# Esports Performance: A Dashboard Proposal

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## Abstract

Esports and data analysis are both rapidly growing sectors on their own right, and their overlap in the analysis of Esports matches to improve Esporters' performance is growing alongside with them. The videogame series FIFA from developer EA Studios is an Esports title rising in popularity around the world, and especially in the Netherlands, but match analysis to improve performance is still missing from this rapidly professionalizing sector. In order to improve on this, insights into performance influencing and determining factors must be found. A dashboard could contribute to this by analysing video recordings of the matches through machine learning and allowing coaches and players to analyse their previously played matches with the goal of gaining insights into their performance to improve the efficiency of their training.

In order to start research into such a dashboard for FIFA, we posed the research question "What aspects should be in a dashboard to monitor FIFA Esports performance?" and aimed to answer this question through the Creative Technology design process. By creating several prototypes and evaluating them in collaboration with several members of soccer teams playing in the Dutch national FIFA Esports division as well as additional experts in Esports health and analysis, a promising start has been made into creating an Esports dashboard for FIFA Esports players, however, additional research is required in order to continue developing and testing this dashboard.

## Acknowledgements

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# Table of Contents

# Chapter 1: Introduction

## 1.1 Context

Esports are a collection of sport competitions surrounding various videogames, played in controlled environment while showing a similar setup and rule structure as traditional sports. Esports started around the turn of the millennium and has been growing rapidly ever since, especially in the 2010s [1] [2]. While these videogames are generally multiplayer games played between professional players, either as a team or as an individual depending on the game [3], in reality every videogame with a component that provides a measurable difference between players that can be played in an organized format could be played competitively as an Esports game. As seen in table 1, Besombes [4] observes ten different categories of game genres in Esports, where every category focuses on a different type of gameplay that allows for a different way of competing by focusing on a different subset of elements of competition. Some examples of these elements of competition are strategy, skill, speed, and score.

| **Esports videogame genres** |
|---|
| Fighting games |
| Shooting games |
| Strategy games |
| MOBA games |
| Card games |
| Sports games |
| Role-playing games |
| Puzzle games |
| Racing games |
| Rhythm games |

*Table 1: Esports videogame genres*

The internet played a major role in the rise of Esports competitions, as better internet connectivity allowed for competitors around the world to connect and play against one another [5] [6], and for broadcasts of the matches to be watched by anyone interested. [7]

A popular competitively played videogame series in the Netherlands is the soccer game FIFA. The eDivisie is a yearly FIFA competition that is played between every soccer team that plays in the Dutch national soccer league the Eredivisie. Each of these soccer teams have to provide two FIFA players to compete in the tournament. There have been two seasons of the eDivisie at the time of writing, and the previous season of 2019-2020 had a total prize pool of €100,000. Since this is still a very new venue but every Eredivisie team is involved, this scene is rapidly professionalizing but a univocal structure like in physical sport is still missing, making it an interesting situation for research to be done at this time.

## 1.2 Problem statement and goal

With this increase in popularity comes an increasing interest from sponsors to select and train the best team. These teams have over time structured themselves similarly to traditional sports teams with health and performance management teams [3]. Because of this, it is increasingly important to

have a good overview of the relevant performance factors for these players by having a platform to collect this data, expand onto it and analyse it to improve players' performance through more efficient training. Several eDivisie teams along with the University of Twente are looking into innovative ways to let their players get this edge in Esports. Since these eDivisie teams have mostly focused on physical sports in the past, they do not have a lot of experience with preparing players for high levels of play in FIFA. To improve player performance, there has to be an understanding which factors have an influence on this performance. When this is known, data on these factors can be collected and analysed. From this analysis, feedback for the players and coaches can be generated and incorporated back into training. If the feedback shows an improvement in performance, this process can be repeated. This could be implemented in several ways, one of which is a dashboard. The goal of this research is then to create a dashboard by gathering what factors are relevant to player performance, finding out which of them can be visualized in a useful way and investigating any link between performance factors and in-game performance.

There are three main perspectives on the collected data:

- The player, who is focused on their own and their opponent's performance and strategies.
- The coach, who is focused on multiple players' performance and how to improve on it.

These parties are interested in different subsets and delivery of the data, but at the moment there is no research to indicate how these different viewpoints would affect the functional design of an Esports dashboard. The goal of the research is to explore the options for these different dashboards and by doing so, provide a horizon for future feedback systems for Esports performance.

A dashboard is a platform for both coaches and players to keep track of statistics and trends regarding in-game performance, training regimes and lifestyle by keeping track of everything in a database while providing summaries, predictions and visualizations using the available data. The gathering of data could be automated either by connecting it to a game's own database through an API, or by scraping it using external software. It could also be gathered and entered manually. Players and coaches could then also be able to add additional information outside of the game. Since we are focusing this research on the implementation of such a dashboard, we are currently not taking the gathering of this data into account but are instead focusing on what is required to create the best implementation of such a dashboard.

To achieve this goal, the currently available scientific literature is analysed, and interviews with industry professionals and experts are held. After all of this information is gathered, design choices and information format preferences should be iteratively designed in cooperation with these teams.

From this, the aim is to create a proposal for both the visual design and functionality of such a dashboard.

## 1.3 Research questions

The main research question is as follows: What aspects should be in a dashboard to monitor FIFA Esports performance?

Sub-research questions for this question have also been set up and are as follows:

- Which factors are linked to FIFA player performance?
- What information should the dashboard contain
- How should this information be displayed?

## 1.4 Outline

This report has the following structure:

First, a short introduction is given to inform the reader on the subject of the report, shape the problem statement and propose the goal with accompanying research questions (ch. 1). Second, the state of the art of this situation is explored (ch. 2) through a literature review and a review of tools that are currently in use to try and answer the first sub-research question. The methods and techniques as well as the design process used in the report are explained (ch. 3), with the goal of having a clear and reproducible procedure.
To try and answer the second and third sub-research questions, all of the phases of the design process are executed. In the ideation chapter (ch. 4), ideas are generated through several techniques, a prototype is created and evaluated, and the first requirements are set up. The goal of this chapter is to provide insights into the users and give a starting direction for the project.
In the specification phase (ch. 5), the ideas and first requirements from the ideation phase are further elaborated in order to set up strict testable requirements that can be used in the next chapter. In the realization phase (ch. 6), the final prototype is created based on the insights from the previous chapters and the requirements set up in the specification phase. An evaluation of the final prototype (ch. 7) is then done through user and expert interviews in order to gain insights into the correctness and usability of the prototype. All of this is then summarized and a conclusion is drawn (ch. 8) based on the results of the evaluation. The limitations of the project are discussed and recommendations are given as a start for a potential future continuation of this project.

# Chapter 2: State of the Art

In order to gain insights into the current state of research into Esports and the use of dashboards in other games, a comparison of the research into the field and a collection of currently used implementations of data-driven applications are explored respectively. First, a literature review is performed to find out how Esports performance is currently determined and measured in research. Second, current implementation of data-driven applications from videogames other than FIFA and other related domains are considered. These other videogames and domains are discussed to give a better overview of what tools are currently in use in the industry and how Esports player performance is measured. Third, the state of affairs of the use of data within FIFA is shown. From these insights, initial requirements for the FIFA dashboard can be set up and the first research question can be answered.

## 2.1 Determinants of Esports performance

While the Esports scene of FIFA keeps growing every year, games like League of Legends, DOTA 2, Counter Strike: Global Offensive already provide an excellent platform for statistics and machine learning to find patterns through their API, and while our focus is on FIFA, a lot of influences and practices from these types of games could still ring true for it.

This literature review aims to look into how Esports performance is studied and how Eathletes' performance is measured by comparing the testing methodology and performance influence of several studies. As competitive videogames are mostly a cognitive challenge, most studies focus on the mental aspect of performance factors like cognitive load, stress coping, self-confidence and game knowledge. A few external factors like cultural differences, nutrition and sleep patterns are also studied. By comparing these studies, their research methods and their results, relevant performance factors and appropriate measuring methods are hopefully found.

In-game behaviour such as knowledge of the game, team efficiency and team communication plays a large role in team-oriented games. For instance, high level Counter-Strike players can afford to not look around the screen as much as newer players, as they know where their teammates are and where to look for enemy activity and therefore, where to aim. [8] In this paper, eye tracking was used to determine how much of the player's gaze is directed to which part of the screen, and the narrower this cone of vision, the higher the overall skill of the players. While this way of measuring is unique to the first person perspective, similar results are seen in the keyboard and mouse-based measurements as these controls are much more directed in professional players. While not a team-focused game, this type of analysis method for player input could still be applied to FIFA as players

that know what they are doing are likely to be more direct with their inputs and therefore less chaotic in their play. Team communication has a similar result in team performance, where teams that work together to provide the more damage-oriented players 'kills' to flourish later in the match while also providing the supporting players 'assists' to level the playing ground have a significant higher performance. [9] Only providing the damage-oriented players with 'kills' does not, however, increase performance as the match becomes more dependent on these specific players. As mentioned in the report, this is in line with previous research in soccer: "When a single player becomes critical for a team, there is a high chance that the opponent will set up tactics to block that player's performance; in highly centralized structures this can bring the team down."

Besides in-game behaviour, there is also external behaviour like players' mental state and stress levels, and cultural differences seen in both individuals and in the context of the team. These cultural differences are examined in two studies, by looking at differences in teams from different countries with different cultural backgrounds, and by looking at diversity in teams through country of origin and native language respectively. [10], [11] Both studies use the five cross-cultural dimensions by Hofstede, which provide the cultural values of a population of a country, and while Wang et al. [10] only look at the difference in values between American and Chinese teams, Parshakov et al. [11] aim to find out if team diversity has an influence on their performance. Wahl et al. show that there is a measurable difference in behaviour between American and Chinese Esports teams, where the Chinese are more focused on uncertainty avoidance because of their defense-oriented behaviour while the Americans show more masculine behaviour because of their offense-oriented in-game behaviour. When using Hofstede's model, Parshakov et al. shows that diversity in individualism and masculinity is a significantly positive trait for a team, while diversity in power distance negatively impacts team performance. When also looking at other models, Parshakov et al. shows language and skill diversity to be more important to the performance of a team than cultural diversity. While not directly applicable to FIFA, the analysis of a player's play style could still contribute to the overall analysis of their performance by giving players the tools to recognize those patterns and adapt their play if it's necessary to improve.

Players' mental state is another big part of Esports performance research. Since playing video games is a cognitive task and Esports earnings are based on performance, it makes sense that one of the main areas of research is mental capabilities like stress resistance, self-confidence and use of feedback. Stress in particular is a large focus of studies [12], [13], [14]. Aliyari et al. [12] compares four different types of games and compare stress levels by looking at hormone levels in saliva. The games described as 'Exciting' and 'Fear' delivered the highest amount of stress for players, whereas other genres like runner and puzzle games did not reach the same levels. As most competitive games

can be considered to fall into the ‘exciting’ category, this shows that stress in these types of games is very prevalent. Smith et al. [13] name several stress factors and ways players deal with stress, with the most pertinent being team issues like criticism, lack of confidence and problems with in-game communication. This makes sense, as communication in a team-based game is an important factor as shown by Mora-Cantallops & Sicilia [9], and self-confidence is shown as playing a large part in player performance and stress resilience by Behnke et al. [14]. They state that ‘strong beliefs in own skills before the competition may lead to successful performance’ and that stress can be a helpful factor in determining performance. They go on to say that both positive and negative feedback to players can affect their performance, as players have a good sense of their own performance but reacting to social comparison still happens.

Physical state is the last aspect of performance that is commonly studied. Sleep is a major part of physical performance and still the subject of a lot of research. Sleep in Esports is a comparatively new field, and both papers [15], [16] describe the culture surrounding video games. A strong tendency to play in the evenings by players, combined with frequent travel and the stress of the competitive aspect can make for a strong disruption of healthy sleep patterns. Bonnar et al. [15] argues coaches should incorporate theory to prevent sleep disruption and techniques to lessen the impact of factors like jetlag into their training in order to boost team performance. Nutrition is another large aspect of physical performance that is relatively new in the context of Esports. Bonnar et al. [16] shows the negative influence of substances like coffee and stimulants like Adderall and Ritalin on sleep quality, while Tartar et al. [17] shows the benefits that certain nutritional supplements can have on energy and anger levels, and factors like accuracy, decision-making and reaction time during gaming.

From the search for articles, it became clear that stress, nutrition and sleep are major focus points of research both inside and outside of Esports, but more research regarding these factors in the realm of Esports is still required to draw strong conclusions and contribute to the training of Eathletes. Additionally, the biggest focus of these studies is on a small subsection of action-filled videogames, namely first-person shooter and multiplayer online battle arena games. However, there are more games in these categories than Counter-Strike and League of Legends or DOTA 2, and there are even a lot of other genres of games that have become or always were just as competitive as these genres like card games, fighter games, sports games, and racing games. It is likely that a lot of research is focused on these games because they have been around for a long time and remain popular, and will most likely remain popular for quite some time which elongates the relevance of these researches. A similar criticism can be formed on the samples of most of these studies. Most studies have at most a 70/30 male to female ratio, which could be attributed to the fact that gamer culture

and Esports especially is still very much a male-dominated field. However, this can mean that a lot of research is less applicable to mixed or fully female teams in the future.

