How to develop the EatMyRide app in a user-centred approach?

Developing a user experience feedback system

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July 2, 2021

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Abstract

Nutrition is a vital part of the cycling experience and can make a big difference on performance, even for amateur riders. Energy consumption differs for every athlete, and everyone has their own sugar capacity and minimum threshold. Currently, EatMyRide develops its mobile application without much user feedback. Therefore this research puts feedback at the centre of design to improve the user-experience.

The aim is to create an in-app system to collect feedback from users, extract useful information and implement the outcome into the application. For this research, EatMyRide users were asked to participate in a diary probe study to evaluate their app usage and analyse their feedback. Afterwards, iterations of the prototype were tested among them to verify the findings.

The system has a menu where users can find help or leave their thoughts at any time. EatMyRide can view this feedback in an online dashboard and connect with users to solve their issues. Finally, in-app feedback systems are a viable way of collecting user input during development, however, they should provide impact and avoid interruptions to properly involve the user.

Acknowledgements

I am proud of this thesis in front of you, however I could not have done it alone.

First of all, I would like to thank my supervisor Robby van Delden and critical observer Armağan Karahanoğlu, for their guidance, feedback, and inspiring thoughts. Our meetings were insightful and I could always reach out in case of questions. Special thanks go to Rochelle van Spaargaren, who was also working with EatMyRide at the same time as me and with whom I had a great collaboration. And of course, thanks to Hans and Joram, my supervisors from EatMyRide, for their help and guidance. In addition, thanks to all participants and experts who helped in making the project come to life.

I would like to thank my mother Pascale, whom I could always call to voice my concerns and thoughts. My father Jurgen, who inspires me to become great at what I do. My two brothers, Floris and Olivier, whom I could always bother to proofread my thesis, even when they had exams. And finally, the family dogs Smits and Dot, who were always there to go for a walk or to give me a hug.

Thank You.

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Glossary

CreaTe Creative Technology, study at the University of Twente

Development roadmap Framework to visualise the technology timeline of a digital product. EatMyRide users a sprint framework for their development.

iOS Operating system on Apple devices

Javascript Programming language that is used for complex features on the web

Garmin Computer Bicycle computer to track riders performance

Native Software which is build specifically for a particular device, in this research for Android and Apple devices

React Native JavaScript library to build user interfaces

Roadmap Planning or strategy used to achieve a development goal

Strava Community of athletes from all over the world, who want to get the most out of themselves. Strava helps athletes experience this via social sporting, by connecting via mobile interactions

UI User interface

UX User experience

UUID Universally unique identifier; a 32 hexadecimal number assigned to database entries

1 Introduction

This chapter introduces EatMyRide, the client involved in the research. Their application and current problems show their need for a feedback system. The aim, approach and research questions are also explained.

1.1 Research background

Nutrition is a vital part of the cycling experience and can make a big difference on performance, even for amateur riders. Energy consumption differs for every athlete, and everyone has its own sugar capacity and minimum threshold [1]. With the EatMyRide application [2], users can make a personalized nutrition and drinking plan to control their energy levels. The plan is based on data from Strava and the Garmin cycling computer, leading to an optimized plan for the athlete's energy needs and consumption. An impression of the application can be seen in figure 1 below.

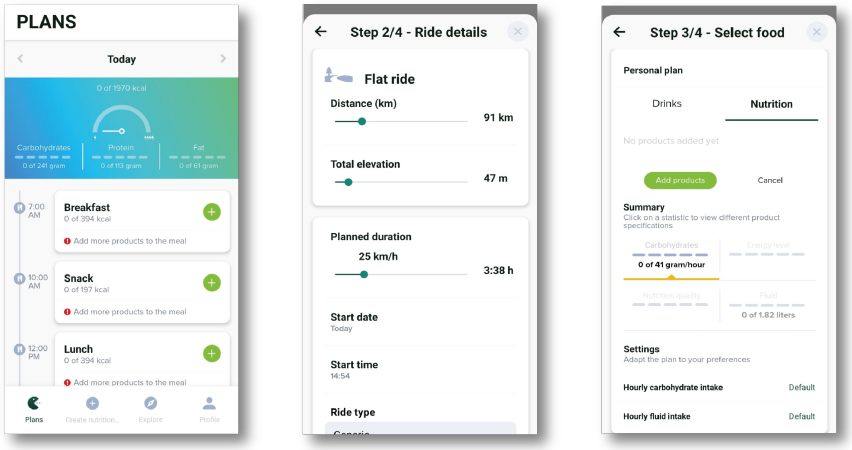


Figure 1: The EatMyRide application

EatMyRide shows the personal energy needs to the athlete, after which products can be chosen to reach the desired amount. This way, athletes still have some freedom in choosing what to eat. Notifications during the ride inform the cyclist to consume the right product at the right time to keep their energy at the right level. Timing is based on the planned route, including weather and height variables.

The current application has been live for well over a year and EatMyRide wants to know how the users are experiencing the application thus far. Up till now, this was mostly done via surveys and personal contact with some active users. The survey responses were limited, as questions were mostly about the basic functionalities and not about the user-experience. Personal contact, via email, WhatsApp, and their website, result in bug reports or login issues. These must be forwarded to the developers working on the app, which takes time and unnecessary steps. The current situation is invisible to most users, and not scalable nor will it capture the needs and experience of athletes.

Decisions on development are currently based on intuition and limited resources that lack user involvement, which is a risk for EatMyRide. Developing new features and updates can take months, and one bad decision could lead to a lot of costs, wasted time and a feature users will not be using. Therefore, a system is required to capture the experience of the EatMyRide users in real-time and adjust the development roadmap to the received feedback.

1.2 Research aim

This research focuses on the development of a feedback tool or system for the EatMyRide application, enabling continuous user involvement in the development of the app. The system aims to collect input and feedback from the user, to improve the user experience and validate the content. The tool will gather information like opinions about new features. Users will also be asked about existing features and their experience with them, to validate their current use. Extracting the useful feedback will form the grounds for development, and ultimately implementation, of new and updated features.

1.3 Approach

For the research, I decided that the best approach was to use iterative design. Beginning with an initial goal, and starting with literature research on feedback. However it starts almost immediately with designing concepts, even during the background research. After I completed the research, I refined the concepts into a single prototype. Stakeholders are heavily involved in the early testing of these prototypes and overall, the design could easily be adapted. The result is a feedback system which is validated and has an improved user experience. The chosen iterative design process for this research is an adaptation of the design process for Creative Technology, by Mader and Eggink [3]. More on the methods will be explained in chapter 3.

1.4 Scope

This thesis will include research on feedback techniques and how these can be implemented in the envisioned feedback system. Existing solutions are analysed in a State of the Art review and will be used to design concepts. A requirement analysis for stakeholders will lead to clear constraints and desires to make the tool useful. Multiple prototypes will be made and tested with users, to suit the system to their needs. At the final stage of the research, an interactive prototype will show how the envisioned tool helps to further develop the EatMyRide application.

During first phases, research on the effectiveness of feedback was done by conducting a literature review. Also, a contextual analysis is conducted to empathize with cyclists and to lay the groundwork for the requirements of the feedback tool. The company envisions three groups of target users: professional riders, fanatic amateur riders and lastly amateur riders. These will be compared to the research and redefined for the tool. In the next phases I will build a prototype and test it with real users. The final prototype consists of an interactive tool based on the current EatMyRide application and is tested more extensively. Finally, the results form a conclusion and I will give advice on future development. The references, ethical analysis and other appendixes can be found at the back of this document.

1.5 Research questions

The main research question for the research is:

> "How should a feedback system be designed, in order to inspire the users to give feedback, and help further develop the EatMyRide application?"

This research question has three sub questions focusing on the way of gathering feedback, when and where to ask for feedback and on how to determine who to ask for feedback. A big part of the research will also focus on the effectiveness of feedback, and what useful feedback looks like, as that is crucial to make the system useful. The following questions will serve as sub questions to the main question.

- "What do 'inspiring questions' look like and how can they be used to gather feedback?"
- "How can users be motivated to keep giving feedback?"
- "What data will be gathered and how should it be analysed?"

1.6 Structure

Figure 2 on the next page summarizes the structure of the thesis in a visual way. The graph on the next page shows the metaphorical mountain climb of this research, as further along more work is needed to realise the prototype. Each of the peaks visualises a milestone in the research with the appropriate method to achieve it. Below the graph each of the thesis sections, as described at 1.4 Research Scope, are shown along with the research questions, and sub goal of the phase.

BSc Project: EatMyRide

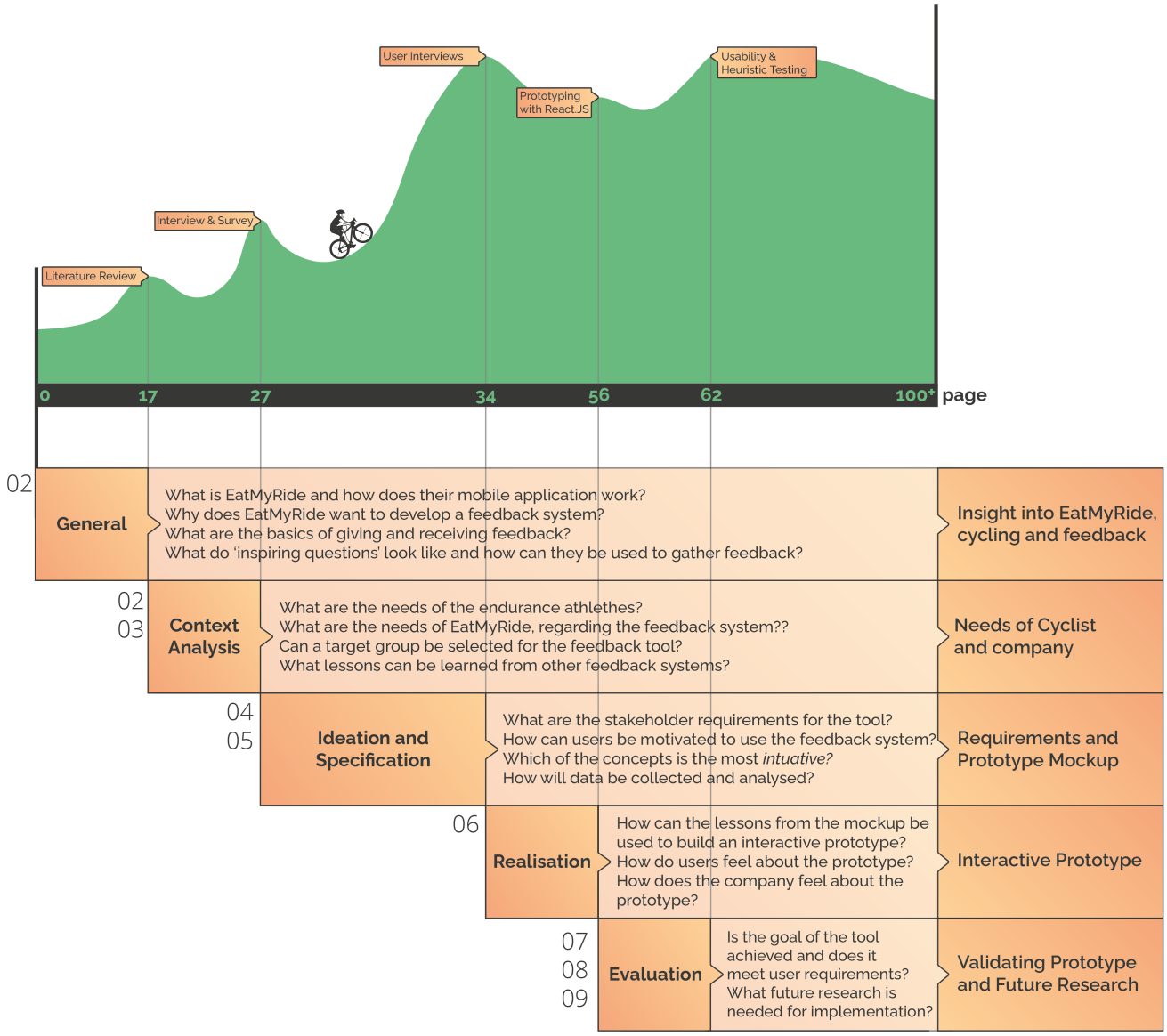


Figure 2: Research outline with research questions

2 Background Research

This chapter includes the necessary research for the development of a feedback system. Literature research on feedback formed basics guidelines for giving and receiving feedback. The state of the art review gives insight into existing applications. Finally, stakeholder research showed the needs of EatMyRide and their users.

2.1 Literature research on feedback

In this section, the results of the literature research on giving and receiving feedback are presented, along with guidelines for implementation in the design of the feedback system. The literature review was conducted as part of the Academic Writing Course at the University of Twente [4].

2.1.1 History of feedback

Feedback and communication have been part of our lives for a long time. When looking for the definition of feedback, the earliest signs date back to China, somewhere around 500BC. The Chinese philosopher Confucius, a teacher to many [5, 6, 7], was the first to state that the key to being understood is clear communication.

With the rise of the industrial revolution, almost two thousand years later, feedback and communication became more relevant for the general public, as more and more people got educated. Around 1775, James Watts made improvements to the steam engine and saved fuel by using feedback in his system [8]. Nowadays, feedback is everywhere, especially in the medical, educational and engineering fields. [9, 10, 11, 12] Feedback is defined according to the definition by Ramaprasad [13].

> "Feedback is information about the gap between the actual level and the reference level which is subsequently used to alter the gap in some way" (Ramaprasad, 1983)

Ramaprasad states three vital feedback points in the definition: The focus, the necessary conditions and comparing the data to bridge an information gap [13]. The focus comes down to limiting the feedback only to the relevant parameters. For feedback to be useful, it is necessary to have known data as reference. The information gap can be bridged by comparing the received and perceived feedback with the reference data. Ramani et al. [12] agrees with these and emphasize the importance of the hosts' engagement in order to learn.

2.1.2 Giving feedback

The relationship between the person giving feedback and the feedback receiver should be determined well before any feedback can be given. This way, the goal of the feedback can become clearer for both parties, as this is influenced by their relationship. Newman et al. [9] state that the receiver is determined as a host, who invites guests over to his house. The guests, in this case, are considered observers, who can help the host to alter their behaviour through the provided feedback.

This relationship helps the person receiving the feedback to be open for feedback. Both Newman and Renninger [9, 7] state that timing is important, as humans are quick to judge feedback as criticism. The research by Baron et. Al shows how destructive criticism can have a negative impact on the receiver

[14]. As a result, the hosts defence mechanisms will be triggered and they will not alter their behaviour. According to Ramani and Newman [12, 9], this also impacts the credibility of the observer negatively and could result in the host not wanting to receive feedback from them anymore.

Secondly, feedback can often get confusing because of the word choice by the observer. Renninger mentions this and points to the avoidance of vague or blur words. These are words of which the meaning can differ for different people, for example like, nice, and kind off [7]. Renninger shows how these blur words can be related to understandable situations, to be converted into data points, to help the host better understand the received feedback. Clarity and directness are key to conveying feedback in an understandable way.

According to Govaerts et al. the prior experience of the observer does not affect the quality of the given feedback [15]. Despite experience having no effect, the observers bias, and assumptions can have a negative influence according to Newman et al. [9]. These should be avoided, and they add that acknowledging the skills of the individual is important. Feedback focused on personal traits, like appearance and personality, should be avoided. As mentioned by Algiraigri [16], the impact of these biases can be reduced by recognizing them and blocking them from affecting the feedback. Ramaprasad underlines this as the information gap only gets larger [13].

2.1.3 Receiving feedback

As stated above, the host is the one receiving feedback from the observer. Both Newman and Algiraigri agree that the host should be deciding when feedback is desired [9, 16]. The attitude of the receiver towards feedback will influence how the feedback will be received by the brain. When the host is not open to feedback, their defence mechanism will be triggered, and the feedback will be perceived as hostile [7]. As a result, the feedback is likely to not be used by the receiver.

Openness and engagement are key to make feedback effective as it should be considered a group effort. The host should listen to the observers' words carefully and ask questions to make sure they are fully understood. However, the observer can also ask the host a question to validate this. Asking for data points or parameters, as mentioned by both Ramaprasad and Renninger [13, 7]. This allows for comparison with the current behaviour and help to understand the received feedback. An example given by Renninger is the observer asking small yes or no questions to the host. The host can answer these questions with yes and put their full attention towards the feedback [7].

Although Govaerts et al. [15] mention feedback quality would not be affected, the credibility of the person giving the feedback certainly is, according to Newman [9]. She observed peers and found they tend to believe the feedback process sooner when the observer is trained [17]. Thus, the credibility should be upheld through careful listening by both the host and observer. Most of the literature is related to peer-to-peer feedback. However, these guidelines can be used for any domain, including design. By listening to the user and setting up clear communication protocols, companies and users can understand each other resulting in better products.

2.1.4 Evaluation

Feedback should not be a linear process but a continuous process where both host and observer benefit from the exchange. By setting clear grounds and boundaries the feedback will be useful for the host. Arguments should be concise and converted to data points. By asking questions, the observer can better understand the host and give helpful feedback. As is common in field research, a debrief should be held after feedback exchange is over to set future goals for the host, as mentioned by Algiraigri [16].

The last part of the feedback process should always be an evaluation plan agreed on by the host and observer. Both Newman and Renninger state that feedback is not a one-off occurrence but rather a continues process where a partnership is formed [9, 7]. The partnership is strengthened by the openness, as Newman also states. Finally, the host is more likely to stick to the plan and do a follow-up with the observer in the future when the observer is supportive towards the host. (As cited by Newman et. Al and, Nadler and Fisher [9, 18].)

2.1.5 Conclusion

Feedback plays an important role in human life and interactions. Although it plays such a big part in everyday life, this does not mean everyone is good at it. It is a continuous process, and both the educational, and medical fields show the benefits, as illustrated by multiple sources.

A set of five clear guidelines can be used to increase the usability of feedback systems. Before starting, the goal and relationship should be understood by both the person receiving and giving the feedback. Secondly, the feedback receiver should be open to feedback and decide on the pace. Thirdly, the person giving the feedback should communicate in an understandable way for the receiver. Feedback is a two-way street and active participation is desired from both sides. Finally, the feedback should conclude with a clear action plan on how the feedback should be processed.

These guidelines are intended to be used in future research on the implementation of feedback in digital products, like mobile apps. Although most of the guidelines are directly related to peer-to-peer feedback, they can also be used for the target users the product is intended for. It can be concluded that this allows for direct qualitative feedback at the centre of design, to accommodate the needs of the user. However, it should be noted that additional user-research is needed to make feedback useful.

2.2 Designing feedback

In this section the general feedback findings are connected to the design of the feedback system. Feedback is divided into two categories, focusing on the functionality and user experience.

2.2.1 Feedback division

Feedback can be distinguished as push or pull feedback, both influencing people in a different way, as illustrated by Yoon [19]. For the feedback system, feedback where the user encounters a problem and wants to report it can be seen as push feedback. Pull feedback is where the application (the company) actively asks the user for input. This can be done via a survey or by having a conversation, where the focus is on the users' experience with the application. This division will be used throughout the rest of the research.

2.2.2 Motivational writing

As found in the literature research, clear communication is important to make feedback useful. Asking the wrong question can lead to confusion or unusable data. User experience (UX) writing focuses on delivering users an optimal experience when reading text and is important for the feedback tool. A Dutch blog about communication wrote about the basics of UX writing [20].

Something I noticed during my talks with EatMyRide is that users are currently seen merely as consumers. However, they are so much more, with stories and backgrounds. Seeing them as humans, who all have different needs, is key to get a better understanding and appreciation of EatMyRide users. Empathizing with users can help users to feel like the app was made for them and allows them to see the benefit of the application [21].

A feedback system can help in determining those needs and make the EatMyRide application more fitting to the user. It is also a chance to give the app a recognizable personality. For example, if the user is given a compliment after a ride, they might feel more motivated and comfortable to give feedback. According to L. Deci, rewarding users with reinforcement and positive feedback, leads to an increase in intrinsic motivation [22, 23]. Burgers et al. agrees and adds that positive feedback is more powerful for long-term motivation [24]. Their research shows that negative feedback can motivate participants to repair for short-term performance. However, both studies were done through verbal feedback and must be evaluated within the EatMyRide application. Deci also suggests that a financial reward leads to a decrease in intrinsic motivation [22], which is undesirable as the feedback should be genuine and give insights on real-time user behaviour.

The long-term motivation, as described by Burgers et al. [24], is an important factor for the feedback system. *CustomerThermometer* researched the effects of survey fatigue, where users get uninterested and stop filling in surveys [25]. Survey fatigue can be reduced by asking feedback shortly after the experience. This is in line with the timing, as suggested by Newman and Renninger in 2.1.2. The research also shows that the feedback should be straight forward and preferably a one-click solution. Finally, the best strategy for timing needs to be determined together with EatMyRide users and can be updated in the future.

2.2.3 Technical possibilities

The EatMyRide application is available on both android and iOS, and is created using the React.JS JavaScript library [26]. Table 1 below shows the possible interactions the library provides and additional tracking possibilities that can be achieved using Smartlook, which EatMyRide is already using [27]. More insight can be gained by collecting more data than just the responses to feedback questions. The collected data is specified in chapter 6.2.2 and will all be according to the latest GDPR regulations [28].

Technical possibility	
3 dots	Commonly used way to indicate options in the application
Button	Commonly used to confirm or access part of the application
Clock	Timing when to target the user
Connection tracking	Track internet connection, determine if at home
Facial recognition	Possible to recognize a person and their emotions, only for latest hardware
Gestures	Adding more ways to interact through predefined gestures e.g. swiping
GPS	Track location of users, give route directions
Multi gestures	Predefined gestures with multiple fingers
Shaking	Motion of the hardware can be detected
Touch	Main interaction with the application

Table 1 Technical possibilities for in-app interactions

2.3 State of the art

In this section, research on existing solutions is presented. A lot can be learned from other companies and feedback systems, about factors to take into consideration for the EatMyRide feedback system. Similarities with real-life scenarios help in setting the tone of the experience.

2.3.1 Feedback gathering tools

The first inspiring category are applications that focus on gathering consumer feedback, to drive sales and a growth in audience. These tools come closest to the intended goal of the system. The tools were selected on their capabilities and user-friendliness.

2.3.1.1 Apptentive

With Apptentive, companies can ask users direct questions about their experience with them and their products. The system is optimized to target the users at the right time with a notification or pop-up to grab their attention, after which they can fill in more surveys. Apptentive notices which users have changed their app behaviour and can help to identify issues in the product. The result is real-time feedback, which can immediately be used in development.
Plus points: A lot of experience, real-time feedback
Minus points: Notifications, intrusive, expensive
Link: https://www.apptentive.com

2.3.1.2 GetFeedback

GetFeedback enables users to give feedback on any page in an app or on a website. Here they can choose to give 'specific' or 'general' feedback. 'Specific' feedback will allow the user to select a part of they are viewing at that moment and submit their thoughts. This can be by rating it via smileys or stars, or by answering a question. By selecting 'general', the user can submit general comments about the company or the application. GetFeedback also has a functionality to send out customer feedback surveys.
Plus points: Mobile integration, understandable for users, a lot of analytics
Minus points: Sales driven instead of UX driven, expensive
Link: https://www.getfeedback.com/

2.3.1.3 Laravel Feedback Component

This component is available for Laravel systems and enables users to submit feedback anywhere on a website. It allows for different kind of feedback typing, such as 'like', 'dislike' and 'suggestion'. The back-end of the tool is easy to use and allows the company to track what can be done with the feedback. Although this is a small tool compared to the alternatives, it allows the company to focus solely on the received feedback.
Plus points: Easy to use, direct feedback, free
Minus points: Lacking scalability
Link: https://github.com/mydnic/laravel-feedback-component

2.3.1.4 Canny

Canny lets users submit feedback through a voting board where they can vote on topics they would like to be implemented next. These results can be used to plan their development accordingly. The voting board comes with a roadmap so users can see what is done with their feedback and when they can expect it to be implemented. Figure 3 on the next page gives an impression of the canny voting board.
Plus points: Voting empowers users, roadmap to visualise progress, know that feedback does not go in a black hole
Minus points: Not in-app feedback, no insight on experience users have with EatMyRide, expensive
Link: https://canny.io/

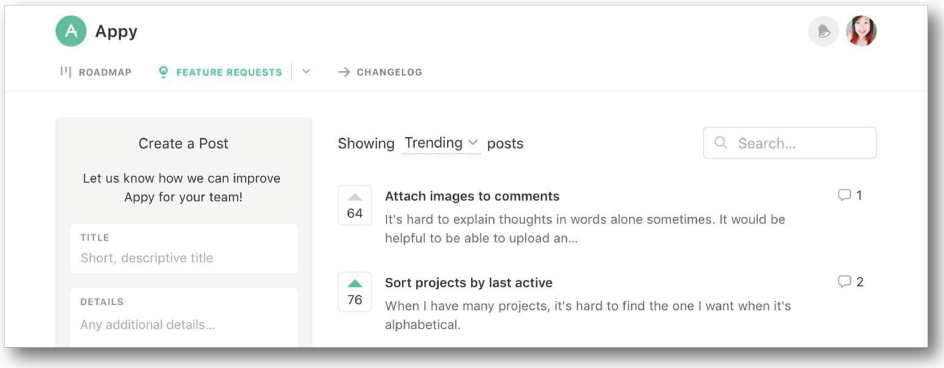


Figure 3: Impression of the Canny application

2.3.1.5 Nolt

Much like Canny, Nolt allows users to submit ideas and vote on existing ones. The development roadmap can be adjusted directly to the results and updated on the platform. Where Nolt differs from Canny that it is community driven. Users can react to ideas and empowered community moderators can manage incoming feedback.

