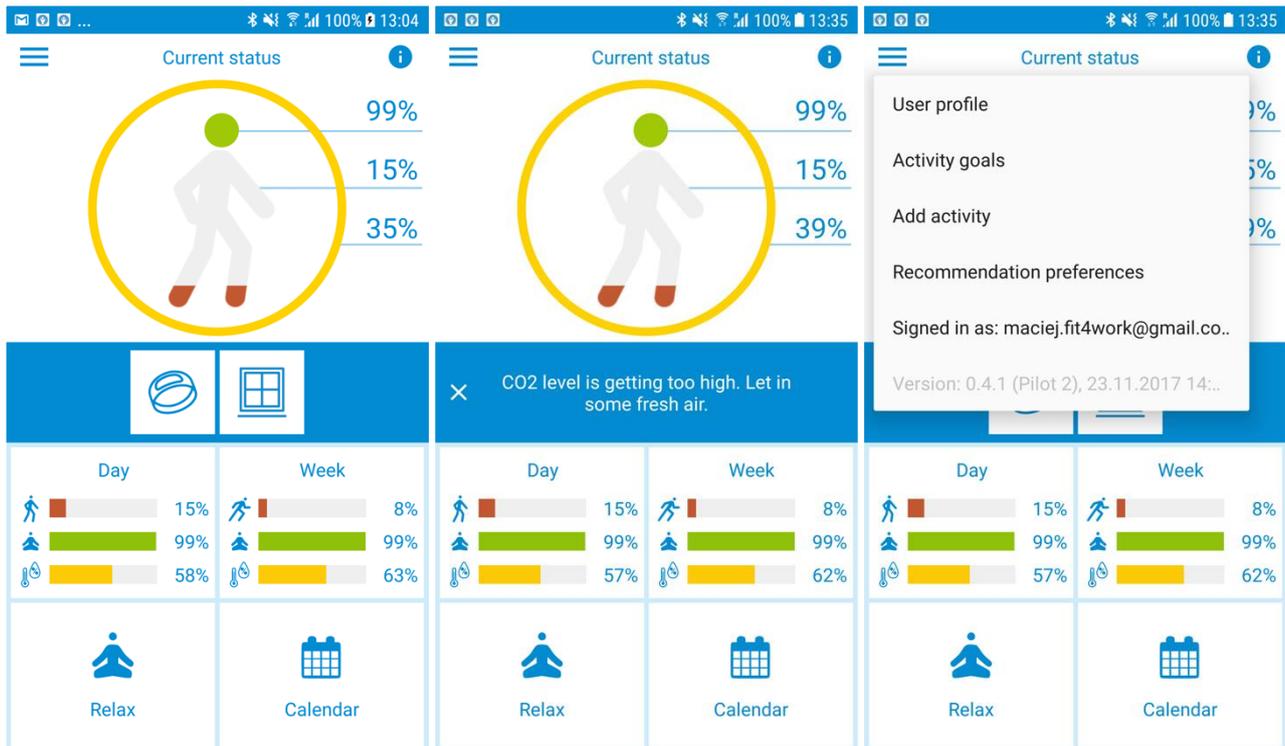
Figure 3.2. Mobile Application final prototype main screen - default view, expanded instant recommendation text, expanded application menu.

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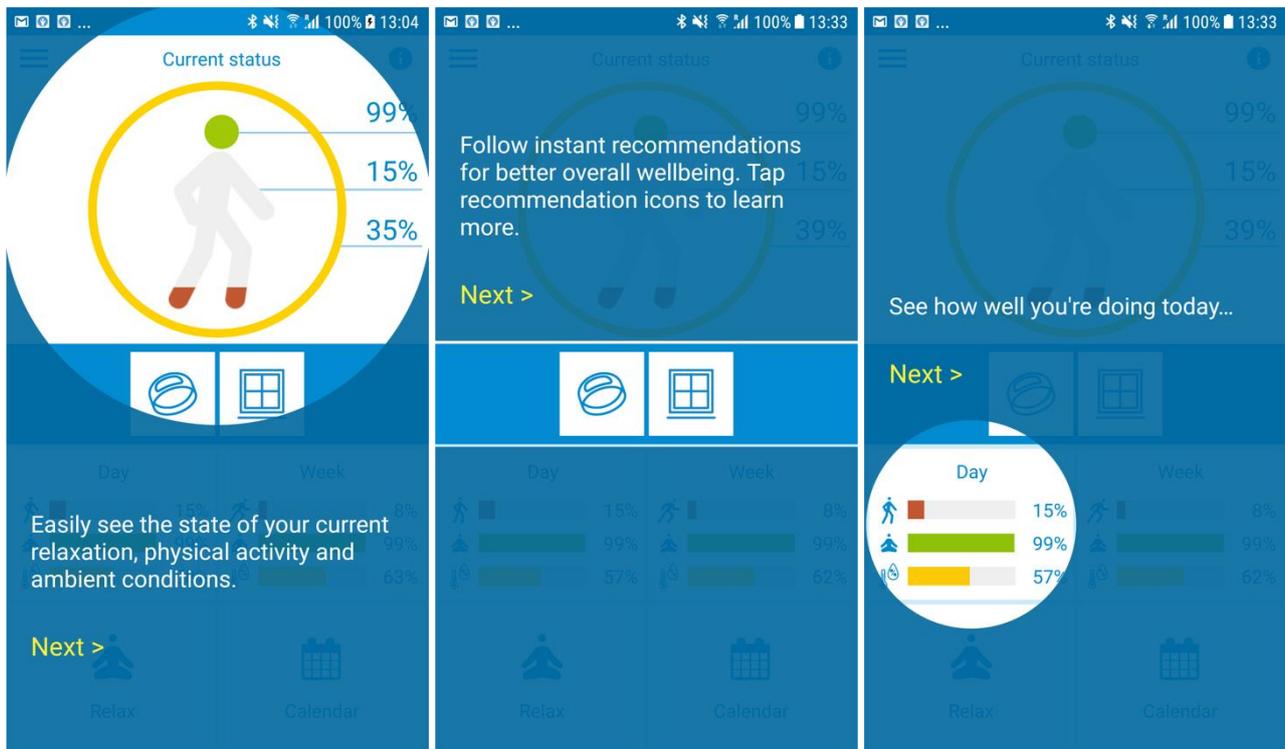
Figure 3.3. Mobile Application final prototype main screen - contextual help/onboarding views (selected 3 views out of 6 shown).

