DaddyDo Mobile Application

CM3070 Computer Science Final Project

[Github link to the code repository]

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Github link to the code repository:

https://github.com/redchrision/DaddyDo-ReactNative-MobileApplication

1. Introduction

1.1. Project concept and motivation

The template chosen is Project Idea Title 1: Task manager mobile app from the CM3050 Mobile Development track.

The pregnancy journey of each individual represents an unique experience that is impacting millions of future parents worldwide. This time is a particular period of approximately 40 weeks, each having its own particularities and requirements.[1] The support for future parents comes from various sources, especially from medical care. However, we can also notice an expanding market meant to help them in other forms. Pregnancy tracker applications represent a market which is considered to be at a considerable growth rate during the forecast period, between 2022 and 2028.[2] Moreover, we can notice that the global women's health app market size was valued at USD 2.3 billion in 2020.[3]

In spite of the success of these solutions for future parents, we can notice a clear disproportion when it comes to comparing how many solutions there are for mothers and for fathers. The vast majority focuses on motherhood and only tangentially are referring to fathers as well. DaddyDo is a mobile application that comes to offer a solution for balancing this and offering a focus on the journey of parenthood of future fathers.

The users of Daddy Do will be fathers who wish to be involved in the pregnancy journey of their partner. During the approximately 40 weeks of pregnancy, fathers are introduced to parenthood by the initial state of being a supportive assistant for their pregnant partner. This journey comes with:

- Significant new information which might be overwhelming for fathers
- Specific tasks to do for every week of the pregnancy, from a medical point of view, administrative, organizational, but also emotional

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[1] NHS, *Pregnancy week-by-week*, https://www.nhs.uk/pregnancy/week-by-week/

[2] Unspecified author, 2022, *Global Pregnancy Tracker Apps Market Insights, Forecast to 2028*, http://www.precisionreports.co/global-pregnancy-tracker-apps-market-19992818

[3] Unspecified author, 2020, *Women's Health App Market Size, Share & Trends Analysis Report By Type (Fitness & Nutrition, Pregnancy Tracking & Postpartum Care, Menopause), By Region (North America, Europe, APAC, Latin America, MEA), And Segment Forecasts, 2021 - 2028*, https://www.grandviewresearch.com/industry-analysis/womens-health-app-market

DaddyDo is destined to accompany users expressly for the approximately 40 weeks of pregnancy and aims to give them a productivity tool that would help them be informed, stay on track with their future parent tasks and, in consequence, make the most of their adventure into parenthood.

1.2. Project objectives

The aim of the project is to design and develop the DaddyDo mobile web application which provides a tool for future fathers that wish to track their activities during the 40 weeks of their pregnancy journey into fatherhood. The app allows its users to:

- Add to do tasks and monitor their progress
- Delete tasks and mark them as being complete
- Edit the description of each task
- A library with information on each week of the pregnancy that contains:
    - Suggestions for fathers on what to do that week
    - Information about the baby development
- An overview of the last seven days tasks inserted in the application, in order to allow users to have an overview of the items listed in the last week.

The mobile web application will pursue two important **social objectives**:

- Improving the availability of tools on the market destined for fathers only, that help them effectively organize their time during the approximately 40 weeks pregnancy journey
- Helping with pointing out the importance of fathers in the pregnancy process and their continuous involvement.

Therefore, the **product vision** can be defined as follows:

> Facilitate access to a tool that is destined for future fathers, designed expressly for tracking the approximately 40 weeks of pregnancy and helping them better organize their journey into fatherhood in this time.

1.3. Overview of the report content

The present report represents an overall summary of the work conducted in order to create the DaddyDo final product. It follows the entire development cycle from the initial research conducted in order to determine the idea for the Final project to the evaluation phase, with the conclusion containing potential further directions for improvements.
The main chapters and their overview on the content are as follows:

- **Introduction**. This chapter reflects general considerations on the theme chosen for the project. It consists of the following areas:
    - **Project concept and motivation** for the project, which refer to the idea of developing a product designed to be a productivity application made for fathers-to-be as users, destined to accompany them in their approximately 40 weeks of pregnancy. It is a reflection also on the current need on the market of such an application.

    - **The project objectives** represent a general reflection of what are the main goals of the DaddyDo product. These objectives will be considered further on, in the Evaluation and the Conclusion sections.
    - An **overview of the report**, which aims to be an introductory piece of information about the entire content of the report.
- **Literature review**. This chapter represents also an introduction in the world of productivity applications and the market of similar products which focus on pregnancy and fathers-to-be as users. It consists on the following parts:
    - **Considerations about productivity applications**, which aims to offer an overview on the general topic of products which help users be more productive. As DaddyDo is a part of this family of products, this analysis is necessary, especially from the perspective of the effectiveness of this kind of application.
    - **Comparisons of DaddyDo with other applications**. This section is destined to make an analysis of main products on the market which have similarities with the DaddyDo application. It is aiming to point out differences and what makes DaddyDo stand up from this crowd.
- **Design**. This section has the following parts:
    - **Domain and users**, a section which aims to identify the domain and the users of the DaddyDo application.
    - **Justification of features based on the domain and users**, aiming to point out the main characteristics of the application and why they are relevant from the perspective of the domain and users.
    - **Overall structure of the project**, which offers both:
        - A **visual interface of the mobile application**, with the help of wireframes.
        - **User flow diagrams** destined to point out main ways used to navigate the application / user stories.
    - **Key technologies and methods** used in the project.
    - **Project management** section, intended to detail the way the project was carried out from the phase of the prototype version to the final product presented at the end of Week 22 of the semester.
- **Implementation**. This section contains the following:
    - **Description of the application main features**, which shows the main elements of the DaddyDo application.
    - **Main algorithms, techniques and methods** used in the application, both from the perspective of the:
        - **Overall software architecture** of the project, with a diagram
        - **The front end of the application**
        - **The back end the application**
- **Evaluation**. This section has the following elements:
    - The **overall evaluation plan** which was designed to encapsulate the key methods used for carrying out the evaluation process.
    - **User testing** considerations, which aims to detail:
        - The **methodologies applied** in the user testing phase of the project.

        - The **overall results** of the user testing with the selected methods.
        - The **implementation of the user feedback** section, which aims to present specifically what was implemented after carrying out the user testing.
    - **Unit testing** considerations, which aims to point general considerations about the unit testing carried out throughout the process of development of the project.
    - **Critical evaluation of the final product** DaddyDo, which represents an evaluation of the:
        - **Successful features** of the application
        - **Possible improvements for future versions** of the application
- **Conclusion**. This section is a summary of the work and results for the application DaddyDo, pointing out also elements to be further considered in the future for the area of research and pregnancy productivity applications.

2. Literatures review

2.1. Considerations about productivity applications

The market of productivity applications in general has a continuous growth and expansion in various domains of human activity. We can notice that in the research space, they are estimated to offer an increase of 34% of the productivity of users, which shows that they are bringing value to the economy of time management of a person.[4] This statistic is from the study conducted in 2014 by the company Salesforce, one of the most successful businesses present on the productivity market applications.

Regardless of the accuracy of such a statistic, we can state that there is no tracking method which can be accurate in measuring the performance of each user of such applications. In fact, DaddyDo aims to compensate for this by making sure that there is no pressure placed on users placed in order to make them feel like they should be doing the tasks they mark as To Do. On the contrary, the objective of DaddyDo is to support users in their journey to parenthood and constantly offer them information on how to better optimize their time, based on what is recommended to do and consider a priority in each of the 40 weeks of pregnancy.

2.2. Comparisons of DaddyDo with other applications

Compared with DaddyDo, another application for fathers on the market is **Daddy Up**[5] is aiming to be the 'the dad's field guide to pregnancy' according to their description.
It has the following features:

[4] SMITH N., 2015, *Are productivity apps more hype than help?*, BBC, https://www.bbc.com/news/business-34506590
[5] Sycamore Spur, LLC, *Daddy Up*, 2022, https://apps.apple.com/us/app/daddy-up/id1097347717

- weekly pregnancy tracking
- baby-size comparisons
- customizable daddy checklist
- journal log
- contraction counter
- shareable baby announcement

In comparison with Daddy Do, this app brings to the table more features which are out of the scope of Daddy Do. The Daddy Do app is aiming to build a daddy checklist, customized for the 40 weeks of pregnancy. It contains information about the baby size and suggestions on what to put on the checklist week by week. It will also have a tracking by date system set in place, in such a way that users can track their tasks based on the date they inserted it in the application; based on this date, the users will be able to also see separately the tasks inserted in the last seven days. Overall, DaddyDo aims to help fathers to be only for the approximately 40 weeks of pregnancy and it's a to do list for better organizing the time. It does not have a weekly pregnancy tracker, baby-size comparisons, journal log, contraction counter or a sharable baby announcement feature.