Plus points: Voting empowers users, roadmap to visualise progress, community driven

Minus points: Not in-app feedback, expensive

Link: https://nolt.io/

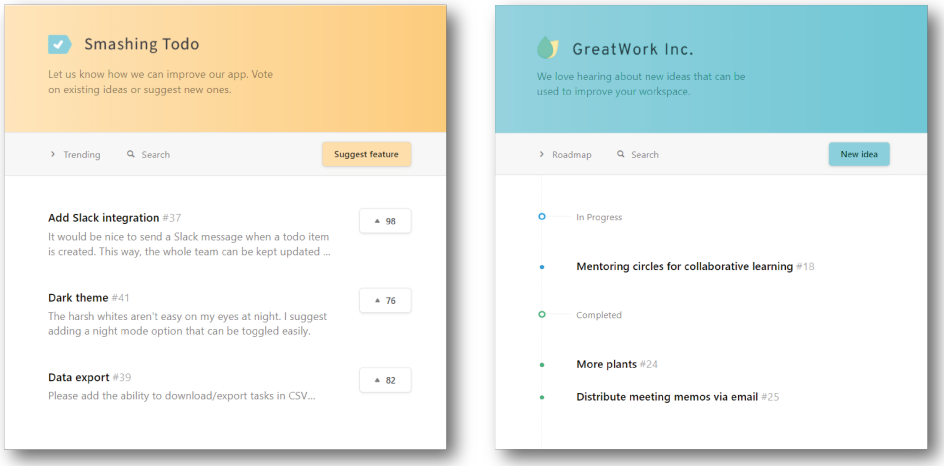


Figure 4: Impression of the Nolt application

2.3.2 Social media

A place where users can share their thoughts and communicate with other users, social media are getting bigger every day. In 2020, Instagram grew to be one of the most used apps in the world [29]. However, are there lessons to be learned about feedback gathering? Taking a closer look at Instagram, I found that the feedback system in place was unsupportive towards users. It takes seven clicks before feedback can be given and the button is hidden somewhere in the settings. This makes it uneasy to report a problem or a request a feature, although this might be by design to prevent users from reporting.

Another large platform are the (web)applications made by Google, which does have a feedback system in place. On YouTube, for example, users can report content and a support team will investigate the report. The Google Drive apps each have the possibility to report feedback, with the possibility to add a screenshot with the affected sections highlighted. The downside of Google is that it is such a large platform that users do not know what is done with their feedback. They are not updated about their report or request. However, Google has a large community where users can ask questions and help each other [30, 31]. EatMyRide could also benefit from building a community, as this allows riders to connect and train together.

To conclude, social media platforms play a large part in most people's life, but users are not invited to give meaningful feedback. With Instagram hiding their feedback button and Google not updating users after reporting, results in less user feedback. Taking a different approach for the feedback system, where feedback is at the foreground and users are updated, can result in more willingness from users to give feedback.

2.3.3 Jumbo Foodcoach

EatMyRide is not the only sports nutrition app currently available. The Jumbo Foodcoach App comes closest to the current capabilities of the EatMyRide application. The app enables users to easily plan their meals and training in a single app, and adjusts the energy needs accordingly [32]. The app is not merely for cyclists, but also for running, fitness, soccer, and hockey. Although planning a ride and getting a nutrition plan for the ride are what makes EatMyRide stand out, the overall look and feel of the Jumbo app is more intuitive in my opinion. For example, the app will inform you about the functionalities when accessing it for the first time. The app is also integrated with the Jumbo supermarket app, which allows users to add the required products directly to their shopping list.

The Jumbo app does not have a feedback system; however it does have a service page on which users can see frequently asked questions and see how they can reach out to a nutritionist. The homepage of the app shows an overview of the upcoming training, and a separate page allows for planning meals. EatMyRide could benefit from a separate training page, where feedback can be provided.

2.3.4 Real-life similarities

Over the past ten years, mobile applications have become an extension of our daily lives, making life easier and bringing joy trough games and memories. Feedback plays a large role in everyday interactions and thus there might be similarities with in-app feedback. What aspects of real-life interactions should the EatMyRide feedback system adapt?

The first thing that comes to mind are restaurants and cafes. Perfect examples of human interaction, where hospitality and guest experience are key. These so-called *implicit interactions*, which occur without the awareness of the user, provide an opportunity for design [33]. Ju and Leifer provide a framework in their paper on implicit interactions and indicate parallels between digital interactions and everyday life. For the restaurants and cafes, they give the example of a waiter refilling a cup of coffee. In case the guest asked for it, the action is *reactive*, however if the waiter anticipates and fills it before the guest asks for it, the action is determined *proactive*. The feedback system should be proactive, as described by Renninger [7]. Although, as Ju and Leifer mention, the autonomy of the technology is questionable, whereas the autonomy of the waiter is clearly established in social interactions. This is established because a waiter is always there if you need them and thus also allowing for reactive interactions, to make the guest experience as good as possible.

Another example are hotels, which are also mentioned by Ju and Leifer [33]. When approaching the door, a clerk will open it for the guests and welcome them to the hotel. Their bags will be transported, and the person at the front desk will help them further. This proactive behaviour of the clerk, instead of an automatic door, makes the guest experience better as they are greeted as well. The feedback system could take note from the hotels, and welcome users when opening the app and opening the door towards the new feedback features. The central position of the front-desk could also be taken by the feedback system; always there if needed. In both hotels and restaurant, guests can leave a tip, which can be seen as feedback. A higher tip means a better experience, which could also be considered for the app. A quick way to rate an interaction, only costing a short amount of time, could indicate how users feel about the EatMyRide application.

Lastly, similarities with education and coaching can help development of the app. Teachers are supportive towards their students and give them feedback trough reviewing papers and handing out grades. Teachers have a desk, office and/or email address, where students can always reach them, again a central point for contact. Coaches are also a central point of communication, and are helping people to become better, in sports, business or life. EatMyRide can fulfil a coaching role towards its users, to help them reach a goal through the proper nutrition. Giving the user feedback on their performance, just like a real coach would do. This can also help in establishing trust between the app and user, resulting in successful implicit interaction.

2.3.5 Conclusion

The state of the art review showed that there are many feedback systems out there already. However, that does not mean they are used in the right way. Many applications, like Instagram, have their feedback options hidden away in the app and thus steering users away from reporting issues. Google does have a feedback system which is more on the foreground and has a community build around it. The only downside is that after a report is filed, the user does not know what is done with it. EatMyRide would benefit from a feedback system which is available easily, like a waiter at a restaurant. A community, much like Google would bring benefits of connecting users and allowing them to help each other.

As the literature review shows, having an action plan is necessary and both Nolt and Canny have a development roadmap. This should definitely be included in the EatMyRide feedback system, as it is proven that showing what is done with the feedback and suggestions helps with future responses. However, the review also showed that (in-app) notifications can be intrusive and irritating, and result in a lack of responses. More specific research on the timing of notifications and feedback queries should be considered for EatMyRide users. The results of the state of the art review are listed below.

- ✓ In-app interactions
- ✓ Real-time feedback
- ✓ Roadmap integration
- ✓ Empowering users to be involved in development
- ✓ Understandable for users
- ✓ Make known to users what their feedback is used for
- ✓ Make users part of a community
- × No linking to webform
- × No intrusive behaviour
- × Not be sales driven
- × No high expenses related to the system

2.4 Stakeholders

EatMyRide launched their application in 2019 and has built a user base of around five to ten thousand users. The company divides their users into three groups, which can be seen in figure 5 below. On the left they have amateur riders, who ride occasionally and are not training regularly. On the far right are the best professional riders like the riders from Team DSM [34], with whom EatMyRide collaborates. To the right of the middle are the fanatic riders, who train regularly but do not ride professionally. Each of these groups has different needs and motivation to provide feedback. Most EatMyRide users are fanatic cyclists, as the app requires rides to be at least 50 kilometres or more.

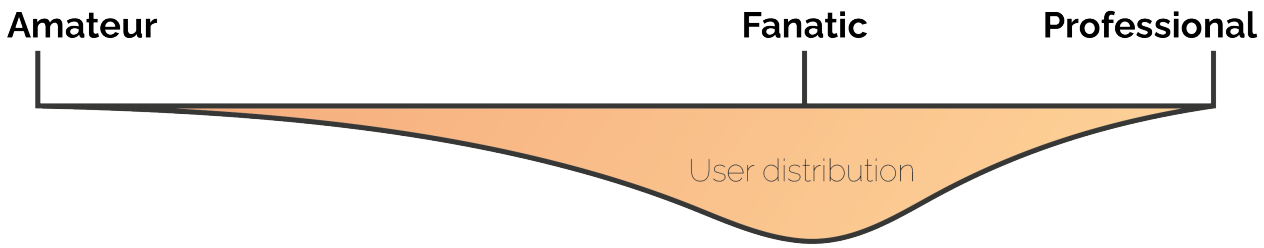


Figure 5: User distribution based on cyclist type, according to EatMyRide

2.4.1 User research

Contact with active EatMyRide users is necessary to understand them. Together with the client, a survey was sent out to users that signed up over the past three months. This way novice users could be reached to capture their experience in the first months of app usage. This way also eliminating users that gave feedback in the past. The questions asked in this research can be found in appendix 12.2. A note needs to be made regarding the results, as there are only eight responses. One of the responses is invalid and thus making the survey, with only seven responses, inconclusive. However, there is still useful information that can be extracted. The results can be found in appendix 12.3.

To start, five out of seven users preferred to be asked for feedback bi-annually. This is a good indication when asking for general feedback about the app. Secondly, when asked about the moment of asking for feedback most users indicated after their ride was completed. This gives an opportunity to show the user an overview of their ride and ask for feedback within the overview. Thirdly, all participants indicated that they cycle with friends, thus indicating the opportunity for a community aspect to the feedback system.

Table 2 below shows the main reasons why users downloaded the EatMyRide application. Almost all users downloaded the app because they want to get insights on their nutrition, whilst two downloaded it because of their connection to the owner. It also shows that almost all users bike with friends or participate in a club. Friends and cycling clubs provide knowledge on cycling nutrition and could be a talking point. Below the table, in figure 6, the moment that uses would be motivated to give feed-

back is shown. Users could pick more than one option, however only one participant indicated more than one option. Thus can be concluded that the majority would like the feedback to be asked after the ride. Lastly, six out of seven participants indicated that they would want to give feedback because of a frustration.

Why did you download the EatMyRide app?	**How often do you cycle?**	**With whom?**
Guidance on planning for eating and drinking whilst cycling but also beforehand	4 or more times per week	Friends, Club
More insight on nutrition plan	4 or more times per week	Alone, Friends, Club
More insight in cycling and nutrition	4 or more times per week	Alone, Friends, Club, Team
More insight on nutrition plan	2 - 3 times per week	Alone, Friends
Curiosity and more insight on what to eat	2 - 3 times per week and drink	Alone, Friends, Club
Personal connection with the owner	2 - 3 times per week	Alone, Friends, Club, Colleagues
Personal connection with the owner	2 - 3 times per week	Alone, Friends, Club, Colleagues, Partner

Table 2 Results of the user experience survey

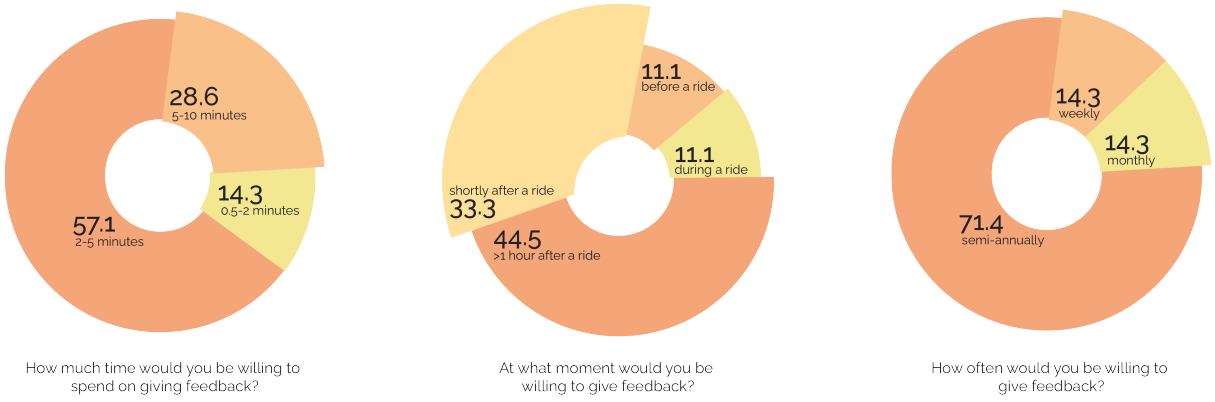


Figure 6: Survey results regarding the timing of asking feedback

2.4.2 Interview with EatMyRide

During an interview with Hans Nuijt, the product manager from EatMyRide, the needs of the company were explained together with their need for a feedback system. Their current development is based on guedses and not on grounded research, which the feedback system can provide. It would be great if the system could capture the experience of the user and confirm their current user division. Possibly the system could clarify what the target audience is, as this is needed for future development.

In the future, EatMyRide would like to grow to also be used for other sporting activities. The feedback system should take scalability and this foreseen growth into account.

2.4.3 Redefining user groups

Despite the efforts, the survey did not receive enough responses to come to a definitive conclusion. Figure 7 shows how the seven users are distributed in terms of terms of cycling level and cyclist type. The cycling level is based on the results of the survey and indicates how serious the respondant is about cycling and nutrition.

Due to two of the responses indicating that they have yet to use the application, the distribution does not make much sense. However, what I noticed from both the responses and the interview with EatMyRide is that the app has a niche for fanatic riders, which comes with a threshold for new users. New inexperienced users are likely to leave the app first and are a potential feedback target if no in-app activity is detected after the first download. By coming in contact with them, EatMyRide can know their issues and convince them to come back.

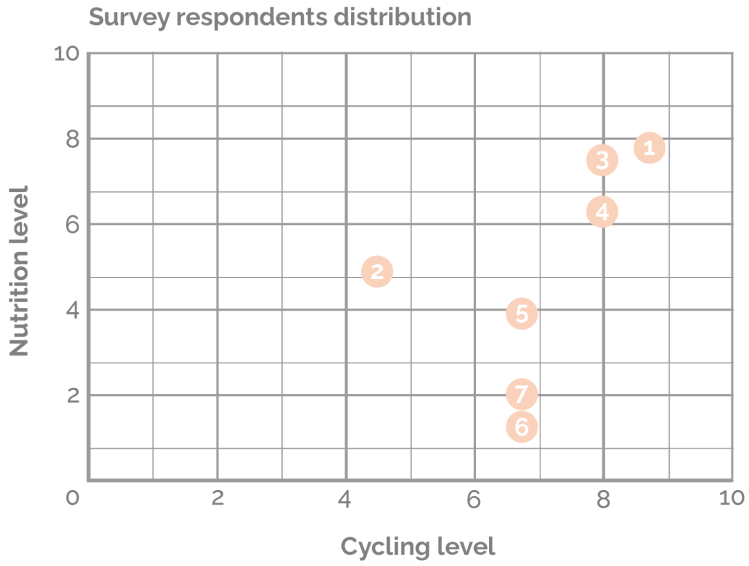


Figure 7: User distribution based on survey results

2.5 Conclusion

Feedback is a way to bridge an information gap between and can be used to form a bridge between users of the EatMyRide app and the developers. The relationship between the feedback giver and receiver should be beneficial to both and can be compared with a two-way street. However, before the feedback is given, the receiver should be open to it and the giver should be prepared and ready. In a digital system, this means that the user should always have the option to refuse. Feedback given to the user, like compliments, should be timed right to make the information relevant. Finally, the system can always be open to receive new input from users and help with problems they might encounter.

Both the literature review and the communication research show the importance of using understandable language. Avoiding words such as 'like' or 'kind off' is recommended, as the meaning can differ between users. By connecting keywords to data points, analysis will be easier and more mean-

ingful. The keywords can differ per stakeholder group to better fit their needs. However, since the responses were insufficient to conclude this, future research should be done. The results will be used in the ideation phase to design personas which will help to come up with new concepts.

There are many user feedback systems out there, which all have unique selling points. The downside is that each of these systems is disconnected from the application and can get quite costly. EatMyRide would like the feedback system to be directly implemented in the app and actively interact with users. To make this work, users should be seen as people with personal needs and backgrounds, and not solely as customers. Asking follow-up questions to the answers given by users and showing what is done with the feedback can make EatMyRide stand out, as other applications mostly hide feedback from the user. This connects with the literature research, as an action plan is required to make the peer-to-peer feedback session useful.

3 Methods and Techniques

This chapter provides an explanation on the methods and techniques used in this research. The iterative design method is explained and linked with the used methods. Lastly a definition of user centred design is given, and the importance of the ethical impact analysis is explained.

3.1 Design method

For the development of the feedback system, an iterative method is used. This means that a lot of ideas and concepts are considered and altered until the right solution is found. As a result a converging step is taken to reduce the number of ideas. The paper by Ju and Leifer formed the basis for the feedback system, as the interaction with the system would benefit from implicit interactions [33]. Also, the design for mood method by Desmet was used to develop a feature to capture the users' experience [35].

3.2 Creative Technology design process

The Creative Technology design process consists of four phases, as described by Mader and Eggink [3]. The design method is an iterative method and the product is continuously evaluated, going back and forth between the phases, which is the best approach for the EatMyRide design problem. Each of the stages is explained below and is also followed for the thesis structure.

3.2.1 Ideation

After completing the background research, multiple ideas were generated to solve the design problem as stated in 1.1. Personas and scenarios were created to get a better understanding of the user and their needs. From the large number of ideas after a first brainstorm, a converging step was taken to reduce the amount and only include the relevant ideas, which will be evaluated during the specification phase.

3.2.2 Specification

The goal of the specification phase is to narrow down the ideas generated during the ideation phase and to set clear requirements. The final prototype will be evaluated according to these requirements.

Requirements were set forth following the interviews with EatMyRide representatives and multiple users. The user requirements and client requirements are kept separately to make the front-end optimised for end-users and the back-end for the client. The requirements are prioritised using the MoSCoW-method in 5.1.5, and the product will be evaluated based on these criteria in 6.2.3.

3.2.3 Realisation

During the realisation phase the idea is made into an interactive prototype. Because of the COVID-19 pandemic physical testing was not possible. As a result, the first prototype was made with Figma to enable online testing [36]. The designs are vector images and made with Adobe Illustrator [37]

The second prototype is a native application for iOS and Android, made using Expo.io [38]. Expo is an open-source platform that allows for native applications build with JavaScript and React. The code is written in Visual Studio Code and uploaded on a private repository on GitHub [39, 40]. This prototype will also be evaluated with EatMyRide users during a usability test in the evaluation phase.

3.2.4 Evaluation

The last phase of the design process is the evaluation, where the prototype gets evaluated with users. Both prototypes are tested separately after completing an eight-day cultural probe study.

Cultural Probes Are used to validate the ideas of the Ideation phase and conducted with eight EatMyRide users, as described in chapter 4. During this eight-day study, participants use the app as they normally would and are asked to fill in a diary. This will give the opportunity to get more insights into users and their app usage. It also provides an opportunity to test various iterations of the rating and feedback component. At the end of the study, participants are interviewed about their answers during a debrief. The results of the study can be found in 5.2.3 User validation.

Usability testing Was done after completion of the probe study. The second part of the interview consisted of interactions with the prototype of the feedback system and provided new insights for iterations. Most users experienced difficulties during the study, and they could be tested via the new prototype. The last three interviews were done with the final prototype, which is evaluated in chapter 6.2.3.

3.3 User centred design

As stated in section 1.5, the main question is how the EatMyRide application can be developed using user centred design. This means that the user is actively involved in every step of the design process, leading to the best product possible. For EatMyRide, this means connecting with their users and getting to know their needs. This allows them to develop the application based on real users' needs, instead of the current guesses. Ultimately the EatMyRide app will suit more users and fulfil their expectations.

3.3.1 Design for mood

User experience and mood are closely related to the design of a product, as illustrated by Desmet [35]. In this paper he gives an overview on mood-focused design. Desmet also shows how mood can be assessed through self-expression and manual tracking. With the COVID-19 pandemic, mood tracking has become more widely available as the measures are expected to leave a psychological impact, as is shown by Bailon et. Al [41].

For the feedback system, moods and emotions need to be separated, as Desmet shows in his paper [35]. Moods are relevant for the system as they are about the internal state of the user. Desmet proposes twenty activity-based mood regulations and defines three categories; Seeking relieve, restoring balance, and building resilience. Interaction with the feedback system can fit in all categories, as for example, a user can report their frustrations to seek relief, but this can also work as building resilience as the user puts its problems in perspective. Finally, moods should be considered in the design of the application and a concept is further explained in the ideation chapter, section 4.4.5.

3.3.2 Prototyping tools

In this research two tools were used for doing prototype testing, which influence the testing capabilities. Figma is used for the first prototype testing and is a web based application [36]. User input could not be tested, due to this being unavailable on Figma. To accommodate this, user input was tested in the final prototype, which is built with React Native and run with expo [26, **?**]. With Expo, the application can be run on a native Apple or Android device, making it possible to test the prototype with the full user experience.

3.4 Ethics impact analysis

As part of the Reflection course for Creative Technology, I conducted an ethical impact analysis [42], which can be found in appendix 12.9. In this report the ethical implications of the feedback system are discussed. The report is used to set ethical requirement for the feedback system, and are evaluated in chapter 7.

4 Ideation

In this chapter, the ideation phase is described and stakeholders are further defined. Using the gained knowledge from the background research in chapter 2, I came up with various concepts for the feedback system.

4.1 Initial ideation

To start off, I took the minutes from the interview with EatMyRide and made a mind map for EatMyRide and their users. They indicated three target groups: amateurs, fanatics, and professionals. Each of the groups has a different cycling experience and thus use the app differently. This mind map can be found in chapter 12.7.

4.2 Stakeholders

Below are the two stakeholder groups that will be interacting with the feedback system, following the background research.

4.2.1 EatMyRide employees

Employees wish to user the system to gather feedback within the app itself. They would like to validate their ideas with users before developing new functionalities. Preferably, the users' experience can also be tracked to anticipate for what they need. Employees will interact with a back-end section of the feedback system and follow a predefined protocol on how to approach users.

4.2.2 Users

Preferably, users will not notice any big changes to the application. The EatMyRide app must still function the way it did before the introduction of the feedback system and should not interfere with creating a nutrition plan. Users must be triggered to interact with the feedback system, but should also be able to report their frustrations.

4.3 Scenarios and Personas

Each of the user groups, as described above, is analysed using a persona and scenario. These are based on the user survey and talks with EatMyRide representatives. The goals and problems stated in the personas and scenarios are used during the ideation phase to come up with concepts. They will also be evaluated in the evaluation to see if the prototype suits their needs. Each persona portrayed is fictional and any similarities with real users are incidental, the images are made using *thispersondoesnotexist.com* [43]. Each of the scenarios also has a storyboard which can be found in appendix 12.4.