3.1.3   Day, week and calendar screens

For general description of day, week and calendar screen features, please see paragraph 2.1.3.

The following changes have been made in the final prototype version of these screens (Figure 3.4):

- Option to change default physical activity goals has been added (for more details see paragraph 3.1.7)
- Contextual help/onboarding views have been added to the day and week screens (accessible through the (i) icon in the top right corner). See Figure 3.5 for the help views.
- For the week view, the weekly physical activity goal score bar has been added to emphasize that the weekly physical activity goal consists of vigorous activity minutes – vs calories for daily goals, and is somewhat separate from the daily goals.
- Memory consumption optimizations have been made by using vector images instead of bitmap images
- Minor layout changes have been made
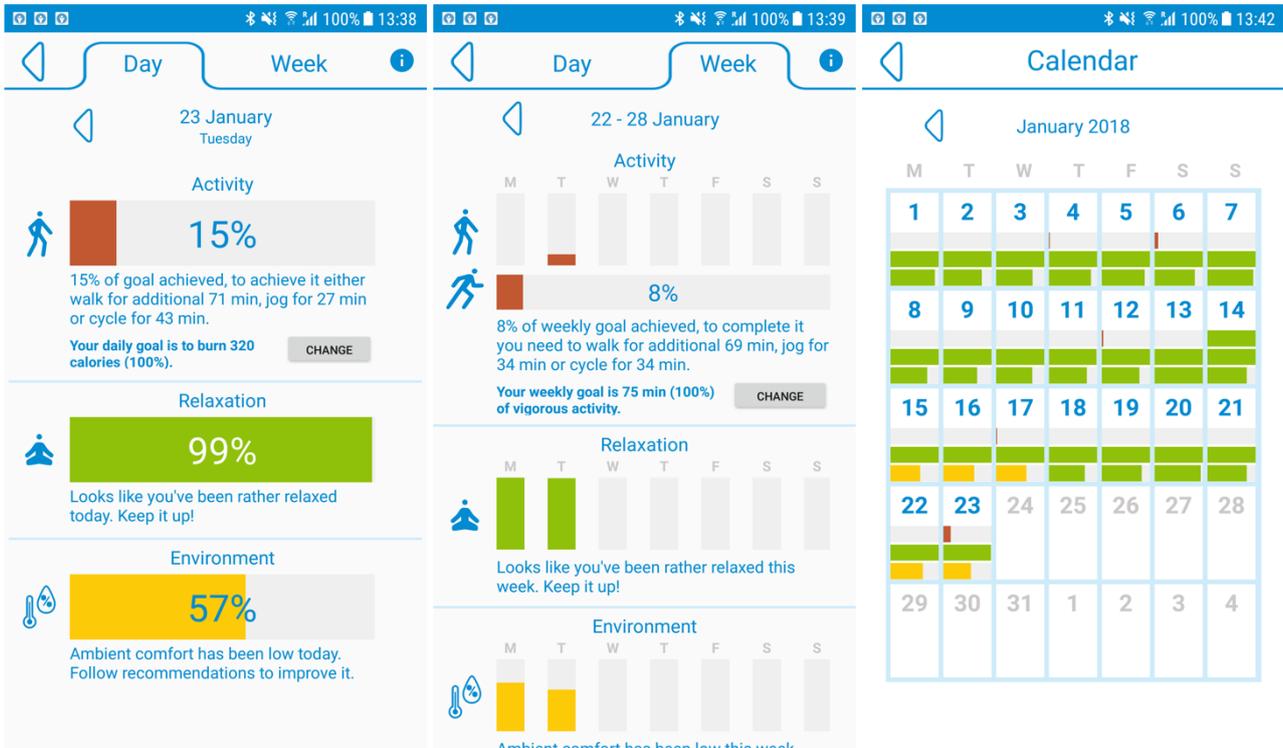
Figure 3.4. Mobile Application final prototype day, week and calendar screens.
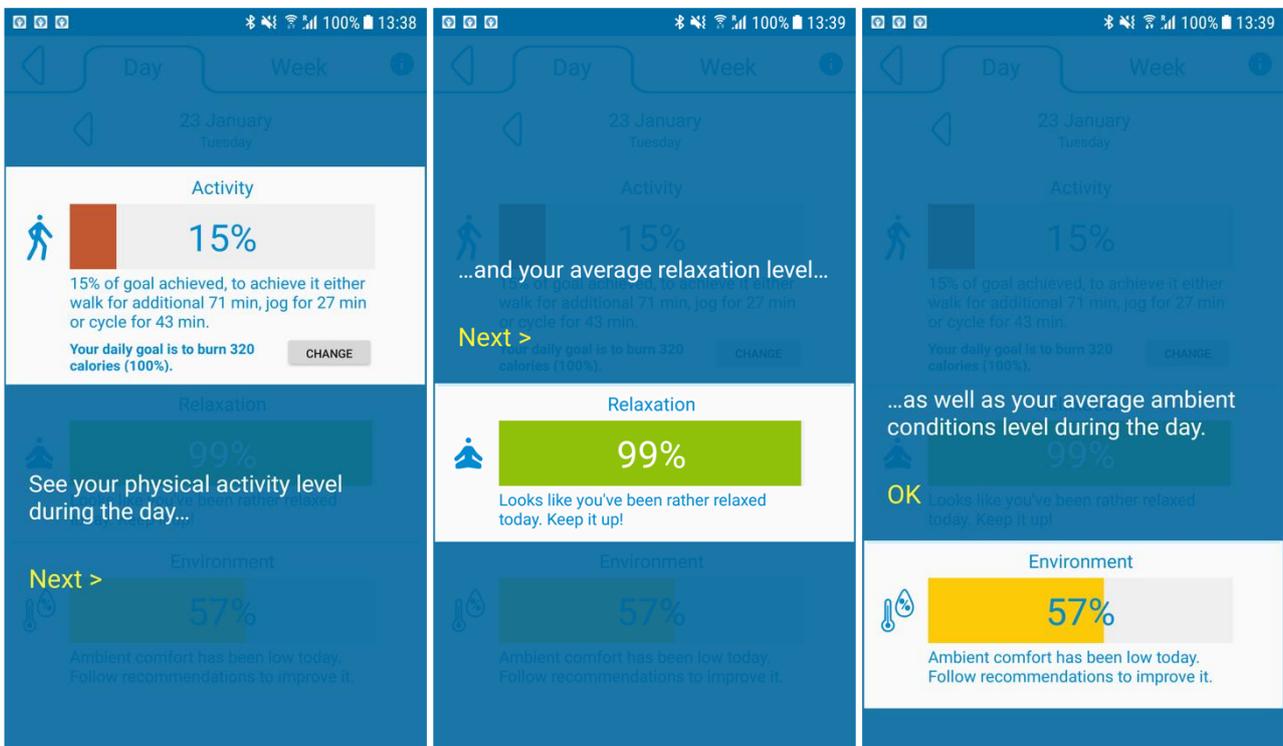
Figure 3.5. Mobile Application final prototype – day screen contextual help/onboarding views.