By going through the factors discussed and looking at their relevance for FIFA, we can assign the following relevance score to these factors. The results of this can be seen in table 2.

| **Performance influencing factor** | **Game** | **Relevance for FIFA** |
|---|---|---|
| Stress/mental state | Counter-Strike | High |
| Nutrition | - | Medium |
| In-game knowledge | Counter-Strike | High |
| Sleep | - | Medium |
| Cultural background/play style | DOTA 2 | Low |

*Table 2: Factors influencing performance and their relevance to FIFA*

From the discussion above we find that stress, nutrition, in-game knowledge, sleep and mental state are all relevant factors that play a role in determining player performance. It would be false to say this literature review gives a clear overview of all factors that are relevant to performance as there are simply too many to summarize in a piece such as this, but it does give an overview of some important factors and how they are researched. Research methods were hard to compare as they varied wildly between papers, ranging from monitoring keyboard inputs to interviews to saliva samples. Even in the use of in-game statistics, which was used most consistently, there is a lot of variation in what data is used and in what ways, which isn't made easier with the different range of games investigated.

## 2.2 Defining Esports performance

Several other videogames with a large Esports following have automated player statistics websites through the game's APIs provided by the developers. For instance, large sites like op.gg collect statistics for a range of games, but there are also specific sites like csgostats.gg [18] for Counter-Strike [19], lolprofile.net [20] for League of Legends [21] etc. These are not directly applicable to use with FIFA, as FIFA does not have an API and the games are completely different. However, general ideas like showing the win-rate, a player's play style or recently played games could be used in the same context for FIFA.

Outside of videogame statistics applications, platforms that provide real soccer statistics and determine player quality could provide additional insights into the factors that determine the level

of performance of FIFA Esports players. SciSports [22] specializes in determining a player's current performance and future potential to link them to clubs. SciSports does this by comparing players to other players with a similar play style through machine learning and trying to find historical patterns to determine where the player is in their potential curve. This goes beyond determining performance factors and is more akin to diving into the raw data and finding patterns there by brute force, and is not applicable to FIFA at this stage of development.

FIFA provides certain in-game statistics at the end of each match (see fig. 1). These statistics are goals, shots on target, ball possession, tackles, fouls, cards, injuries, offsides, corners, and shot and pass accuracy, as well as the Most Valuable Player (MVP) for that match. These statistics provide some insight in how a player performed within that match, although in the end only the amount of goals decides the outcome of the match.


*Fig. 1: Example of statistics from the end of a FIFA 20 match*

There are currently no automated statistics collection platforms for FIFA 20, but there are some websites where you can enter your own statistics at the end of a game and keep track of it over time like FUTWiz [23] (see fig. 2). The disadvantage of these websites is that the user has to enter all of the information manually, and since you can't see previous matches in FIFA, the only data taken into account is the matches that were input by the user when they actively started tracking the statistics themselves. FUTWiz adds some additional statistics, like a predicted rank based on previous performance, and visual aids for the amounts of wins and losses, average ball possession and shot statistics.

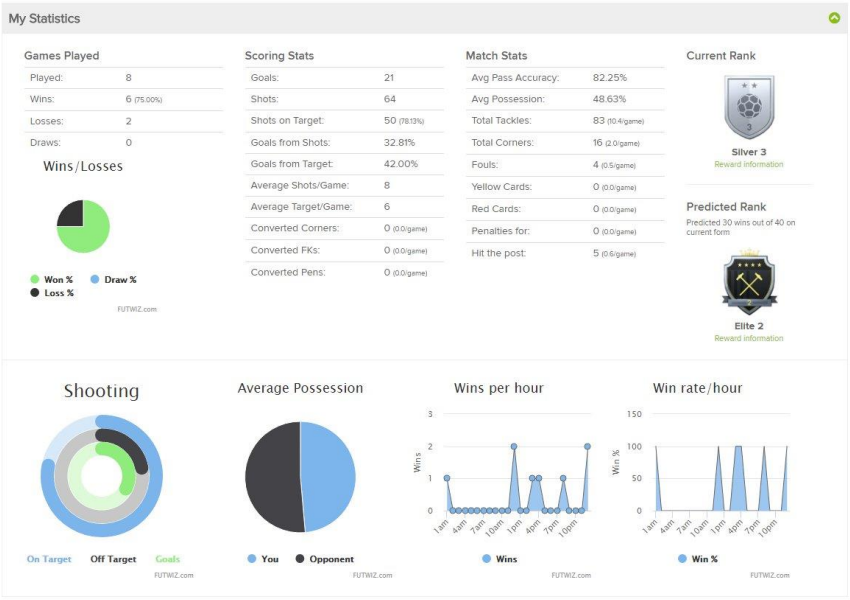



*Fig. 2: Example of an Esports player's statistics page, futwiz.com*

The developer of FIFA 20, EA studios [24], does keep track of players with a skill rating in FUT Champions [25]. However, where this rating comes from is not clear as the company has not made this knowledge publicly available and the value only shows up for the top 100 players. This statistic can be seen in the official FIFA 20 web app [26]. fifa.gg [27] is the official site used for broadcasting and tracking this Esports ranking, but no additional information is available through there. The only additional information shown in the livestreams is the average goals made by and against the players at the start of the match, and some statistics on former champion and world cup wins.

Contact with several Esports teams like Team Gullit [28], FC Twente [29] and Heracles Almelo [30] has concluded that while some research has been done into the use of data-driven applications, it has not been seen through completely because while teams see the potential advantage, the costs are still high and the current trainings from the coaches allow them to stay competitive.

## 2.3 Conclusion

From the discussion, we can sort all of the mentioned factors into two categories: factors that influence performance which will be called independent factors, and factors that indicate performance which will be called dependent factors.

| **Performance factor** | **Relevance for FIFA** | **Dependence** |
|---|---|---|
| Stress/mental state | High | Independent |
| Nutrition | Medium | Independent |
| In-game knowledge | High | Independent |
| Sleep | Medium | Independent |
| Cultural background/Play style | Medium | Independent |
| Match statistics | High | Dependent |
| Win-rate | High | Dependent |
| Player rank | Medium | Dependent |

*Table 3: Performance factors with their relevance for this project and their dependence.*

These factors all play a role in influencing and indicating performance for players, and should therefore be considered as contents of the dashboard. The dependent factors especially are important as they are the result of all of the independent factors and determine the performance in-game, and could therefore give insight into making performance measurable. Since it is currently not completely clear which factors determine Esports player performance, how in-depth this data should be and how it can be visualized, further work is required. In order to create a prototype, the impact of the currently available statistics should be reviewed and additional FIFA-specific performance data is required.

Examples of this additional performance data could be team setups, the amount of skill-moves a player uses in a match or what formation a certain player prefers. Combinations of factors should also be considered, for instance whether a player's intended play style can be deduced from that player's team setup.

From the aforementioned data, a prototype of a dashboard can be made. Together with industry experts from the Esports teams, this dashboard can then be improved iteratively to accommodate players and coaches.

# Chapter 3: Methodology

During this research several methods and techniques were used with the goal of developing prototypes for the dashboard and evaluating them with the users. In this chapter, these methods and techniques are explained.

## 3.1 Design process

For the main structure of this project, the design structure for Creative Technology as laid out by Mader & Eggink [31] will be followed. This structure can be seen in figure 3. This design process contains a diverging phase to come up with multiple different ideas, as well as a convergent phase where the ideas are brought together and developed into more concise concepts. This process can be repeated as prototypes are developed and iteratively improved upon. Afterwards, the prototype can be evaluated to see whether it is functional and fulfils the users' needs.

Ideation is the first phase of the process. In this phase, the users' needs are explored, and the ways in which the prototype can be built are assessed. The ideation phase may contain brainstorms, stakeholder analyses and interviews, and should result in a clear idea for the resulting product, as well as the first prototype.

This idea is then worked out in the specification phase, which aims to transform the high-level requirements from the ideation phase to specific low-level requirements that can then be actualized in one or more simple prototypes before moving on to the creation of the final prototype. Specifying the requirements can be done through the use of a PACT-FICS analysis, or by creating and evaluating prototypes.

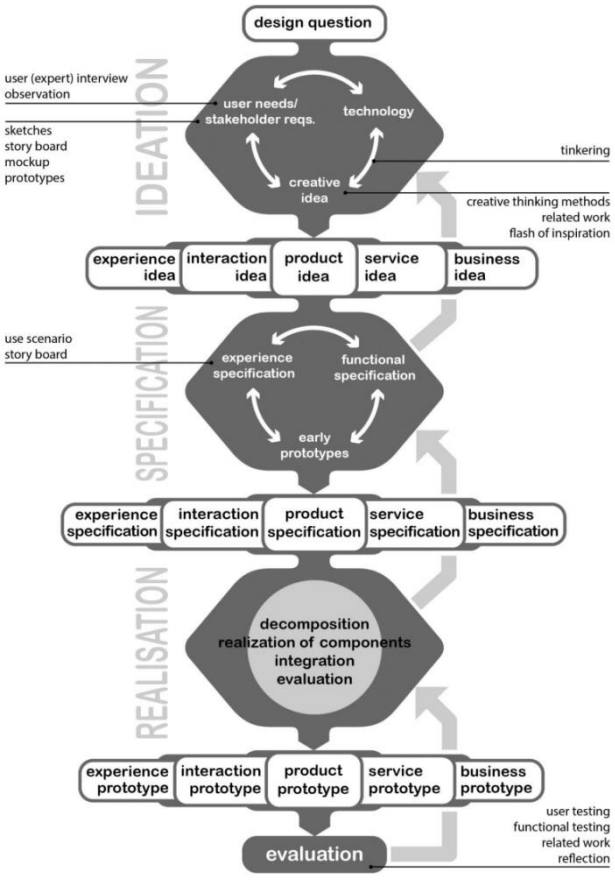



*Fig. 3: The design process for Creative Technology*

In the realization phase, the final prototype is created based on the requirements worked out in the specification phase. The choices made for certain aspects are explained alongside the prototype.

The final prototype is then tested in the last phase, which is the evaluation phase. This is done by checking if the prototype fulfils the requirements previously set up, which is done by the researcher

himself, and through user testing, which in this case means user and expert interviews. In these interviews, the previously interviewed parties along with additional experts in relevant fields can provide input on the correctness and usefulness of their respective parts of the prototype, as well as provide ways to improve on it. The results from these two methods can then be combined and a final reflection on the prototype can be given, along with recommendations for future research.

### 3.2 Brainstorm

To start the diverging phase of the ideation, ideas are needed that can be evaluated and converged later. To generate these ideas, a brainstorm can be held. There are several ways to conduct a brainstorm [32] [33], and in this project, both an individual and a group brainstorm will be held. The individual brainstorm is used in a freeform way to get an idea of the different ideas possible by mapping out relevant keywords and concepts in a mind map and either include or exclude them from the scope of the project, while the group sessions with fellow students is used to determine the details of these ideas and try to think of different ways to implement certain requirements through open discussion.

### 3.3 Stakeholder analysis

In order to determine the roles of different stakeholders in the project, a stakeholder analysis can be held [34]. A stakeholder is any group or individual that can impact or is impacted by the project. In a power-versus-interest graph as seen in figure 4, an estimate is made on the amount of influence a group or individual can assert on the project, and the interest they have in the project after which they are placed on the corresponding positions in the graph. The resulting graph can then be split into four categories depending on their power and interest, which guide the developer in choosing the focus group of their project while retaining an eye on other relevant parties.

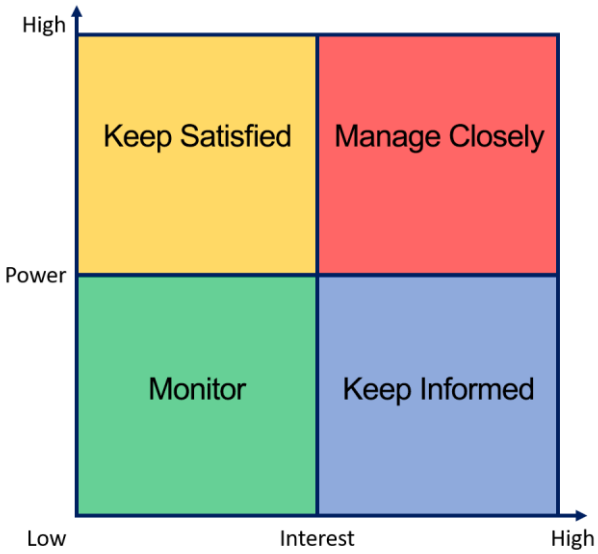



*Fig. 4: Stakeholder chart with actions based on position*

### 3.4 Interviews

In order to get a feel for the users' preferences regarding their requirements by finding out the importance of possible features and prevent unnecessary work, interviews are held with different types of users in the ideation phase,. There are three styles of interviewing: unstructured, semi-structured and fully structured [35]. An unstructured interview does not have any pre-determined questions and is more akin to a normal conversation where the topic to be discussed is the leading subject. A structured interview consists of pre-determined questions that are not deviated from. A semi-structured interview is a mix of these two, with some pre-determined questions while also allowing for additional questions if a topic seems interesting to the interviewer. This results in a choice for the researcher: unstructured interviews allow for more freedom and focus on the interesting side of the topic per interviewee, while structured interviews are easier to compare due to similar questioning. The advantage of semi-structured interviews is that the interview can still go in different directions per interviewee, but still has a baseline structure that makes comparing them easier. The choice is made to go with semi-structured interviews, as it might prove useful to ask additional questions to go in-depth on features of high-importance, while questions on less important features can be skimmed over.