The business model of Daddy Up is to be a free application running ads. The main revenue is from ads.

Another application on the market is **Who's Your Daddy?**[6] This is the No. 1 App in Health and Fitness in Australia. According to its description, it aims to help dads in their journey to parenthood using simple and humorous language. It has the following features:

- Daily tips about what to do and what not to do during pregnancy
- 42 weekly updates for the father to be, mother to be and baby
- A timeline with key dates for the pregnancy and a calendar integration
- Various other tools: contraction counter, a hospital bag checklist, to-do-list and baby name list.

In comparison, the users of Daddy Do will only be dads. The app will only provide tips for fathers to be, weekly, during the 40 weeks of pregnancy. It will provide information to dads in the form of available documentation to read week by week and tips on what to do (not in the form of daly tips). It will not exceed the to-do productivity app scope with bringing other features into the spotlight (like a contraction timer). However, in the weekly available documentation, there will be suggestions on what to add as a hospital back checklist and potential resources for deciding on baby names.

The business model of Who's your Daddy is to charge a fee for users (2.99 $ in the App store).

What to Expect[7] is an app designed especially for mothers to be, but it is used by dads as well. According to its description, it is widely used by ~15 millions users worldwide, mostly moms. It has multiple features like:

- Week-by-week pregnancy tracker

[6] Unspecified author, 2022, *Who's Your Daddy*, https://apps.apple.com/us/app/whos-your-daddy/id843714656

[7] Everyday Health, Inc., 2022, *Pregnancy & Baby Tracker WTE 12+,* https://apps.apple.com/us/app/pregnancy-tracker-from-whattoexpect/id289560144

- Baby development week-by-week and month-by-month guides
- Daily tips
- Ovulation calculator
- Photo journal
- Baby feeding tracker
- Baby registry checklist
- Baby product reviews

In comparison, this application exceeds the scope of Daddy Do, given that 1/ it is focused on mothers to be, the baby and not on fathers to be 2/ it is designed to cover more than the 40 weeks of pregnancy 3/ it is not focused on the to-do feature app for dads.
The business model of What to expect is to be a Free application running ads.

The business model of DaddyDo will consider the final project outcome. Based on this, it can:

- Be listed on stores at a certain price;
- Be free for users and run ads for revenue;
- Become open source software, and provide support services for users on top of it.

In conclusion, Daddy Do is an idea which will fill in the gap currently existent on the market in order to offer to fathers to be a simple and efficient product, guiding them through their fatherhood journey.

3. Design

3.1. Domain and users

The domain of the DaddyDo mobile application is the pregnancy tracker applications category, as explained in Section 1 of the present report.

The users are future fathers that will find in this application a comprehensive tool meant to guide them into their fatherhood journey during the approximately 40 weeks of pregnancy. The focus is on fathers only, since DaddyDo is meant to balance the existing gap between solutions available for mothers and for fathers, which currently is focusing significantly on mothers only and only tangentially on fathers as well.

Also, as opposed to a general purpose productivity application, DaddyDo is focused solely on this pregnancy journey of fathers-to-be. What makes it particularly stand out from the crowd of other applications is the feature related to the information and tips for the approximately 40 weeks of pregnancy, which is targeted on the specific users. The domain of pregnancy applications in general combines information that is relevant for the various actors involved in the pregnancy journey. Advice targeted solely on fathers-to-be is something which is not common for the vast majority of information available currently on the market, as explained in Section 1 of the present report. As a goal, the users of the DaddyDo application will find the

personalized content as a reason for using the application as opposed to a general purpose productivity application.

3.2. Justification of features based on the domain and users

The main features of the DaddyDo application are the following:

- **Ability to add tasks** in the application with the help of a customized button present / accessible on the main pages of the application, with the exception of the pages with the individual week's cards. This ability helps users organize their specific tasks. Each entry has a title description on the Tasks pages (All Tasks and the Last 7 days tasks) of the application. This description is available also on the page where the individual task is managed (entered or edited).
- **View all tasks page** which is helping users get an overview of all the tasks on the list. This contains the following elements, in order to provide the user with the relevant information:
    - The **description of the task**, for providing the user with a visual information about the information.
    - The **date** when the task was created, for helping the user keep track of the tasks.
- **Last 7 days tasks page**, which aims to display for the user only the tasks which were dated in the last 7 days, according to the date provided.
- **Task manager page**, which is available in two modes: Edit and Add.
    - If the page is in **Edit mode**, it was accessed by the user by tapping on an already existent task. This will display the following feature elements:
        - The **description** and the **date** for the task
        - The **delete button** for the selected task. This button is available for the users only here, in order to make sure that they are not deleting relevant tasks too easily from the main page.
- **Weekly pregnancy cards library**: this is a page accessible from the bottom tags navigation available. It is displaying a page with multiple buttons which are destined for 42 individual pages. These pages are multiple information cards, one for each of the approximately 40 weeks of pregnancy. By clicking on the card, the user will be taken to the page of the relevant week card, which displays information specific to that week, tips for what to do in that week and aspects to consider. Each of the 40 weeks of pregnancy has its own specific information to follow, so this feature is meant to offer users a comprehensive guide on:
    - **The size of the baby**, comparing it to a familiar element (e.g. a fruit). This is aiming to be an interesting way of presenting the information for the users. The cover of each card will be an image with that element.
    - **Five ideas for what to do** in that particular week and customized for fathers-to-be, from their perspective.

3.3. Overall structure of the project

3.3.1. Visual interface of the mobile application

In Figure 1 we can notice the All 40+ weeks of pregnancy wireframe with all the buttons specific for each week.

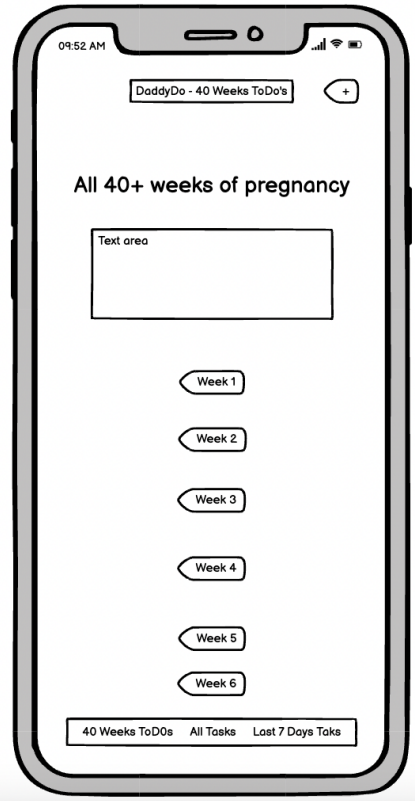

Figure 1

In Figure 2 we can notice the wireframe for a page with the content displayed for specific each pregnancy week.

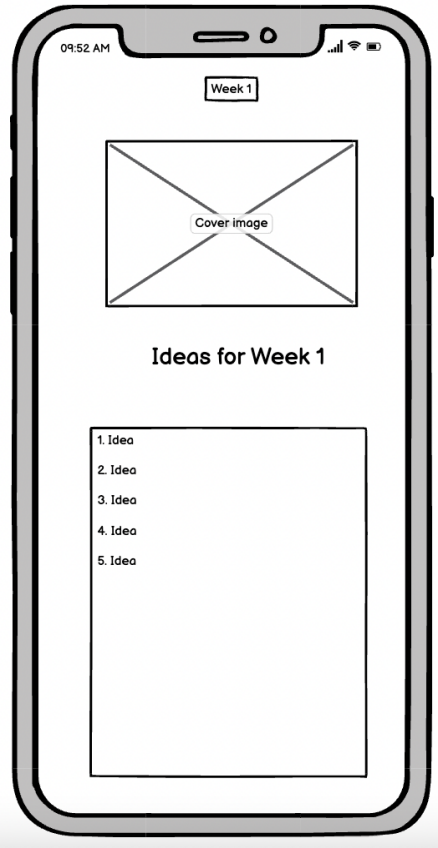

Figure 2

In Figure 3 we can notice the wireframe for the All Tasks page.