4.3.1 Beginning rider

Lesley van der Berg is a beginning cyclist and recently bought a second-hand bicycle. She enjoys cycling with her colleagues in Utrecht, but only rides of around 30-40 km. She read about EatMyRide through an Instagram post and decided to try out the free version, as she is unfamiliar with sports nutrition. Her colleagues recommend some products in the past, but EatMyRide showed her how to improve her nutrition intake.

After a week, Lesley stopped using the EatMyRide app due to it being difficult for her to use. She finds it a hurdle to fill in her rides and does feel like it will make a difference to her. Another issue she found is that she forgot to plan her rides on time, and thus could not eat the right amount of food before a ride. Also, Lesley finds the drinking plan difficult to interpret.

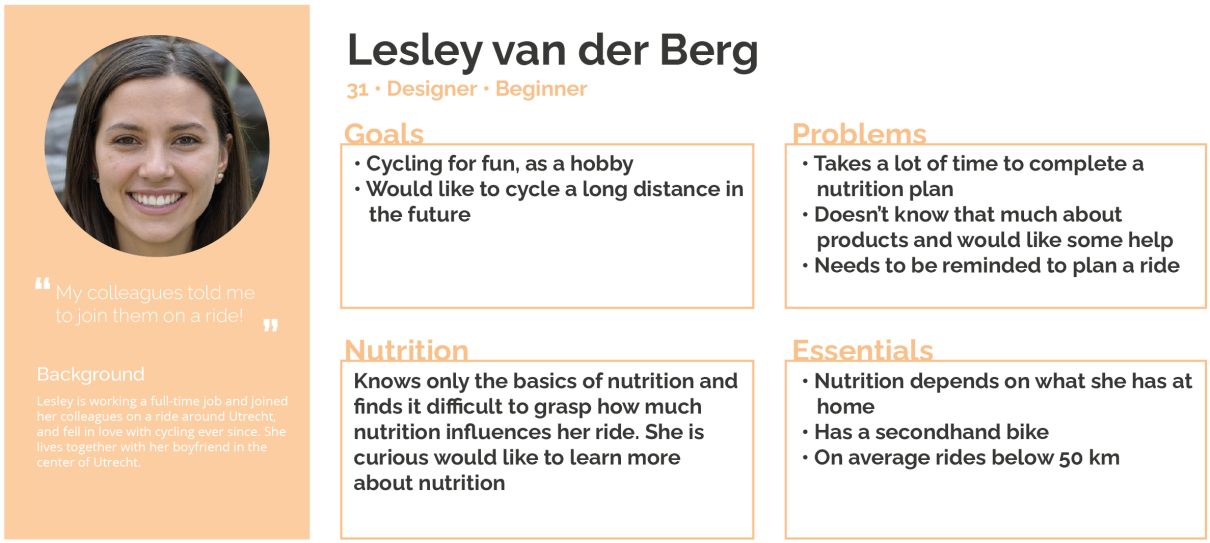


Figure 8: Persona of beginning rider, Lesley van der Berg

4.3.2 Fanatic rider

Marcel Claessen is a 47 year old doctor from Groesbeek and is a fanatic rider. He tries to ride at least three times per week with his friends. Together, they try to ride a cyclo race once a year. A cyclo is a race where you do not need to have a license, so they can join without needing to achieve. Marcel started using EatMyRide through one of his friends to prepare for the next cyclo. He uses the premium version to also keep track of his daily intake. Marcel uses an iPhone and is enrolled in the Apple Beta Program where he regularly tries new updates and submits feedback [44].

It took Marcel some time to figure out how the app worked, but eventually managed with the help of his friends. Marcel rides with his Garmin computer but often finds it difficult to setup the nutrition plan. As Marcel rides distances of around 80-150 km, however he never plans them carefully, so the ride distance often differs. He would like to have a simpler version of the ride planning but does not know where to do such a request.

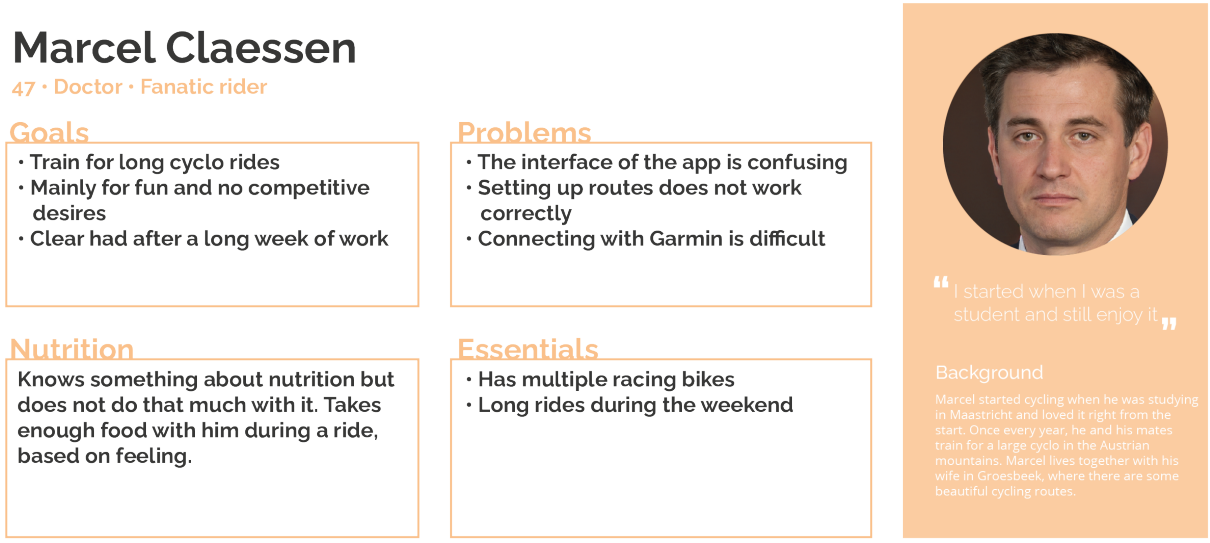


Figure 9: Persona of fanatic rider, Marcel Claessen

4.3.3 Professional rider

Victoria Robbens is a talented cycling rider for TeamNano where data is driving innovation. EatMyRide works closely together with TeamNano during events to supply them with real-time data. Victoria's coach also has access to her account to make sure she receives the right amounts of nutrition. When Victoria has time off, she must keep track of her nutrition but without her coach present she tends to forget it.

On most rides, Victoria and her team have planned a complete route which can be linked to the nutrition plan. As a result, nutrition plan is adjusted according to the weather and slope However, this is not indicated so the coach decides how much the athletes need to drink.

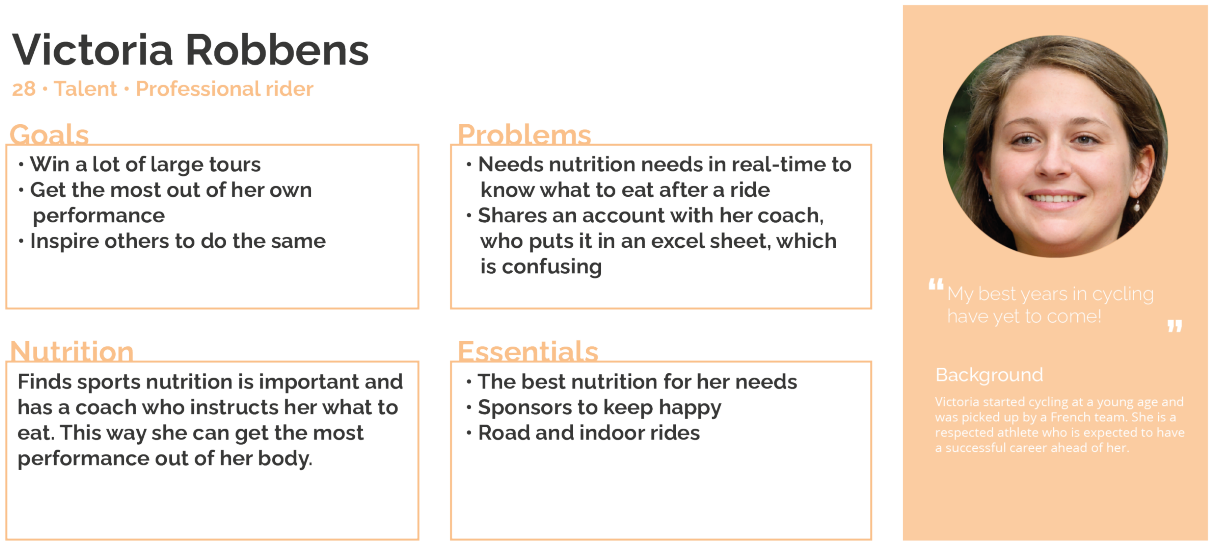


Figure 10: Persona of professional rider, Victoria Robbens

4.3.4 EatMyRide employee

Alex Bernard is responsible for the development of the EatMyRide application as product owner. He is also an active cyclist, cycling around 200 kms every week whilst using the EatMyRide app. Alex works to streamline the development and keeps his team on track. He would like to know what users really think about the application and how he can better suit their needs. Alex wants to align the development roadmap with the most urgent problems users face. EatMyRide has contacted users before but would like to have real-time data to anticipate new features. Alex is in close contact with the nutritionists that work at EatMyRide to make sure the content of the features is truthful.

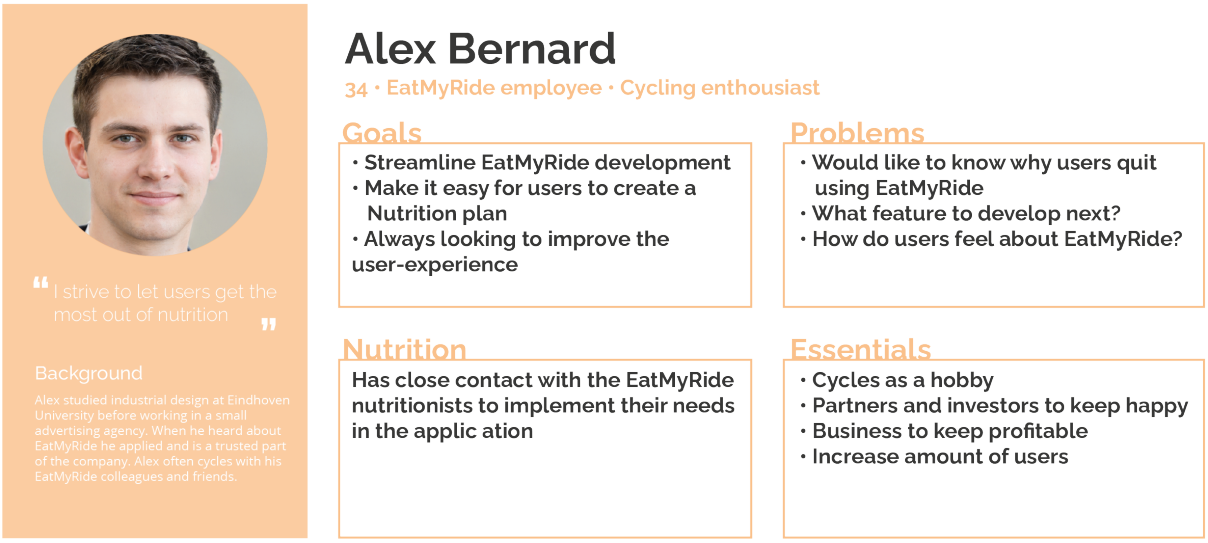


Figure 11: Persona of EatMyRide employee, Alex Bernard

4.3.5 Preliminary requirements

Following the personas and scenarios described above, the first preliminary requirements can be set forth. The EatMyRide employee will only interact with the back-end side of the feedback system, which should show him with real-time data to help him in deciding what features to develop next.

Although every user group has different needs, they share that they experience problems with the EatMyRide app. Thus the feedback system should be available, despite their cycling level. The system should provide as much information as possible, which can even help professional riders. By having the opportunity to talk to expert nutritionists, amateurs can get the care they need. Finally, the personas helped in developing concept 7, the user dashboard, as all users can benefit from getting an overview of their performance.

4.4 Concepts

During a second brainstorm, based on the personas and scenarios, I came up with a set of concepts for the feedback system. By taking the problems of both the users and EatMyRide, the system can be optimized for their usage. The results of the brainstorm can be found in appendix 12.7. Each of the concepts is summarised below.

4.4.1 Shake frustration

In case the user needs help or encounters a problem, they can shake their phone to bring up the help screen, as shown in figure 12 below. This concept can be used to gather general feedback, related to problems. The function can always be available to help the user. However, it could also be turned off in certain areas by EatMyRide or the user could opt out via settings.

The concept needs to be tested with multiple devices to prevent accidental triggering of the feedback system, as their sensitivity can differ. In case the system is still triggered accidentally it can be swiped away easily.

Figure 12: Concept 1 — Shake when frustrated

4.4.2 Central feedback

The literature research and state of the art review showed that feedback should be at the foreground of the design. In most applications it is hidden in the settings and thus lacking user input. In this concept a feedback menu is created with a recognizable icon, which the user can interact with at any point. The menu will give access to three functions:

- Asking for help, which will link to a chat functionality
- Reporting an issue with the application
- Reporting a desired feature or suggestion

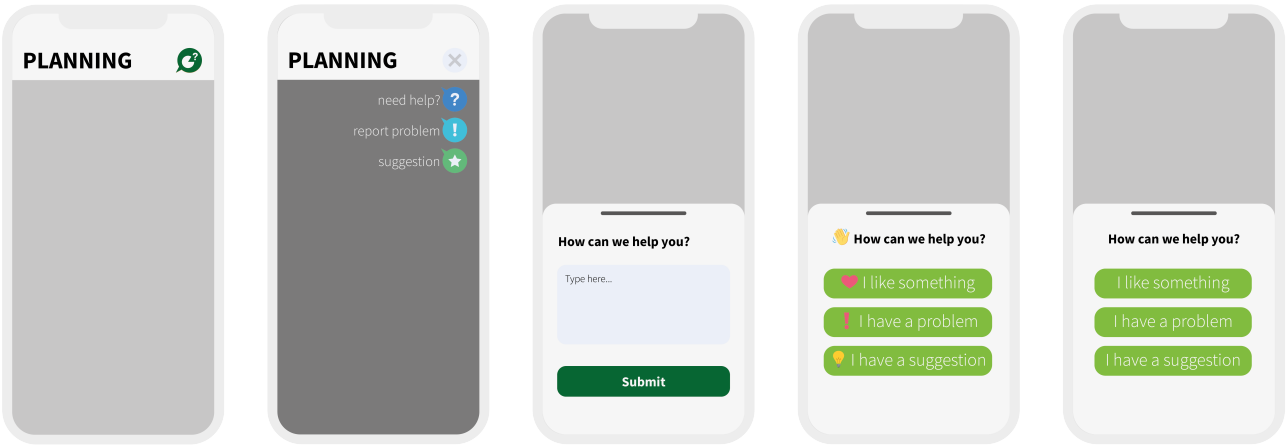


Figure 13: Concept 2 — Central point of feedback

4.4.3 Notification

Notifying users about the feedback possibilities and asking them to give feedback on their performance. This corresponds with the user survey to target users after completion of an activity. Users can also leave an optional explanation if they desire to do so. The background research in chapter 2 showed how active feedback can be used to interact with users, and is shown in 14

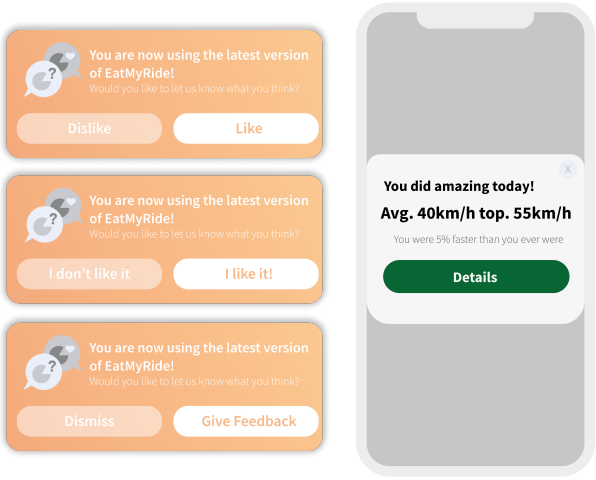


Figure 14: Concept 3 — Feedback notification

4.4.4 Contact with experts

EatMyRide has a unique opportunity to create a forum like environment within the app where cyclists can interact with each other. As the survey showed there are EatMyRide users who ride with friends or at clubs. As stated by EatMyRide, novice users find it difficult to navigate the app for the first time, as the threshold is quite high. Through a forum, new users can find experience cyclist and get assisted in their cycling adventure. The forum could have subjects for discussion like nutrition, routes, or even setup a marketplace for used bicycles. The collaboration with TeamDSM and the EatMyRide nutritionists could also provide special insights for users.

4.4.5 Personal experience

To capture the full user experience and to get a better insight in user behaviour, users can have the ability to track their performance. This way they can get insight in their own data as well as how the experienced it. EatMyRide can alter its recommendation algorithms accordingly and recommend more personal food and drinks. Figure 15 shows how the rating can be implemented as a separate modal or within the current planning screen of the app. Next to that the meals can be confirmed once the user consumed them.

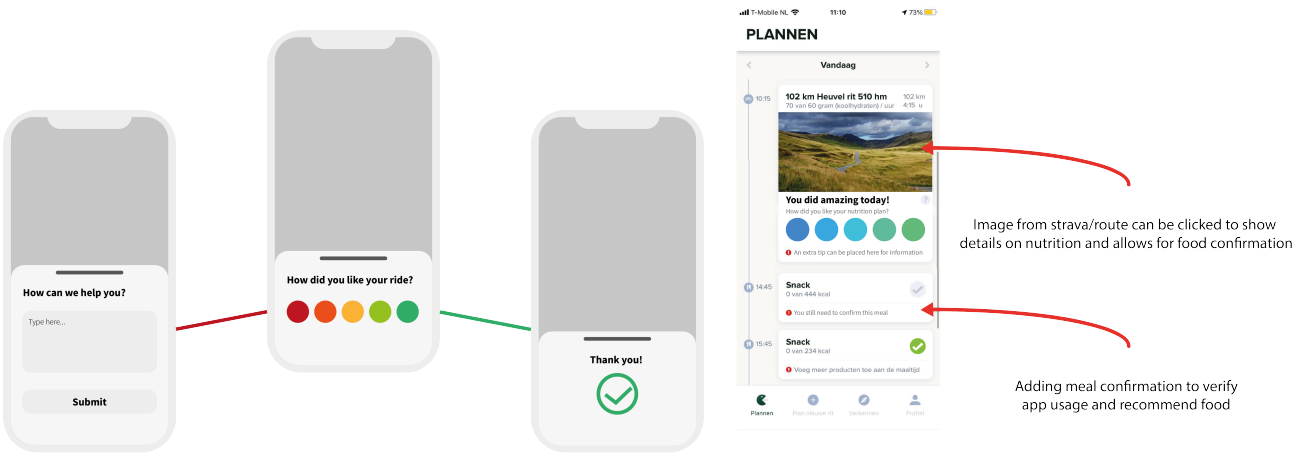


Figure 15: Concept 5 — Validating personal experience

4.4.6 Validating statements

In this concept users can validate each other's statements. These will be anonymous but a quick and understandable way of validating new functions and ideas. After interacting with the pop-up, users are asked to give their own suggestion as shown in figure 16. With this concept, users validate each other, which gives EatMyRide a clear idea of what suggestions are generally accepted.

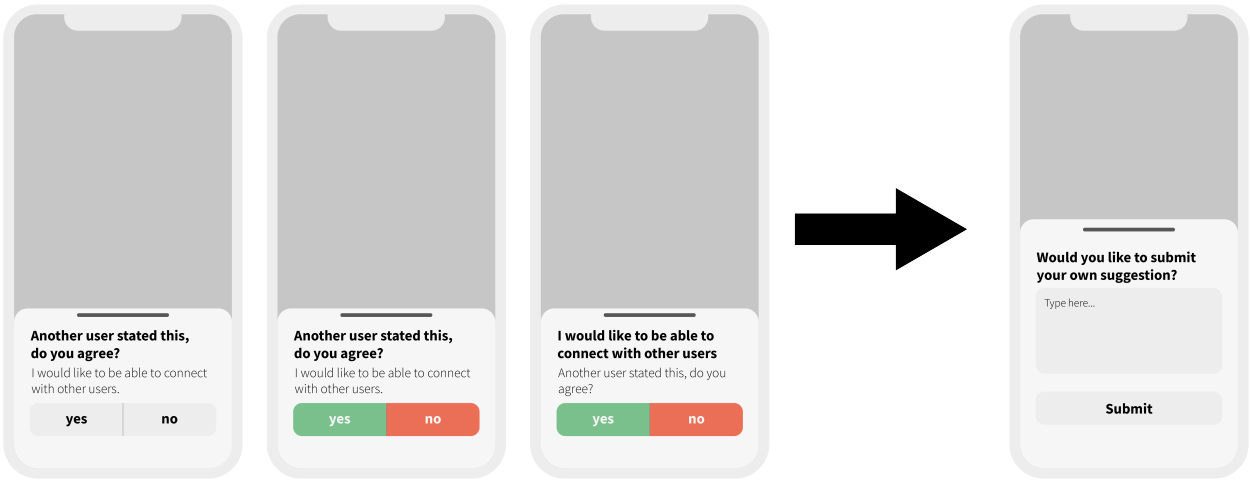


Figure 16: Concept 6 — Validating user input

4.4.7 User dashboard

After completing a ride, the user can get an overview of their performance, which can help them get insights in their mood and behaviour. Giving the ride a rating can help with recommending future food, for example during a race.

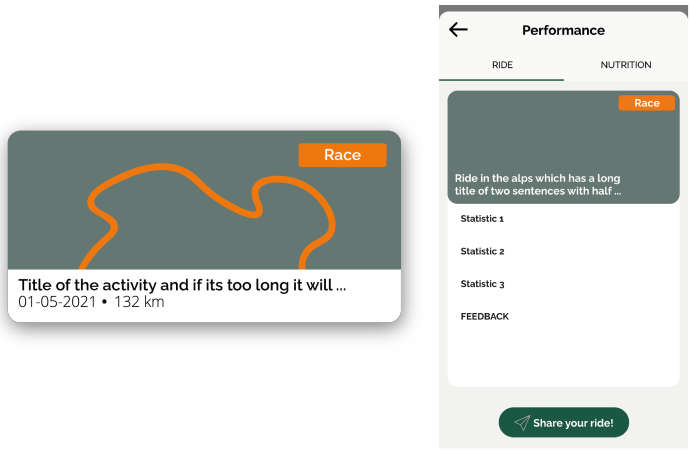


Figure 17: Concept 7 — Ride and nutrition overview

4.4.8 Back-end

This is where EatMyRide will be able to analyse the received feedback. Depending on the kind of feedback the product owner can determine to follow up or to assign it to an employee. The background research showed that feedback should be concluded with an evaluation plan, which is in the form of a development road map. This allows for openness towards users to show what is done with their feedback. It also allows the planning to be adjusted to urgent problems. Figure 18 shows a mock-up of the admin dashboard. The version on the right is in Dutch, as most employees and users are Dutch.

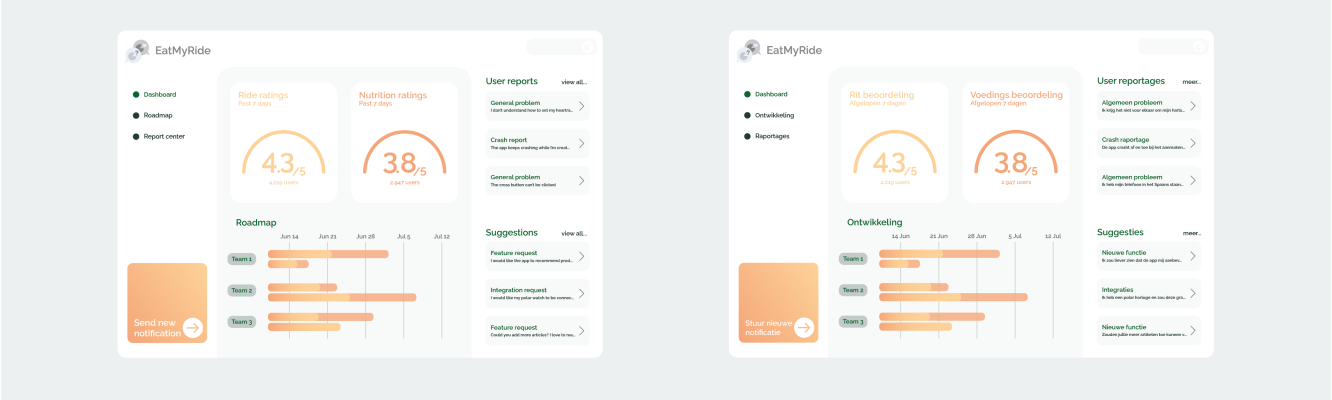


Figure 18: Concept 8 — Admin dashboard

4.5 Design choices

The EatMyRide app has an established design, which the users are used to interacting with. In order for the feedback system to be adapted, the system should fit the application design. The figure below shows the colour scheme and fonts used in the application.