### 3.5 Requirement elicitation

From the information gathered in the brainstorm, the stakeholder analysis, and the interviews, the requirements can be set up. This is done using the MoSCoW method [36], which is an acronym for 'Must have', 'Should have', 'Could have' and 'Won't have'. This method assigns a priority to requirements, where 'Must haves' are requirements that have to be fulfilled for a working prototype, 'Should haves' are important but not critical requirements, 'Could haves' are requirements that would be nice to have but are not necessarily important, and 'Won't haves' are requirements that will not be taken into account at this moment in time, but could be valuable in future continuations of this project.

In the ideation phase, these requirements are still worded to be very general and unspecific. In the specification phase, these requirements are then further examined and refined into actionable requirements that are suitable for engineering the prototype.

### 3.6 Prototype development tools

In order to create the dashboard prototypes, some form of software has to be used. Several tools were considered for the prototyping process. Adobe XD is a tool specifically made around creating a

prototype with some basic navigation and animation functionality completely in the program itself, while several other platforms like Marvel App or Proto.io use existing images and create their own overlay to add this type of functionality. Adobe XD is more attractive, since there is not a very clear idea on how the dashboard should look yet and this is quite a big part of development. It is easier to keep all of the functionality in one tool, rather than having to make new images and add the interactive elements afterwards every time something changes to the layout.

Since the first prototype will not need interactive elements yet, the chosen tool for this is Adobe Photoshop as it offers a professional layer-based tool. By using this tool it is easy to create the first prototype while keeping it editable for quick adaptations.

### 3.7 PACT and FICS

The PACT and FICS analyses [37] are a way of structuring user-based design with personas, in order to avoid misinterpretation of scenarios through explicit claims regarding the scenarios. PACT stands for People, Activities, Context and Technology, and is focused on the users and their actions for common situations, whereas FICS stands for Functions, Interactions, Content and Services and is used to focus on the functionality of the system.

# Ch. 4: Ideation

In order to generate requirements for the final dashboard, ideas have to be generated and the users' needs have to be explored first. By having a brainstorm, and analyzing and interviewing the stakeholders, the first requirements can be set up and translated into a first prototype. This first prototype is then evaluated to further specify the requirements for the next prototype.

## 4.1 Brainstorm

### *4.1.1 Individual brainstorm*

To start this brainstorm, the mind map in figure 5 was created. This was done by means of word association: Starting in the middle, keywords in the same context were thought of and written down in order to determine some of the early requirements and structure for the dashboard. [38]

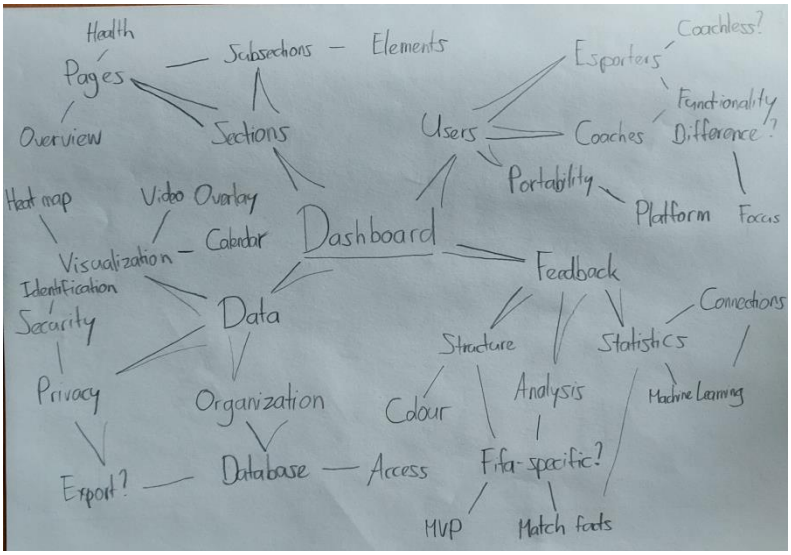



*Fig. 5: Individual brainstorm mind-map*

From this mindmap, the idea of separating the required content into several different pages with sub-sections arose, as well as the concept of needing different functionalities for the coach and the Esporter and needing a way to identify them. Different types of data visualizations were thought of for different types of data, like a heatmap for position and possession, and a calendar for appointments.

### *4.1.2 Group brainstorm*

In the group brainstorm, the ideas above were proposed to fellow students and discussed for feasibility and possible implementation. From here, we found that breaking down the match into different actions could be useful for analysis using pattern recognition, similarly showing a heatmap with the positions of the specific action and its statistics at the time of playback were suggested. A suggested separation of the data into different screens could be a screen with an overview as the home screen, a screen for analyzing a match, a screen for health information, a screen for the match history and a screen for additional information such as stress monitoring.

The resulting requirements from the brainstorms can be found in table 4:

| **Requirement** |
|---|
| Include heat map for position in analysis |
| Be logically set up into different sections |
| Be usable from different devices |
| Have a way to identify the user accessing the database |
| Provide feedback |

Table 4: *Resulting requirements from brainstorms*

## 4.2 Stakeholder analysis

In this chapter, the stakeholder analysis as described in chapter 3.x is executed.

In order to find stakeholders, we can use the outer circle of Besombes' graph of Esports Related Professions [1] and work inwards to the main categories in the inner circle of as seen in figure 6 to identify the role of each stakeholder deemed relevant in the Esports teams.

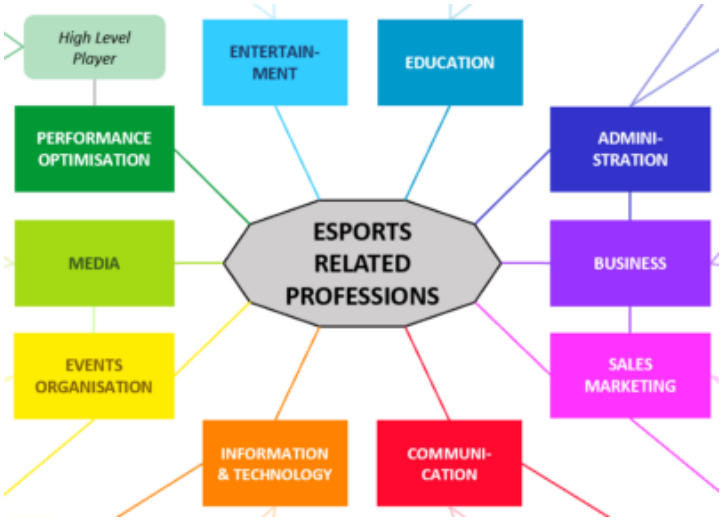



*Fig. 6: Inner circle of Besombes Esports Related Professions*

### *4.2.1 Esporters:*

Esporters can be found under Performance Optimisation in figure 6. As they are one of the main focus points of this research, they are one of the two main end users. They are knowledgeable of the game itself and the statistics it provides, and usually already play at a high competitive level. However, they may not be aware of the best ways to train and improve at the game by themselves. Esporters want the data to be easily accessible and customizable, as every player may have different statistics they deem important. They may also want to view the statistics in different ways, as some players are visually oriented where others may prefer the raw numbers. They may want to save their data even when switching to another club, so their data should either be transferable or stay with them when switching, there should either be an export function or a way to enter the current club and have a distinction between current and former clubs.

### *4.2.2 Coaches:*

Coaches can also be found in Performance Optimisation are the second main end users. They are the most direct link to players in Besombes' graph. As such, they may not always be knowledgeable of the game they are coaching players in but do know how to observe and train these players. In FIFA, a

large part of coaching is observation during play and providing feedback during and after matches. Coaches will want more flexibility and customizability from the platform, by being able to compare multiple players at the same time and even customize their overview per player they are coaching, as each player may focus on different aspects of their play to increase their overall performance level.

### *4.2.3 Managers:*

The Esports team manager can also be found in Performance Optimisation, but are much further up and are therefore still focused on performance and improvement of the Esports team (so they can be considered users), but less so than the players and their coaches. They may guide coaches to use certain principles and tools and are therefore also decision makers, and act as contact persons for external parties. Their game knowledge may be lower but they should still be aware of the improvement to the training methods by including the dashboard. Managers may see some of the interface through communication with the coach, and the coach should be able to adequately explain their methods with the dashboard. As they may manage multiple teams over different games, the manager may want to see additional implementations of the dashboard for different games on the same platform, so that players could switch between games and teams and still retain their previous data.

### *4.2.4 Event organization staff:*

While the early prototypes are mostly focused on the Esports teams, there is likely a future stakeholder in the Esports event organization staff. The staff aims to improve the viewing experience of the viewers and might want to incorporate data from the dashboard for this as a user that can view specific data. They will have to be kept in mind during the implementation of the dashboard, as this party would benefit greatly from some sort of automated export function for raw data or graphs when they become an active stakeholder. A straight-forward organization of the database will help this cooperation run smoothly. This also introduces another actor accessing the data, and should be handled carefully in regards to privacy. As most of their required functionality is also covered in the coaches section, they mostly have to stay informed at this stage of the project.

### *4.2.5 Electronic Arts:*

Electronic Arts (EA), the developers of the FIFA franchise, determine the available data for the dashboard either by changing the statistics shown at the end of a match or by including an API for extracting the data more easily. This can be done by publishing a new game or updating the current game. As they have an influence on the data collected but don’t have a specific interest in the dashboard, they only have to be monitored.

### *4.2.6 University of Twente:*

The University of Twente currently researches Esports, and aims to provide new insights from a scientific background, using truthfulness and reproducibility. This stakeholder contains both the researchers for this project as well as the supporting parties within the university, and is therefore both a developer and a decision maker.

### *4.2.7 Conclusion*

By looking at these groups and their power and interest in this project, we can give them a position in the stakeholder graph as seen in figure 7 and determine the focus points of the research.

| **Stakeholder** | **Role** |
|---|---|
| *Esports Team* | |
| Esporters | User |
| Coaches | User |
| Managers | Decision maker, User |
| | |
| *Other* | |
| Event organization staff | User |
| Game developers | Decision maker |
| University of Twente | Developer, Decision maker |

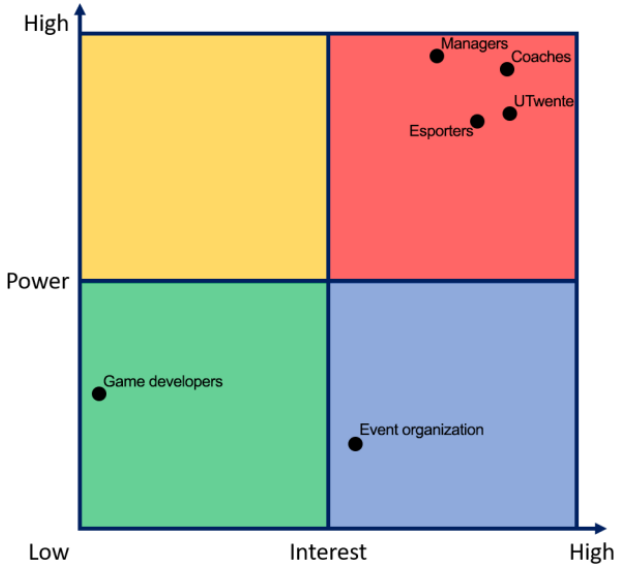



*Table 5 (right): Stakeholders with their role* and *Fig. 7 (right): Stakeholder chart*

Since coaches and Esporters are the main end users and the functionality of the Manager and Event organization staff is covered in their use-cases, we focus our implementation on these groups.

## 4.3 PACT analysis

In order to better understand the behaviors of these groups and how they would act in certain contexts, we can set up personas for these groups and work out scenarios.

### *4.3.1 People*

#### Coach perspective

*Fig. 8: Coach persona Tim*

Tim is a 28-year old FIFA coach, who played FIFA both casually and professionally for a few years before choosing to become a coach for his team of 3 players, which he has been doing for a year now. He instructed his players to send him clips of highlights of tough games and tracks the performance of his players very roughly in an Excel sheet and performs some statistics with it. Based on this, he either gives tips on a single aspect of play for one player, or chooses a highlight to go over with the entire team in order for them to learn from it. He wants to use the dashboard to keep an overview of all of his players, and is mostly interested in performance trends for each of them. He wants to be able to see where things go wrong or right in the larger scheme of things, and try to find a relation between the performance and the statistics. Since he is focusing on different things for each player, he would like to customize each player's profile and overview so he is only updated on the necessary parts.