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3.1.4   Stress relief exercises

Screens related to relaxation have a different design style from the rest of the application to visually support the execution of stress relief exercises in reducing user's stress.

A set of 8 stress relief exercises has been developed and added to the final application prototype, divided into breathing and muscle relaxation exercises. After choosing the "Relax" option on the main screen, the user is taken to an introductory screen and then to a list of exercises (see Figure 3.6). A recommended exercise is pre-selected by the system, but the user can choose to perform any exercise they want.

After selecting an exercise from the list, an exercise session is started. Each exercise session consists of a series of steps with written instructions that are also spoken out loud by the application. The user can pause or stop the execution of the exercise at any moment. When the exercise is finished, the user is presented with a summary screen showing the duration of the exercise, as well as user's heart rate and relaxation score at the end of the session (see Figure 3.7).
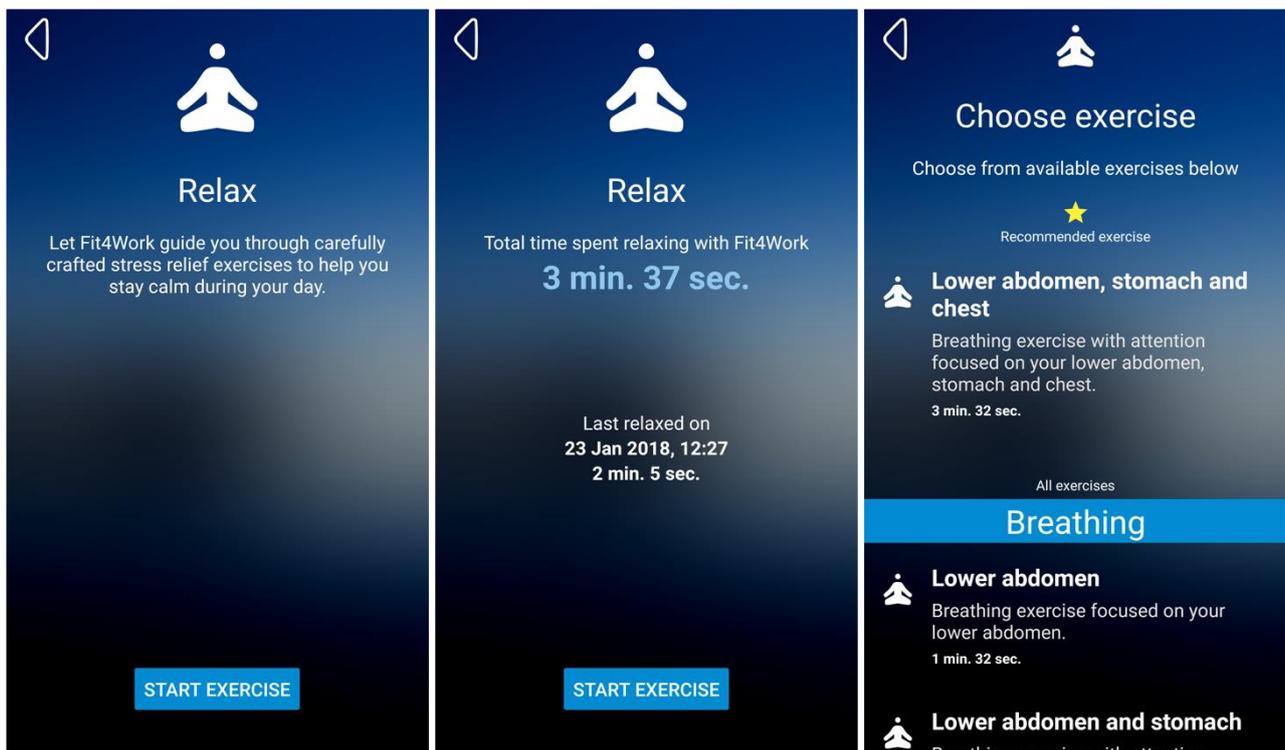
Figure 3.6. Mobile Application final prototype - intro screen (when no exercises performed previously), intro screen (when some exercises have been performed previously), choose exercise screen.
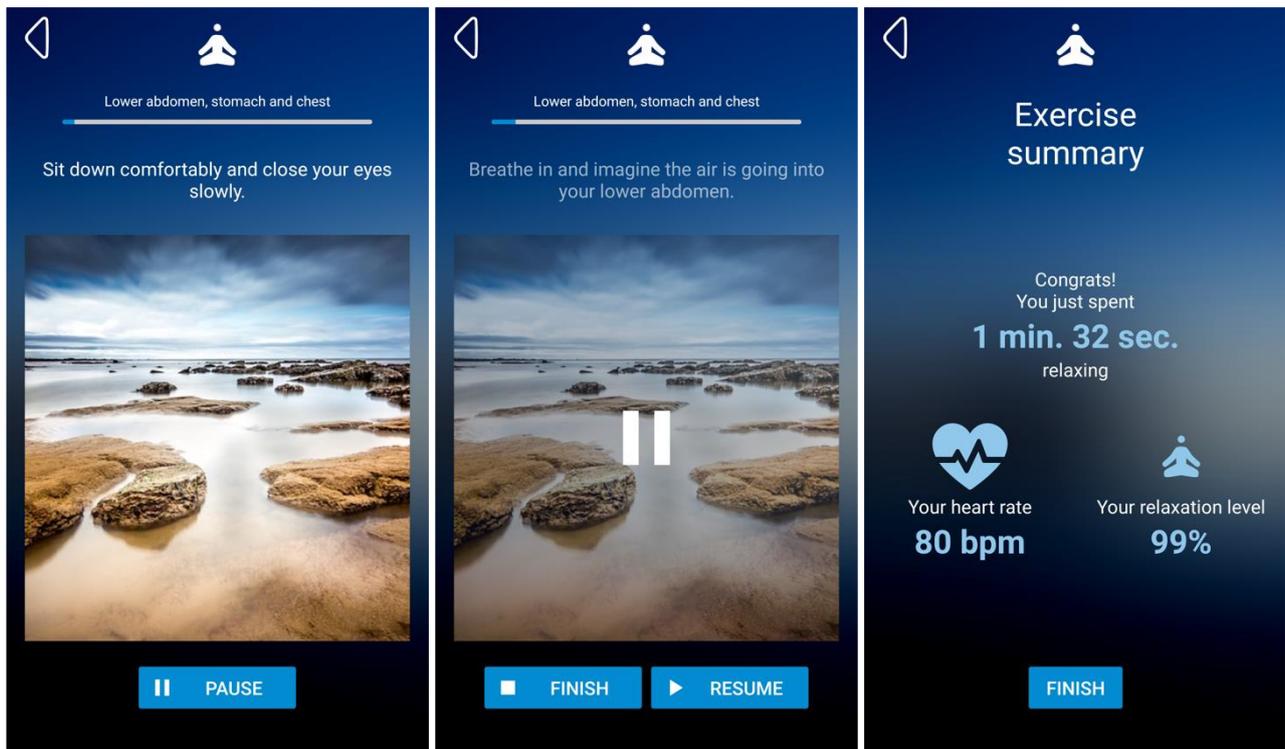
Figure 3.7. Mobile Application final prototype – perform exercise screen, perform exercise screen (exercise paused), exercise summary screen.