Figure 19: EatMyRide style overview

4.5.1 Icon design

Below are the designs for the icons that can be used in the feedback system. A recognisable button is needed to show users when feedback can be given.

Figure 20: Possible button and icon options

4.5.2 Colours and rating shapes

The graphic below shows the possible shapes and colours for rating options, like the experience rating.

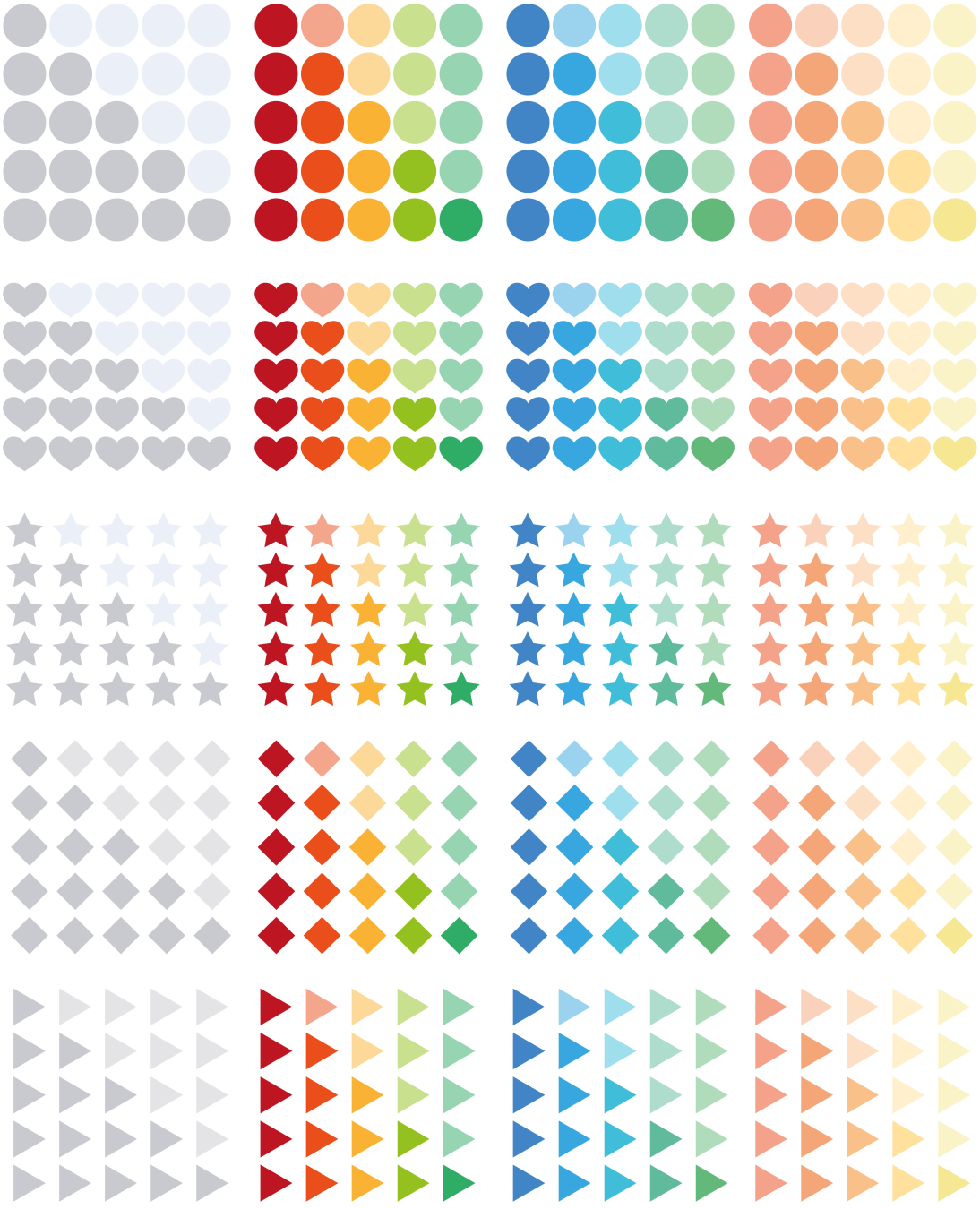


Figure 21: Possible rating colour combinations

4.6 Conclusion

Each of the above mentioned concepts can be combined to form a comprehensive feedback system for the EatMyRide application. In the specification phase, more research needs to be done on the UX writing, to better suit the users. The colours and icons need to be validated with users to know their preference.

The feedback menu should definitely be implemented in the prototype, as it is easier for users then to send an email. The needs of the stakeholders are further specified in the next chapter, however, incentive and time are the key principles to keep in mind during the specification phase.

5 Specification

In this chapter the specification phase is described, as requirements for the final concept were set together with users and EatMyRide. A prototype including some of the concepts from chapter 4.4 was tested among several users to get the feedback before developing the final concept. The ethical analysis, as described in chapter 3.4, was used to set technical requirements to prevent the ethical implications the system.

5.1 Requirements

Requirements are measurable and can be seen as goals the system has to achieve. The user requirements are based on the first set of interviews with three participants of the *Diary Probe Study*, as described in chapter 3.2.2. The requirements for EatMyRide are based on multiple interviews with representatives and are both front- and back-end related.

5.1.1 Users

Participants were selected via the local ice-skating association and via acquaintances. All are fanatic cyclists, cycling at least three times per week, and are between 18 and 34 years old. Before partaking in the study an introductory interview was held, of which the results can be found in appendix 11. The requirements can be found in table 3, including a specification on the ideation concepts.

After completion of the 8-day study, participants were asked about their overall experience with the EatMyRide application during an in-person interview. Their answers serve as example input for the feedback system. Overall, the first three participants found it easier to indicate parts which they would like to see improved, rather than parts they really liked. All participants indicated that they would like to know more about the way their nutrition plan is built up. One user even said:" I would like to have as much information as possible and would like more articles on the discover page." When implementing the feedback system, users should have a clear idea of how the system works and what is done with their feedback. They also stated that setting up the nutrition plan itself took a long time, indicating that the feedback system should require as little time as possible.

One of the sections of the diary probe asked user to give their ride, nutrition plan and overall app usage a rating. Every two days a different rating option was tested, as shown in appendix 12.6. Participants indicated that they prefer both the 5-star and uncoloured smileys. When asked about the possibility to give a review based on feelings, participants were divided. For the nutrition plan rating the products and whether it was sufficient is enough, whilst for a ride more nuance is needed. To conclude, users would like to see a rating possibility in the feedback system.

5.1.2 Onboarding

During the first three user interviews it became clear that they all had difficulties when first opening the app. They stated that they would prefer to have an explanation regarding the functionalities of the app. They also stated that it took a lot of work to put the first information in the app. It would help if users were informed beforehand on why they would need to give so much input. For the feedback system, a tutorial or guide should be added, explaining what the newly added functionalities do.

5.1.3 Diary probe results

In total, 6 participants completed the diary probe for the prototype test. One participant was unable to use the application, due to technical difficulties with their phone. However, this participant still participated in the usability test, as their input was still valuable for the research. Participants were selected via the local ice-skating and triathlon student associations, and are between 18 and 29 years old. All cycle at least 150 kms per week and are considered amateur to fanatic riders, according to the user groups from figure 7. Figure 35 shows an info-graphic with the results of the usability tests.

Starting with the user response to questions regarding feedback.

Rq.	The feedback system should	Specification	Priority
1	Enable users to report problems	Shaking only for problems	⋆
		Included in feedback menu	⋆⋆⋆
		Included in settings	⋆
2	Enable users to send in suggestions for the app	Included in feedback menu	⋆⋆⋆
3	Enable users to ask for help when needed	Included in feedback menu	⋆⋆
		Included in settings	⋆⋆
4	Enable users to rate their experience	Ride and nutrition rating	⋆⋆
		Design for mood	⋆⋆
5	Be understandable for all users	UX writing	⋆⋆⋆
		English language	⋆⋆
		More language options	⋆
6	Fit the consistency of the app	Fit design guide	⋆
7	Be intuitive and not take long time to use	Understandable icons	⋆⋆
8	Enable EatMyRide to respond to feedback	Follow up via email	⋆⋆
		Follow up notification	⋆
		Allow anonymous feedback	⋆⋆
9	Be within the app environment	Not on Garmin	⋆

Table 3 User requirements for the feedback system

5.1.4 EatMyRide

The client requirements are determined from the various online interviews with Joram Kolf and Hans Nuijt, respectively CEO and product owner of EatMyRide. Within the small team of employees, they are responsible for the decision making as they are the most experienced. We discussed what feedback they previously received and discussed the stickiness of the application. As explained by Joram, users need to have a reason to return to the app after completing a ride, there needs to be a user journey [45]. Something which the feedback system can help achieve. They would also like the system to assist them

in validating the primary reasons users use EatMyRide.

Regarding feedback motivation, EatMyRide is willing to reward users who give a lot of feedback. However, the only thing they can currently offer is a free month of premium, which is unrewarding for those who already have a premium account. Gamification could also be rewarding for the user but goes beyond the scope of the feedback system, as the entire app would need gamification elements [46]. Finally, EatMyRide would like the system to be scalable with their future user growth, meaning the system can grow along with the application. This would also allow more users to validate their experience and adjust the nutrition plan algorithm accordingly.

Rq.	The feedback system should	Specification	Priority
1	Assist in validating the reasons for app usage	Usage insights	⋆⋆⋆
2	Accommodate for future growth	CRM elements	⋆⋆
3	Be rewarding for users to use	1 month free premium	⋆
		Discount code	⋆
4	Make users to return to the app more frequently	Persuasive design	⋆⋆
5	Let users validate app measurements	User can validate	⋆⋆
		User can understand	⋆⋆⋆
		User can report faulty data	⋆
6	Show who reported so EatMyRide can follow-up	Send email	⋆
		Send Notification	⋆
		Send WhatsApp	⋆
7	Adjust development to urgent problems	User can report problems	⋆⋆⋆
		Prioritizing	⋆⋆
		Implementing with backlog	⋆⋆

Table 4 EatMyRide requirements for the feedback system

5.1.5 Ethical analysis

During the course Reflection II I analysed the ethical dilemmas of the EatMyRide feedback system, as described in 3.4. I indicated issues for three focus areas: General, nutrition advice and the feedback tool. The Venn diagram in figure 22 shows the areas with their dilemmas, which formed the ethical system requirements. The key discipline for the EatMyRide app and the feedback system is **truthfulness**. The advice needs to be **transparent** and **validated** when possible. The feedback system must collect truthful data and users need to be able to trust the system. The full list of dilemmas can be found in appendix 12.9.

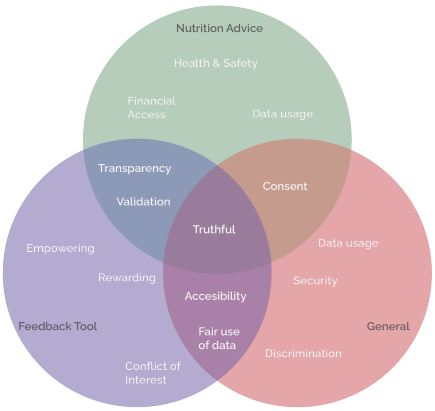


Figure 22: Venn diagram showing ethical dilemmas for the EatMyRide application+

Rq.	The feedback system should	Specification
1	Be truthful to all users	The system is open about what is done with the feedback Users use the feedback system honestly
2	Comply with all GDPR regulations	Privacy statement Fair data usage statement
3	Have sufficient security in place	At least two-factor authentication
4	Rewarding to use	Users should not feel drained from their information
5	Allow users to opt-out	Disabling notifications and tracking

Table 5 Ethical system requirements

5.1.6 Prioritizing

Not all requirements have the same priority and to analyse this I the MosCoW method, as described in chapter 3.2.2. The system is divided in front- and back-end requirements, as they will be used by the users and EatMyRide employees respectively. The requirements are shown below in table 6 and 7.

FRONT-END REQUIREMENTS

Must have	Should have	Could have	Would have
Report problems Do suggestions Receive help Optional participation	First time usage introduction Status of feedback FAQ page	Nutrition advice	Personal preferences

Table 6 Front-end requirements for the feedback system

BACK-END REQUIREMENTS

Must have	Should have	Could have	Would have
Overview of reports	Ability to distinguish User groups	Comment function	Machine learning
Ability to filter users	Status of reports	Easy adaptability	
Clear manual	Tracking user behaviour	Integration with other apps (Slack, Trello)	
GDPR ready	Prioritising web-app Development roadmap		

Table 7 Back-end requirements for the feedback system

5.2 First prototype

To validate my findings and concepts, as described in chapter 4, I created an interactive prototype using Figma [36]. Figure 23 shows the layout of the interactions. The prototype was created to test the feedback button at the top right of the screen, which is based on the icons from Ideation figure 21. The notification concept at the centre of the screen was also tested with real users. Finally the ride rating concept was tested within the app's timeline, as shown in figure 24.

Following the requirements I decided to specify the feedback system to these three concepts. As they were easy, accessible and would deliver sensible data. Figma does not have the possibility to collect data, so this part will be tested with the final interactive prototype.

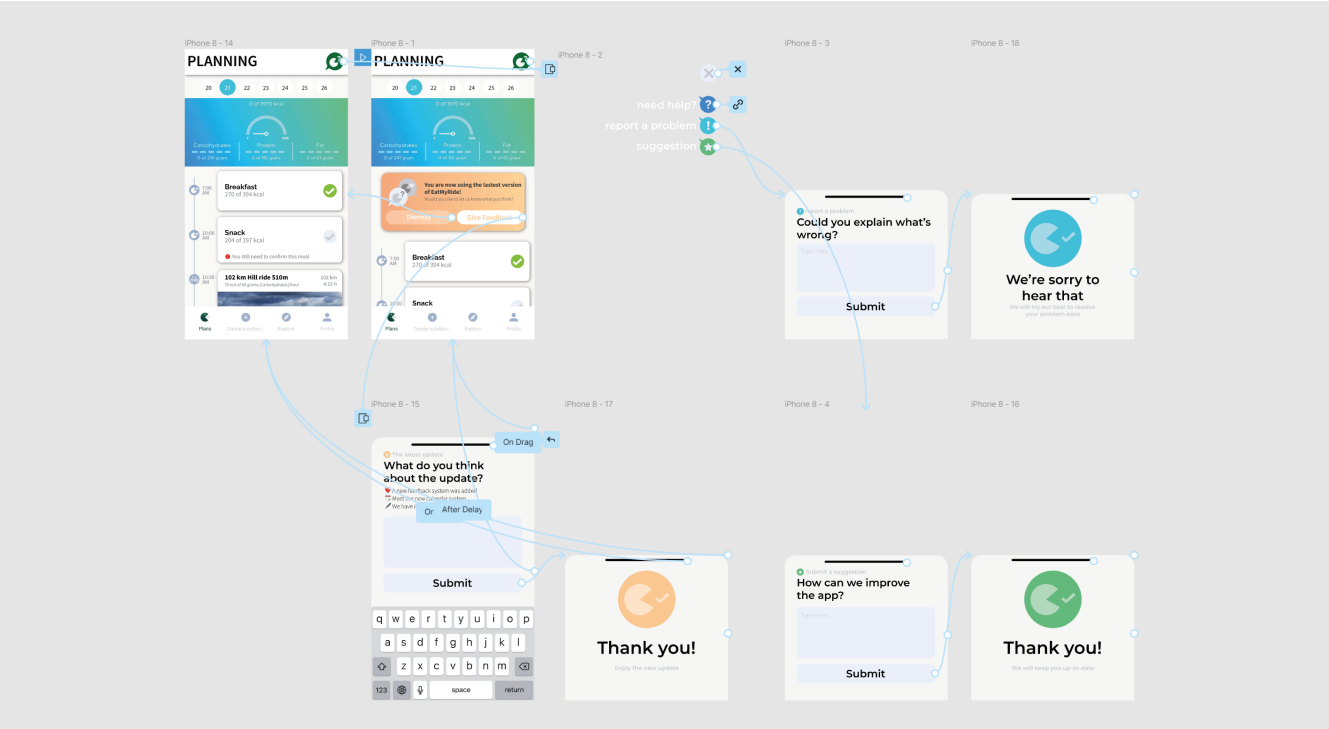


Figure 23: The first interactive prototype in Figma

5.2.1 Feedback gathering

The basis of the feedback system will be the feedback menu at the top right of the screen. This location is currently empty on most screens in the EatMyRide app and offers users a recognizable location. The green icon is the same colour as confirmation buttons in the application, which implies that it is a button. When registering for EatMyRide, users must complete a registration with the same coloured buttons, so they are likely to recognize it as a button.

The menu opens three buttons, with text next to them, indicating the functionality. The 'Need help?' button is connected to WhatsApp Messenger so users can contact EatMyRide directly, whilst the other two options are connected to a screen where the user can report their problem or suggestion. Each screen ends with a *thank you* message, confirming it was sent correctly. The Figma prototype is unable to handle user input, so the usability testing was limited to validating the user experience.

5.2.2 Notification

The second concept implemented in the prototype is the central notification. Despite the central position, users can still use the app without interruption of a pop-up notification. This way users can return later if they have had time to think about what they would like to say. The text on the notification can be adjusted to the liking of EatMyRide, from asking about the latest update to asking for features users really need.

5.2.3 Experience rating

The final concept tested in the prototype is the experience rating. Figure 24 shows how the rating was implemented in the timeline. The placement is in line with the interaction flow of the application. As users return to the next meal of the day, after completion of their ride, to get their energy levels back up.

The colours used in this prototype are based on the EatMyRide blue-green gradient. Participants will be asked about the colours and whether they would use this system. Also this prototype does not have a mood experience and will also be discussed with participants.

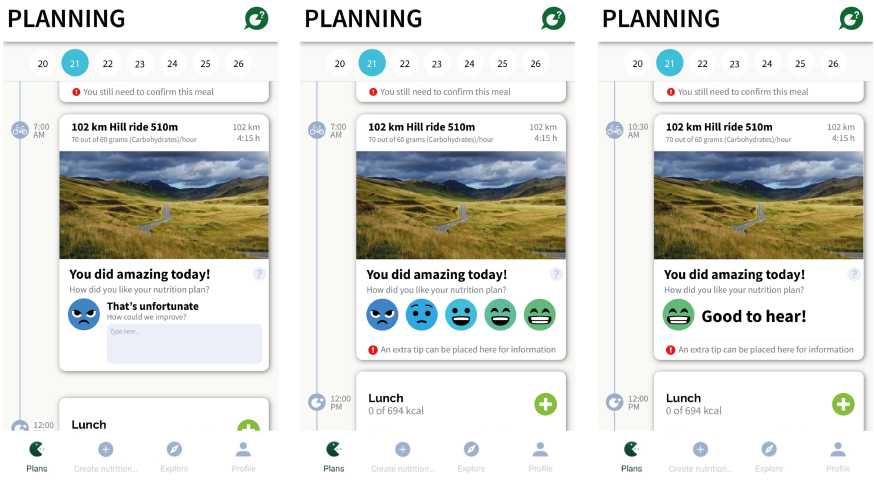


Figure 24: Prototype for the experience rating

5.3 User validation

To get the most accurate data possible, new users were recruited via local ice skating and triathlon sports associations. In total, nine persons participated over the course of four weeks. Seven participants ($n = 7$, $71,43\%$ male) evaluated the first versions of the prototype, and a single person the final React Native application. The prototype was adjusted after the third test, to also test the introduction feature, which is evaluated in section 7 as it is part of the final prototype.

5.3.1 Interview setup

Before the start of the test, participants were asked for an initial interview where they were informed about the test. They were also asked about the amount of cycling they do each week, to confirm that they would be potential EatMyRide users. All participants were rewarded with a month free premium to fully test the capabilities of the EatMyRide application.

After their account was upgraded the diary probe study started, as mentioned in 3.2.2. During the upcoming days, users would fill in the diary and answer questions regarding feedback and their ride experience. The results of the study can be found in chapter 7.2 and the full diary can be found in appendix 12.6. After completion, users were invited for an in-person interview at the University of Twente. This way, the users' interaction with the prototype could be fully observed. For users who were unable to meet in-person, an online interview was scheduled. The interviews were held in Dutch and English, so participants could express themselves in their own language.

This first part of the interview served as a debrief for the diary probe and the second part to test the interactive prototype. The interview setup is shown in figure 25, with the Figma page loaded on an iPhone 7. The second researcher made minutes during the meeting and served as second observer. The first task for users was to interact with the feedback menu and to state what they expected each button to do. The next task was to interact with the notification and finally testing the experience rating. Additionally, some participants started with an introductory section and were asked about their experience.

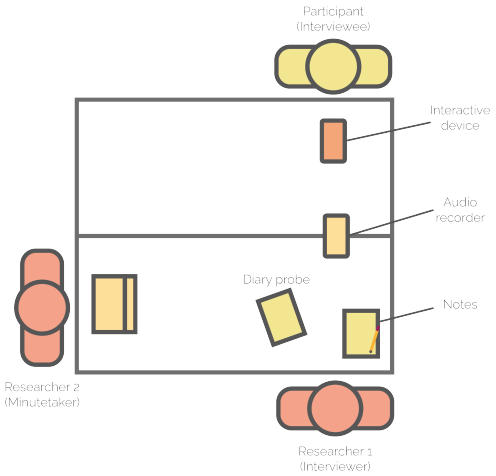


Figure 25: Setup of the usability test

5.3.2 Preliminary test results

Participants were presented with the prototype and were asked about the feedback icon at the top right of the screen. All stated that it was clear that the icon was a button where they expected to be a feedback system. A note to be made here is that users first interacted with another prototype of a similar study, and thus were aware of the study, so their answer might be biased. Next, they were asked about their expectations when interacting with the icons, which can be found in table 11 in appendix 12.5.

As can be seen, almost all users expected the possibility to talk with an EatMyRide employee, however, they prefer to first have a frequently asked questions (FAQ) page to try and figure it out themselves. In the final prototype, an FAQ page will be included to accommodate this. However, the goal in the future should be to minimize the usage of the FAQ, as all questions should be solved in the design.

Secondly, the notification at the centre of the screen was evaluated and participants indicated how they would interact with it. All three indicated that they like the placement of the notification, however, the text of the modal needed adjustments to help users write down their thoughts. Additionally, a simple way of rating could be added, for example stars or a like/dislike functionality, to make it easier for users. For the final prototype, this is not implemented due to the preference for qualitative data.

5.4 Accessibility

The EatMyRide application is available to all cyclist, including those with disabilities, and so should the feedback system. By evaluating the design using colour-test filters within Adobe Illustrator, I optimized the colours to suit those with colour blindness type protanopia and deuteranopia. The rating colours were changed from red-green to blue-green to reduce the effect, as shown in figure 26 below.

The application is currently available in five languages, for which EatMyRide uses an automatic translate API. This would mean the feedback system is translated to the available translation options and as a result allow users to give feedback in their native language. One of the participants from the first user tests indicated that his phone was set to Spanish, and the UI was moved of the screen due to the text being longer than anticipated. It would be good to test the app, and feedback system, in all available languages to prevent this from happening.