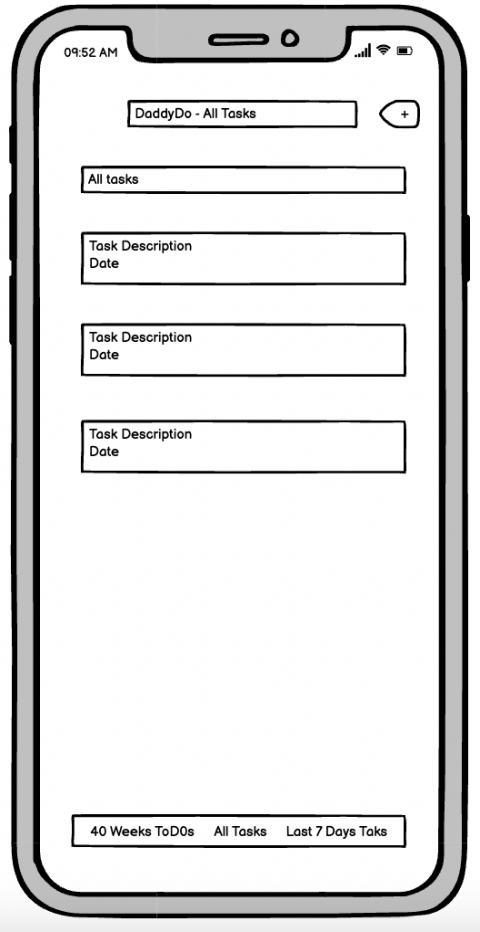

Figure 3

In Figure 4, we can notice the Last 7 Days Taks page, which is almost identical to the one presented in Figure 3 with the All tasks page, for simplicity of application use.

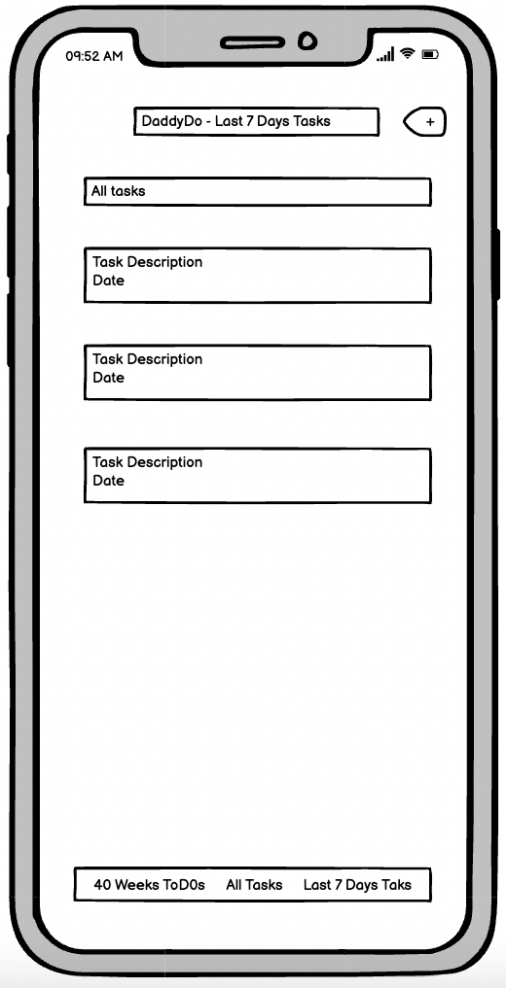

Figure 4

In Figure 5, we can notice the wireframe for the Task manager page, which is displayed in the Add task mode, without the delete button present.

Figure 5

In Figure 6, we can see the same Task manager page, but in Edit mode, having present on the display also the delete button.

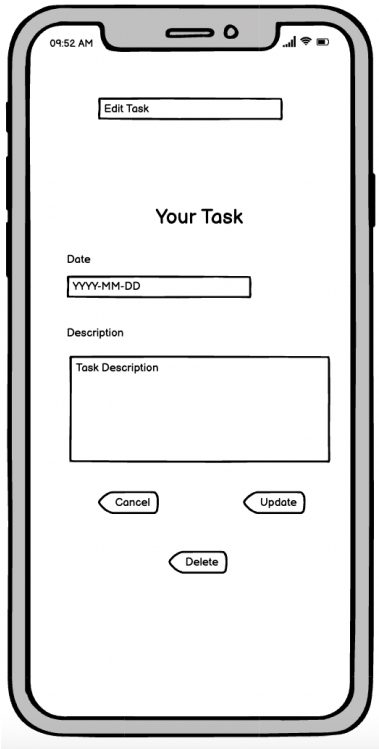

Figure 6

In terms of visual representation of the DaddyDo application, the error messages and alert texts from the Task manager page are important features as well, but the level of detail of the wireframes is less than the one that would display the relevant error color that is shown when the user inserts wrong content into the Date or Description fields.

3.3.2. User flow diagram

In Figure 7, we can notice a visual representation of the user flow diagram, showing how the user is navigating from the main screens, based on both the navigation and also the buttons available on each page.

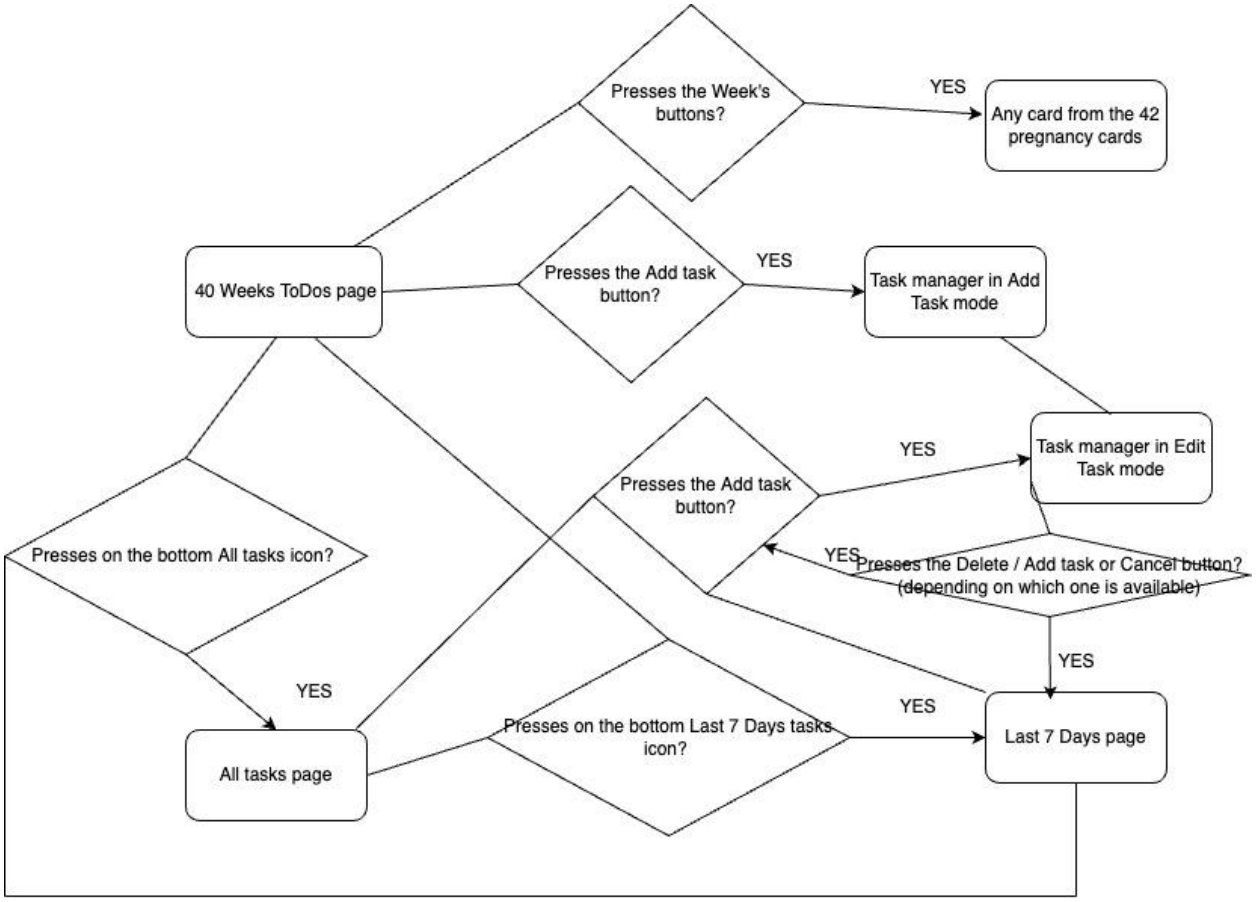

Figure 7

3.4. Key technologies and methods

In terms of techniques and processes, this project makes use of:

- **User flow diagrams** and **wireframing**. In the project planning, two sets of wireframes were scheduled: the first ones were used in the project preliminary report and were a base for the prototype version of the project (present in Figures 19 to 23 from Annex 1, from the present report) . The second ones (present in Figures 1 to 6) were created during the first spring from the planning, having as aim to determine a final look for the product and considering some elements from the user feedback arriving up to that date. Regarding the user flow diagram, the elements considered were how will the users navigate from each page of the application and how will the main features of the application be easily available.
- **Iterative development**. As seen in the planning, the project was split into granular tasks which are aimed to be reviewed cyclically and refined throughout the software development process.