#### Esporter perspective

*Fig. 9: Esporter persona Jorge*

Jorge is a 19-year old FIFA Esporter who has been playing FIFA since his childhood, and has been playing competitively for a few years now for his hometown soccer club. He does not keep track of his performance besides determining how he does during a match, and only records highlights of his hard matches because his coach told him to do so. There are matches where the opponent seems to be doing much better than him without a clear reason why, and he would like to know how this happens so he can improve himself. He has hooked up the analysis system and checks the dashboard after a bad match, and sometimes at the end of the day if no bad matches occurred in his playtime. Jorge is not very good with computers and technology besides his game console, and he wants a clean interface without having the interface be too technical or complicated. He reviews scenarios with his coach, and receives feedback on specific parts of his play. He would also like to receive correlations on his lifestyle outside of the game and performance in-game, so he can prepare for the eDivisie.

### *4.3.2 Activities*

While using the dashboard is the main activity, we can still recognize different scenarios for the different users. For both coaches and players, being able to dive into the analysis of a highlight without having to perform many actions in the menus is important, as it is one of the main functionalities of the dashboard. Similarly, players should be prompted for their daily data, as they cannot be expected to immediately do this by themselves every day. The activities for players can be summed up as such:

- Checking performance overview at the end of the day
- Checking performance after a match
- Checking a highlight
- Input daily data

These activities can also be combined, for instance when a player inputs their daily data and checks out their performance for the day afterwards.

For coaches, the activities are more or less the same, except the coaches choose a player to focus on first before going into these activities, and the coach might focus more on actionable improvement. For them, opening the dashboard to an overview of the players is important, as this will often be their main source of quick information and the way they choose a specific player to look into.

### *4.3.3 Context*

There are several different locations an Esporter may use this dashboard, most of which is at home or in the team's training facilities when training together with other players. An Esporter may use the dashboard after every challenging match or not at all if the matches on that day are particularly easy. If the Esporter is playing at home by himself, it may be easier to forget to check the dashboard frequently. Preferably, the Esporter should open the dashboard at least once daily to fill in personal data and get an idea of their performance and possible relevant correlations. This input of data could be instigated through a notification in the evening if the Esporter forgets to open the dashboard by themselves.

### *4.3.4 Technology*

For the current scope of the project, the technology used is simply a computer or laptop with an internet connection, as all use is done through a browser. Since the dashboard is dependent on the analysis subsystem, this should also be taken into account. This would probably consist of a screen

recording device, as well as some form of (micro)-computer to process and upload the video stream. Since the entire video must be uploaded per match in decent quality, a strong internet connection is recommended.

#### *4.3.5 Conclusion*

From this analysis, some situations were explored in which the users would use the dashboard, and a few requirements have been set up as seen below in table 6.

| **Requirement** |
|---|
| Have notifications to ensure daily data entry |
| Have a distinction between Esporter and coach functionality |
| Be usable from different devices |
| Be customizable regarding dependent factors to user's preference |
| Be able to transfer between clubs |
| Be able to export data |

*Table 6: Resulting requirements from stakeholder and PACT analysis*

### 4.4 User interviews

In order to gain insights into the users' wishes, interviews are held with managers of some eDivisie teams, as well as several players and a coach.

#### *4.4.1 Interviews Edivisie teams*

The first interviews were done with the FIFA eDivisie teams, where representatives of two teams were asked about their current implementation of data-driven training, their use of dashboards similar to this one and whether they take into account external factors that could influence their players' performances. One representative explained that they had not looked into data-driven training yet and while they did try to provide their players with healthy diets and good amounts of sleep, they did not track this or use a dashboard such as the proposed project yet. Another team had started developing a dashboard similar to this project a few years ago, but the required tooling for their intentions was missing and while their partners were excited, there was no cooperation to work out the details. They decided not to pursue the dashboard at that time because they did not feel the rest of the industry was ready for it yet, and because of increasing costs for in-house development and the fact they were already at the top of the Dutch competition so it was not deemed necessary.

### *4.4.2 Esporter interviews*

After the interviews with the teams, interviews with the players from one of the eDivisie teams were held. All of the players play on the same team and sometimes train together which might influence their responses somewhat, but since most of their training is done individually their responses should still give a look into what higher level FIFA players require from a dashboard like this. These Esporters were asked to say what currently available statistics can show the performance level of a player and what they would like to see in a dashboard. The most relevant factors for all three players included goals for and against, as this obviously determines the winner at the end of the game as well as statistics like the total amount of shots, the amount of shots on goal and possession of the ball. Additionally, all of the players showed an interest in more complex information that is not currently available like an opponent's defensive or offensive behaviour and context for actions on the field like angles for shots on goal and results of tackles.

Performance from the perspective of the Esporters was mainly focused on focus and game feel at the time of playing. The Esporters did not feel like diet or sleep made an impact at all. It might be interesting to look at the relation between these factors, their impact and Esporters' awareness of this impact.

Most players expressed a wish for additional context regarding their actions on the field, as the match facts at the end of each match did not always properly inform them. While shots on goal and shots on target were mentioned as important statistics, not all shots were of equal value, as there were also situations where a player could have a made a lot of shots while not having a lot of goals to show for it. Showing additional context per offensive or defensive portion of the match could show what shots were actually impactful and which were not.

Similarly, a wish for player profiling was a common occurrence in the requests: whether or not a player plays aggressively or defensively, what skill moves were used and where, and what formations a player uses most. All players stated they learned more when someone would observe them while providing insights or criticism than when playing alone. Since a lot of players play alone, having some sort of feedback system in the absence of a coach would also be a welcome feature.

### *4.4.3 Coach interview*

The interview with a coach was much more focused on required functionality of the analysis system and its effects on the functionality of the dashboard. During normal play, the Esporters are good enough players that they can generally win most of the matches they play against a random set of players. However, in the matches they struggle to win as easily or where they lose, they are

currently instructed to record that portion of the match so their coach can look back at the fragments, see what went wrong and figure out how to improve on it. These highlights are then viewed back either one on one with the player, or shown to fellow players in a group session to teach the entire team about it if the coach thinks they can benefit from it as well.

As the current training methods are very much focused on these highlights of the matches, it would be up to the analysis system to accurately find these irregularities among the matches, and highlight it for the coach and players to review to prevent doing this by hand and further distracting the player.

Important factors mentioned by the coach were the current match facts, the statistics regarding precision that can be deduced from them, as well as penalties, corners, free kicks and who was the MVP. More complex requirements from the analysis system were the ranking of the opposing player as well as whether they were verified or not, and if the player plays differently against these verified players or not. The knowledge of this change in playing behaviour or intensity can be helpful to be aware of during training, as it can decrease players' mental performance. Additionally, the coach wanted all of the feedback towards the player to be as simple and concise as possible, as going into the statistics is often not in the player's interests, and they would rather receive the feedback in a short summary from the system or immediately from the coach.

### *4.4.4 Conclusion*

From the interviews, several requirements have been found and these are listed in table 7. It was interesting to hear from a coach that is already using data analysis, albeit completely by hand in an Excel sheet, being enthusiastic for this implementation as this gave confirmation to the demand theorized in the previous chapters for a dashboard such as this.

| **Requirement** |
|---|
| Include heat map for position in analysis |
| Provide feedback to player without coach |
| Have all currently available statistics (Ch. 2.2) |
| Be easy to work with and navigate through |
| Have some form of player profiling |

*Table 7: Resulting requirements from interviews*

## 4.5 High level requirements

As it is not clear which factors contribute to the overall performance of a player and in the current way of working this differs per person, as much currently available statistics as possible must be in the dashboard.

Several different types of users will use the dashboard for different purposes, so there must be a distinction in functionality between coaches and players, preferably extending on the player's functionality for the coach to keep interactions straight-forward. In order to facilitate this and the access of personal and match information from the database for different users, some sort of identification system should also be included. This also means different user groups with different levels of technology literacy will use the product, which means the prototype will have to be simple enough to not confuse less technology-literate users, without taking away from the full potential of the functionality.

Ease of usability was a point mentioned often in user interviews, so a simple menu structure with consistent theming and clear visualizations should be maintained. While a phone or tablet size implementation would be good for their portability advantages, the focus is mostly to give a general idea of the workflow focused mostly on the coach, and therefore the implementation will be done in a web interface. Since the focus of players is on different parts of their play and coaches want to have an overview of different properties of play of their players, a customizable home screen for players and coaches is preferable.

Since we limit the scope of this project due to time constraints, there are some things the prototype will not take into account. Supporting games other than FIFA for multidisciplinary Esports teams, usability from different devices and the ability to transfer between teams with the same statistics by exporting and importing this data will not yet be explored during the implementation, as they don't contribute to the core functionality and the prototype would still function without them.

Table 8 contains a summary of the requirements found in the previous sections of the ideation, combined with some insights from chapter 2, and were given a priority based on the estimated importance to the functionality of the prototype.

| **Priority** | **Requirement** |
|---|---|
| Must | Have all currently available statistics (as seen in Ch. 2.2) |
| | Have a distinction between Esporter and coach functionality |
| | Have a way to identify the user accessing the database |
| | |
| Should | Be easy to work with and navigate through |
| | Be logically set up into different sections |
| | Include visualisations like a heat map for position in analysis |
| | Have submenus and elements be customizable to user's preference |
| | |
| Could | Provide feedback |
| | Have notifications to ensure daily data entry |
| | Have some form of player profiling |

| | |
|---|---|
| Won't | Support games other than FIFA |
| | Be able to transfer between clubs |
| | Be usable from different devices |
| | Be able to export data |
| | Provide feedback to player without coach |

*Table 8: Summary of requirements as a result of the ideation phase*

### 4.6 First design iteration

The choice was made to have different types of screens that will be consistent for both players and coaches, since a coach will focus on one player at a time. Since the coach's functionality extends onto that of the player with overviews, it was decided to first create the dashboard from the player's perspective, and look at the coach's functionality in a later stage of prototyping.

As seen below, the dashboard has a simple layout, and not a lot of colour is used. The different sections of the dashboard are labelled with the function or data they aim to present to the user. Based on the insights gained in the previous sections and chapters, the ideas for the different screens were set up as follows:

- The overview shows the overall data of the player, as well as some recent games
- The matches screen contains a table with a list of recently played games and its related and derived statistics as a form of match history
- The analysis screen is divided into a list of actions regarding a period of time, a heat map of the playing field with the action and its location visualized, and at the top is additional information and context thought to be relevant for analysing a situation play by play
- The personal screen contains personal health-related information like amount and quality of sleep, meals, physical exercise, and mental state
- The external screen contains in-depth information regarding external factors like controller or keyboard input, stress, and posture
- The data screen was added as a way to dive into the raw data without the limitations of the user interface, this would be a table with all of the available data and several ways to filter and search

As the overview and analysis screens are the most important for the prototype and the rest of the screens follow the functionality of these screens and the analysis systems, these are shown below.

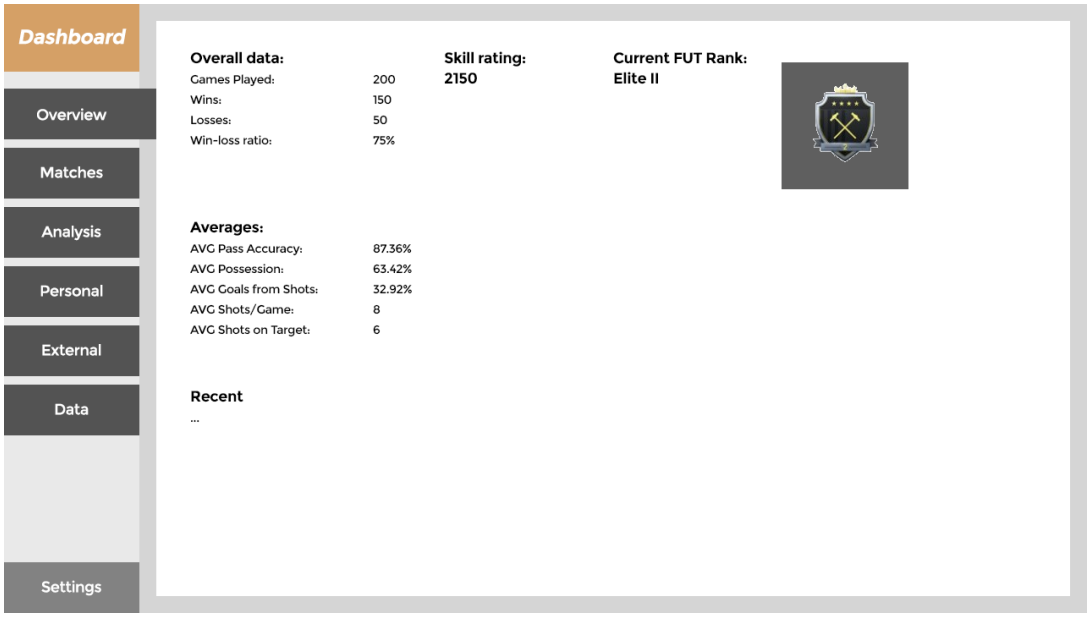



*Fig. 10: First design iteration of the overview screen for a single player*

The idea for the overview screen was to create an overview so that a player and their coach could quickly see recent games as well as overall performance for the player.