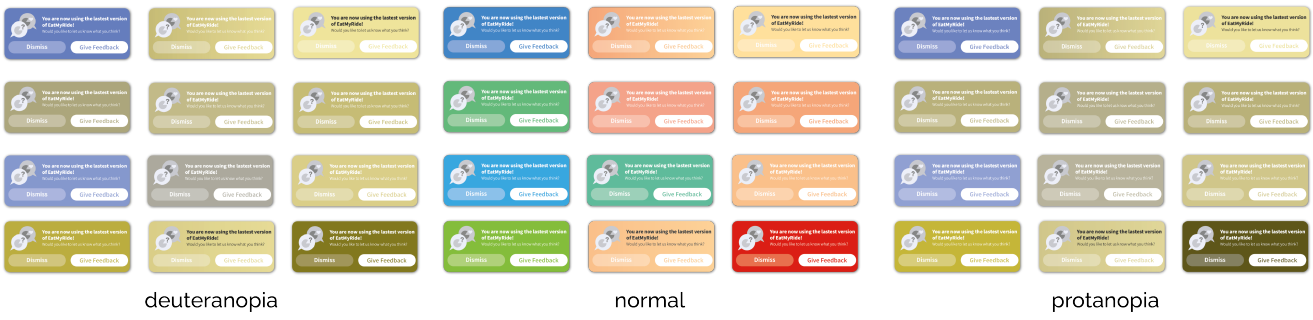


Figure 26: Colour accessibility test

5.4.1 Shake function

Although participants stated they liked the shaking for help concept, as described in 4.4.1, and would definitely like to try it, pursuing this idea will not be useful. Two participants stated that their phone lacked a shake detection functionality, making it unusable. The feedback system should be accessible to all users and not only to those with the latest technology, thus this will not be part of the final prototype.

5.5 Conclusion

The requirements set during this phase of the research must be evaluated in chapter 7. The ethical analysis should be discussed with EatMyRide after completion of the research, as this goes beyond the scope of the feedback system but should definitely not be forgotten.

The first responses to the three concepts were good and the requested additions should be added for the final prototype. The next group of users should be asked about the FAQ page and how they experience the confirmation screens. Also, it would be beneficial for the feedback system and the EatMyRide app to add an introduction when first opening the app. This way users know what they can do with the feedback system and what is done with their feedback.

Due to the lack of accessibility for certain users, the shaking function will not be further developed for now. An alternative could be researched which does not rely on motion but on a gesture for example. Finally, the prototype should still be evaluated with users that fit the EatMyRide target group better. The first group of participants stated that they did not want to continue using the EatMyRide app after the research, which could have influenced their answers.

6 Realisation

In this chapter, the final concept and interactive prototype are described, as part of the *realisation* phase. The final prototype is a native mobile application and will be evaluated in chapter 7 Evaluation. The app can communicate with an admin dashboard online, which is also evaluated with an EatMyRide representative.

6.1 Front-end

Using the results of the diary probes and interviews, I created a mobile application in React Native. All concepts were created according to the conventional react.js methods. Each of the front-end sections is explained below and a complete guide for the prototype can be found on Github[1].

6.1.1 Application layout

The app is based on the React Navigation bottom tab lay out [47]. Here the four tabs from the EatMyRide application, *Plans, Ride, Discover and Profile*, are implemented. Figure 27 shows how these screens are connected. Within the Plans section, the general feedback section and notification are loaded. The discover page has the experience rating feature, and the profile section has an FAQ linked. Before loading the app an on-boarding introduction is called to make the user aware of the added functionalities.

+

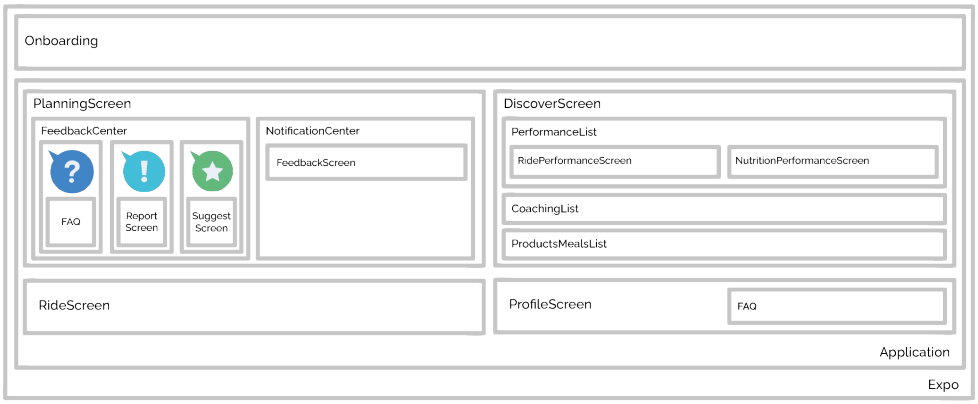


Figure 27: An overview of the final prototype

6.1.2 Introduction

Following the user tests, an explanatory feature was designed to help with understanding what the app does and why it is important to give feedback. The on-boarding is only enabled when first opening the app and will not be opened afterwards. Figure 31 shows the ideation for this functionality. For EatMyRide, this feature can be useful when the feedback is fully implemented and can make users aware of the newly added functionalities. It also helps users understand their personal benefit of giving feedback.

[1]To gain access to the code on github, send an email to *l.g.l.vugts@student.utwente.nl*

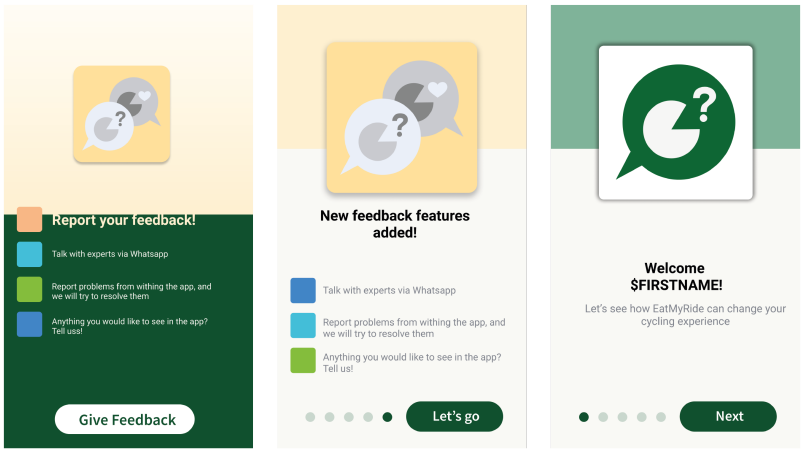


Figure 28: An overview of the tutorial concept

6.1.3 General feedback section

The usability test indicated that the icon colour and placement are the right choice. The header is loaded on top of the content and allows the menu to overlay the entire app. When the icon is pressed the menu becomes visible and links to the respective pages. Each of the pages is a full modal, which means they slide in from the bottom and can be closed by swiping down. For iOS, this works perfectly, however for Android a close button needs to be added to better suit Android users. The help icon is linked to an FAQ and includes the possibility to chat with EatMyRide at the bottom of the page. The exclamation mark and star both open modal with text input, which can be submitted to EatMyRide.

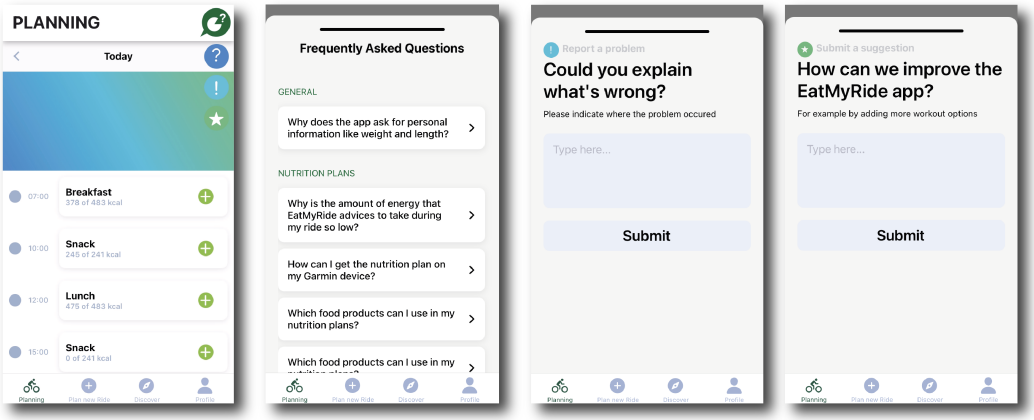
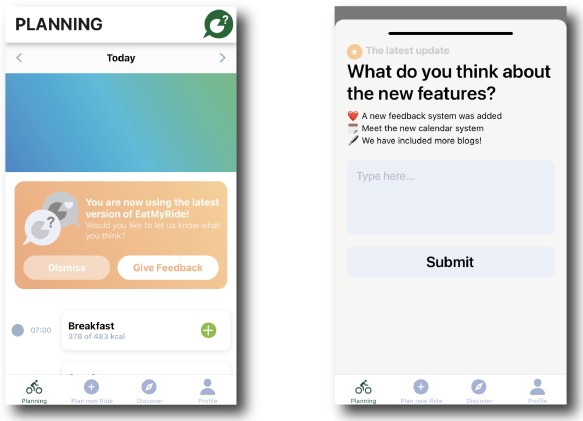


Figure 29: The final design for the feedback menu

6.1.4 Notification

The notification is integrated in the scrollable view of the plans page, and can be adjusted to show information or to ask for feedback. The current version opens a full screen modal where users can submit their feedback regarding the latest update, as shown in figure 30 below.



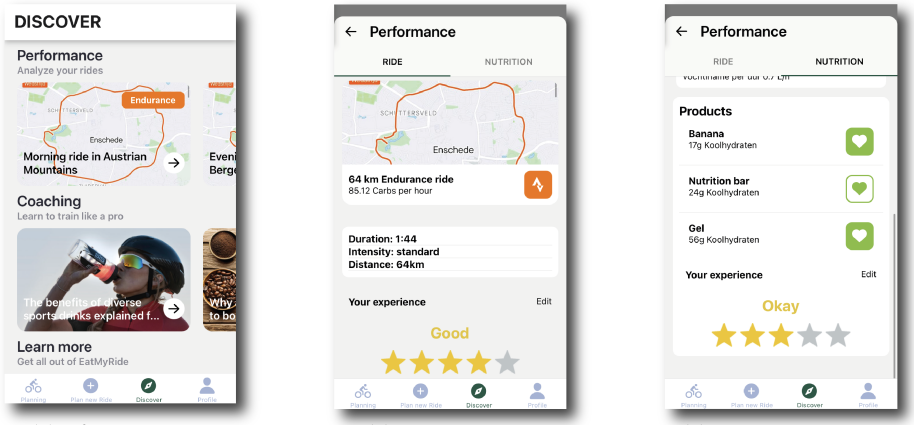
(A) Notification on the planning page (B) Submit update feedback

Figure 30: The final design for the notification

6.1.5 Performance overview

The current *discover* tab shows a WordPress page with blog articles about coaching and app usage. Participant agreed that they would like to have as much information as possible on nutrition and how their performance is affected. However, one user stated:"I thought the page was an advertisement page, so I did not look at it". Reacting to their remark, I introduced a new section called *Performance* to make the section more relevant to the user.

The section shows a list of rides in the last seven days. Each ride has an overview of performance during the ride which can be imported from Strava. Next to the ride, it also shows an overview of the nutrition taken during the ride. In these views, the experience rating concept is applied. Following the usability testing the definitive icons are stars, as they are universal and clear to all users.



(A) Performance section (B) Ride details screen (B) Nutrition details screen

Figure 31: The final design for the performance rating

6.1.6 Settings

In the EatMyRide app the profile tab also has the app settings. Two participants mentioned they would first look at the app settings, as other apps use this place to ask users for feedback. The FAQ and chat functions are implemented here for redundancy. The feedback icon in the top right links to the chat functionality here, as the FAQ is placed in the settings view. Using the *Alert* function of React, the user will get a pop-up that fits the OS interface [48]. Finally users can set their preference for the number of notifications they receive.

6.2 Back-end

A back-end system was made using PHP, in which EatMyRide employees can see responses to the feedback system. Below is a database layout showing how data is stored and how they link together. The lay-out was also first made using Figma and later build using PHP and HTML.

6.2.1 Data connection

The initial idea for the data connection was to have *Node.js* communicate through an API with a web-server that runs *Express.js*. This communicates with a *MySQL* database, which can be accessed through *PHP* on the web. However, this is unwise to have in place for the implementation of the feedback system as it is outdated and has security risks. So figure 32 below shows how the application would communicate through a safe connection, preferably with two-factor authentication in place. Finally, the EatMyRide application uses a lot of python, to which the feedback system can be linked in the future.

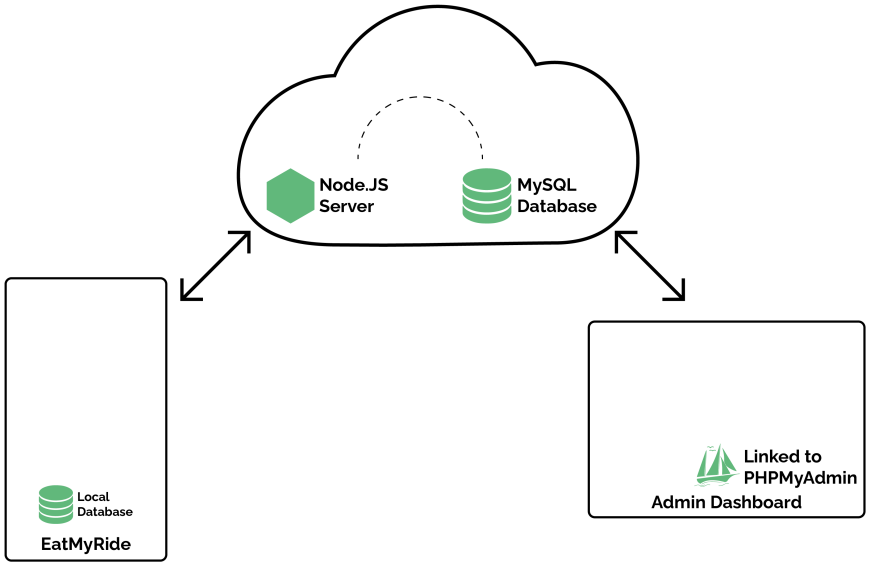


Figure 32: An overview of the communications in the final prototype

6.2.2 Database

Figure 33 below shows how the database for the feedback system can be setup and user data is collected. The issues and feature requests are linked to individual users, so EatMyRide can reach out to provide the needed help. A suggestion can be linked to a roadmap entry so a follow-up can take place after the feature is implemented. A *uuid* is used instead of a normal id to improve security and allow for future up-scaling [49].

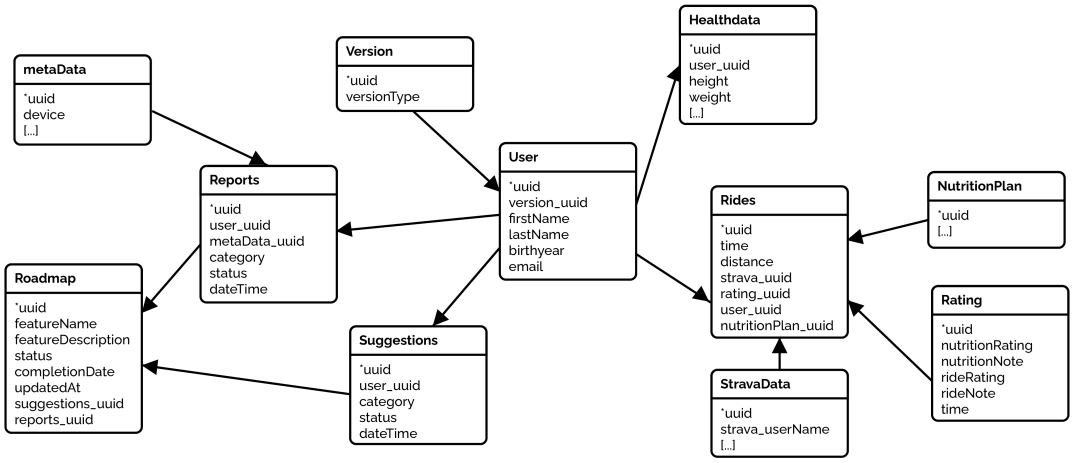


Figure 33: An overview of the database for the final prototype

6.2.3 Design

The final design for the back-end is shown in figure 34 and is divided in three sections: the performance scores, roadmap and reports. The menu on the left can be used to navigate to the development roadmap and the report centre, which contains all feedback. Below the menu is a button to manage the notification and analyse the related feedback.

In the center are the results of the performance ratings from section 6.1.5, which gives EatMyRide real-time data on how their users are doing. The rating is based on the past seven days and can indicate how variables, like the weather or vacations, can influence the user experience. Below the ratings is the development roadmap to give an overview whether the team is on track. The roadmap allows EatMyRide to schedule urgent features whilst keeping the teams on track. The section on the right shows the latest reports and suggestions. The EatMyRide employees can click on the reports to get more details and follow-up with the user.

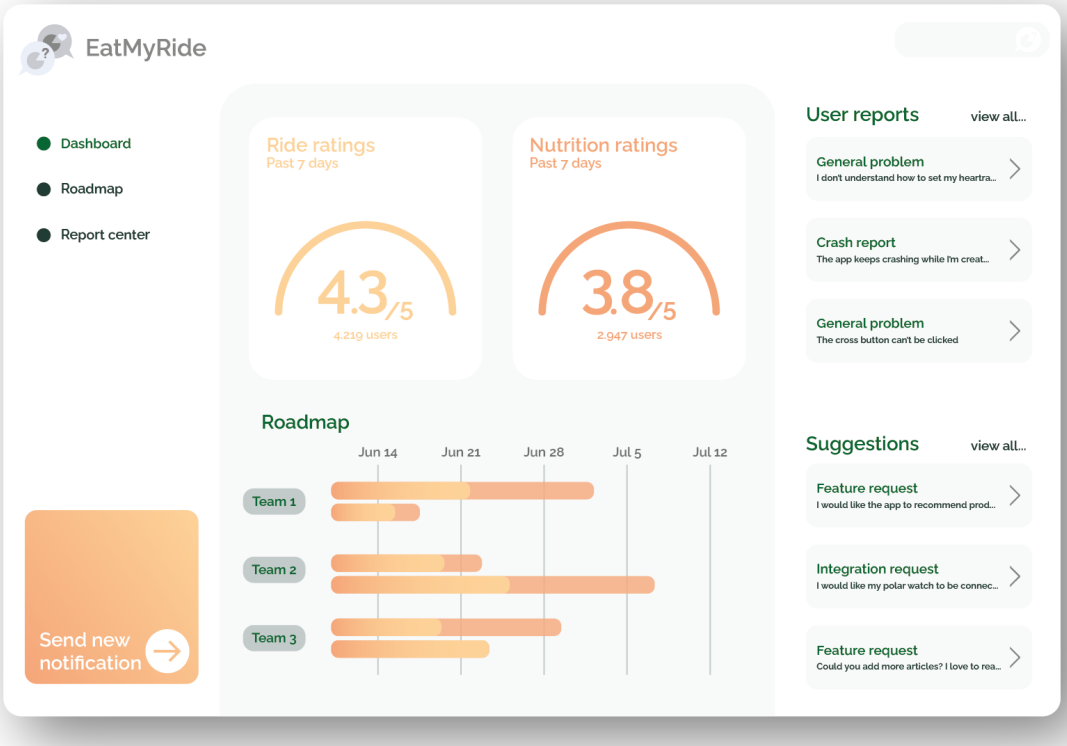


Figure 34: The final design for the back-end dashboard

7 Evaluation

In this chapter, the final prototype is evaluated, and the usability tests are concluded. The results of the diary probe are presented, as well as an interview with an expert evaluation with EatMyRide and a timeline of prototype iterations. Finally, the requirements set in chapter 4.6 are checked.

7.1 Evaluation plan

For the evaluation of the final prototype, only one participant was able to participate, and occurred via a video call. For future research, I would recommend testing the system with users who submitted feedback in the past. This way, users that are likely to give feedback can get accustomed to the system before it is finally implemented.

7.2 Results

In this section the overall results of the diary probe study are discussed, together with the results of the final usability test.

7.2.1 Diary probe

Over the course of eight days, participants filled in a diary and answered questions regarding feedback. The results can be found in visualisation below. The overall conclusion is that the feedback system is a valid way to reach out to users. However, they prefer to have a simple understandable system which takes a short time to fill in. Regarding motivation, some participants indicated that they would like to be rewarded. More research must be done to determine what kind of reward real EatMyRide users would like.

Finally, users were asked whether they would like to continue using the EatMyRide application after completion of the research. From the nine participants, one indicated that they would only use the free version, while all other users did not want to. The top five reason are shown in figure 35, which can be seen as possible feedback users submit through the feedback system.

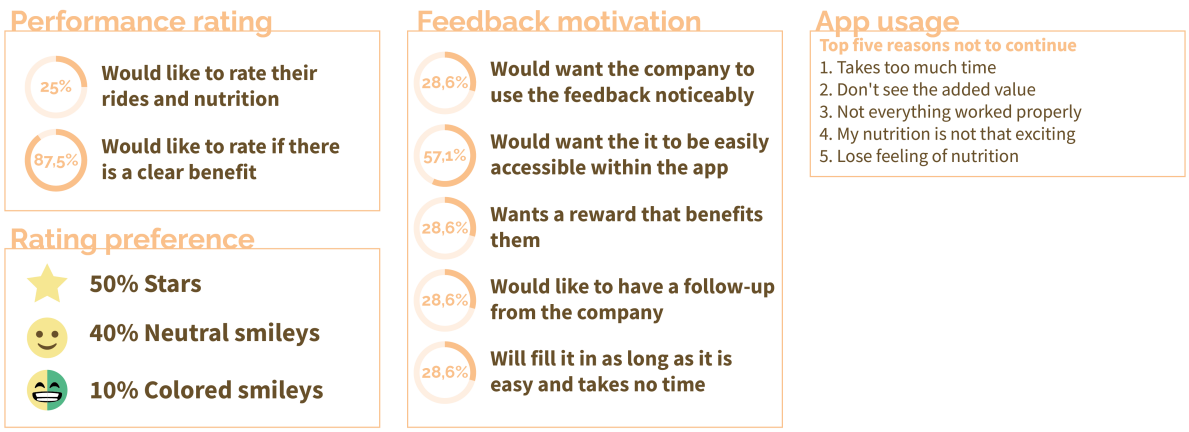


Figure 35: Results of the diary probe study

7.2.2 Final usability test

The final usability test was done with one male participant due to another participant being unable to get the EatMyRide app working correctly. The participant was recruited via Rochelle, who works on a similar research, and is an active cyclist who has a goal of reaching 7500 km this year. The interview and usability test took place via a video call, with the prototype being tested via screen-sharing. The test started by showing the introduction screens and asking the participant what they thought about it. The participant indicated that he would like the images to be replaced with screenshots and to have more information on the thought behind the application. Also, they indicated that an introduction when first starting EatMyRide would be welcome.

The notification concept was presented, and the participant indicated that they would close it, as they experienced it like noise. "When opening the application, I want to do what I came for and not be prompted by this notification." Is what they said when asked why they would dismiss the notification. The participant recognized the feedback button in the top right as a help functionality and would press it. Their expectations for each of the menu's options is shown in table 8. For the help menu, they preferred to have the FAQ page first so they can figure it out on their own before reaching out. WhatsApp was not a problem for this participant as they did not feel like it was a privacy concern. The participant indicated that he would like to have a cross instead of a swiping bar, as it did not feel intuitive to them.

Finally, the participant was shown the performance rating and the concept was explained. They indicated that these functionalities are also in Strava and that it would not be beneficial to them. However, as EatMyRide is the nutrition app, a nutrition overview alone would help them. Although the participant stated later, in case EatMyRide can take over some of Strava's functionalities, they would prefer a ride overview. For them to use the rating functionality, all benefits should be clear and noticeable.

Icon	Expectation
?	Need help, have a question which I can ask
!	Reporting a problem
⋆	Giving an opinion through rating or giving feedback

Table 8 Participant expectations for the feedback menu in the final prototype

7.3 Expert evaluation

The final prototype is evaluated together with Hans Nuijts, the product owner of EatMyRide. He indicated that the admin panel looked good and was clear. However, the roadmap feature would need attention as it was not entirely the way they currently use it, although he did see the benefit of integrating it in the admin dashboard. EatMyRide also has English speaking employees and thus the preferred language of the system is English.

Hans was very enthusiastic about the front-end of the feedback system and only indicated a possible change for the performance rating. As the rating is currently not linked to the nutrition plan and it would take a long time to fully implement such a feature. Hans also indicated that the system can

automatically be translated using their translation API.

7.4 Conclusion

To conclude, the participant showed how important it is for users to trust the application. He indicated how he would like the app to give him suggestions on what products to consume, if there is a 'seal of approval' with information to confirm the advice. This aligns with the background research in chapter 2 and the article by Ju and Leifer [33].

7.4.1 System requirements

The must and should requirements, from table 6 and 7, are evaluated below. The status indicates how far the requirements is achieved.