Regarding the wireframes and diagrams, for the simple wireframes I opted to use **Balsamiq**, which offers a simple solution for visualizing main elements from a technical project. For the user flow diagram I opted for the **draw.io** solution.

Regarding the user feedback, this was collected using **Google forms** distributed to users that are fathers or fathers-to-be. For the interviews conducted, I opted for personal records and notes files.

The front end of the application is built with **React Native**. The choice of this technology is considering its versatility regarding building mobile applications and the features available for doing development work. This allowed testing the application on multiple platforms, on IOS and Android simulators.

Given the connection with React Native, the project makes use also of the **React** framework for various aspects related to the front end of the DaddyDo Application. Also, as a base, **Vanilla JavaScript** methods are used as well in order to complete some of the functionalities.

As a development setup, the DaddyDo application is created using the **Expo CLI** setup. This was compared at the initial moment with the **React native CLI** setup, given that it has more features, especially in regards to the testing process. The definitive decision about going with Expo CLI setup is related to the fact that it is easier to use, given that it involves less complex setup elements.

In order to install Expo CLI, by following the documentation, it was necessary to make use of **Node.js**, which enabled running the server and visualizing the output of the development work. To note is that this process helps also with the debugging aspect of the application, which is planned at every step of the development process.

Regarding a development environment, I opt for **Visual Studio Code**, which offers various features that help me during the development process.

The backend is ensured by **Firebase**, given its simplicity to use and create a mock database available in the tool. For being able to use Firebase, **Axios** was installed as well. An attempt to connect the application to **SQlite** was done as well on the local environment, but this was left out from the final product delivered .

For unit testing the application, the project made use of **Jest** and **React Test Renderer**, both tools which are specific to performing testing on React Native applications. They were used in the local environment for testing the core features of the application.

3.5. Project management

The work plan defined for the project can be seen in Gantt charts present in Figure 9 and Figure 10, both explained with the Legend image from Figure 11. The work plan for the development of

the application was formed by a series of 2 weeks sprints meant to track the progress of development, gather user feedback and implement it and test the new features developed in that period.

The two week sprints were planned as shown in the table from Figure 8:

Sprint 1
Work on 40 Weeks ToDos page
Create individual weeks cards structure
Create more accurate wireframes
Testing new app features
Sprint 2
Work on All Tasks page
Add button to edit and add tasks
Test new app features
Gather user feedback
Sprint 3
Work on the Last 7 Days Tasks page
Work on the Task manager page
Test new app features
Implement user feedback
Sprint 4
Connect the application to the backend server
Find info on cards page to display
Test new app features
Gather user feedback
Sprint 5
Implement user feedback
Testing the application

Figure 8

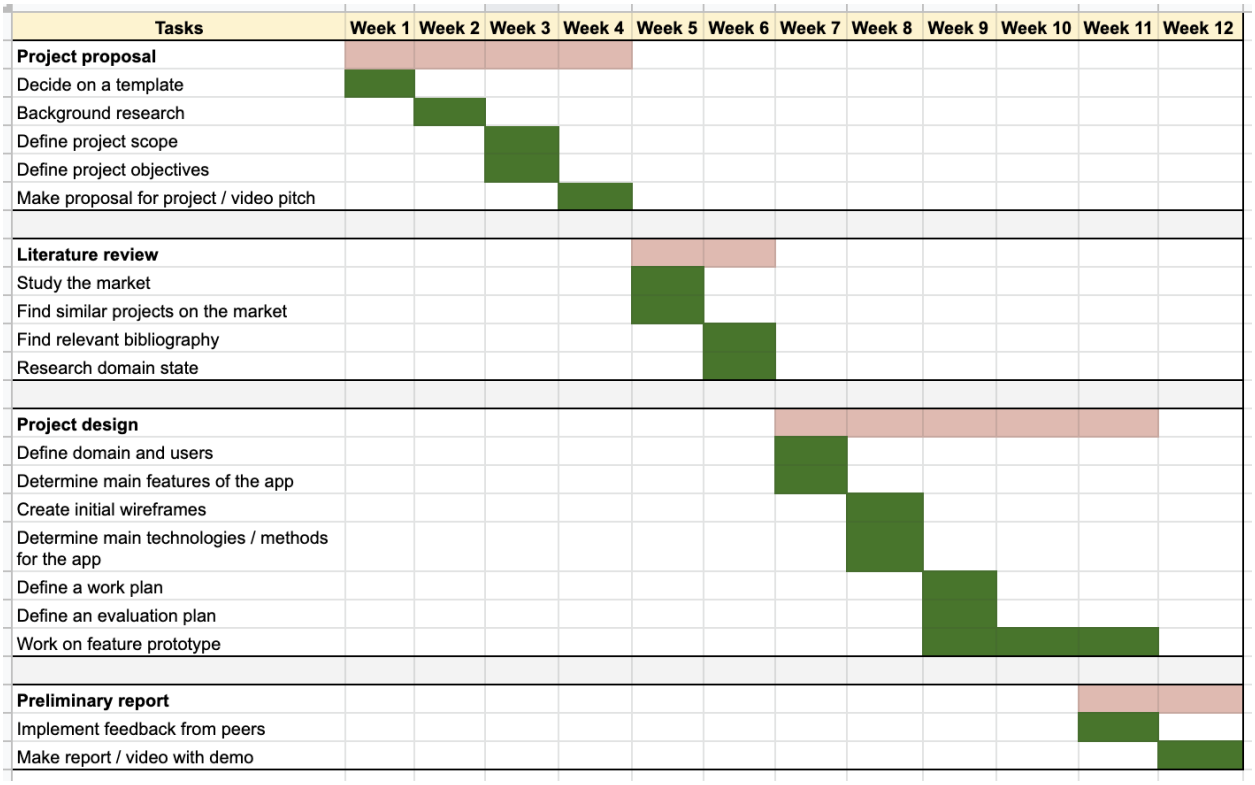
Tasks
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Project proposal
Decide on a template
Background research
Define project scope
Define project objectives
Make proposal for project / video pitch
Literature review
Study the market
Find similar projects on the market
Find relevant bibliography
Research domain state
Project design
Define domain and users
Determine main features of the app
Create initial wireframes
Determine main technologies / methods for the app
Define a work plan
Define an evaluation plan
Work on feature prototype
Preliminary report
Implement feedback from peers
Make report / video with demo