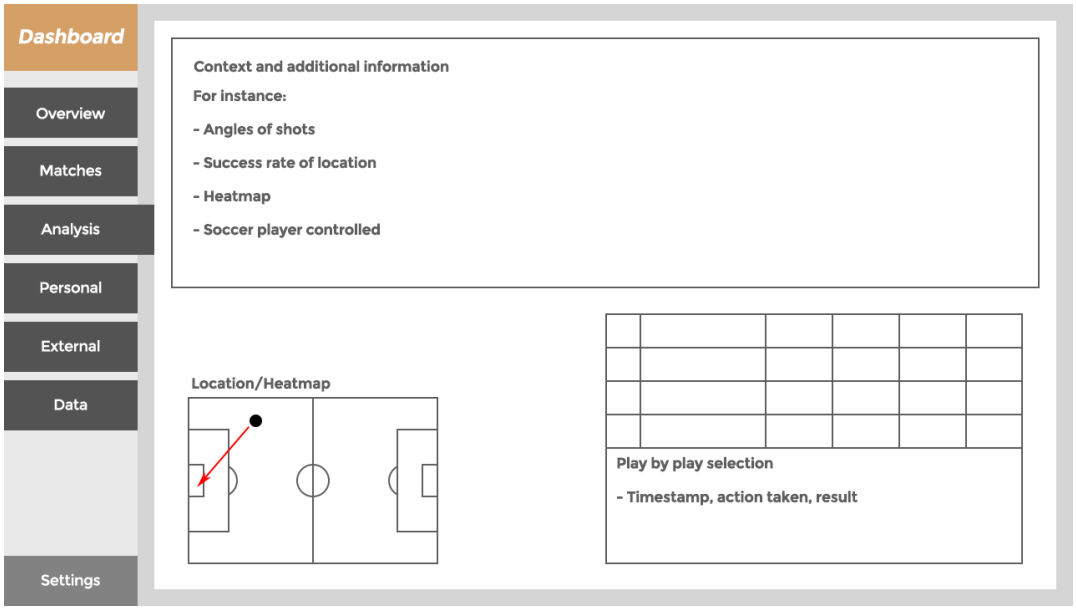



*Fig. 11: First design iteration of the analysis screen for a single player*

This prototype was evaluated with the interviews of the Esporters as well as co- researchers to determine how well this structure would work, and what should be added or changed to the elements currently shown.

From this evaluation, the following points came up:

- General
    - The idea is good, and the clear separation between sections works
    - Most sections are not filled in enough to give feedback on but the sections themselves make sense
- Overview
    - Some additional visualizations would be nice, for instance for win-rate or overall performance or something similar
    - It is currently not clear what the skill rating means
- Analysis:
    - The heat map is good but a recording of the match with an overlay might be better
    - External input like controller input or a stress monitor at the specific video playback time would be useful
    - The match facts should contain all current statistics at playback time, and should be separate from action context like distance, angle etc.
    - Action context could perhaps also be shown on the video overlay
    - Some information on or profiling of the opponent would be nice

# Ch. 5: Specification

In order to keep iterating on the prototype made in the ideation phase and prepare specific and actionable requirements for the prototype to be made in the realization, the scenarios from the PACT analysis in the ideation phase is combined with a FICS analysis. Additionally, requirements that were set up in the ideation phase are reviewed and together with the insights from previous chapters, worked out into more specific, low-level requirements.

## 5.1 PACT-FICS analysis

### *5.1.1 FICS*

#### 5.1.1.1 Functions & events

The most important functionality of the dashboard is the analysis section, as the rest of the data could also be tracked in a spreadsheet. The data will have to be processed beforehand, so that the dashboard only handles organized data with minimal additional input from the player. This functionality is not explored in this prototype but is essential for the realization of this project to work. Some assumptions to its functionality are therefore made and not further discussed, like the organization of the database being in line with the functionality required for the prototype to work.

#### 5.1.1.2 Interactions

The main interaction with the system is done through the computer cursor, and additional interactions would be typing additional input for filters or settings with the keyboard.

#### 5.1.1.3 Content

The content of the dashboard is the data provided by the players and the coaches, divided over the different screens. Each screen has a different subset of the overall data, with the overview having a summary of all of the other screens. As mentioned previously, matches can be analysed in the analysis screen, where a video of the match with an overlay can be seen, alongside the actions taken in chronological order and additional context for the match and each of these actions.

#### 5.1.1.4 Services

As the current scope of the project is to create a web-based application, the dashboard is dependent on having to be connected through the internet to a server with a database containing all of the information, as well as the server having to identify the person accessing the database.

### *5.1.2 Use scenario*

Jorge had a bad match against a player that he didn't feel was really better than him. He wants to find out what happened in the video. The video of his match is recorded and analysed. The analysis system recognizes the match as a loss and sees his login. It tries to find the tipping point of the match and creates a few relevant highlights to review. When Jorge selects the highlight he wants to review, he is taken to the analysis page where the server lets him stream the video file with the overlay, as well as all of the additional information. After the analysis, the dashboard system receives a comment from Jorge on the highlight he watched and attaches it to the highlight for the coach to review. When the coach looks at the highlight, he adds additional text to Jorge's comment, which is also added to the highlight by the system.

He shares the information with his coach, who reviews it with him in the dashboard. When the match shows up in his match history on the dashboard, they can see it is flagged as having a highlight after analysis. When they click on the highlight, they are taken to the analysis screen, where the time surrounding the highlight is deconstructed into concise actions, and Jorge's coach can go through it step by step, and filter on the actions surrounding the situations that may have led to goals made against him.

## 5.2 Low-level requirements

By taking the requirements from the previous section, as well as the evaluation of the first prototype, the requirements as seen in table 9 can be set up. These requirements adhere to the MoSCoW ordering of priorities, as well as being tagged as 'F' for functional requirements which are testable functions the system should have, or 'NF' for non-functional requirements which are subjective requirements the system should follow. This distinction allows for an easier evaluation of the requirements, as functional requirements can be ticked off, while non-functional requirements should be adhered to but can't be distinctly tested for.

| **Priority** | **Requirement** | **Type** |
|---|---|---|
| Must: | General: | |
| | Be customizable through movable segments | F |
| | Have a simple menu structure and clear buttons without too many colours | NF |
| | Be available from different devices by being a web service with logins | F |
| | | |
| | Overview screen: | |
| | Have general statistics derived from match facts and averages | F |
| | Have a trend line for performance | F |
| | Have a list of highlights for the coach and player to review | F |

| | | |
|---|---|---|
| | | |
| | Analysis screen: | |
| | Have video playback | F |
| | Show match facts and additional context at playback time | F |
| | | |
| Should: | General: | |
| | Have a calendar screen for planning purposes | F |
| | Have a matches screen to look back at data, check correctness and select matches to review | F |
| | Able to receive notifications | F |
| | Able to change settings | F |
| | Be able to import/export data | F |
| | | |
| | Analysis screen: | |
| | Show stress monitor data if available | F |
| | Show controller input data if available | F |
| | | |
| | Matches screen: | |
| | Show history of previously played matches | F |
| | Show match facts per match | F |
| | | |
| Could: | Personal screen: | |
| | Track and visualize diet | F |
| | Track and visualize sleep patterns | F |
| | Track and visualize workouts | F |
| | Track and visualize mental wellbeing | F |
| | Have a welcome screen/notification that reminds the Esporter to fill in their daily | F |
| | | |
| Won't | Support other games than FIFA | F |
| | Support switching between clubs | F |
| | | |
| | | |

*Table 9: Summary of requirements as a result of the specification phase*

## Ch. 6: Realization

In order to test the requirements set up in the specification chapter, a new prototype needs to be created and evaluated. In this chapter, the choice of software used to create the prototype is explained, as well as the choices that were made during creation.

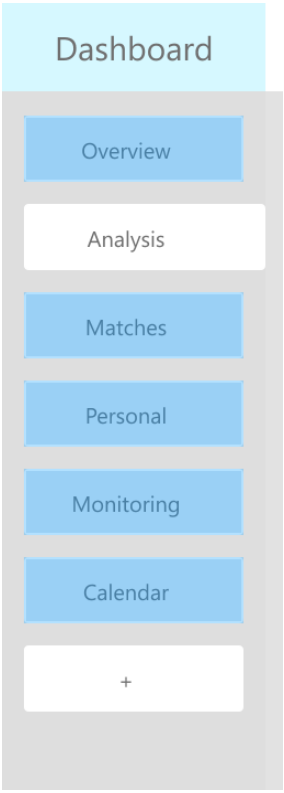



*Fig. 12: Highlight example*

### 6.1 Software

Adobe XD offers functionality to keep the overall design consistent which improves the prototyping speed significantly. For instance, when creating the menu structure to go on the side of all screens, a copy of the original element was created for each screen where changes to the original were also put into effect on the copies, allowing for an easier workflow.

The program also offers positioning tools for easy distribution of elements over a distance and horizontal and vertical alignment of elements.

Clicking anywhere in the web-based prototype brings up blue boxes around interactive elements, as can be seen in figure 12. This can guide the user to interactive elements, but may also give a distorted view of the final prototype as it will not be present there and not all elements will have interactivity. This was not accounted for in this phase, and may mean the design of interactive elements should be made clearer, perhaps with some sort of highlight. Adobe XD does not offer this functionality, so it may be considered for future implementations.

As there is no functionality possible yet, all of the data seen in the screens is placeholder data, and the focus is on the presentation of this data back to the user and the usability of the screens.

### 6.2 Second design iteration

From the stakeholder analysis and the first interviews, it is clear that while there will be different end users with different perspectives on the data, and the coach is most likely to dive into the data and use the dashboard for deeper analysis. To facilitate this, there should be a login screen leading to different overviews based on the role of the person logging in. The coach will want an overview of the players from where they will be able to choose a player to focus on and see their highlights or just look at the overview for multiple players, while Esporters themselves should always end up on their own overview since they are focused solely on themselves. This login screen should not

automatically log out the player so the player does not have to login every time they open the dashboard.

Elements of the dashboard with six dots at the top of them can be moved around by the user and should be saved by the dashboard on that position between visits. That way, the users can get comfortable with their own layout and focus points. Similarly, if there is filter icon on the screen or in a specific element, some information can be filtered out if it is less relevant.

To keep a non-distracting and easy to use, the use of colour throughout the prototype is very limited. In the overview and personal screens, colours are only used for performance and mental health indications, whereas in the analysis screen, colours are also used to indicate selections and teams.

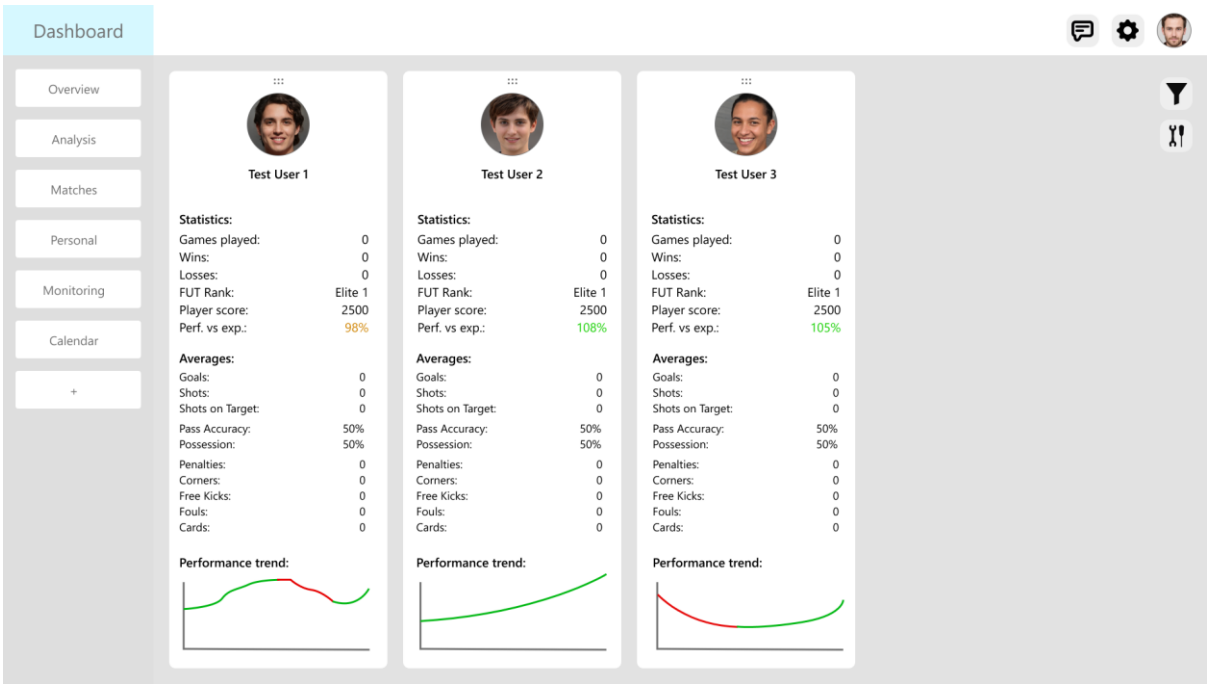



*Fig. 13: The overview screen as seen by the coach with an element for each player*

In the coach's overview, up to 4 of the players on his team are immediately visible, and even more with horizontal scrolling. The coach can reorder the locations of the players by clicking on the dots at the top of each player card and dragging to the desired location. In each card, we can see some overall statistics for the player, as well as averages of the statistics per match. Included is also a generalised performance trend graph, it must however be noted that the way to fill in this graph has not researched yet at the time of writing, and is purely speculative to give the coach an indication of performance.