Front-end requirements

Requirement	Notes	Status
The system must allow for reporting problems	Feedback menu	++
The system must allow for reporting suggestions	Feedback menu and notification	++
The system must provide help when needed	Feedback menu and profile page	++
The system should allow users to opt-out	Not implemented, necessary for ethics	-
The system should be clear to new users	Participants like the introduction	++
The system should show feedback status	Reports are followed-up	0
The system should have an FAQ page	Feedback menu	+

Table 9 Front-end requirement analysis

Back-end requirements

Requirement	Notes	Status
The system must have an overview of reports	Right panel in dashboard	++
The system must have a user filter option	Not implemented, possible with database	-
The system must have a clear manual	Beyond the scope of this research	–
The system must be GDPR ready	Database is GDPR proof	+
The system should have user group selection	Not implemented, necessary for ethics	-
The system should show report status	Database allows for status	+
The system should track user behaviour	The current tracking system in place must be evaluated	0
The system should be a web-app	Mock-up is a webapp	++
The system should have a dev roadmap	Present in centre panel	+

Table 10 Back-end requirement analysis

8 Discussion

In this chapter the results to the research questions are presented and discussed. Followed by the limitations that influenced the outcome of the research.

8.1 Research questions

The three sub research questions helped to answer the main research questions. Each of them will be discussed below.

"What do 'inspiring questions' look like and how can they be used to gather feedback?"

To answer this question, I did research on the definition of feedback and asked participants what they thought about the way a question was asked. However, I designed the performance rating concept, described in 6.1.5, which inspired users to give feedback as long as there was a personal benefit. Inspiring questions are difficult to define, as it differs per person, country and even context within the application.

"How can users be motivated to keep giving feedback?"

Despite not finding a clear definition on how to inspire users, I did find a way to keep them motivated. From the interviews, as described in 7, I found that users see feedback differently and although some like to be disturbed, others did not. I answered the research question by designing a thank you screen for after users submitted their feedback. The confirmation gave them confidence that the company would take their feedback seriously, however, they would be more motivated if EatMyRide would do a follow-up regarding their feedback. This can be done by sending an email or notification when their feedback is implemented.

"What data will be gathered and how should it be analysed?"

The final sub question could not be fully answered during the research. Due to the lack of real users and real user-feedback, it could not be analysed. An overview of the data can be found in section 6.2, where the back-end prototype is shown as well. Here I gave an idea of how the data can be analysed, however, this is solely based on categories.

8.2 Research participants

For the survey used in section 2.4.1, participants were first contacted via email by EatMyRide. The idea was to target around 200 new users, however there were no responses to the mail. To still gather results, the survey was sent out to a group of 25 users who are close with EatMyRide. Thus the seven responses are not a representative sample of all EatMyRide users.

For the user testing, no active EatMyRide users were available so new users had to be found to participate in this research. By contacting the ice-skating and triathlon student associations, seven participants could be found and introduced to the EatMyRide app. This limited the research as they are much younger than 40, the average EatMyRide users' age. Additionally, participants are all studying at the University of Twente, and thus have a different educational background compared to EatMyRide users.

8.3 Limitations

Unfortunately, the research did not go as planned and had some limitations that affected the outcome of this research. Covid-19 influenced the interaction with stakeholders and the prototype testing method also had some limitations.

8.3.1 Covid-19

Due to the pandemic the research was difficult to start up, as there were no physical meetings possible in February 2021. This meant that all meetings were held online, including client and user interviews. This limited the research, as I would like to have attended a training of the local cycling association early in the process. This made it difficult to connect with users and get a deeper understanding of their needs.

Luckily the debrief interviews of the usability test were held online, however this resulted in an unnatural interaction setting at the University of Twente. Normally, users would use the system during dinner or on the couch after a ride and we were unable to verify when and where the app was used. This could have led to more insights on user behaviour, for example gathering data on their digestion if a user would use the app on the toilet.

For future research, I would advise to sit together with users in their home environment and spend a day together. This is a great way to get to know the user, know what they think and know how they experience cycling. It would also be great to see how cyclists have change due to the pandemic, however, this goes beyond the scope of this research.

8.3.2 Figma

As described in section 5.2, Figma is used for the first prototype. However, Figma lacks user interacting capabilities and thus actual user input could not be tested. The participants were asked to press the submit button and did not have enough time to think about something to write. Also, Figma is loaded in the browser of an iPhone, which meant that the address bar was still present during testing. As a result, the bottom part of the screen, the bottom navigation bar, was only partially visible.

8.3.3 Double testing

This research is done simultaneously with another research on the same subject. User testing was combined to reduce the number of participants needed for the research. However, during usability testing, users first tested the prototype of the other project before testing the Figma prototype of this research. This influenced users as they were already familiar with the kind of questions. They also were aware of the new button at the top right of the screen, and thus the placement of this button could not be verified with this research alone.

9 Future works

This is the last chapter, where I look ahead to what can be done after completion of this research. I discuss how the feedback system can be implemented, what future research needs to be done and what goals EatMyRide can set for the future.

9.1 Implementation

The feedback centre, where users can report problems, and the notification, where users can give feedback directly, are ready to be implemented as soon as possible. However, I would advise to also include the introduction to make users aware of the new functionalities and the importance of feedback. The components need to be linked to the right screens and the database needs to be updated. Before implementation, the interaction for Android needs to be sorted out, as the full screen modal gesture does not work [50]. The solution would be to put a cross similar to other parts of the EatMyRide application.

The ride rating concept is harder to implement. As described in chapter 7, users need to have an incentive to give their ride and nutrition plan a rating. I recommend making the nutrition plan more personal by adjusting it to personal preferences. Rating a ride and nutrition plan can be the way towards a more personal app experience, whilst provide EatMyRide valuable insights in their users behaviour.

9.2 Future research

When I stared this research, my goal was to also be able to determine what to prioritize in development, based on the feedback system. In this research, I only could base this on the amount of times a report has come in and to base it on intuition. However, this needs to be researched further and the results of this research could also be relevant to other companies beside EatMyRide.

If more companies implement extensive feedback systems in their applications, users can actively be involved in the development of apps. Resulting in apps that are relevant and more suitable to the users' needs. However, companies should be aware of the ethical issues involved with feedback systems and implement solutions to counter these. As a start, a code of conduct and sufficient security measures should be in place.

9.3 Future goals

Below are the future goals for the EatMyRide application and the feedback system, after integration with the app.

9.3.1 Frequently asked questions

Currently the FAQ page is only available on the website and is implemented in the prototype after participants stated they would have liked an FAQ. However, I think the goal for EatMyRide is to reduce the number of questions on the page to almost zero. This goal can drive the design and UI of features to be clear to user for all users. For example, by using tooltips in places where an explanation could be needed. Or by reducing the amount of information the user needs to fill in, to make it harder to do something wrong.

9.3.2 More endurance sports

In the future the EatMyRide app could expand to also include swimming and running, making it suitable to triathlon athletes. The feedback system can be used to differ their needs from cycling needs and adjust the app experience to the specific needs. By also including side activities like walking and fitness, the daily nutrition plan can be truly optimized for every kind of athlete.

9.3.3 Events

EatMyRide has a huge opportunity to help athletes during events. If the ride experience is implemented, users can give their nutrition plan a rating and their plan can be adjusted accordingly. This way they can get their favourite food during an event, helping them reach their goal. The huge amount of data gathered during an event can be used to improve the EatMyRide algorithm, as a lot of variables are the same for participants.

The application can also have an impact on organisation of events. For example during a marathon, water points could be adjusted in distance according to the needs of most users so they can get maximum performance. It could also be possible to set a nutrition plan where their nutrition is placed on locations beside the track, so they can focus on the race instead of when to eat exactly.

9.3.4 In-app events

During the latest Apple developer conference WWDC21, Apple announced the upcoming software features for their products, a new feature for the App Store was introduced [51, 52]. With in-app events, apps can be highlighted in the App Store to make users aware of special events. EatMyRide can use this to create a community and set goals for users to achieve. This is a great way to grow the application, gather data and give users a great experience.

Users can compete against one another or be challenged to achieve a set goal. New features that users have been asking for can also be released during a premiere event, to create awareness and attract new users. Next to highlighting events, the product page can also show specific functions to appeal to different users [53].

10 Conclusion

The goal of this research was to design a feedback system for the EatMyRide application, that allows EatMyRide to learn more about its users and to design the app in a more user-centred approach. It has been an inspirational experience, and after five months, the research can be concluded and provide a partial answer to the research question:

> "How should a feedback system be designed, in order to inspire the users to give feedback, and help further develop the EatMyRide application?"

To better understand this question and help provide a possible outcome, I tried to define the concept of feedback. As feedback is part of daily life and there are lessons to be learned from other disciplines, like educational and medical fields. As a result, I found five guidelines to follow when dealing with feedback, which form the basis for the feedback system.

1. Before dealing with feedback, the **goal** and **relationship** should be clear. For a feedback system all persons interacting with it should be clearly instructed.

2. The person receiving the feedback should be **open** to feedback and decide the **pace**. The system anticipates this by being available to the user anywhere, similar to a waiter at a restaurant. Notifications can be adjusted in the settings to suit the persons wishes.

3. When dealing with feedback, **communication** is key to **understand** the feedback. To provide clarity, users are introduced to the feedback system before interacting with it.

4. **Participation** is necessary in a normal one-on-one feedback session, and so it is for the feedback system. The system allows for follow-ups with users to understand them and **provide** the help they need. Feedback is like a two-way street, which the system establishes by providing users with useful information before asking them to leave feedback.

5. Finally the feedback session should be concluded with an **action plan**, which is clear to all involved. With the system **real-time data**, like features and bugs, can easily be scheduled in the development roadmap. This allows for adjustments to the current needs of user; however it should be clearly communicated.

These five points were the inspiration for the multiple concepts, of which four were implemented in a mock-up of the EatMyRide application. What followed were multiple rounds of user testing to validate the prototype, following the Design method by Mader and Eggink [3]. When first opening the app, users are greeted with an introduction, which is an excellent way to make users aware of the new features. With a feedback menu available on multiple pages, users can ask for help or report a problem at any time. The other concepts, a custom notification and a way to rate rides, are interwoven in the apps experience. They are part of the interaction and are a way to provide the user with more information whilst asking for feedback.

The personal aspect of the feedback menu and the usefulness of the ride rating are what make this feedback system stand out. Each of the concepts is evaluated with participants in three rounds, where small adjustments to the prototype were made and tested in the next round. The overall system, including the back-end, were analysed during an interview with EatMyRide to confirm that their needs were fulfilled. The research shows that a feedback system can indeed help the development of the EatMyRide application, and even inspire users when using the right techniques.

Lastly, the conclusions of this research go beyond the EatMyRide application, as more applications can use a feedback system to improve their design. The three greatest lessons for the design of a feedback system are explained below.

10.1 Create incentive

The research shows how users can be inspired and motivated to give feedback when a beneficial scenario is presented. For the EatMyRide app, this was the introduction of a way for the user to give their performance a rating which the app would use in the personal nutrition plan. The personal connection to the outcome of the feedback stimulates users to give feedback and provides the company with real-time user data.

Although it sounds easy, communicating clearly is difficult as most users have a bias due to their experience with feedback in other apps. If the communication is clear, and users know the importance of their feedback, the app can be developed using the user input and put users first.

10.2 Avoid interruptions

The research shows no clear preference towards pop-up notifications, it is still best to avoid interruption altogether. Users open the app with a purpose and might close the pop-up as they are interrupted. It is best to put the feedback directly into the flow of the app, making it part of their experience. However, if the interaction takes too much time it will still be an interruption and users are likely to discard the feedback session.

10.3 Be involved

When dealing with users, keep in mind that they are people with different needs and backgrounds. Users that trust the company with their feedback are valuable assets and can be involved in future development. By listening and making a connection, users can feel understood which can inspire and motivate them.

For a company using a feedback system, responding to requests and problems should be a priority. This way users know what is done with their feedback and can help the company to gain a deeper understanding of their users.

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12 Appendices

12.1 Appendix A: Brochure and consent form

On the next pages, the ethics brochure and consent form can be found. These were send to participants upon participation in the research.

Information Brochure

How to develop the EatMyRide app in a user-centered approach?
Developing a feedback system to provide new insights on future developments,

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Graduation project for Creative Technology in collaboration with EatMyRide

Background
Nutrition is a vital part of the cycling experience, even for amateur riders. EatMyRide is a mobile application that gives personal and professional nutrition advice to endurance athletes. The application can be used on a Garmin cycling computer or smartwatch and can provide notifications during the sports activity, to make sure the user eats the right food at the right time.

To further develop the application and provide the functionalities that cyclists need, EatMyRide wants to redesign using user-centered design. That is where I, as a creative technologist, come in. This is part of my bachelor graduation project and my goal is to develop a tool that allows EatMyRide to align the development with the user's needs.

This brochure will explain the project's procedures and answer frequent questions.

Participant Types
Amateur riders
These are cyclists that train 1-2 times a week with around 50km per ride. Affinity with EatMyRide or another nutrition app is not required.

Fanatic riders
These are cyclists who train or want to train 3-5 times a week with around 200km weekly basis. Affinity with EatMyRide or other nutrition apps is not required.

Professionals from TeamDSM
TeamDSM is a professional cycling team based in Deventer. Participants from the team will be the coach, nutritionist and cyclists, which likely will be contacted through online means.

Research Types Plan
Type 1: Questionnaire
An online questionnaire will be sent via email for you to fill in. Here you will be presented with questions regarding giving feedback. There might also be concepts and features for the EatMyRide app, and you will be asked for input on these. Also, there will be some questions about your needs as a cyclist.

Type 2: Interview
During the interviews, the researcher will ask you to do certain tasks and observe how you handle them. These tasks may include interacting with the application, filling out a diary or taking pictures of, for example, your sports nutrition. Additional questions might be asked on why you do certain things. The goal of this research is to gain as much insight and understanding of cyclists as possible.

Type 3: Observational research
During the observational research the researcher will follow along with a training. The researcher won't interfere with the training itself but will ask you questions about it before and/or after the training, like research type 2 above.

Type 4: Evaluation user-test
During these tests, you will be asked to interact with a (finished) prototype and perform certain tasks, to evaluate the usability of the application. The researcher will note your responses and might ask additional questions along with your actions.

Participation Information
Participation is completely voluntary and you can decline or withdraw from the research at any time. The maximum duration of participating will be one hour, unless indicated differently. You will be asked to sign a consent form to use your data and participation in the study. There are no costs connected to participation and in case you're asked to download the EatMyRide application, this will come with a premium membership, free of charge.

GDPR
What data will be collected?
Depending on each type of research a different kind of data will be collected. See the table to see per type what kind of data will be collected.

Type 1	Answers to questionnaire
Type 2	Answers to questions, written notes, if online a recording of the interview (with permission of participant)
Type 3	Written notes of the observation, pictures (with permission of participant)
Type 4	Written notes, answers to questions, recording of user test (with permission of participant)

How will the data be stored?
Data will be securely stored according to the GDPR guidelines with correct encryption in place and will be anonymised as early as possible. Data is stored for as long as deemed fitting for the research, according to VSNU guidelines.

How will the date be used?
Your data will only be used for this research and will help to develop a tool for EatMyRide. The results will be anonymised for use in this graduation project. EatMyRide will have access to the raw data of the survey, however these results will be completely anonymous. To make the data anonymised the recordings of interviews will be transcribed and the recordings of the user test will be analysed and annotated, extracting the features and observations, then the original recordings will be deleted. EatMyRide will only have access to the anonymized results.

Who has access to the data?
Only those involved in the research and future research will have access to the data and will not be disclosed to third parties. These persons include researchers and employees and, upon request, these names will be disclosed. No personal information will be shared with EatMyRide, but the anonymized results.

Can I have my data deleted?
In case you decided to withdraw from the research, all identifiable data collected up to that point will be deleted. At any given time, you can request your personal data to be deleted.

COVID-19
In case of in-person contact, everything will be done to adhere to the current COVID-19 regulations. Most contact will take place online, outside, or in a well-ventilated room. The researcher will keep 1.5 meters distance and a face-mask at all times. You have the right to withdraw from the research at any time, also when you feel unsafe due to COVID-19.

Debrief
After the research is over, you will be debriefed and if you have any additional questions, I will try my best to answer them. Please contact the secretary of the Ethics Committee via *ethicscommittee-cis@utwente.nl* for independent advice, in case of resting questions or any complaints.

Informed Consent for Research
'I hereby declare that I have been informed in a manner which is clear to me about the nature and method of the research as described in the information brochure **'How to develop the EatMyRide app in a user-centered approach?'** My questions have been answered to my satisfaction and I agree with my own free will to participate in this research. I reserve the right to withdraw this consent without the need to give any reason and I am aware that I may withdraw from this research at any time. If my results are to be used in scientific publications, to be used by EatMyRide or made public in any other manner, they will be completely anonymous. My personal data will not be disclosed to third parties without my expressed permission. If I request further information about the research, now or in the future, I may contact Rochelle Spaargaren, *r.spaargaren@student.utwente.nl*, or Lukas Vugts, *l.g.l.vugts@student.utwente.nl*.

If you have any complaints regarding this research, please direct them to the secretary of the Ethics Committee of the Faculty of Electrical Engineering, Mathematics and Computer Science at the University of Twente, P.O. Box 217, 7500 AE Enschede (NL), email: ethicscommittee-cis@utwente.nl.

Signed in duplicate:

....
Name Signature

I have provided explanatory notes about the research. I declare myself willing to answer to the best of my ability any questions which may still arise about the research.'

....
Researcher Signature

Informed Consent for Online Research

'I hereby declare that I have been informed in a manner which is clear to me about the nature and method of the research as described in the information brochure **'How to develop the EatMyRide app in a user-centered approach?'** My questions have been answered to my satisfaction and I agree with my own free will to participate in this research. I reserve the right to withdraw this consent without the need to give any reason and I am aware that I may withdraw from this research at any time. If my results are to be used in scientific publications, to be used by EatMyRide or made public in any other manner, they will be completely anonymous. My personal data will not be disclosed to third parties without my expressed permission. If I request further information about the research, now or in the future, I may contact Rochelle Spaargaren, *r.spaargaren@student.utwente.nl*, or Lukas Vugts, *l.g.l.vugts@student.utwente.nl*.

If you have any complaints regarding this research, please direct them to the secretary of the Ethics Committee of the Faculty of Electrical Engineering, Mathematics and Computer Science at the University of Twente, P.O. Box 217, 7500 AE Enschede (NL), email: ethicscommittee-cis@utwente.nl.

For an online survey consent form the following information will be added to confirm the consent of the participant:

By continuing to the next page indicates that:

- You have read and understood the above information
- You understand that EatMyRide will have access to your anonymized raw data
- You voluntarily agree to participate
- You are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by closing this browser window.

For an online interview the following question will be asked to confirm the consent of the participant:

Before starting the interview and recording the researcher will ask the participant if he/she consents to the here above stated consent. If the participant does, the recording will start and the question will be repeated so that there is a proof of evidence.

12.2 Appendix B: EatMyRide user survey

On the next pages, the user survey for EatMyRide users can be found. The results were used in chapter 2 *Background research*.

Survey EatMyRide 2021

Dear sir/madam,

In collaboration between EatMyRide and the University of Twente, we need your feedback to further improve and develop the app! This survey is meant to get a better idea about you as user and what you think about giving feedback. Completing this survey only takes 10 minutes. The survey consists of three parts, about you as cyclist, your experience with the EatMyRide app and finally about giving feedback.

Participation in this research is completely voluntary and you can decide to stop at any moment.

Before starting with the survey, please read the following information carefully.

"I hereby declare that I have been informed in a manner which is clear to me about the nature and method of the research. I agree with my own free will to participate in this research. I reserve the right to withdraw this consent without the need to give any reason and I am aware that I may withdraw from this research at any time. If my results are to be used in scientific publications, to be used by EatMyRide or made public in any other manner, they will be completely anonymous. My personal data will not be disclosed to third parties without my expressed permission."

If you request further information about the research, now or in the future, you may contact Rochelle Spaargaren, r.spaargaren@student.utwente.nl or Lukas Vugts, *l.g.l.vugts@student.utwente.nl*.

I declare the following:

- I have read and understood the above information

- I am at least 18 years of age

- I understand that EatMyRide will have access to my anonymised answers

- I voluntarily agree to participate

1. Do you accept the conditions stated above?

Question instructions: *In case you wish not to participate, please close this survey*

- ◯ Yes
- ◯ No

Information about you as cyclist

2. On average, how often do you cycle?

Question instructions: *Select one answer*

- ◯ 4 or more times per week
- ◯ 2 - 3 times per week
- ◯ Once a week
- ◯ Once a month
- ◯ Other... ____

3. With whom do you cycle, both now and pre-covid?

Question instructions: *Select one or more answers*

- ☐ Alone
- ☐ Friends
- ☐ Colleagues
- ☐ Club
- ☐ Team
- ☐ Other... ____

4. Have you ever joined a cycling race or are you planning to in the future?

Question instructions: *Select one answer*

- ◯ Yes
- ◯ No

5. What races have you participated in or want to participate in the future?

Question instructions: *Select one or more answers*

- ☐ Races longer than 3 hours, such as cyclos/GranFondos races
- ☐ Races shorter than 3 hours, such as team competitions
- ☐ Tours
- ☐ Multiday races
- ☐ Other... ____

Information about the EatMyRide app

The following questions are about your use and experience with the EatMyRide app.

6. Why did you download the EatMyRide app?

____

7. Which version of the EatMyRide app do you have?

Question instructions: *Select one answer*

- ◯ Premium version
- ◯ Free version

8. How often do you use the EatMyRide app?

Question instructions: *Select one answer*

- ◯ 2 - 3 times per week
- ◯ Once per week
- ◯ Once per two weeks
- ◯ Once per month
- ◯ Once per two months
- ◯ Other... ____

9. How would you describe your current experience with the EatMyRide app?

____

Giving feedback

We would like to know how you feel about giving feedback, to improve the EatMyRide app in the future. An example of feedback is to ask you about a new functionality or asking how you liked your nutrition advice.

10. What would motivate you to give feedback in the future?

Question instructions: *Select one or more answers*

- ☐ An app that is better suited to the user
- ☐ Informing other people about my experiences with the app
- ☐ Showing appreciation to the developers for a specific feature
- ☐ Free premium subscription
- ☐ Other... ____

11. Indicate to what extend you agree with the following statements:

Question instructions: *Select one answer in each row*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I like giving feedback	◯	◯	◯	◯	◯
I would like to be rewarded for giving feedback	◯	◯	◯	◯	◯
When I give feedback, something must be done with it	◯	◯	◯	◯	◯
I would like to receive updates regarding my feedback	◯	◯	◯	◯	◯

12. At what moment would you be most motivated to give feedback about the EatMyRide application?

Question instructions: *Select one or more answers*

- ☐ Before the start of a ride
- ☐ During a ride
- ☐ During the break of a ride
- ☐ Shortly after a ride
- ☐ An hour or longer after a ride
- ☐ Other... ____

13. How often would you be willing to give feedback about the EatMyRide app?

Question instructions: *Select one answer*

- ◯ Weekly
- ◯ Monthly
- ◯ Semi-annually
- ◯ Annually
- ◯ Never
- ◯ Other... ____

14. How much time are you willing to spend on giving feedback about the EatMyRide app?

Question instructions: *Select one answer*

- ◯ 0 - 30 seconds
- ◯ 0.5 - 2 minutes
- ◯ 2 - 5 minutes
- ◯ 5 - 10 minutes
- ◯ 10 - 15 minutes
- ◯ More than 15 minutes

15. Do you currently have any feedback or additions to the EatMyRide app?

Question instructions: *Select one answer*

- ◯ Yes, namely ____
- ◯ No, currently not

Inspiration & Creativity

16. When giving feedback (in the future), for example about an idea for a new functionality, what would inspire you to do so?

Question instructions: *Select one or more answers*

- ☐ A frustration in the app
- ☐ Functionality in another app
- ☐ Something missing that a dietitian can offer
- ☐ Other... ____

17. Please indicate to what extend you agree with the following statements:

Question instructions: *Select one answer in each row*

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I think I am creative	◯	◯	◯	◯	◯
I am critical	◯	◯	◯	◯	◯
I am quickly satisfied	◯	◯	◯	◯	◯

18. Please indicate to what extend you agree with the following statements:

Question instructions: *Regarding feedback, I*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
easily come up with original ideas	◯	◯	◯	◯	◯
give feedback that could lead to new features	◯	◯	◯	◯	◯
need inspiration from others	◯	◯	◯	◯	◯
find giving feedback easy, without specific instructions	◯	◯	◯	◯	◯
would describe my feedback as creative	◯	◯	◯	◯	◯

12.3 Appendix C: Results of the user feedback survey

On the next pages the results of the user survey can be found.