Figure 9

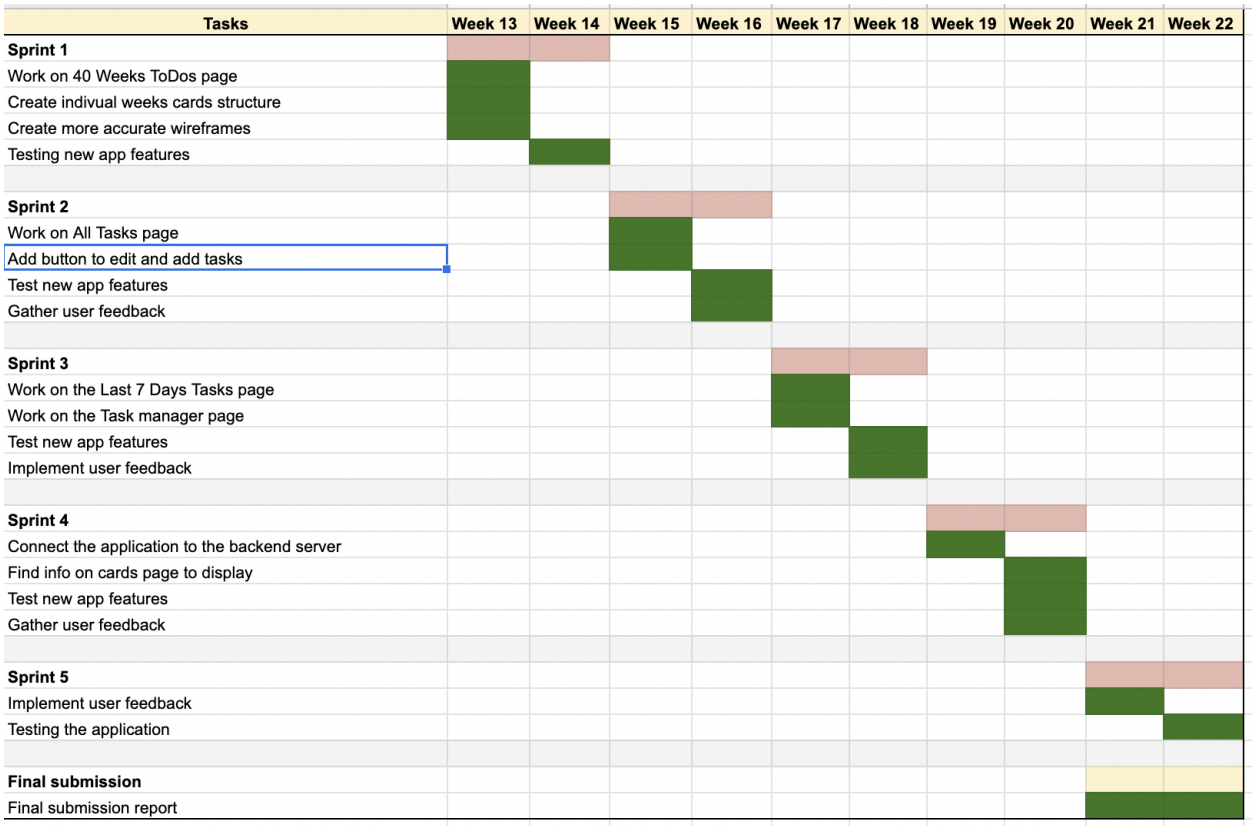

Figure 10

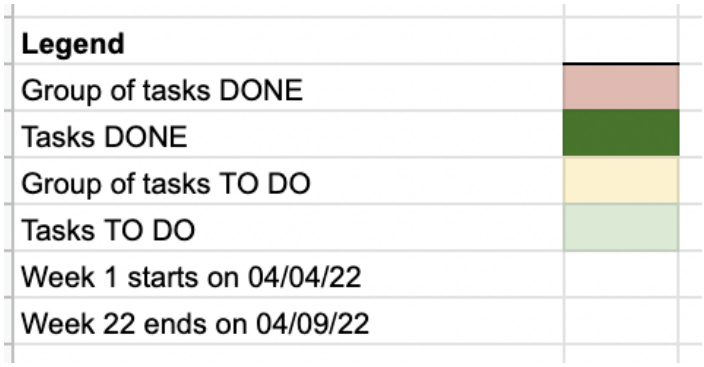

Figure 11

4. Implementation

4.1. Description of the application main features

The application consists on making available to the user the following main pages, which have the code in the Screens folder of the repository:

- An **All tasks page** which is accessible from the bottom tags of the navigation and contains an overview of all the tasks that the user has inserted in the application.

- A **Last 7 days Tasks page** which displays to the user only the tasks that were inserted in the last 7 days, according to the date added for each.
- A **Task manager** page which is available in two modes: Edit and Add task. Each mode has its own particular features:
    - In order to access the **Edit mode**, the user needs to tap on the task inserted. In particular, this page also offers a **Delete button** for the user, in such a way that makes it possible for the user to delete the task. Also, it has an **Update button** for updating the specific task.
    - For accessing the **Add task mode**, the user needs to tap on the customized button accessible from all the main screens of the application. As a particularity, this page has an **Add task button**.
    - Both modes contain the following features:
        - **Specific, customized form fields** where the user can insert the date and the description of the specific task.
        - A **Cancel button** which takes the user on the original page from where the user arrived on the Task Manager page.
    - The form present in the Task Manager page has also specific elements for **validation** of the content inserted and also **visual validation**, like displaying error messages for the user, when it's the case.
- A **Weeks Overview** page which is a summary of all the 42 weeks of pregnancy, available for the user as a main page and on each main screen in the bottom tabs navigator. This contains 42 buttons connected to each week's card which displays relevant information for the user with ideas for what to do in that specific week and information on the size of the baby.

4.2. Main algorithms, techniques and methods used in the application

4.2.1. Overall software architecture elements

In terms of the elements that make part of the architecture of the DaddyDo mobile application, the main components of the system are present in the diagram from Figure 12 . The application is collecting information from the user in terms of the tasks to be inserted in the form. It outputs the results in terms of displaying the relevant information (e.g. tasks, the information about the weeks.

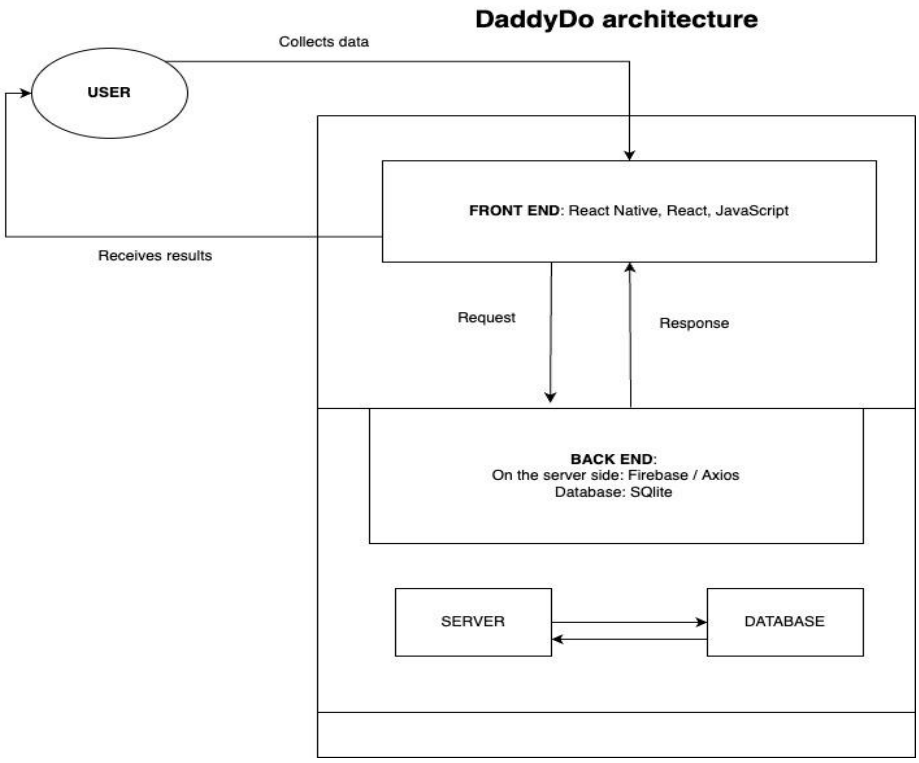

Figure 12

From a front end perspective, the program makes use of React Native, React and JavaScript, being at its core a React Native application. This makes it possible to combine all the elements of the React framework as a user interface and also, as a base, of the JavaScript programming language.

From a back end point of view, the application is connected to Firebase as a server and has some elements which makes it possible to fetch the data from there. However, this was not concluded with fully connecting the application to a database like SQlite, but this was taken into consideration on the local environment. These elements are present in Figure 12 , which shows how the server connects to the database on the back end and how the back end connects to the front end, with receiving requests and outputting the relevant responses.

4.2.2. Considerations about the frontend of the application

From the perspective of the front end side, the application is making use of some navigation components available in React Native, like NavigationContainer, createNativeStackNavigator and createBottomTabNavigator. The way it is configured is taking into consideration the user experience. It starts on the DaddyDo 40 Weeks of pregnancy overview cards page, then the bottom navigation can take the user of all the other main screens: the All task and the Last 7 Days Tasks page. The individual weeks cards and the Task manager pages are not available in the bottom page navigator or in other places apart from very specific places: by clicking the buttons of the weeks and respectively by adding or deleting a task.

In the folder structure, there is a Constants folder containing a Styles.js file, which has the GlobalStyles constant that is used throughout the entire project in order to set the main colors used in the styling of elements.

Initially there was a set of dummy data inserted in the application such that it was displayed every time the user was running the application. This was located in the store folder, in the tasks-context.js file and was replaced once there was an attempt to connect the application to a server.

We can also notice that the date is formatted using the getFormattedDate and the getDateMinusDays functions from the util folder, date.js file.

The TaskManager.js file from the Screens folder is responsible for the Add Item and the Edit Item modes in which it can be displayed. We can notice that there are more if statements considering the isEditing constant, which detects if the user is editing or not, in order to display the relevant content and activate the different functionalities available in these two modes. For example, the deleteTaskHandler function gets activated and available through the trash icon only when the user is in Editing mode.

The DaddyDo application makes use also of the Context API available in React Native, which offers a method to pass data through the component tree without having to pass props in a manual way at every level from the application. This is an improvement in terms of managing the data flow from the application. The file which is responsible for the global management of specific elements from DaddyDo is tasks-context.js from the store folder. The TasksReducer and the TasksContextProvider functions help manage the actions based on the user input (e.g.pressing on the relevant buttons), based on the cases considered: ADD, SET, UPDATE, and DELETE.

In terms of handling further user input, the form available on the Edit Task and Add Task mode from DaddyDo is outputted from the TaskForm function in the TaskForm.js file from the Manage Task folder. We can notice that the elements of the form have specific components, like the description is configured using the multiline characteristic and the date has a specific placeholder.