3.1.5 Sign in screen

This screen has not changed compared to the initial prototype (please see paragraph 2.1.4 for details).

3.1.6 Profile screen

This screen has not changed compared to the initial prototype (please see paragraph 2.1.5 for details).

3.1.7 Physical activity goals screen

The final Mobile Application prototype comes with the ability to set custom daily and weekly physical activity goals. The default value for the daily goal has also been changed from 200 kcal (recommended WHO minimum) to a value calculated based on user's weight.

The screen for setting these goals (see Figure 3.8) is presented or accessible to the user in multiple ways:

- During the initial application setup, after signing in and creating a profile
- From the application menu on the main screen
- From day and week screens, by choosing the "Change" option next to goal value

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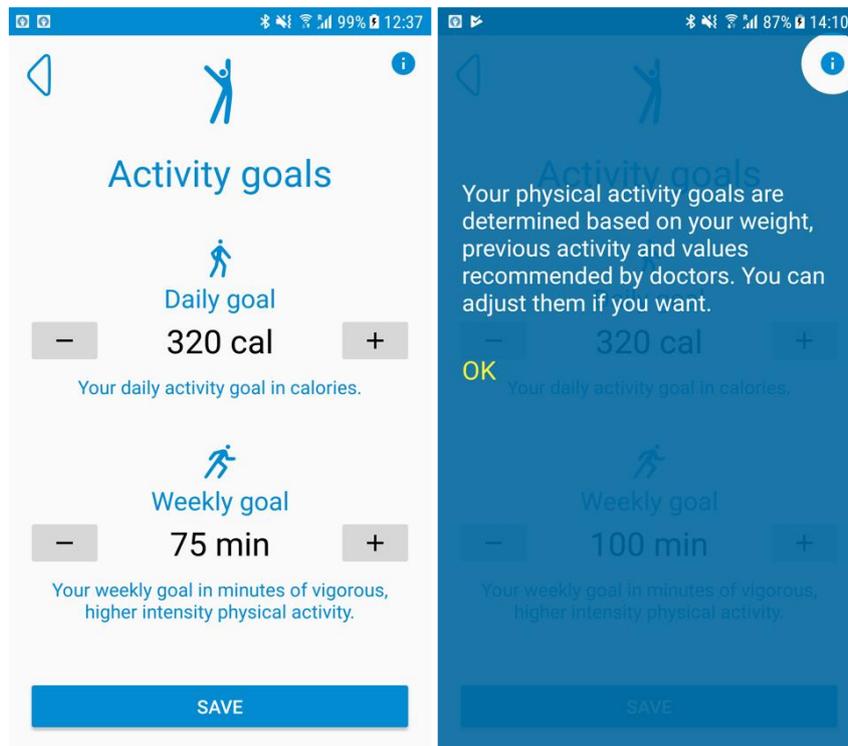
Figure 3.8. Mobile Application final prototype - physical activity goals screen - regular and with contextual help triggered by the user.

3.1.8   Recommendation preferences screen

Recommendation preferences refer to showing or hiding ambient conditions related recommendations based on the location of the user. The Ambient Sensor is located at user's workplace, usually at their office. The users can move around to other locations while at work and it doesn't make sense to show them ambient related recommendations when they are outside of the "range" of what the Ambient Sensor can measure. The same situation applies for when they leave work.

In order to be able to show ambient recommendations to the user only when they are, with high probability, within space monitored by the Ambient Sensor, locating the user based on available Wi-Fi networks has been introduced (see Figure 3.9). The user is asked to choose the Wi-Fi network they use at work (which is the same Wi-Fi network the Ambient Sensor should be connected to). The Mobile Application scans available Wi-Fi network periodically and if the selected network is available shows ambient recommendations, and if it isn't, those recommendations are not shown.

Using Wi-Fi network availability was also selected over regular GPS location, because it's usually hard to obtain a precise GPS location within buildings.