By clicking on the element of one of the players, the coach selects that player and is taken to their respective overview screen.

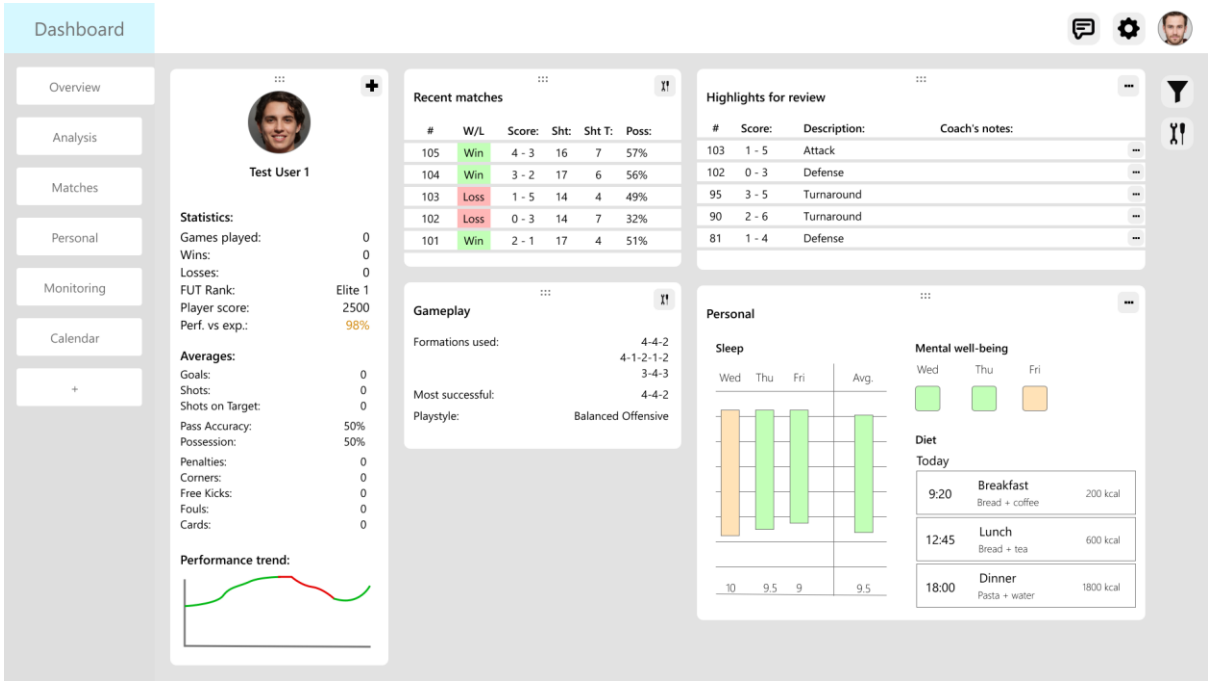



*Fig. 14: The overview screen for a single player*

In this overview, the data from the player card stays the same as to not confuse the players and coach, and additional screens are shown. This page provides a summary for most of the other screens, as the most recent five matches can be seen, as well as the personal information of the past few days, some general gameplay behaviour and the highlights generated for the past matches. Clicking on these summaries leads to their respective pages and clicking on one of the highlights leads to the highlight being loaded up in the analysis screen.

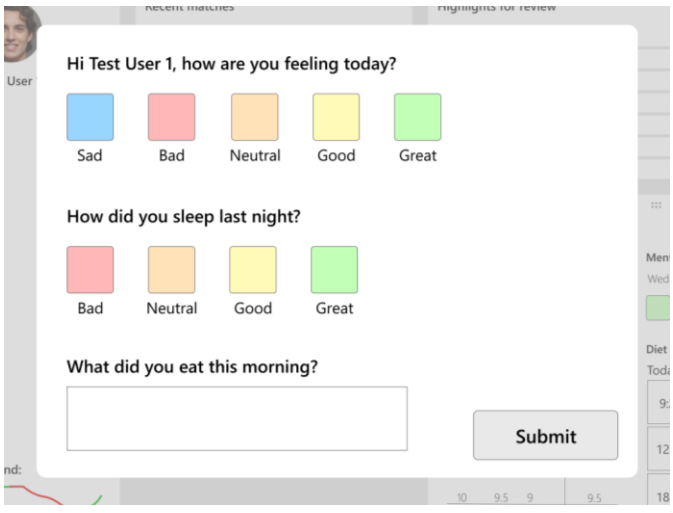



*Fig. 15: Screen for personal data acquisition*

When clicking the plus in the player's element on the player's overview, the personal data acquisition screen (figure 15) can be seen. When the prototype was created, it was not sure what questions had to be asked to properly gather this data, and as such, the focus was put on the design: greying out the rest of the screen and showing a popup screen asking these questions, and focusing on multiple choice questions with straightforward selections to keep it simple and quick for the Esporter to answer as they will have to fill this in every day.

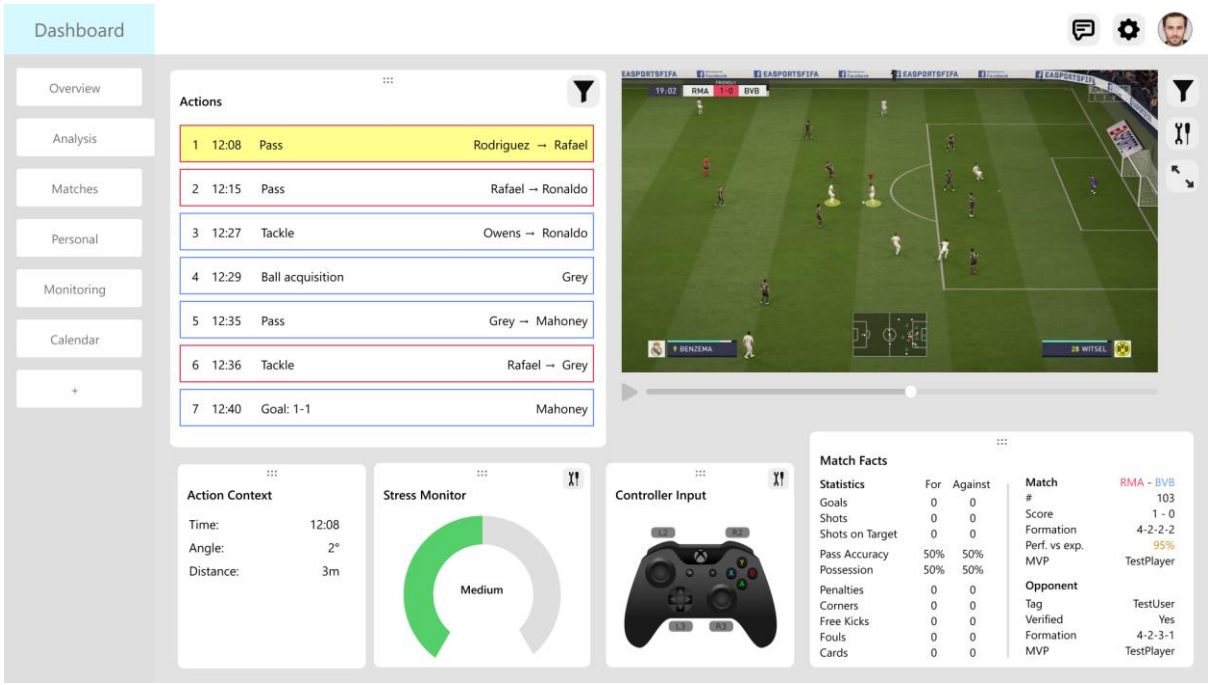
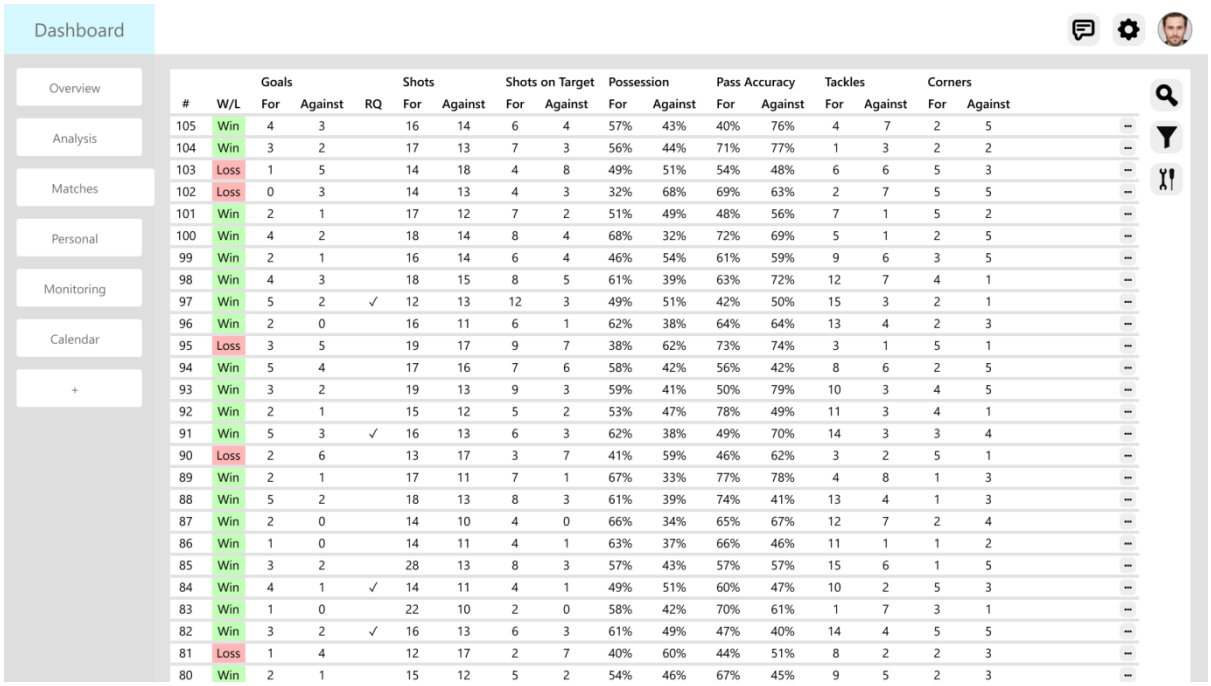



*Fig. 16: The analysis screen for a highlight*

In the analysis screen (figure 16), the video footage of the selected highlight can be seen, as well as a simple overlay of the selected action and its relevant players. Additionally, some numeric context for the action as well as the stress monitor level, controller input and dependent factors regarding the match at the time of playback can be seen at the bottom of the screen. If no data is available for the stress monitor or controller input, this could be shown, for instance visually by either greying them out or showing some sort of text like "data not available".