Survey EatMyRide 2021

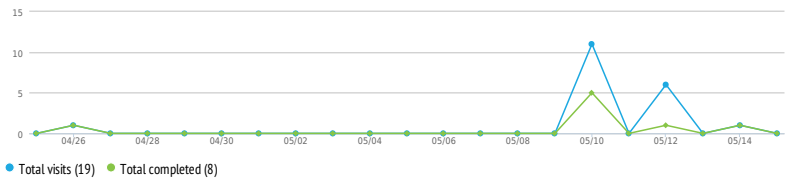
General

Survey name	Survey EatMyRide 2021
Author	Joram Kolf
Survey language	English
Survey URL	https://www.survio.com/survey/d/A3G1S9R7M9E3K5S2O
First response	04/26/2021
Last response	05/14/2021
Duration	19 days

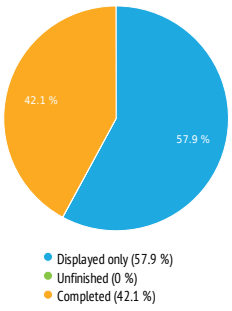
Survey visits

19	8	0	11	42.1 %
Total visits	Total completed	Total unfinished	Displayed only	Overall completion rate

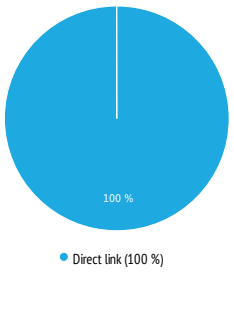
Visit History (04/26/2021 – 05/14/2021)



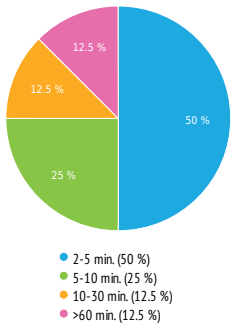
Total Hits



Visit Sources



Average Time of Completion

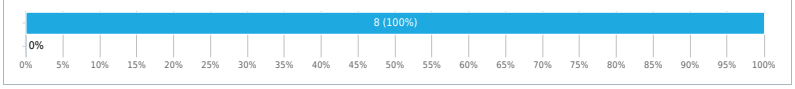


Results

1. Do you accept the conditions stated above?

Single choice, answers 8x, unanswered 0x

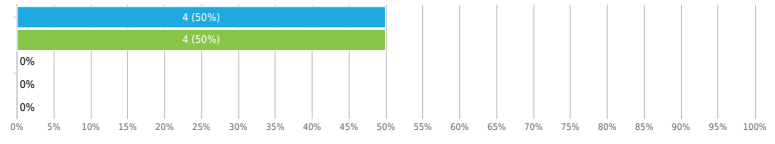
Answer Choices	Responses	Ratio
Yes	8	100 %
No	0	0 %



2. On average, how often do you cycle?

Single choice, answers 8x, unanswered 0x

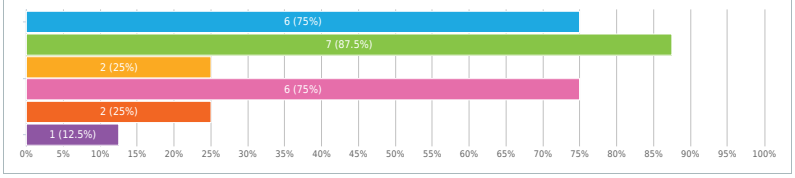
Answer Choices	Responses	Ratio
4 or more times per week	4	50 %
2 - 3 times per week	4	50 %
Once a week	0	0 %
Once a month	0	0 %
Other...	0	0 %



3. With whom do you cycle, both now and pre-covid?

Multiple choice, answers 8x, unanswered 0x

Answer Choices	Responses	Ratio
Alone	6	75 %
Friends	7	87.5 %
Colleagues	2	25 %
Club	6	75 %
Team	2	25 %
Other...	1	12.5 %

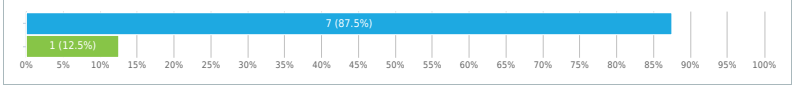


- Partner

4. Have you ever joined a cycling race or are you planning to in the future?

Single choice, answers 8x, unanswered 0x

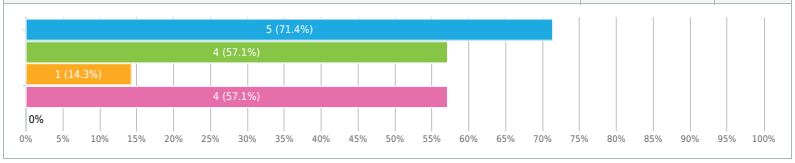
Answer Choices	Responses	Ratio
Yes	7	87.5 %
No	1	12.5 %



5. What races have you participated in or want to participate in the future?

Multiple choice, answers 7x, unanswered 1x

Answer Choices	Responses	Ratio
Races longer than 3 hours, such as cyclos/GranFondos races	5	71.4 %
Races shorter than 3 hours, such as team competitions	4	57.1 %
Tours	1	14.3 %
Multiday races	4	57.1 %
Other...	0	0 %



6. Why did you download the EatMyRide app?

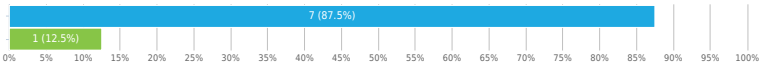
Text answer, answers 8x, unanswered 0x

- optimaliseren van voeding om prestatie te verbeteren
- meer inzicht in hoeveel ik moet eten, interesse
- To get more info abuyt using a foodplan
- I want to get guidance in my planning for eating and drinking while cycling but also before
- Interest in food and cycling
- Curiousity and get better insights on what to eat and drink
- Via owner
- Personal connection with owner

7. Which version of the EatMyRide app do you have?

Single choice, answers 8x, unanswered 0x

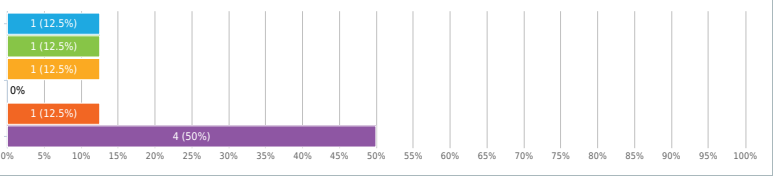
Answer Choices	Responses	Ratio
Premium version	7	87.5 %
Free version	1	12.5 %



8. How often do you use the EatMyRide app?

Single choice, answers 8x, unanswered 0x

Answer Choices	Responses	Ratio
2 - 3 times per week	1	12.5 %
Once per week	1	12.5 %
Once per two weeks	1	12.5 %
Once per month	0	0 %
Once per two months	1	12.5 %
Other...	4	50 %



- nearly every day
- Only on trips
- Don't know. Just downloaded it
- Not yet

Survey EatMyRide 2021

9. How would you describe your current experience with the EatMyRide app?

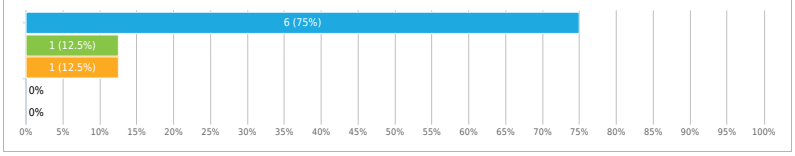
Text answer, answers 8x, unanswered 0x

- Goed, maar nog veel ruimte voor verbetering
- het wordt steeds beter en meer toepasbaar
- Im still exploring the app
- great, but still some user experience tooling to be added
- Interesting
- App interface looks great. Useful integration with strava/komoot/garmin. It is a bit difficult (time consuming) to fill in the nutrition plan
- .
- Used it only once

10. What would motivate you to give feedback in the future?

Multiple choice, answers 8x, unanswered 0x

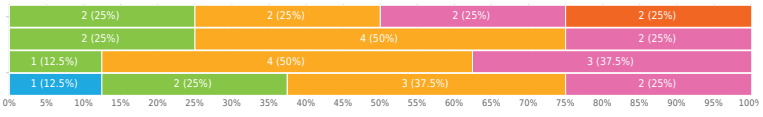
Answer Choices	Responses	Ratio
An app that is better suited to the user	6	75 %
Informing other people about my experiences with the app	1	12.5 %
Showing appreciation to the developers for a specific feature	1	12.5 %
Free premium subscription	0	0 %
Other...	0	0 %



11. Indicate to what extent you agree with the following statements:

Matrix of single choices, answers 8x, unanswered 0x

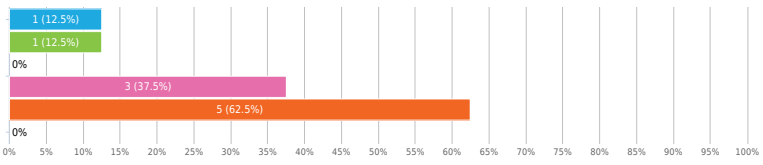
Answer	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I like giving feedback	0	2 (25 %)	2 (25 %)	2 (25 %)	2 (25 %)
I would like to be rewarded for giving feedback	0	2 (25 %)	4 (50 %)	2 (25 %)	0
When I give feedback, something must be done with it	0	1 (12.5 %)	4 (50 %)	3 (37.5 %)	0
I would like to receive updates regarding my feedback	1 (12.5 %)	2 (25 %)	3 (37.5 %)	2 (25 %)	0



12. At what moment would you be most motivated to give feedback about the EatMyRide application?

Multiple choice, answers 8x, unanswered 0x

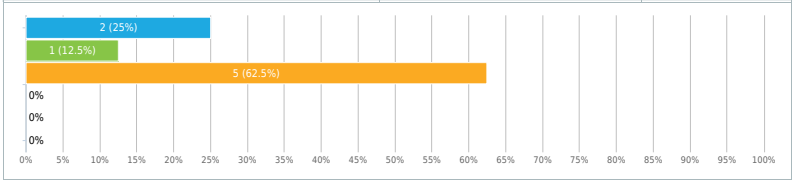
Answer Choices	Responses	Ratio
Before the start of a ride	1	12.5 %
During a ride	1	12.5 %
During the break of a ride	0	0 %
Shortly after a ride	3	37.5 %
An hour or longer after a ride	5	62.5 %
Other...	0	0 %



13. How often would you be willing to give feedback about the EatMyRide app?

Single choice, answers 8x, unanswered 0x

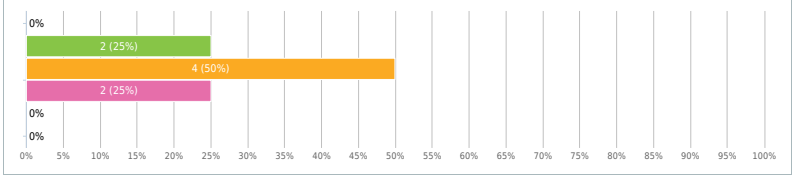
Answer Choices	Responses	Ratio
Weekly	2	25 %
Monthly	1	12.5 %
Semi-annually	5	62.5 %
Annually	0	0 %
Never	0	0 %
Other...	0	0 %



14. How much time are you willing to spend on giving feedback about the EatMyRide app?

Single choice, answers 8x, unanswered 0x

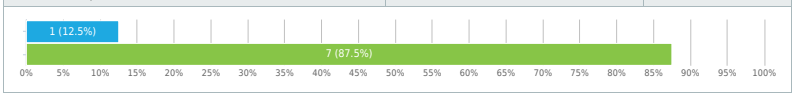
Answer Choices	Responses	Ratio
0 - 30 seconds	0	0 %
0.5 - 2 minutes	2	25 %
2 - 5 minutes	4	50 %
5 - 10 minutes	2	25 %
10 - 15 minutes	0	0 %
More than 15 minutes	0	0 %



15. Do you currently have any feedback or additions to the EatMyRide app?

Single choice, answers 8x, unanswered 0x

Answer Choices	Responses	Ratio
Yes, namely	1	12.5 %
No, currently not	7	87.5 %

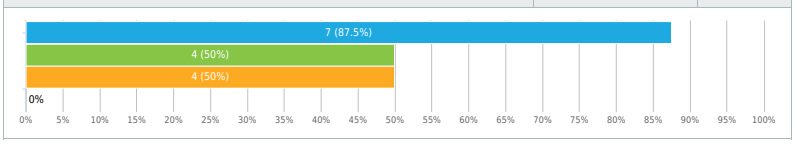


- A computer version would be nice. and several other which are already discussed

16. When giving feedback (in the future), for example about an idea for a new functionality, what would inspire you to do so?

Multiple choice, answers 8x, unanswered 0x

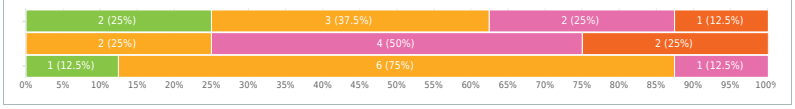
Answer Choices	Responses	Ratio
A frustration in the app	7	87.5 %
Functionality in another app	4	50 %
Something missing that a dietitian can offer	4	50 %
Other...	0	0 %



17. Please indicate to what extent you agree with the following statements:

Matrix of single choices, answers 8x, unanswered 0x

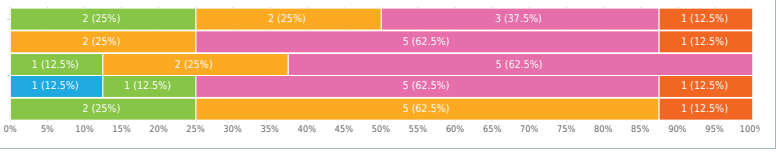
Answer	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I think I am creative	0	2 (25 %)	3 (37.5 %)	2 (25 %)	1 (12.5 %)
I am critical	0	0	2 (25 %)	4 (50 %)	2 (25 %)
I am quickly satisfied	0	1 (12.5 %)	6 (75 %)	1 (12.5 %)	0



18. Please indicate to what extent you agree with the following statements:

Matrix of single choices, answers 8x, unanswered 0x

Answer	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
easily come up with original ideas	0	2 (25 %)	2 (25 %)	3 (37.5 %)	1 (12.5 %)
give feedback that could lead to new features	0	0	2 (25 %)	5 (62.5 %)	1 (12.5 %)
need inspiration from others	0	1 (12.5 %)	2 (25 %)	5 (62.5 %)	0
find giving feedback easy, without specific instructions	1 (12.5 %)	1 (12.5 %)	0	5 (62.5 %)	1 (12.5 %)
would describe my feedback as creative	0	2 (25 %)	5 (62.5 %)	0	1 (12.5 %)



Survey settings

Questions per page	All
Allow multiple submissions?	✓
Allow return to previous questions?	✓
Display question numbers?	✓
Randomize questions order?	
Show progress bar?	✓
Receive response notifications by e-mail?	
Password protection?	
IP restriction?	

Appendix: Survey

Survey EatMyRide 2021

Dear sir/madam,

In collaboration between EatMyRide and the University of Twente, we need your feedback to further improve and develop the app! This survey is meant to get a better idea about you as user and what you think about giving feedback. Completing this survey only takes 10 minutes. The survey consists of three parts, about you as cyclist, your experience with the EatMyRide app and finally about giving feedback.

Participation in this research is completely voluntary and you can decide to stop at any moment.

Before starting with the survey, please read the following information carefully.

"I hereby declare that I have been informed in a manner which is clear to me about the nature and method of the research. I agree with my own free will to participate in this research. I reserve the right to withdraw this consent without the need to give any reason and I am aware that I may withdraw from this research at any time. If my results are to be used in scientific publications, to be used by EatMyRide or made public in any other manner, they will be completely anonymous. My personal data will not be disclosed to third parties without my expressed permission."

If you request further information about the research, now or in the future, you may contact Rochelle Spaargaren, *r.spaargaren@student.utwente.nl* or Lukas Vugts, *l.g.l.vugts@student.utwente.nl.*

I declare the following:

- I have read and understood the above information

- I am at least 18 years of age

- I understand that EatMyRide will have access to my anonymised answers

- I voluntarily agree to participate

1. Do you accept the conditions stated above?

Question instructions: *In case you wish not to participate, please close this survey*

○ Yes
○ No

Information about you as cyclist

2. On average, how often do you cycle?

Question instructions: *Select one answer*

○ 4 or more times per week
○ 2 - 3 times per week
○ Once a week
○ Once a month
○ Other...

3. With whom do you cycle, both now and pre-covid?

Question instructions: *Select one or more answers*

☐ Alone
☐ Friends
☐ Colleagues
☐ Club
☐ Team
☐ Other...

4. Have you ever joined a cycling race or are you planning to in the future?

Question instructions: *Select one answer*

○ Yes
○ No

5. What races have you participated in or want to participate in the future?

Question instructions: *Select one or more answers*

☐ Races longer than 3 hours, such as cyclos/GranFondos races
☐ Races shorter than 3 hours, such as team competitions
☐ Tours
☐ Multiday races
☐ Other...

Information about the EatMyRide app

The following questions are about your use and experience with the EatMyRide app.

6. Why did you download the EatMyRide app?

7. Which version of the EatMyRide app do you have?

Question instructions: *Select one answer*

- ○ Premium version
- ○ Free version

8. How often do you use the EatMyRide app?

Question instructions: *Select one answer*

- ○ 2 - 3 times per week
- ○ Once per week
- ○ Once per two weeks
- ○ Once per month
- ○ Once per two months
- ○ Other...

9. How would you describe your current experience with the EatMyRide app?

Giving feedback

We would like to know how you feel about giving feedback, to improve the EatMyRide app in the future. An example of feedback is to ask you about a new functionality or asking how you liked your nutrition advice.

10. What would motivate you to give feedback in the future?

Question instructions: *Select one or more answers*

- ☐ An app that is better suited to the user
- ☐ Informing other people about my experiences with the app
- ☐ Showing appreciation to the developers for a specific feature
- ☐ Free premium subscription
- ☐ Other...

11. Indicate to what extent you agree with the following statements:

Question instructions: *Select one answer in each row*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I like giving feedback	○	○	○	○	○
I would like to be rewarded for giving feedback	○	○	○	○	○
When I give feedback, something must be done with it	○	○	○	○	○
I would like to receive updates regarding my feedback	○	○	○	○	○

12. At what moment would you be most motivated to give feedback about the EatMyRide application?

Question instructions: *Select one or more answers*

- ☐ Before the start of a ride
- ☐ During a ride
- ☐ During the break of a ride
- ☐ Shortly after a ride
- ☐ An hour or longer after a ride
- ☐ Other...

13. How often would you be willing to give feedback about the EatMyRide app?

Question instructions: *Select one answer*

- ○ Weekly
- ○ Monthly
- ○ Semi-annually
- ○ Annually
- ○ Never
- ○ Other...

14. How much time are you willing to spend on giving feedback about the EatMyRide app?

Question instructions: *Select one answer*

- ○ 0 - 30 seconds
- ○ 0.5 - 2 minutes
- ○ 2 - 5 minutes
- ○ 5 - 10 minutes
- ○ 10 - 15 minutes
- ○ More than 15 minutes

15. Do you currently have any feedback or additions to the EatMyRide app?

Question instructions: *Select one answer*

- ○ Yes, namely
- ○ No, currently not

Inspiration & Creativity

16. When giving feedback (in the future), for example about an idea for a new functionality, what would inspire you to do so?

Question instructions: *Select one or more answers*

- ☐ A frustration in the app
- ☐ Functionality in another app
- ☐ Something missing that a dietitian can offer
- ☐ Other... ☐

17. Please indicate to what extent you agree with the following statements:

Question instructions: *Select one answer in each row*

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I think I am creative	○	○	○	○	○
I am critical	○	○	○	○	○
I am quickly satisfied	○	○	○	○	○

18. Please indicate to what extent you agree with the following statements:

Question instructions: *Regarding feedback, I*

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
easily come up with original ideas	○	○	○	○	○
give feedback that could lead to new features	○	○	○	○	○
need inspiration from others	○	○	○	○	○
find giving feedback easy, without specific instructions	○	○	○	○	○
would describe my feedback as creative	○	○	○	○	○

12.4 Appendix D: Ideation Storyboard

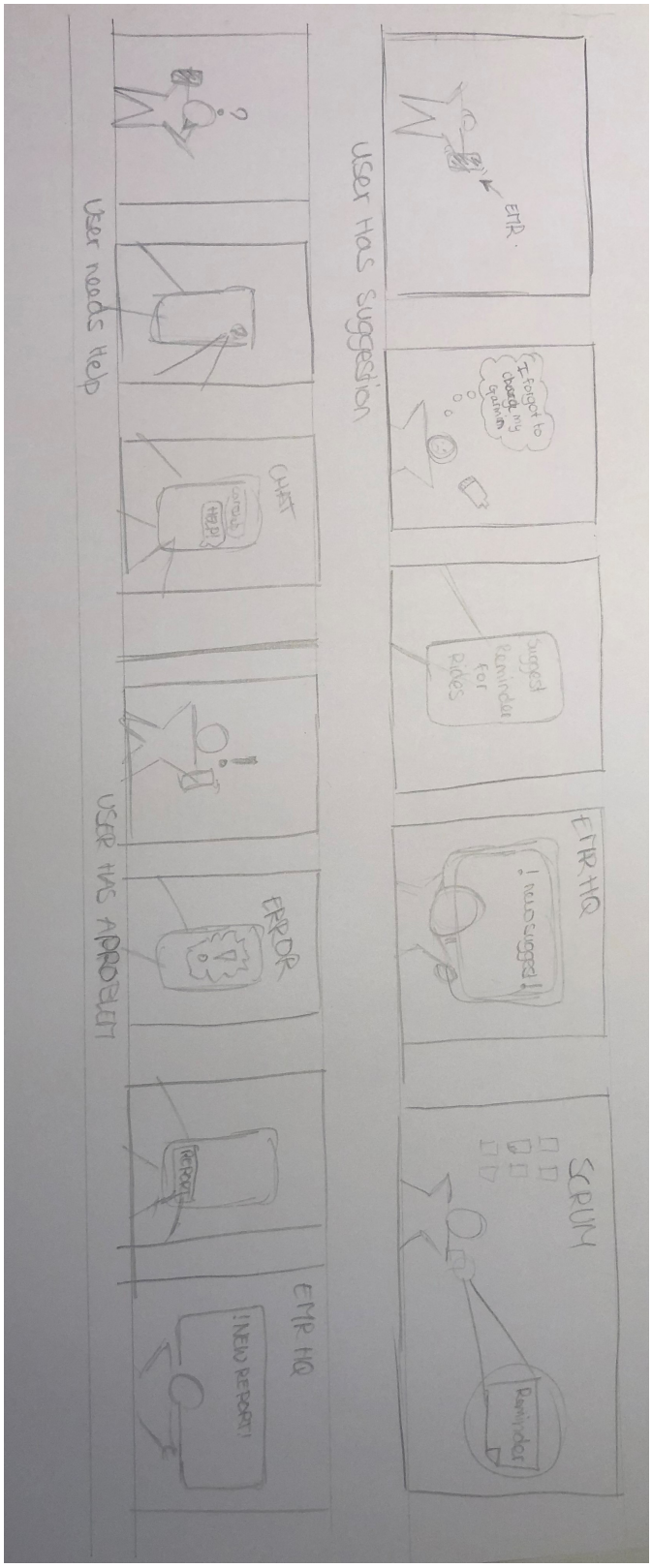


Figure 36: Storyboard for ideation stakeholders

12.5 Appendix E: Results of usability testing

#	Help icon
1	Expect an FAQ with the possibility to talk to someone
2	Expect an FAQ page
3	Expect an FAQ page or chat function
4	When I do not understand the app — FAQ page or documentation, possible to chat
5	Chat box to ask a question, prefer FAQ first to figure it out myself
6	Chat box with a bot or employee, would prefer FAQ first
7	Search function with FAQ or a forum, chat box with WhatsApp
#	**Problem icon**
1	Reporting a problem
2	Reporting a problem
3	Reporting a bug
4	Stuck, something is missing or a bug report. Expect text input
5	Chat box to send a message
6	Pop-up to submit questions
7	Text input for problem or crash
#	**Suggestion icon**
1	Text input to do a feature request, could also do that at problem
2	Requesting feature
3	Rating features
4	Text input feature request
5	Text input with response from EatMyRide, not anonymous
6	Text input for feature request, however think suggestion and problem could be combined
7	Text input, would prefer an example as inspiration
#	**Notification**
1	Is a lot to think about, a rating would be easier and still have possibility to add explanation
2	Would expect text box, but prefer star rating so the data is a bit more valuable
3	Nice, the confirmation is okay and doesn't cost anything
4	Expect to lead to suggestion, would like confirmation
5	Scrolled past it, expect yes/no or rating so it is quick
6	Would only fill it in if I had feedback
7	Not interrupting and would let it sit there until I have thought about it

Table 11 Results of general feedback usability test

12.6 Appendix F: Diary probe

The following diary probe was to be filled in by participants and was evaluated in chapter 7 *Evaluation*.