If the user never selects the work Wi-Fi network, ambient recommendations will always be shown.
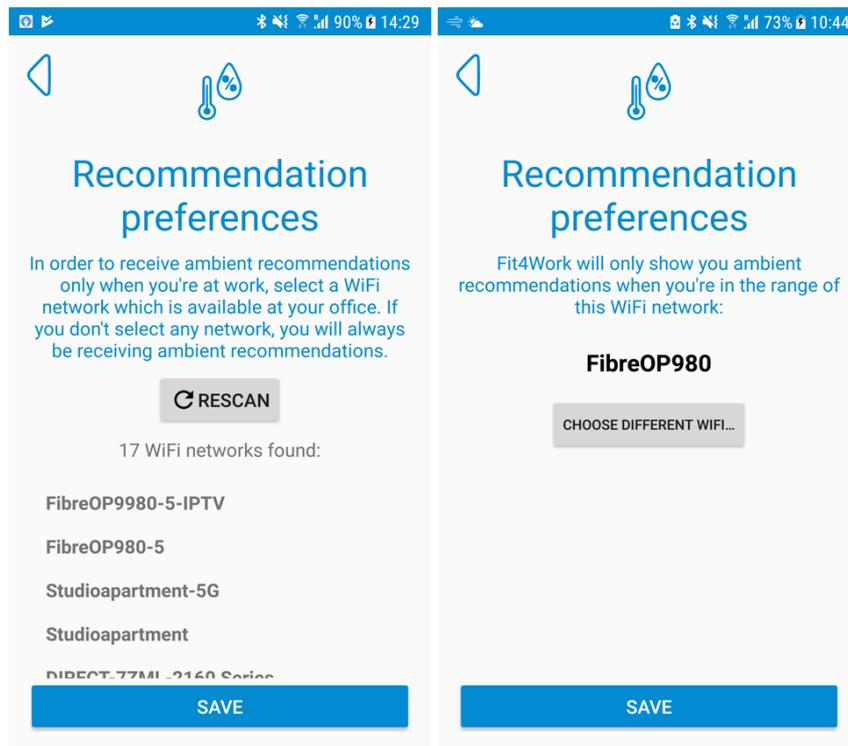
Figure 3.9. Mobile Application final prototype – recommendation preference screen (selecting work Wi-Fi and work Wi-Fi selected)

3.1.9   Smart recommendations

In order to improve user experience with recommendations generated by the Fit4Work system, a Smart Recommendations feature has been introduced. As an input, it takes recommendations generated data analysis components and decides whether to show them to the user at a particular time, or not, based on pre-defined set of conditions. The conditions take into account time of day, day of the week (week day or weekend), user location and whether or not particular recommendation has been shown to the user recently.

This feature also utilizes Android system notifications to communicate new recommendations to the user when they are not using the Mobile Application (see Figure 3.10).

3.1.10 Add physical activity screens

There are situations when users perform certain activities, like running, playing soccer or swimming, without wearing the Activity Sensor or having their mobile phone on their person. Because those activities, unmonitored by Fit4Work, should still count towards users' daily and weekly physical activity goals, an option to manually log activities has been introduced in the final prototype.

This option is accessible from the application menu on the main screen. The user can select from a number of popular activities, then choose the date and time they started performing the activity, as well as its duration. The Mobile Application calculates calories burned and active minutes for this activity and adds it to other (automatically detected) user activities (see Figure 3.11).

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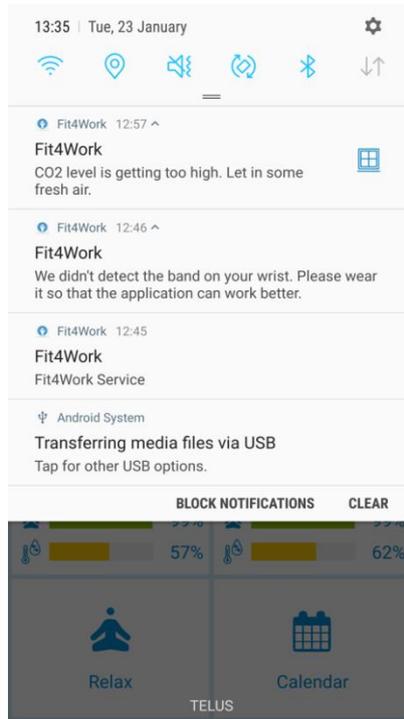
Figure 3.10. Mobile Application final prototype – system notifications with instant recommendations.
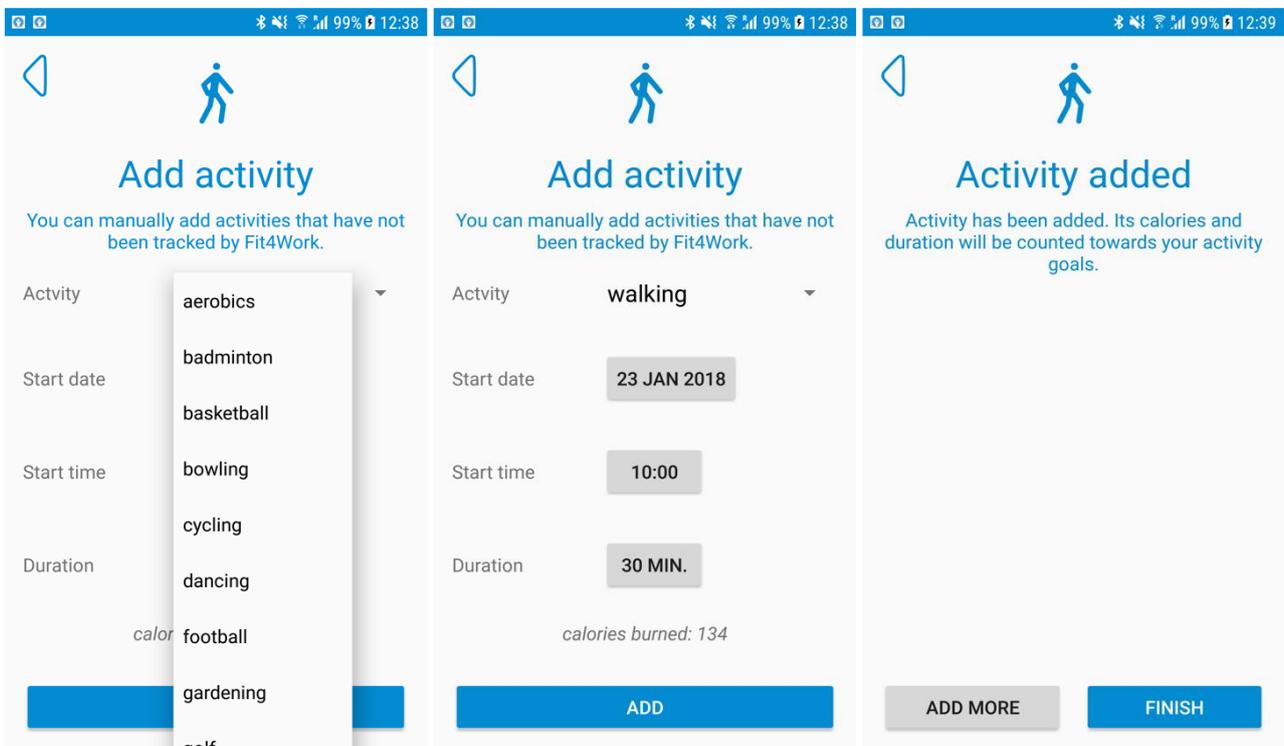
Figure 3.11. Mobile Application final prototype – log unmonitored physical activity screen (selecting activity, activity selected, activity added).