| # | W/L | Goals For | Goals Against | RQ | Shots For | Shots Against | Shots on Target For | Shots on Target Against | Possession For | Possession Against | Pass Accuracy For | Pass Accuracy Against | Tackles For | Tackles Against | Corners For | Corners Against |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105 | Win | 4 | 3 | | 16 | 14 | 6 | 4 | 57% | 43% | 40% | 76% | 4 | 7 | 2 | 5 |
| 104 | Win | 3 | 2 | | 17 | 13 | 7 | 3 | 56% | 44% | 71% | 77% | 1 | 3 | 2 | 2 |
| 103 | Loss | 1 | 5 | | 14 | 18 | 4 | 8 | 49% | 51% | 54% | 48% | 6 | 6 | 5 | 3 |
| 102 | Loss | 0 | 3 | | 14 | 13 | 4 | 3 | 32% | 68% | 69% | 63% | 2 | 7 | 5 | 5 |
| 101 | Win | 2 | 1 | | 17 | 12 | 7 | 2 | 51% | 49% | 48% | 56% | 7 | 1 | 5 | 2 |
| 100 | Win | 4 | 2 | | 18 | 14 | 8 | 4 | 68% | 32% | 72% | 69% | 5 | 1 | 2 | 5 |
| 99 | Win | 2 | 1 | | 16 | 14 | 6 | 4 | 46% | 54% | 61% | 59% | 9 | 6 | 3 | 5 |
| 98 | Win | 4 | 3 | | 18 | 15 | 8 | 5 | 61% | 39% | 63% | 72% | 12 | 7 | 4 | 1 |
| 97 | Win | 5 | 2 | ✓ | 12 | 13 | 12 | 3 | 49% | 51% | 42% | 50% | 15 | 3 | 2 | 1 |
| 96 | Win | 2 | 0 | | 16 | 11 | 6 | 1 | 62% | 38% | 64% | 64% | 13 | 4 | 2 | 3 |
| 95 | Loss | 3 | 5 | | 19 | 17 | 9 | 7 | 38% | 62% | 73% | 74% | 3 | 1 | 5 | 1 |
| 94 | Win | 5 | 4 | | 17 | 16 | 7 | 6 | 58% | 42% | 56% | 42% | 8 | 6 | 2 | 5 |
| 93 | Win | 3 | 2 | | 19 | 13 | 9 | 3 | 59% | 41% | 50% | 79% | 10 | 3 | 4 | 5 |
| 92 | Win | 2 | 1 | | 15 | 12 | 5 | 2 | 53% | 47% | 78% | 49% | 11 | 3 | 4 | 1 |
| 91 | Win | 5 | 3 | ✓ | 16 | 13 | 6 | 3 | 62% | 38% | 49% | 70% | 14 | 3 | 3 | 4 |
| 90 | Loss | 2 | 6 | | 13 | 17 | 3 | 7 | 41% | 59% | 46% | 62% | 3 | 2 | 5 | 1 |
| 89 | Win | 2 | 1 | | 17 | 11 | 7 | 1 | 67% | 33% | 77% | 78% | 4 | 8 | 1 | 3 |
| 88 | Win | 5 | 2 | | 18 | 13 | 8 | 3 | 61% | 39% | 74% | 41% | 13 | 4 | 1 | 3 |
| 87 | Win | 2 | 0 | | 14 | 10 | 4 | 0 | 66% | 34% | 65% | 67% | 12 | 7 | 2 | 4 |
| 86 | Win | 1 | 0 | | 14 | 11 | 4 | 1 | 63% | 37% | 66% | 46% | 11 | 1 | 1 | 2 |
| 85 | Win | 3 | 2 | | 28 | 13 | 8 | 3 | 57% | 43% | 57% | 57% | 15 | 6 | 1 | 5 |
| 84 | Win | 4 | 1 | ✓ | 14 | 11 | 4 | 1 | 49% | 51% | 60% | 47% | 10 | 2 | 5 | 3 |
| 83 | Win | 1 | 0 | | 22 | 10 | 2 | 0 | 58% | 42% | 70% | 61% | 1 | 7 | 3 | 1 |
| 82 | Win | 3 | 2 | ✓ | 16 | 13 | 6 | 3 | 61% | 49% | 47% | 40% | 14 | 4 | 5 | 5 |
| 81 | Loss | 1 | 4 | | 12 | 17 | 2 | 7 | 40% | 60% | 44% | 51% | 8 | 2 | 2 | 3 |
| 80 | Win | 2 | 1 | | 15 | 12 | 5 | 2 | 54% | 46% | 67% | 45% | 9 | 5 | 2 | 3 |

*Fig. 17: The matches screen*

In the matches screen (figure 17), all of the past matches played can be seen. The choice was made to group the statistics for both players instead of spreading them out into two groups like having all of the ‘for’ statistics on the left and the ‘against’ statistics on the right to make comparisons easier.

An example of a filtering submenu for the matches screen can be seen in figure 18. This type of menu allows players and coaches to look for matches with certain statistics in order to make comparisons.

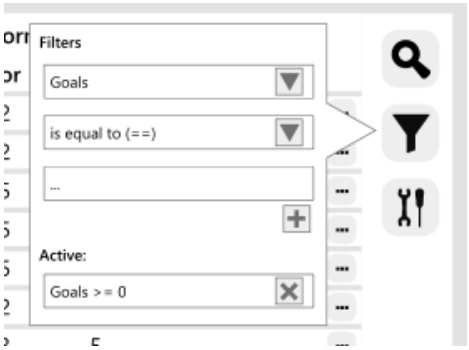



*Fig. 18: Example filter submenu*

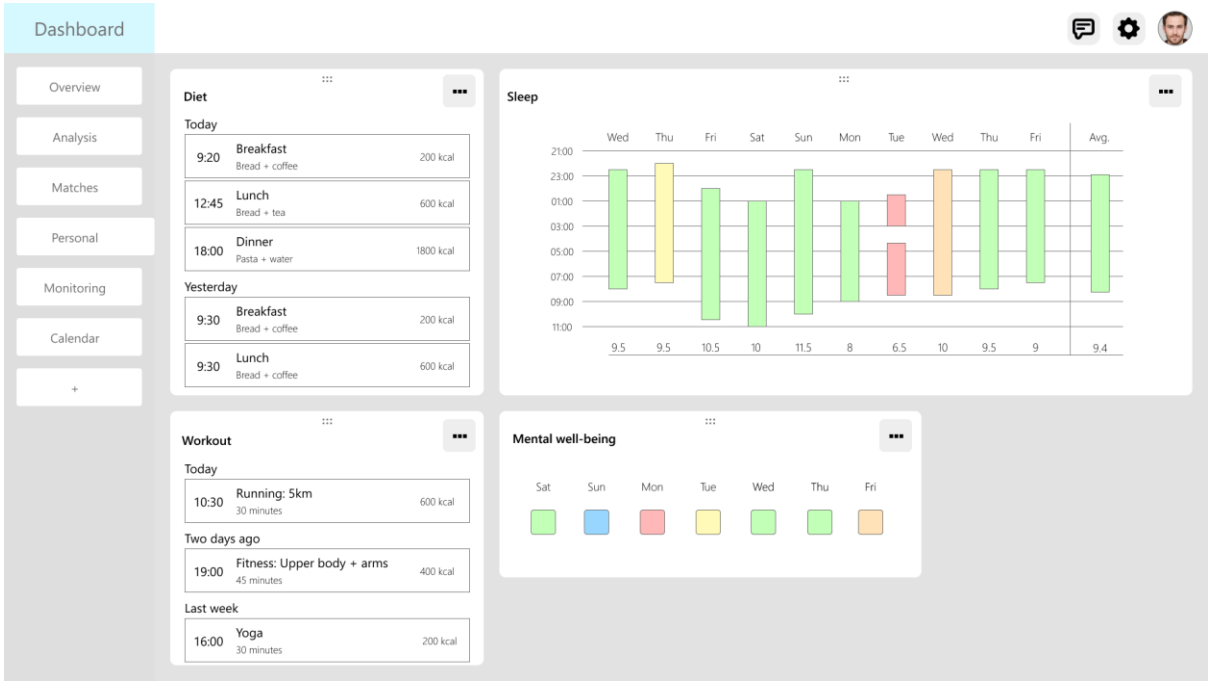



*Fig. 19: The personal screen*

In the personal screen (figure 19), independent factors from outside of the game that are not easily measurable are tracked. Sleep is shown with a calendar-style graph for a visual representation of sleep time and quality. Mental well-being is tracked using colours, without the legend as the Esporter will be asked to input this information on a daily basis and it is assumed they will very quickly be able to remember what colour is connected to what state of well-being. Sleep tracking for instance also could be automatically tracked by using the last time a user accessed the dashboard on his phone and compare it to the first time of access in the morning, but that assumes both the first and last action in an Esporter's day is accessing the dashboard, so the choice was made to include this in the data acquisition screen.

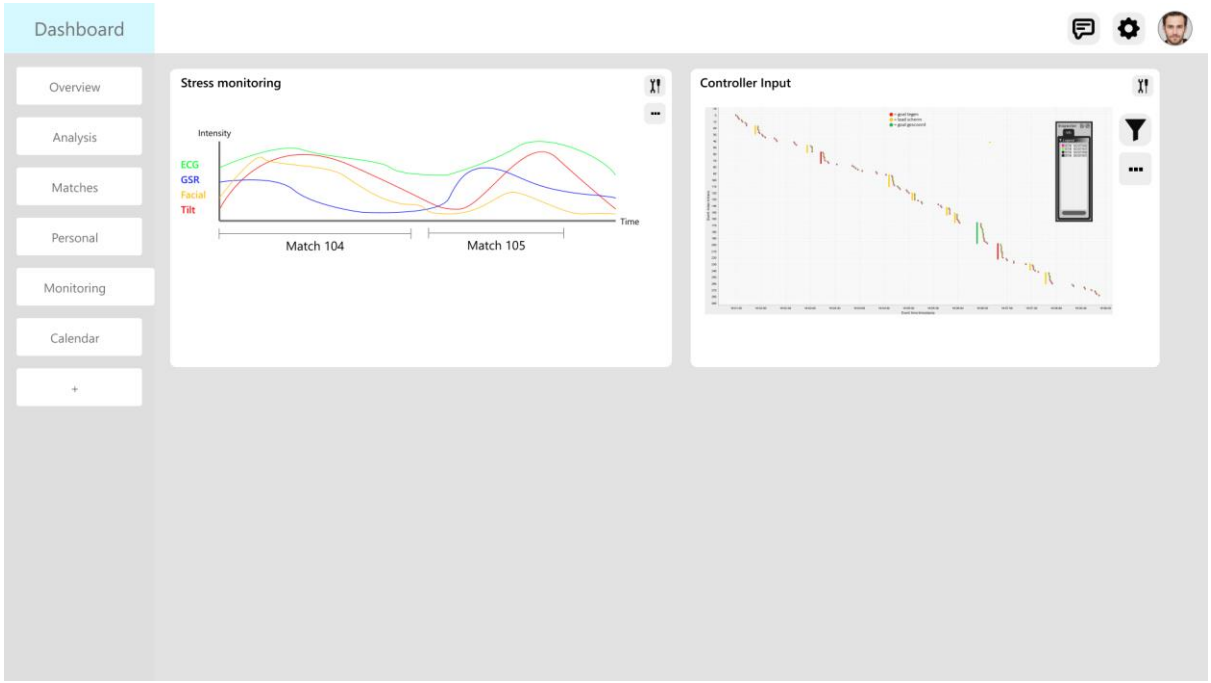



*Fig. 20: The monitoring screen*

The monitoring screen (figure 20) shows the data of externally measured factors if available in the data. The current implementation shows an example of a graph of combined stress levels and a graph with button frequency over time. This data can only be shown if the data is available in the database for certain matches. This means the data for controller input or stress monitoring should somehow be included in the data for the match statistics, or be linked to this match data by using a timestamp if the data is processed separately.

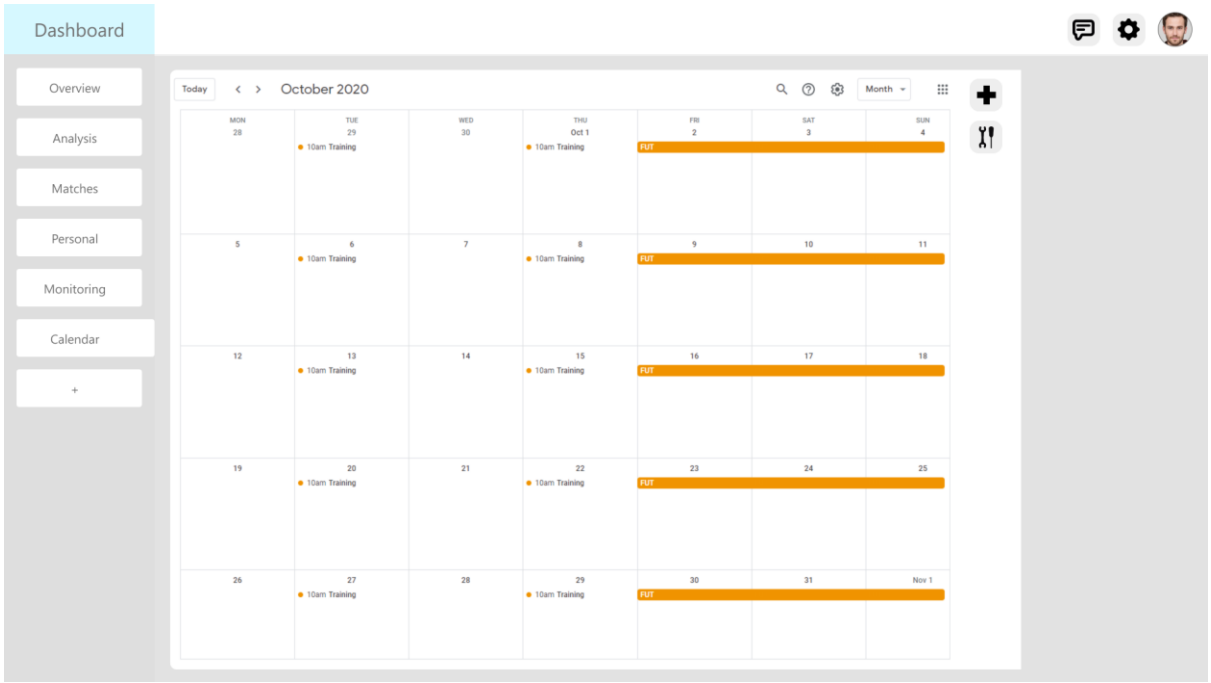



*Fig. 21: The calendar screen*

The calendar screen (figure 21) shows a Google Calendar implementation of the calendar. Since this layout is familiar, user-friendly, widely used and already compatible with a lot of different devices through Google's API, it was chosen to incorporate this into the dashboard instead of making a new implementation that would be less intuitive and strictly tied to the dashboard, whereas the Google Calendar used in the dashboard could also be used independently by users on their mobile devices.