Furthermore, we can notice that in the form there are validation elements that help the user know if the input is correct or not. This is also in the form of visual validation exceeding the text that the input is not correct and it makes use of colors for a better outlining of the error.

4.2.3. Considerations about the backend of the application

In terms of the backend, the solutions which were found was to use the Firebase platform in order to create a server and a dummy database. It also makes use of the Axios Javascript library for making HTTP requests. In terms of connecting this server to a real database API, what was considered was to do it on the local environment and not add further backend code

into the application program. The final product has, therefore, only a connection to the server from Firebase.

The advantage of this method is that after connecting it to the server, the application can be further connected to a database API. The diagrams presented in the current project consider using SQlite, given its simplicity for mobile applications usages.

In the folder structure from DaddyDo, we can notice in the util foder the http.js file which is used to connect the application to the server. Currently, the server only stores tasks and fetches them, using the storeTask and fetchTask functions.

4.4. Visual representation of the final product

In terms of the visual representation of the final product DaddyDo, we can notice the following pages:

- The 40 Weeks ToDo's page with all the individual week's buttons, which can be seen in Figure 13.
- One week card, as example, given that they all coincide in terms of structure - which can be seen in Figure 14.
- The All week, which is displayed in Figure 15.
- The Last 7 days task page, which can be seen in Figure 16.
- The Task manager page, which can be seen in Figure 17 in Add task mode and in Figure 18 in Edit task mode.

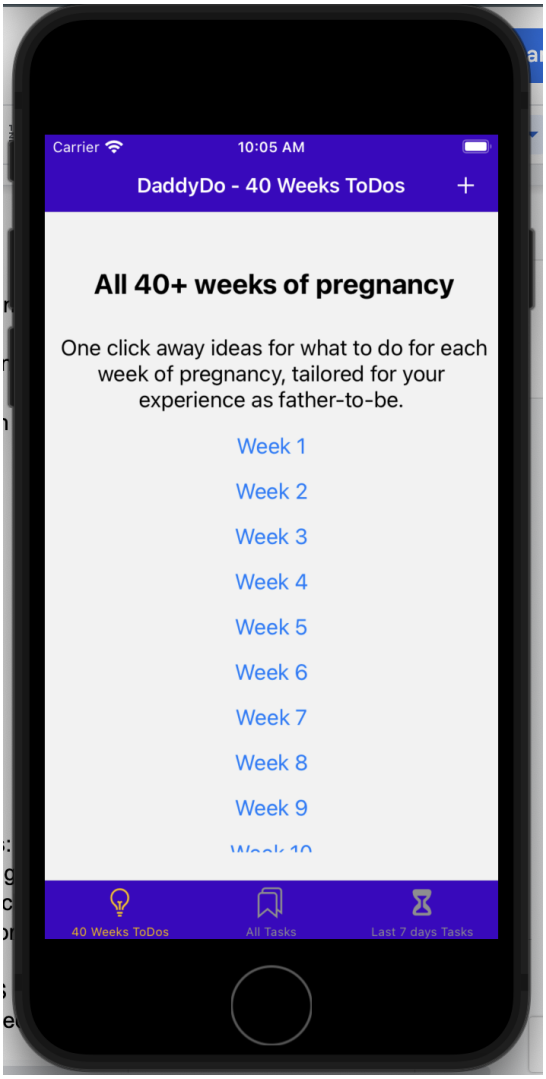
Carrier
10:05 AM
DaddyDo - 40 Weeks ToDos
All 40+ weeks of pregnancy
One click away ideas for what to do for each week of pregnancy, tailored for your experience as father-to-be.
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
40 Weeks ToDos
All Tasks
Last 7 days Tasks

Figure 13


Carrier
10:06 AM
Week 1
Ideas for Week 1
This week your baby has no size yet, because it is not yet conceived. The first two weeks of a pregnancy are destined to have an ovulation happenig, and conception takes place afterwards.
Here are some suggestions about what to do this week:
1. Plan to spend as much time with your partner and make sure you are working on conceiving the baby.

Figure 14

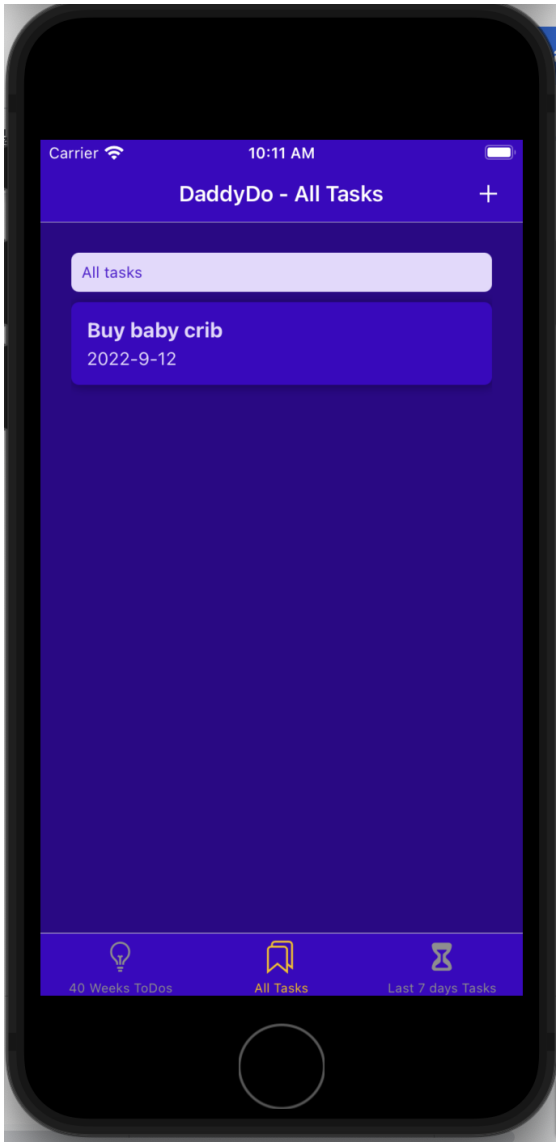
Carrier
10:11 AM
DaddyDo - All Tasks
All tasks
Buy baby crib
2022-9-12
40 Weeks ToDos
All Tasks
Last 7 days Tasks

Figure 15

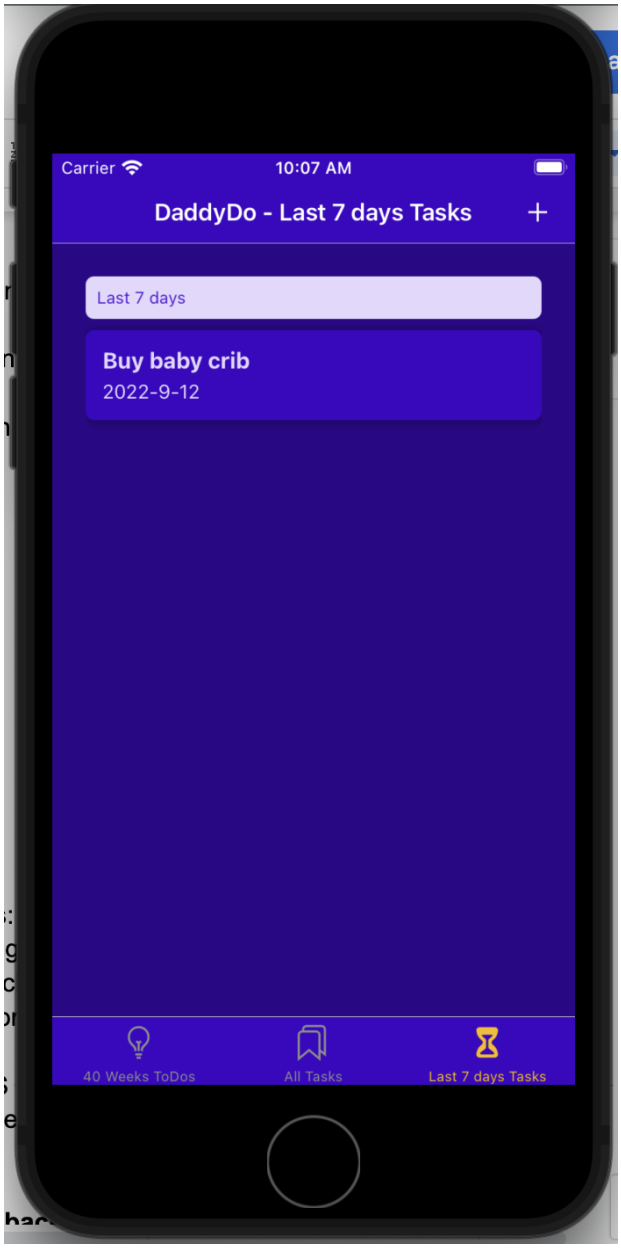
Carrier
10:07 AM
DaddyDo - Last 7 days Tasks
Last 7 days
Buy baby crib
2022-9-12
40 Weeks ToDos
All Tasks
Last 7 days Tasks