3.2 Desktop Application

For the final prototype, it has been decided that the Desktop Application should not just copy the functionality of the Mobile Application. Instead, the design of the initial prototype was changed and the final prototype of the Desktop Application focuses on helping the user better understand the data. It does this by performing analysis on the data and producing new interpretations and visualizations.

3.2.1 General functionality

The following list presents high level user-facing system features of the final prototype of the Desktop Application:

- Viewing daily, weekly, monthly and total results for physical activities grouped by activity type
- Viewing total daily, weekly and monthly calories burned
- Viewing daily activity intensity
- Viewing user wellbeing
- Signing in into Fit4Work
- Creating a Fit4Work profile

3.2.2 Main screen

The design of the initial prototype of the Desktop Application, which had a single, main screen with all the information, has been changed. Instead, in the top part of the screen, a navigation menu with tabs has been added, which can be used to select the desired screen. In the right corner of the navigation menu the user name is shown, next to a button where the user can select to view the Profile Info or Sign Out.

Underneath the navigation menu the actual graphs for the selected screen are shown. By default, the Activity screen is selected.

The new design of the main screen is shown in Figure 3.12.

3.2.3 Activity screen

The Activity screen contains visualizations regarding user's physical activity, more specifically the types of activities the user has engaged in during the selected period. These can include, for example, walking, sitting, running or cycling.

The visualizations are bar charts, where each bar represents an activity type. The name of the activity is shown underneath the bar. The height of each bar represents the total number of minutes for each activity, for the selected period. The bars are ordered from left to right according to total number of minutes, in descending order. Furthermore, the colors of the bars are also different according to their size.

There are four types of periods for the activity breakdown (see Figure 3.13), which can be selected from the tabs above the graph:

- Daily Activities – selects a single day of activities
- Weekly Activities – selects a week of activities
- Monthly Activities – selects a month of activities

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- Total Activities – all the logged activities are taken into consideration

For the Daily, Weekly and Monthly Activities, the actual period is shown above the graph and it can be changed using the arrows around it.

3.2.4   Calories screen

The Calories screen contains visualizations regarding the number of calories burned by the user during a selected period. The total number of calories is calculated by adding up the number of calories burned for each individual activity during the period.

The visualizations are bar charts, where each bar represents the total number of calories burned. Similarly, to the Activity visualizations, the size of the bars and their color correspond to the amount of burned calories they represent. However, the bars are not sorted according to their size, but are shown chronologically, from left to right. The corresponding time frame for each bar is shown underneath it. A blue horizontal line indicates the burned calories goal for the selected period.

There are three types of periods for the calories breakdown (see Figure 3.14), which can be selected from the tabs above the graph:

- Daily Burned Calories – selects burned calories per day, for a certain month; each bar represents a day of the month
- Weekly Burned Calories – selects burned calories per week, for a certain month; each bar represents a week of the month
- Monthly Burned Calories – selects burned calories per month, for a certain year; each bar represents a month of the year

The actual period to be displayed is shown above the graph and it can be changed using the arrows around it.

3.2.5   Intensity screen

The Intensity screen contains a visualization regarding the intensity of the physical activities performed by the user in a selected day. The intensity is calculated as the number of calories burned per time unit. Hence time frames when the user burned more calories will correspond to the higher intensities.

The visualization is a line chart (see Figure 3.15), where the height of the line indicated the intensity of the user's activities for the corresponding time unit. Two horizontal blue lines divide the intensity into three, easily understandable segments: low, medium and high. The corresponding time units are shown beneath the graph.