Day 1

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

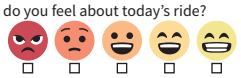
Today's performance

Kcal: _____ Protein: _____

Carbohydrates: _____ Fat: _____

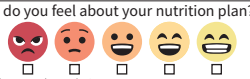
Your experience

How do you feel about today's ride?



Could you explain why? _____

How do you feel about your nutrition plan?



Could you explain why? _____

How do you feel about the EatMyRide app?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Other

What is your first impression after using the EatMyRide app today?

Did any problems occur throughout the day?

Could you explain what happened? _____

Day 2

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

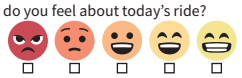
Today's performance

Kcal: _____ Protein: _____

Carbohydrates: _____ Fat: _____

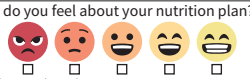
Your experience

How do you feel about today's ride?



Could you explain why? _____

How do you feel about your nutrition plan?



Could you explain why? _____

How do you feel about the EatMyRide app?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Feedback

Did any problems occur throughout the day?

Could you explain what happened? _____

What would motivate you to give feedback in the future?

Could you give an example? _____

Day 3

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

Today's performance

Kcal: _____ Protein: _____

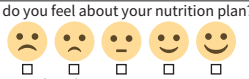
Carbohydrates: _____ Fat: _____

Your experience

How do you feel about today's ride?

Could you explain why? _____

How do you feel about your nutrition plan?



Could you explain why? _____

How do you feel about the EatMyRide app?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Feedback

If you could wish for anything to improve the application, what would it be?

Could you explain why? _____

If you would like to add a sketch, please do so by adding it as attachment.

Day 4

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

Today's performance

Kcal: _____ Protein: _____

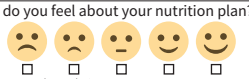
Carbohydrates: _____ Fat: _____

Your experience

How do you feel about today's ride?

Could you explain why? _____

How do you feel about your nutrition plan?



Could you explain why? _____

How do you feel about the EatMyRide app?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Other

Did any problems occur throughout the day?

Could you explain what happened? _____

Day 5

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

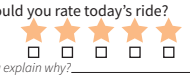
Today's performance

Kcal: _____ Protein: _____

Carbohydrates: _____ Fat: _____

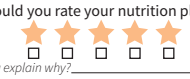
Your experience

How would you rate today's ride?



Could you explain why? _____

How would you rate your nutrition plan?



Could you explain why? _____

How would you rate your overall experience?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Other

Did any problems occur throughout the day?

Could you explain what happened? _____

Day 6

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

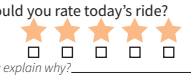
Today's performance

Kcal: _____ Protein: _____

Carbohydrates: _____ Fat: _____

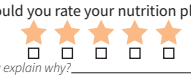
Your experience

How would you rate today's ride?



Could you explain why? _____

How would you rate your nutrition plan?



Could you explain why? _____

How would you rate your overall experience?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Feedback

EatMyRide has the following idea:

"Create meals: The user can easily add meals/ recipes which can be later on reused. The user can then add a meal instead of all the individual ingredients."

Is this idea lacking in your user needs?

Could you explain why/how? _____

Day 7

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

Today's performance

Kcal: _____ Protein: _____

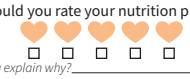
Carbohydrates: _____ Fat: _____

Your experience

How would you rate today's ride?

Could you explain why? _____

How would you rate your nutrition plan?



Could you explain why? _____

How would you rate your overall experience?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Other

Did any problems occur throughout the day?

Could you explain what happened? _____

Day 8

General

Date: _____

Did you use the application? ○ Yes ○ No

Did you ride today? ○ Yes ○ No

What type of ride?

○ General ○ Endurance ○ Recovery ○ Interval ○ Race

Performance

Distance of your ride: _____

Training time: _____

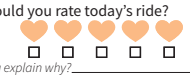
Today's performance

Kcal: _____ Protein: _____

Carbohydrates: _____ Fat: _____

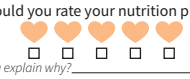
Your experience

How would you rate today's ride?



Could you explain why? _____

How would you rate your nutrition plan?



Could you explain why? _____

How would you rate your overall experience?

Could you explain why? _____

App usage

When did you use the app during the day?

Could you indicate it below?

Morning

Afternoon

Evening

Feedback

Did any problems occur throughout the day?

Could you explain what happened? _____

How did you experience the past 8 days?

Do you wish to continue using the EatMyRide application? ○ Yes ○ No

Could you explain why? _____

12.7 Appendix G: Ideation brainstorm

Initial brainstorm based on the first interview with EatMyRide.

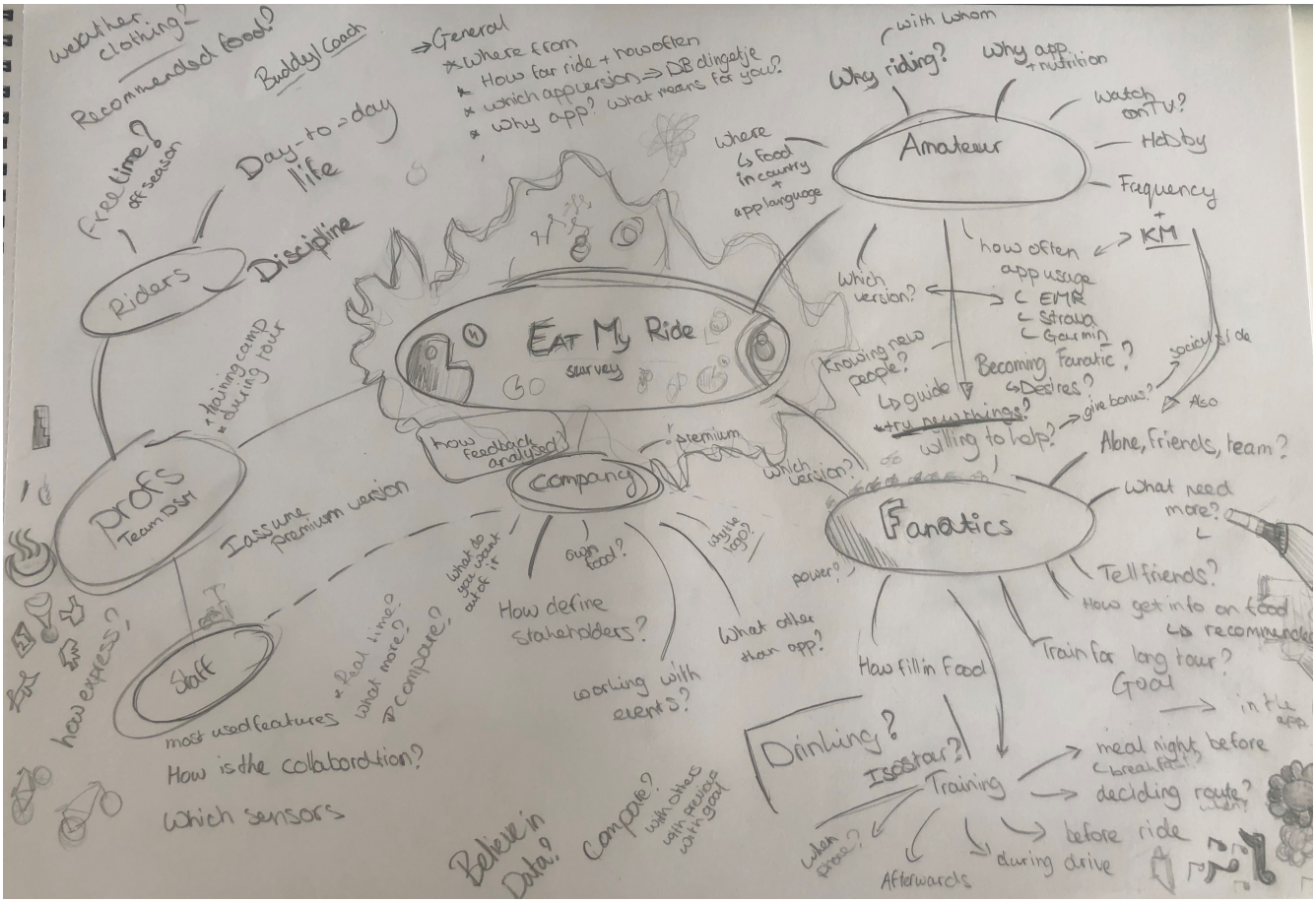


Figure 37: Brainstorm on stakeholders

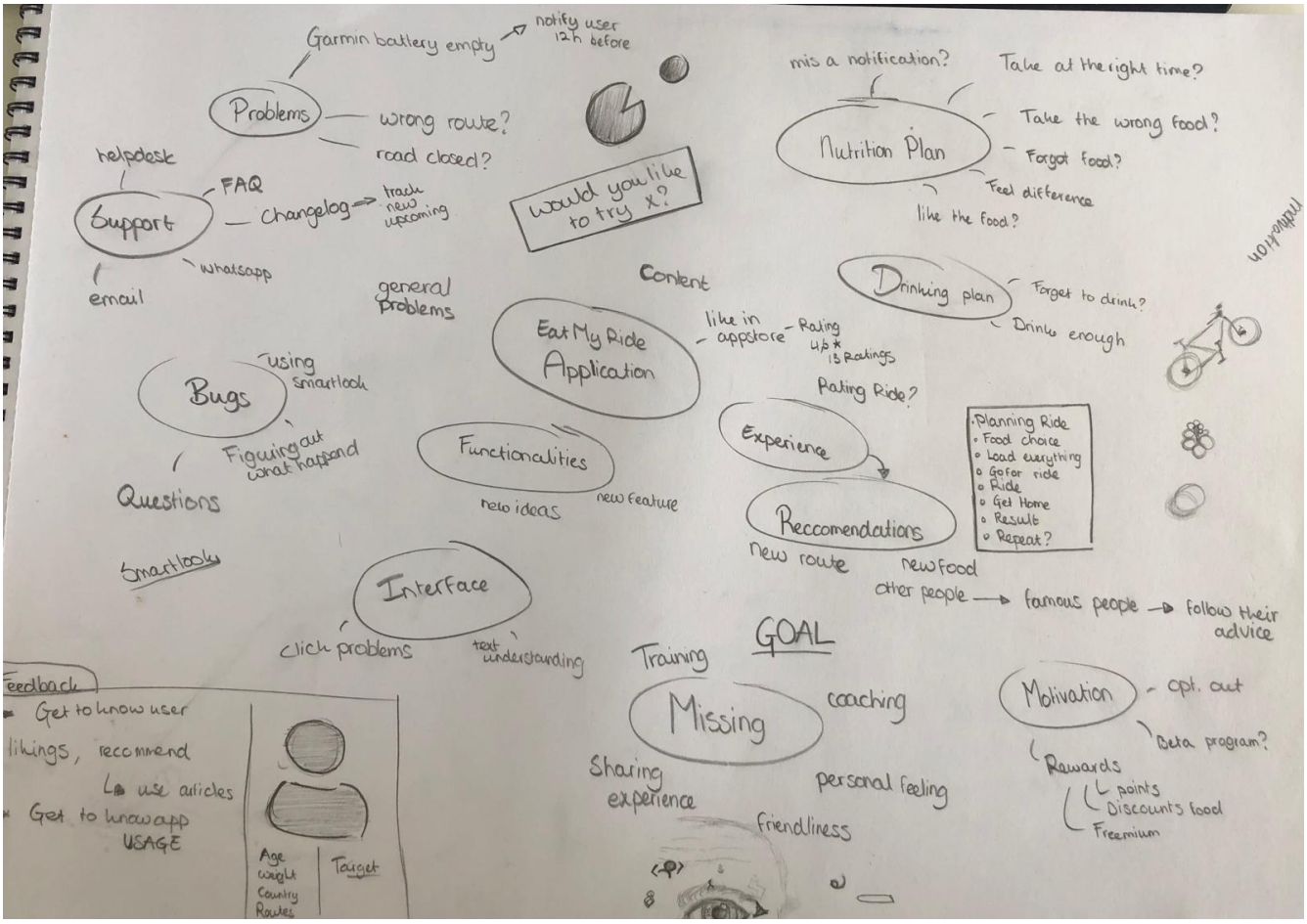


Figure 38: brainstorm on user encountered problems

12.8 Appendix H: Usability test questions

The following questions were asked during the usability testing, as described in chapter 5 and 7.

12.8.1 Introduction

- Inform participants about the duration of the meeting: 1 - 1.5 hours

12.8.2 Ervaring met EMR (gebaseerd op diary probe)

1. Wat was je gehele ervaring met de EatMyRide applicatie?
    - Wat waren dingen die je minder vond aan de EatMyRide applicatie?
    - Wat waren dingen die je heel goed vond aan de EatMyRide applicatie?
2. Wanneer maakte je door de week gebruik van de app?
    - Op welk moment plande je een rit in?
    - Hoe plande je de rit? Kun je het demonstreren?
    - Zijn de rit types duidelijk?
3. Wat vond je ervan om iedere dag het dagboek in te vullen?
    - Welke van de vier beoordelingen vond je het beste werken? Waarom?
        - Voelde je je opgedrongen om een uitleg te geven bij iedere beoordeling?
        - Waren de emojis duidelijk, zou het beter werken met emotionele feedback?
    - Zou je dit met enige regelmaat in de app willen doen? Waarom?
    - Waren er nog dingen die ontbraken tijdens het invullen van het dagboek?
4. Wat zou jou motiveren om feedback te geven?
5. Als je een wens kon uitbrengen om de applicatie te verbeteren, wat zou het zijn?
6. Wat vond je van de vraagstelling toen we vroegen om jou mening van de Create Meals idee?
7. Je geeft aan dat je de app op dit moment de app niet wilt blijven gebruiken omdat je niet kunt zien tijdens het fietsen wat je moet eten. Zou je het wel willen gebruiken als dat wel zo zou zijn?
    - Je geeft ook aan dat je bang bent om je gevoel kwijt te raken , kun je hier iets meer over uitwijden?

12.8.3 Task list

- Open het prototype
- Valt je iets op?
- Notificatie testen
- Open feedback menu
- Was dit wat je verwachtte?
- Ride rating -¿ Hoe zoe je je rit omschrijven? Juist schaal van 5 of liever met woorden zoals moe, energiek, had honger, etc.

12.9 Appendix I: Ethical analysis

The section below gives a list of ethical dilemmas that come with the EatMyRide application. Following the list, each component of "The Ethical Cycle" by Poel and Royakkers is discussed in detail [54]. The chapter ends with a discussion of my proposed code of ethics for the EatMyRide feedback system.

12.9.1 Ethical dilemmas

To identify the key ethical dilemmas, I defined three scopes in regards to the EatMyRide application. These helped to identify the dilemmas that come with giving nutrition advice and having a feedback tool.

12.9.2 General

The company, and feedback system, should adhere to these general points at all times.

Consent Users should give explicit and informed consent for usage of their data. In case of withdrawal, personal data should be deleted and other data must be made anonymous or deleted as well. Third parties should not be able to have access to data unless the user consents. In case of the feedback system, users can decide whether they would like to leave their feedback anonymous or with name and data. Also they can opt of the tracking in the settings.

Data need The company uses data from Strava and Garmin and should have reason to use this data. They should only receive data they actually need and be able to delete this data if consent from Strava or Garmin is withdrawn. The need for Strava data is to give an overview at the end of a ride, where feedback can be asked regarding the users' ride experience.

Discrimination and Accessibility The EatMyRide application should in no way discriminate users and be accessible for everyone. All according to the Web Content Accessibility Guidelines (WCAG) [55], making it perceivable, operable and understandable.

Privacy The company should adhere to the General Data Protection Regulation (GDPR) guidelines [56] and make sure user data is kept safely. The entire graduation project is also according to this standard.

Security The company should take measures to secure their data and facilities and prevent data loss and access. The back-end system of the feedback system is kept secure using credentials but could be improved using two-factor authentication when real user data will be collected.

12.9.3 Nutrition advice

In regards to the nutrition advice the company gives, these dilemmas should be taken into account.

Health and Safety As the app partially takes over the job of the nutritionist, the advice should be healthy. The plan should have no negative consequences to the user following it. The quality of the advice should be kept to the same standard as the nutritionist, according to the Code of Ethics for the Nutrition and Dietetics Profession [57], which includes an approach to decision making.

Cultural influence This should not influence the safety of the user. If the user is following a diet or is, for example, vegetarian, this should result in a nutrition plan of equal quality to that of users without a diet. Cultural influences have no effect on the workings of the feedback system.

Transparency and Validation For me, a question that arose was; How is the quality of the nutrition labels determined? Products receive a rating between 1 and 5 and for each product the nutrition information can be found. However, the basis for this rating is unclear because there is no real explanation. Although the feedback system does not have nutrition information, it does provide an explanation for transparency.

Recommendation Although it currently is not implemented, the company will provide recommendations in the near future. The basis for these recommendations should be transparent and users should have the ability to validate this. Also the impact of the recommendations should be measured, as it should not only promote non environmental friendly products.

Financial Access All users should have equal access to the application despite their background and financial status.

Pay-to-win The application offers a free and premium membership. The premium membership offers more integration possibilities, like ride types and intensities, and a more personalized nutrition plan. The access to these functionalities should be reasonably priced. The quality of the recommended nutrition should not be less for those with the free version of the app.

Own Nutrition Line The company has expressed interest in developing their own line of products. A risk is that the company will only recommend those products, giving them an unfair competitive advantage, making more money.

Transparency Recommending their own products should not be a problem, as long as the advice is fair and transparent. Negatives should not be kept from the user and the products should be tested by an independent laboratory.

Perspective Long term and on a bigger scale, the advice can result in environmental changes. If the app only recommends palm products for example, more plantations will be built which is catastrophic for the environment. The workers will probably be underpaid, compared to food that is made in western regions. A risk here is that EatMyRide says; 'Well our footprint is not too big and we can't fix these problems on our own.' A lot of other companies say the same and this will keep piling up. In hindsight,

it would be better if all companies would think about their footprint and try to keep it at a minimum.

12.9.4 Feedback tool

A to-be-developed feedback tool will allow users to be involved in the development of the EatMyRide app.

Transparency For all users it should be clear how their feedback will be collected, how it will be stored and what will be done with it. The gathered information should only be used for the development of this app and not be misused. Users should be informed about progress, also if no further action is taken.

Corruption Feedback should be considered explicit information and must be protected from harming the user. In case of negative feedback, the user should not lose the ability to use certain functions. Removing critics from the feedback tool, or in the worst case the entire application, should be prevented.

Conflict of Interest The company should not be in charge of the questions asked, as the tool should empower users to give feedback without the bias of the company. The management might want to pursue their goals of making more money through the feedback system, which is not the purpose of the tool. The tool should focus on making the experience better for the user, eventually leading to more users.

Empowering users Users can have a say in the development of the application and should be rewarded. However, these rewards could be seen as bribery, thus every form of feedback should be rewarded. The tool should communicate in two ways so the users are not drained from their energy, making sure providing feedback is worth it.

Unpaid Work The amount of work the user does and the rewards received should be balanced. This is a dilemma, as this balance is dynamic and should be closely monitored.

Autonomy Ultimately, users should be the one deciding to give feedback and at no point it should be obligated to give feedback or be involved in the development. In case the company wants to do a follow up with the user, this should be the user's decision to participate in.

Perspective If all apps were to implement the tool and would start asking users for feedback regularly, the result would be a drained audience. This could lead to users disliking feedback and the app's development would come to a halt.

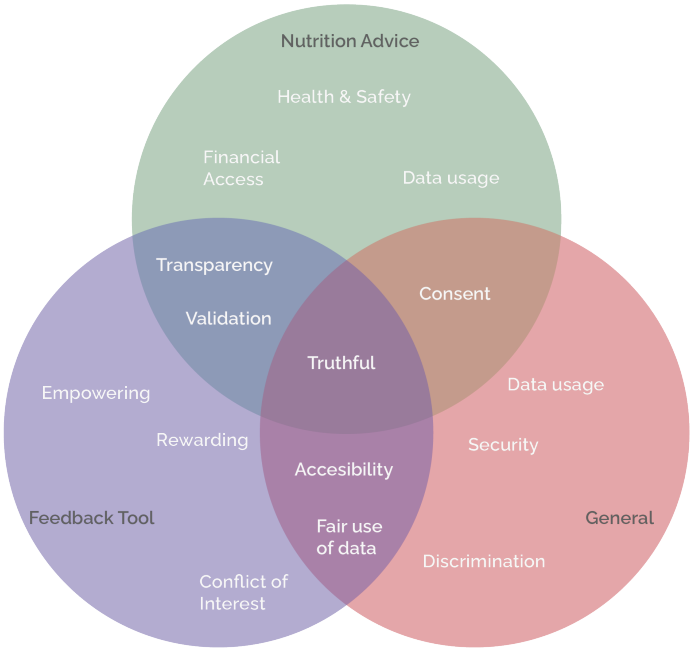


Figure 39: Venn diagram showing the ethical aspects of the project

12.9.5 Key discipline

For my Graduation Project, the key discipline is **truthfulness**. Both in the feedback and nutrition advice given to the user and the feedback received from the user. The advice needs to be **transparent** and **validated** when possible. The user should be rewarded for the feedback and the process should be transparent. The Venn diagram in figure 39 above shows the indicated dilemmas with Truthful at the centre. The green circle represents nutrition advice as a functionality of the application. The feedback tool is represented in blue and the other (general) related parts are placed in the red circle. Each of the functionalities overlaps where both have common values.

The diagram formed the basis for the design of the feedback system, which is build to collect truthful information. In order to redesign the application to suit the user better the answers provided by users should be true. Each of the dilemmas indicated in the blue circle are addressed in the final solution, with some of the general points, like security and discrimination as well.

12.9.6 Code of ethics

As part of this ethical analysis I developed a code of ethics for the EatMyRide application and the feedback system. The IEEE Code of Conduct [58] and the CalTech Code of Conduct [59].

EatMyRide Code of Ethics

As part of a Creative Technology Graduation Project

We, employees and partners of EatMyRide, all recognize and embrace the importance of our company and application and will follow these principles.

1. Be truthful and transparent
    - We ensure all our nutrition advice is according to the highest standard and we provide additional information to the user.
    - We will have do everything we can to avoid a bias, at all times.
    - We empower users to validate their app usage and feedback practices.
2. Be respectful towards others
    - We will work responsibly and respectful, in a safe environment.
    - We will not discriminate in any way against anyone.
3. Handle data carefully
    - We will use data fairly and with explicit consent from our users
    - We have security measures in place to protect data of all our users, partners and others involved with our business doings.
    - We will test our security measures in time with an independent test facility to make sure they are to the highest standard.
4. Obey the law in all countries where EatMyRide is active and does business
    - We are to adhere to all applicable laws, rules and regulations in all our doings.
    - We are accurate and attentive.
    - We reject all forms of bribery.
    - We will not misuse or infringe the intellectual property of others.

12.9.7 Code discussion

First of all, when EatMyRide has a code of conduct in place, it is important that all employees and partners adhere to the principles to make sure their practice is correct. As the company has investors and partners, they should also keep themselves to these as much as possible when acting on behalf of EatMyRide.

Being truthful and transparent are the key ethical dilemmas pointed out before. Users build a trust towards the application and the provide advice which should be truthful. Not every user would like to have an explanation every time, however, it should be available for them to see if desired. In the design of the solution, the explanation for the feedback system and how the received feedback is used is placed in a separated section in settings. From interviews held with users, those who said they would like to have the information available indicated settings as the preferred place.

Being respectful towards others has not influenced the design that much, but is the second most important factor of the feedback system. Any received negative feedback will be handled professionally and their will in no way be discriminated.