Figure 16

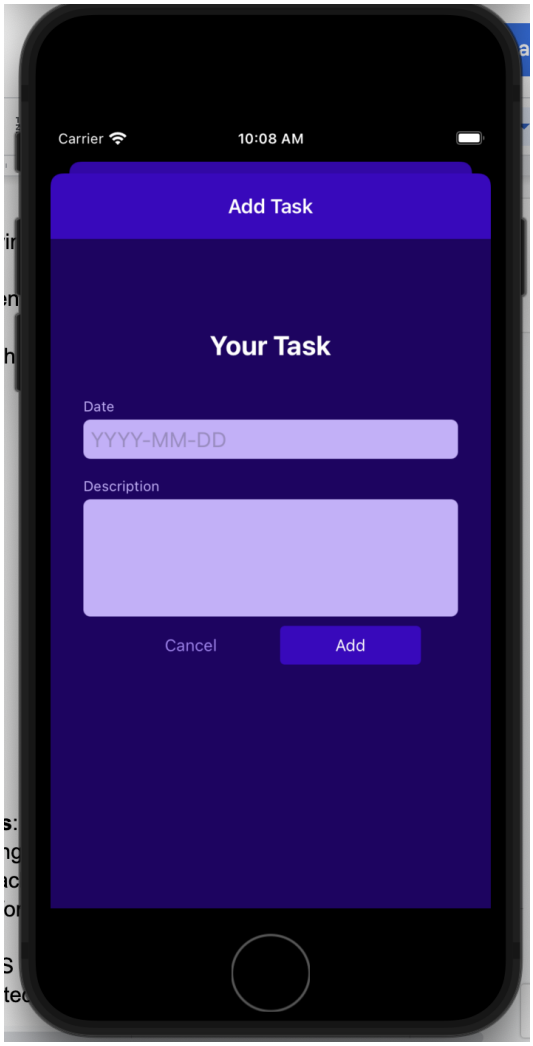
Carrier
10:08 AM
Add Task
Your Task
Date
YYYY-MM-DD
Description
Cancel
Add

Figure 17

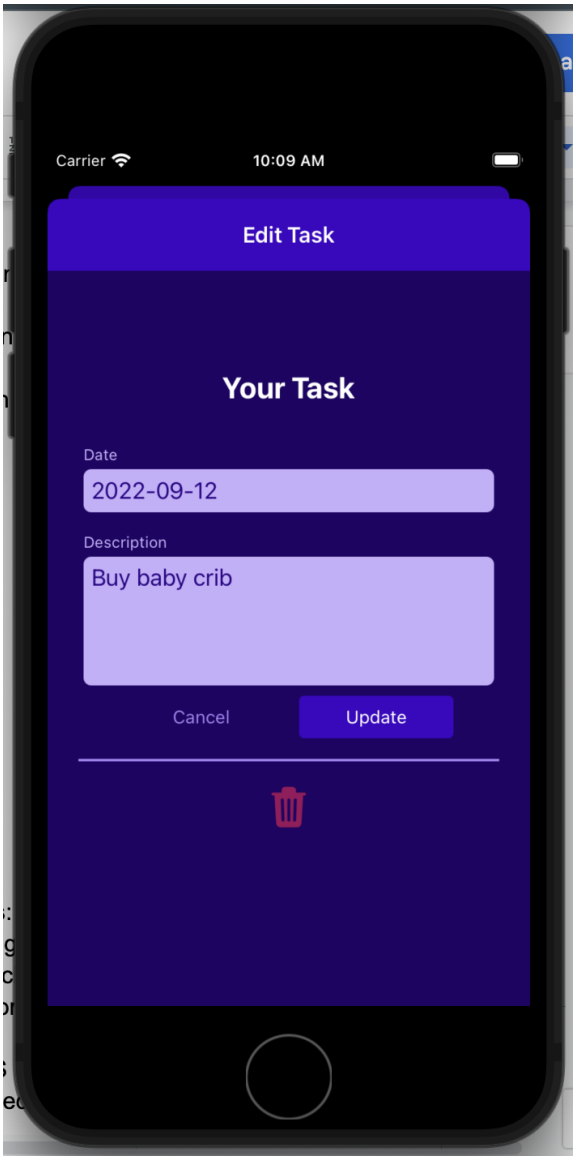

Figure 18

5. Evaluation

5.1. Overall evaluation plan

The evaluation plan for the DaddyDo application considered the following **testing methods**:

- **Unit testing** performed using Jest and React Test Renderer. This had as aim testing the main features of the application and making sure they work properly. The testing tackled both the logic and the UI of the mobile application. A detailed plan and execution for the testing was scheduled each Sprint.

- **User testing**. This had as aim to test the application on different platforms: IoS and Android. This was performed manually and was initially scheduled to be executed in each of the Sprints.

Regarding evaluating the application, apart from testing, the following **gathering feedback methods** ware ere planned:

- **Iterative feedback** from various use cases throughout the development stage, scheduled at each of the five Sprints. This feedback gathered helped improve the development process. The Sprints were planned in an alternate way: one week for gathering the feedback and one week for implementing it.
- **Feedback from users** planned in Sprints 2 and 4, meant to gather feedback about the main features of the application which will be built during that period. Sprints 3 and 5 have planned an implementation of this feedback, for improving the application.

5.2. User testing

5.2.1. Methodologies applied and overall results of user testing

Considering that DaddyDo is a mobile application with end users coming from various backgrounds, but all having in common the particularity that they are fathers-to-be, the profile for the user to consider was shaped accordingly. The methodologies applied in order to gather user feedback were balanced in between quantitative and qualitative methods.

In terms of the quantitative methods, a survey was conducted in Sprint 2 for one week and given to participants who are either fathers-to-be or are fathers (given that they can use their previous experience and this would fit the profile). The form given to participants was the System Usability Scale (SUS) Score Calculator that takes into consideration the following elements present in Figure 24 from Annex 2.[8]

Also, there is a grading for each of these items from Strongly disagree to Strongly agree. The questionnaire was applied to 10 users and the DaddyDo application received a 75% overall score.

Given that this method was insightful for determining the usability of the project overall, the results of this method lacked in terms of specific details. The qualitative method of interviewing users was used to balance this and gather further details. Three users were interviewed in one on one meetings, via videoconference of 30 minutes each. The users provided useful feedback for the application's features and this helped in the overall results of the user testing and the implementation of the user feedback.

[8] BROOKE J., *System Usability Scale (SUS) Score Calculator*, https://stuart-cunningham.github.io/sus/

5.2.2. Implementation of user-specific feedback

The user feedback provided details which helped improve specific elements of the application:

- The individual cards for each pregnancy week were changed from their initial form in order to provide the information in a more succinct format. They were originally thought to be more focused on detailed information, but the majority of the users considered that a more succinct format would be more suitable for the way the application is constructed. Therefore, each card will display only 5 tips for each week of the pregnancy cards and will also provide the visual element of the image as a conver.

- The validation visual elements from the form were improved based on user feedback. Initially they were designed as simple Alert messages. This was changed to adding the change of color elements for making more obvious to the user that the information displayed is not correct.

- The presence of the Add button from the top of the page on the right was changed based on user feedback. Initially, the button was supposed to have text written inside it, but this was changed into a simple customized button with the '+' sign, which makes use of the expectation of users that this sign is enough for knowing that this will add a task.

- Some elements were adapted based on the IOS platform and the Android one. This was based on the evaluation conducted on specific simulators. For example, the elevation element for styling is used for adapting to the Android platform.

5.3. Considerations about unit testing

In terms of the unit testing conducted, this took place in the local environment and it consisted in testing the main features of the application in all phases of the development process using Jest and React Test Renderer. The results were passed tests for some of the main functions from the DaddyDo application.

5.4. Critical evaluation of the final product

5.3.1. Successful features of the final product

In terms of the successful features of the final product, the DaddyDo application helps users better organize the tasks specific to each week of the approximately 40 weeks of pregnancy. This is done using the following main features of the final product:

- The add task button was appreciated particularly by users for its simplicity in its final form.

- The form for the task management which is displayed both in Edit and in Add task modes has each field configured based on its specific elements: the date and the description need specific inputs.
- The validation error system for each task is a success of the project, helping users better be informed about the content they insert in the application.
- The navigation specific elements and navigating programmatically between screens is something that helps users have a better experience.
- Each card specific for the weeks has a format which is simple and better organized in terms of structure for the content and visual representation of the information.

5.3.2. Possible improvements for future versions

Regarding possible improvements for future versions of the DaddyDo application, some ideas would be as following:

- Connecting the application to a backend with a database.