The actual day to be displayed is shown above the graph and it can be changed using the arrows around it.
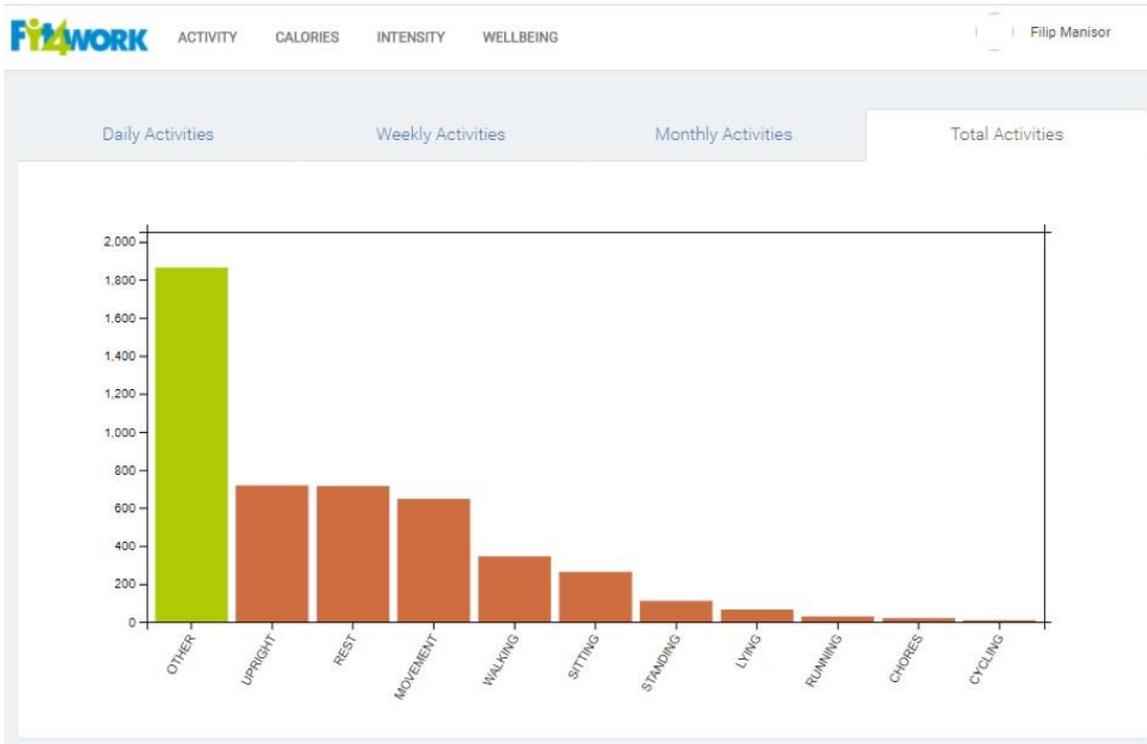
Figure 3.12. Final Desktop Application prototype - main screen

Figure 3.13. Final Desktop Application prototype - Daily Activities (top left), Weekly Activities (top right), Monthly Activities (bottom left) and Total Activities (bottom right).

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Figure 3.14. Final Desktop Application prototype - Daily Burned Calories (top left), Weekly Burned Calories (top right) and Monthly Burned Calories (bottom)
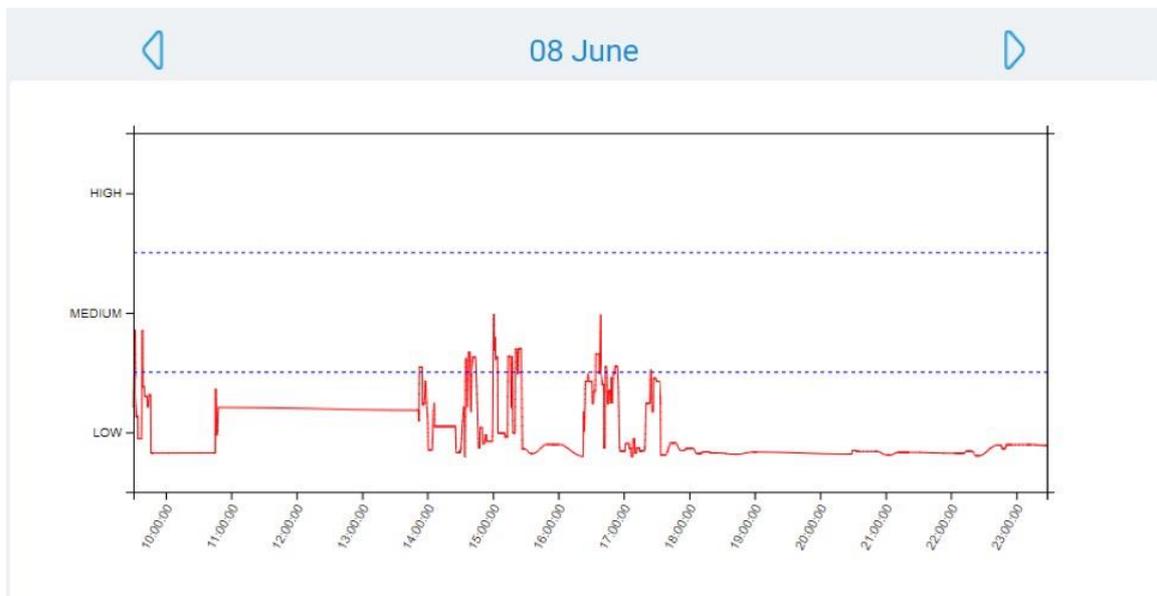
Figure 3.15. Final Desktop Application prototype - user's activity intensity for a day

3.2.6 Wellbeing screen

The Wellbeing screen contains a visualization regarding the evolution of the user's physical wellbeing. The wellbeing score is calculated by the Fit4Work system according to the user's activity and is a number between 0 (worst) and 100 (best).

The Wellbeing Chart (Figure 3.16) shows the evolution of the score using a filled-in line graph, where the height of the line represents the score and the most recent scores are to the right. The corresponding times of the score are shown underneath the graph.
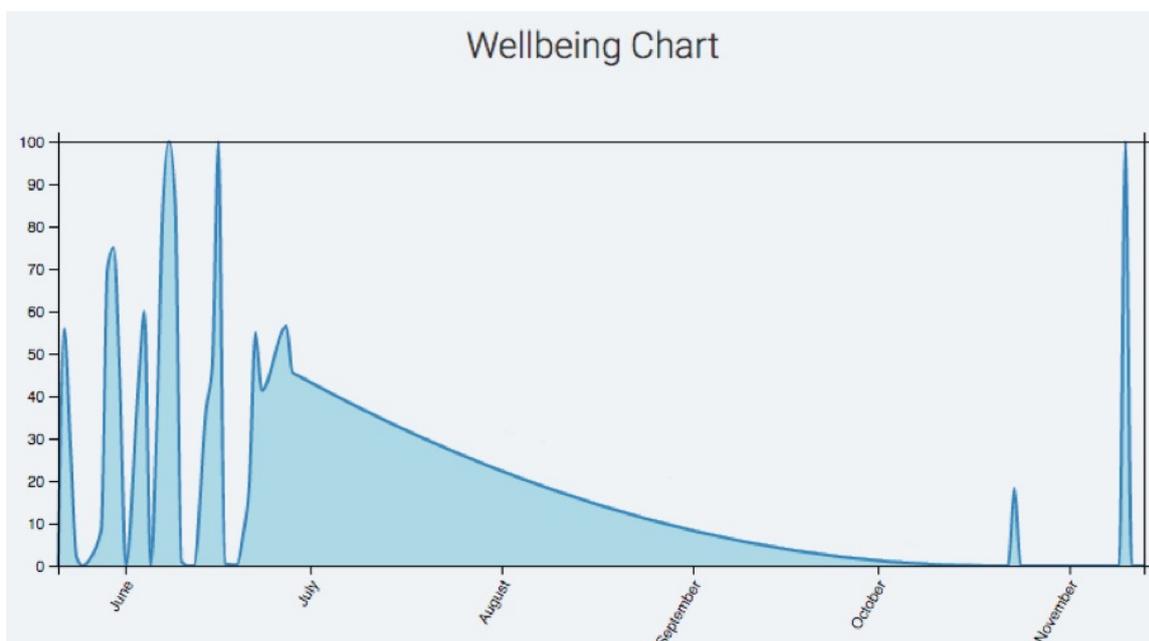
Figure 3.16. Desktop Application final prototype - user's physical wellbeing chart

3.2.7 Sign in screen

The Sign in screen allows users to sign into the Fit4Work system, so that the Desktop Application can analyze their personal data and produce visualizations based on it. The Sign in screen consists of a pop-up which appears the first time the user opens the Desktop Application (see Figure 3.17). The authentication is performed with user's pre-existing Google account.

After the user chooses the "Sign in with Google" option, a new screen appears, where the user can select one of the accounts already used on the computer or use a different Google account (see Figure 3.18). When the account is selected, the user grants access to the Fit4Work application and the application signals the fact that the sign in process is complete. Afterwards, the user is redirected to the main screen of the Desktop Application.

The user can sign out at any time, by clicking the "Sign out" option in the top right part of the navigation menu.

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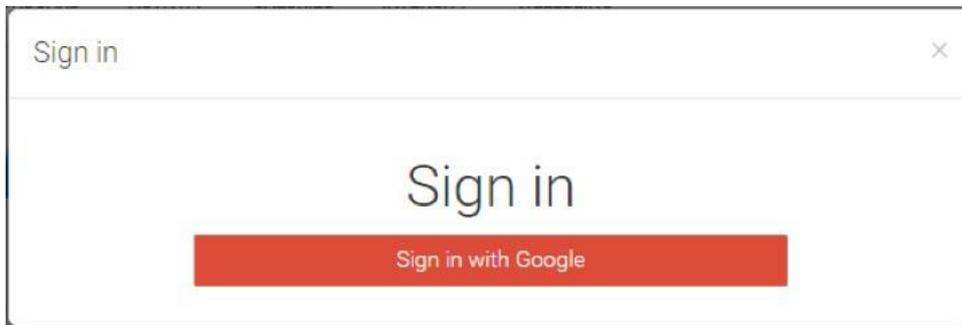
Figure 3.17. Final Desktop Application prototype - user is asked to sign in using Google Sign in
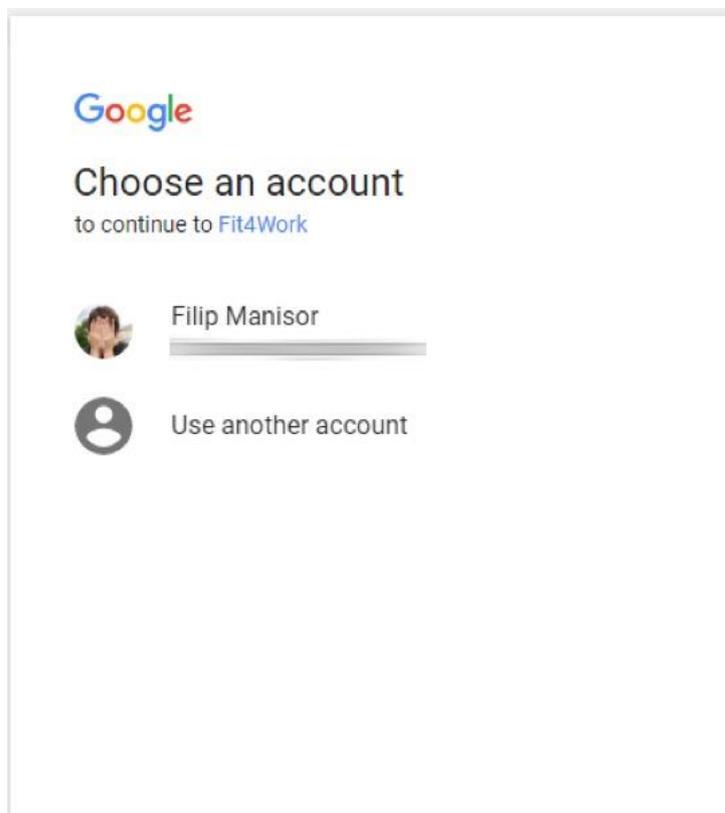
Figure 3.18. Final Desktop Application prototype - user selects a Google account

3.2.8 Profile screen

The Profile screen allows the user to see and change the information associated with their Fit4Work account (see Figure 3.19). The Profile screen can be accessed by clicking the "Profile Info" option in the top right part of the navigation menu.

The name, gender, age and height of the user are displayed in the top part of the screen. Beneath them, a series of editable fields with all the profile information is shown. The user information consists of the user's name, e-mail, date of birth, gender, weight and height. Each one of these can be modified by the user and is afterwards automatically saved in the database.

Figure 3.19. Desktop Application final prototype - user profile screen

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4   Summary

This document describes two versions of the Fit4Work user gateway applications developed in the scope of the project. The user feedback and analytics data gather during tests, have been used to extend and improve the applications between the initial and final prototypes. Those changes have been highlighted above.

The description of gateway applications features has been based on individual views presented by those applications and augmented with appropriate screenshots.

Fit4Work user gateway applications design is the corner stone of system features developed within the project and impacted the design and implementation of other components.

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