- Adding authentication to the application, for better protection and privacy for the user.

- Adding specific content for each of the cards. This was challenging to do in the current format and, based on user feedback, the decision to focus more on the structure than on the content was taken. Actual content for each week should be decided based on a multi-disciplinary team in a future version of the application. The information currently available in the final product is offered only as a placeholder for content which should be either decided with specific information (e.g. from the medical field) from someone with the appropriate expertise or with adding a clear disclaimer that the information is not professional advice.

- Connecting the application to a calendar API like Google Calendar, in order to add tasks in a calendar format.

- Making more fields available in the form from the Task Manager screen, which could potentially give the user the possibility to add images to each task or select a location using Google Maps or a similar API.

6. Conclusion

The conclusion of this report is going to be presented from the perspective of the objectives set in the introductory section.

One aim of the project was to design and develop the DaddyDo mobile web application which provides a tool for future fathers that wish to track their activities during the 40 weeks of their pregnancy journey into fatherhood. This was achieved with the final product, though

improvements can be done in terms of usability, testing, and adding more features in future versions of the application. However, the fact that the development of the application followed a plan and had a deliverable shape at the end of the semester can be seen as a success on which more elements could be built in the future. For making the application available in one of the main stores for mobile applications, it would require improvements and this can take place in future versions.

Another aspect to consider is also making the application open source, in such a way that the global community of developers could contribute to its future shape. This would mean changes from the perspective of intellectual property, adapted to the chosen license in which the project can be released (e.g. LGPL license).

The research conducted in the field of pregnancy productivity applications relieved a clear need for a focus on fathers-to-be as users. One of the initial objectives stated was to improve the availability of tools on the market which are available solely to fathers-to-be as users. This aspect was achieved, given that the application targets only fathers-to-be and aims to offer them a solution tailored for their specific needs.

Another important objective was to stress out the importance of fathers-to-be in the pregnancy process and enhance their continuous involvement in the pregnancy process. Given that the application is destined for this type of specific users, the opportunity to interact with users in order to get feedback for the application revealed an interest for such application and will to have fathers-to-be more involved.

In conclusion, the need for applications such as DaddyDo is clearly existent on the current market of pregnancy tracking applications and the domain of potential users is vast. The implementation of the main features of the application reflects the focus on productivity application elements, such as adding, deleting or updating tasks in lists. Though for a final submission for one of the relevant stores for mobile applications improvements would need to be done for the final DaddyDo product, it represents an important step forward into achieving its main objectives, in particular the societal one of promoting fathers-to-be involvement into the pregnancy process.

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8. Annexes

8.1. Initial wireframes for the project

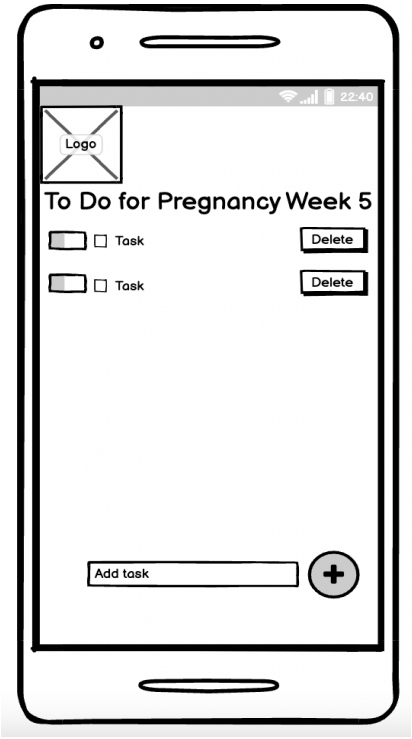

Figure 19

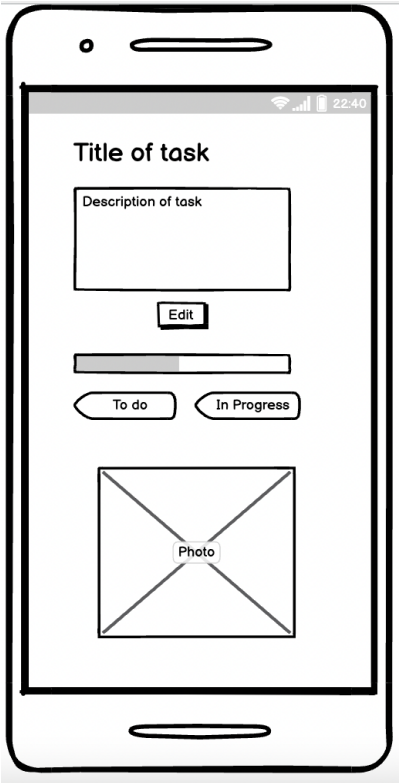
22:40
Title of task
Description of task
Edit
To do
In Progress
Photo

Figure 20

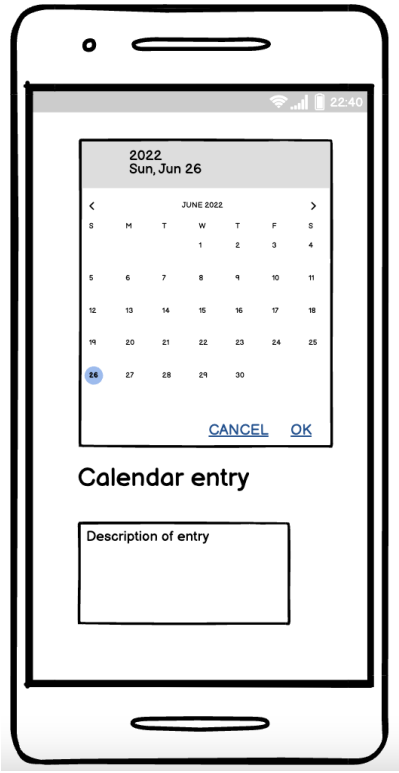
22:40
2022
Sun, Jun 26
JUNE 2022
S M T W T F S
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30
CANCEL OK
Calendar entry
Description of entry

Figure 21

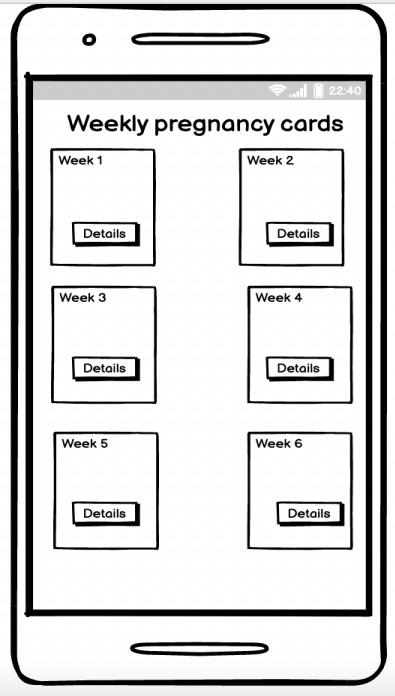

Figure 22

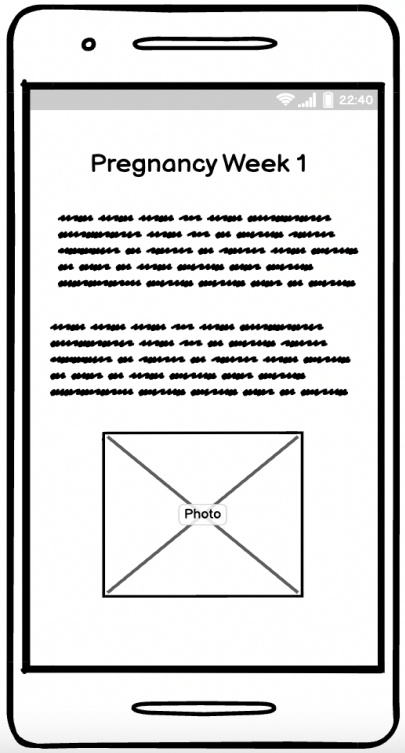

Figure 23

8.2. System Usability Scale (SUS) Score Calculator

Question	1	2	3	4	5
	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently.	○	○	○	○	○
2. I found the system unnecessarily complex.	○	○	○	○	○
3. I thought the system was easy to use.	○	○	○	○	○
4. I think that I would need the support of a technical person to be able to use this system.	○	○	○	○	○
5. I found the various functions in this system were well integrated.	○	○	○	○	○
6. I thought there was too much inconsistency in this system.	○	○	○	○	○
7. I would imagine that most people would learn to use this system very quickly.	○	○	○	○	○
8. I found the system very cumbersome to use.	○	○	○	○	○
9. I felt very confident using the system.	○	○	○	○	○
10. I needed to learn a lot of things before I could get going with this system.	○	○	○	○	○

Figure 24