## Ch. 7: Evaluation

The goal of this chapter is to test the prototype created in the realization chapter in order to be able to draw a conclusion in the next chapter. This is done by reviewing the requirements used to create the prototype, as well as interviewing three Esporters, an Esports health expert and a member of the University of Twente Esports student team on the dashboard to assess correctness and usability.

### 7.1 Requirements review

| Priority | Requirement | Type |
|---|---|---|
| Must: | General: | |
| | Be customizable through movable segments | F |
| | Have a simple menu structure and clear buttons without too many colours | NF |
| | Be available from different devices by being a web service with logins | F |
| | | |
| | Overview screen: | |
| | Have general statistics derived from match facts and averages | F |
| | Have a trend line for performance | F |
| | Have a list of highlights for the coach and player to review | F |
| | | |
| | Analysis screen: | |
| | Have video playback | F |
| | Show match facts and additional context at playback time | F |
| | | |
| Should: | General: | |
| | Have a calendar screen for planning purposes | F |
| | Have a matches screen to look back at data, check correctness and select matches to review | F |
| | Able to receive notifications | F |
| | Able to change settings | F |
| | Be able to import/export data | F |
| | | |
| | Analysis screen: | |
| | Show stress monitor data if available | F |
| | Show controller input data if available | F |
| | | |
| | Matches screen: | |
| | Show history of previously played matches | F |
| | Show match facts per match | F |
| | | |
| Could: | Personal screen: | |
| | Track and visualize diet | F |
| | Track and visualize sleep patterns | F |
| | Track and visualize workouts | F |
| | Track and visualize mental wellbeing | F |
| | Have a welcome screen/notification that reminds the Esporter to fill in their daily data | F |

*Table 10: Realization requirements table coloured for included (green) or missing (red)*

Table 10 shows the requirement as set up in the specification and used to create the dashboard in the realization, coloured green for when it is included, and red for if it is missing from the final prototype. All of the requirements in the 'Must have' category are fulfilled, and most of the requirements in 'Should have' and 'Could have' are as well. The missing requirements are 'Be able to import/export data' and 'Have a welcome screen/notification that reminds the Esporter to fill in their daily data', which were only missing because of time constraints. Some other requirements such as 'Able to receive notifications' and 'Able to change settings' were added in the form of buttons in the dashboard, but were not fully explored in the design. For the settings requirements, this was partly because it is not clear yet what settings the dashboard should regarding the data, but for both this and the notification requirement, design mock-ups could have been created but were omitted because of time concerns.

## 7.2 Expert interviews

A summary of the interviews are given here, the full transcript of these interviews can be found in appendix A-E.

### *7.2.1 Esporters interviews*

In the interviews with the three Esporters, the focus was mostly on the overview and analysis screens as well as a more general look at the reception of the dashboard was positive. In general, all of the required functionality is present, and aside from some small adjustments or additions, the Esporters would see themselves using this dashboard personally. Their focus is mostly on checking out games that did not go well, but the inclusion of an overview with more general statistics and health monitoring was also appreciated. The Esporters were aware that they are not always making the right decisions regarding when to keep playing, and having a system to remind them to take a break or rethink their strategy through trend lines was positively received.

Among the criticisms mentioned as the lack of heat maps for position-relevant statistics like possession and pass accuracy, as it is seen as more impactful for these statistics to be high when the ball is mostly on the opponent's side of the field as this shows a dominant, aggressive position for the player, while having these statistics high when the ball is mostly on the player's side is seen as more defensive and passive. The context menu for statistics like formation could have some more information, as players often switch formations halfway through matches to react to their opponent's play style, so just saying one formation is the 'most successful' does not say much. The Esporters liked the personal screen, but were confused by some of the uses of colour and the lack of a legend.

### *7.2.2 Esports health professional interview*

In the interview with the Esports health professional, the focus was put on the personal screen and the data acquisition from the Esporters. While the personal screen looked good, some additional legends would probably be good. The data acquisition still for the personal data needs quite a lot of work, and the advice was to have a maximum of 10 multiple choice questions per day as to not burn out the Esporters on filling it in. When asked what to do about the connection players have with their personal information and its relation to their performance, the advice was to try and find straightforward correlations between data point like 'You score 10% better on average on days with 9 hours of sleep.' that could be found in the data.

### *7.2.3 University of Twente Esports student team member interview*

In the interview with the university Esports student team member, the focus was on general usability for all users and functionality for the coach, as well as future possibilities for continued research. According to the interviewee, the project could be considered a success if the implementation would reduce the review time per match for the coach which seemed likely with the proposed functionality in comparison with the current ways of analysing matches through match recordings and spreadsheets. However, some things can still be improved. It is currently not clear how to determine the performance trend, which is quite an important factor for the overview functionality to be complete. Specific player profiling could be done mostly for tournaments, it is probably not easily doable for weekend leagues because the pool of players is too large and multiple encounters between all players can't be guaranteed, but perhaps a form of general play style profiling could be more interesting.

There are also some ethical considerations at hand, like having a player perform well while he's living unhealthy which could be tricky. It would for instance be bad to say: 'You scored significantly better after nights with only 5 hours of sleep!' Future research could be executed in collaboration with several local Esports or soccer student associations, as both will most likely be interested in testing an implementation of the dashboard in their FIFA tournaments.

## 7.3 Discussion

While these interviews provide some good insights into the proposed functionality of the dashboard, the project cannot yet be called finished. Since the focus of this project was on web interfaces and we did not look at tablets or phones, the usability would most likely change immensely to accommodate those platforms. Because of the current COVID-19 situation, no in-person testing was done and limited evaluations were performed, and the user experience was hardly tested. The

functionality for the coach was hard to gauge without interviewing a coach interested in data analysis. All in all, the situation introduced some communication hitches with external parties which was unfortunate. There were also some requested features that have come up in testing or interviews but were not acted upon in the final prototype because of the project scope or a lack of foresight beforehand from the researchers that could still be explored in future iterations.

These features were:

- A welcome screen/notification that reminds the player to enter their daily personal information
- MVP information and statistics using a heat map in the matches screen
- Whether or not players play better or worse against a verified player
- Correlations/deductions from data points
- Import/export database function
- Play style profiling for both the player and their opponent
- Dates of matches in the matches screen

### 7.4 Conclusion:

Many insights were gained in the functionality test as well as the interviews, which alludes to the fact the project is not yet finished. While the interviews with all parties were positive and the evaluation of the final prototype shows promise for future implementations of the project, points for improvement were still aplenty

From these insights gathered from the functionality test and the expert and user interviews performed above, the final requirements list was set up as seen in table 11. However, future implementations of the prototype will introduce more requirements, most of which will likely be in the non-functional category as factors like usability, stability and speed were currently not taken into account during testing as it is not possible to test in the current state of the prototype.

| **Priority** | **Requirement** | **Type** |
|---|---|---|
| Must: | General: | |
| | Be customizable through movable segments | F |
| | Have a simple menu structure and clear buttons without too many colours | NF |
| | Be available from different devices by being a web service with logins | F |
| | | |
| | Overview screen: | |
| | Have general statistics derived from match facts and averages | F |
| | Have a trend line for performance | F |
| | Have a list of highlights for the coach and player to review | F |

| | | |
|---|---|---|
| | | |
| | Analysis screen: | |
| | Have video playback | F |
| | Show match facts and additional context at playback time | F |
| | | |
| Should: | General: | |
| | Have a calendar screen for planning purposes | F |
| | Have a matches screen to look back at data, check correctness and select matches to review | F |
| | Able to receive notifications | F |
| | Able to change settings | F |
| | Be able to import/export data | F |
| | | |
| | Analysis screen: | |
| | Show stress monitor data if available | F |
| | Show controller input data if available | F |
| | Show player and opponent's play style | F |
| | | |
| | Matches screen: | |
| | Show history of previously played matches | F |
| | Show match facts per match | F |
| | Show match date and length per match | F |
| | | |
| Could: | Personal screen: | |
| | Track and visualize diet | F |
| | Track and visualize sleep patterns | F |
| | Track and visualize workouts | F |
| | Track and visualize mental wellbeing | F |
| | Have a welcome screen/notification that reminds the Esporter to fill in their daily data | F |
| | Support switching between clubs | F |

*Table 11: Final requirements list*

# Ch. 8: Conclusion and recommendations

The goal of this chapter is to review the research by drawing a conclusion from the outcomes and limitations of the research done so far, and formulate recommendations for possible continuations.

## 8.1 Conclusion

The purpose of this project was to answer the question “What aspects should be in a dashboard to monitor FIFA Esports performance?” through the use of some sub-research questions.

The first sub-research question, ‘Which factors determine FIFA player performance?’ could not yet be answered, due to a lack of conclusive prior research, and the answer could therefore not be included in the final prototype. Because of this, the second sub-research question, ‘What information should the dashboard contain?’ was answered in a very general way: the dashboard should contain all currently available and obtainable data, as at this stage it could all be relevant.

The third sub-research question, “How should this information be displayed?” is answered through the creation and evaluation of the second prototype: By creating an easy to use dashboard with different sections, the available data can be displayed either by raw numbers or data visualizations based on the context.

The answer to the main research question is then: All of the currently available and measurable statistics should be included in the dashboard, and the dashboard could be set up using different sections with their own relevant data and visualizations. The relevant data at this point in research is all of the dependent factors like match statistics as listed in chapter 2.2 and derived statistics, as well as the independent factors sleep, diet, controller input, stress, mental state and physical health. The dashboard should at least adhere to the final requirements list as set up in chapter 7.3.

## 8.2 Recommendations for future research

There are several ways in which future research could build on this research. The most obvious continuation lies in the implementation and testing of the proposed dashboard, as well as further specifying required functionality. Some examples would be determining a way to accurately deduce performance level of Esports players from the gathered data, or finding possible correlations between data.

Another direction could be to take the current proposal and adapt it to work for mobile devices, implement functionality for live use in the form of a second screen, or branch out to similar functionality for other Esports titles.

Additional influences that were mentioned in interviews but were not deemed important enough to implement in the current prototype were the effects of external influences like controller delay, internet speed, connection quality of the opponent and Esports event circumstances like local connection quality and impact of sound levels on player performance.

## Appendix A: Interview eDivisie Esporter 1

*Could you use the dashboard and tell me what you are thinking out loud?*

Alright, everything looks good in the Overview, all of the important statistics are there. Do I have to fill in the info in Matches myself?

*No, the idea is that this will be done automatically.*

Okay, that's good. What does the angle mean in Analysis?

*The angle is the difference of where the player is looking and where the shot ends up.*

Alright. Personal looks good, amount of hours of sleep is relatively clear although not immediately. Mental well-being is also quite vague, a legend would be nice here.

Monitoring is quite vague and not immediately clear, but would I be able to zoom in the finished version?

*Yes, you would be able to go into it.*

Calendar looks nice, very clear. Formation is also automatic?

*Yes, this will most likely be done through the minimap.*

Alright.

*The idea was to have the system automatically create highlights and have the coach review them and leave comments. Do you think you would use this, and why?*

Yes, I would focus on watching the highlights, look at what I do right and wrong. I would use the performance trend to look at my overall performance and see when it is time to take a break. I would want to look at bad matches immediately afterwards, but if things go well I would probably only look once at the end of the day.

*Would you change anything, or is there anything missing and if so, what?*

I would like to know when to take a break when my performance goes down, so something like a notification for that. Live functionality to have it open during the match would also be nice, so I can see how to improve during the break of a challenging match. I often make stupid mistakes while playing, so some sort of insight into that and being made aware of it would be great.

## Appendix B: Interview eDivisie Esporter 2

*Could you use the dashboard and tell me what you are thinking out loud?*

'Most successful' formation in the Overview screen is a bit vague, if you're playing several formations in one game it does not say much. The information could be good, but there may be combinations, more context would be good, like formations with play style, or most effective counters according to data.

Controller input seems really useful in Analysis. Can you only look back at the highlights or could I view the whole match?

*You could view back the whole match if you would want to, but the highlights are supposed to be the most interesting parts.*

Alright. Some sort of systemic view or heat map instead of the video if you want to see some sort of quick summary of the match would be nice. This could also be done in the Matches screen. How will Performance versus Expectation be measured?

*This will most likely be based on previous matches against players with a similar play style, their level of play can most likely also be analyzed and then based on their play style and performance and your history against those players, we will base the expected performance against that player.*

Ah alright. For possession and pass accuracy in the Matches screen more context would be nice, like a heat map for where the ball actually was in your possession and where the passes take place, because a high pass accuracy percentage on the opponent's half of the playing field can be more impactful.

I think in the Personal section, mental wellbeing is the most important part as FIFA is a game with quite a high cognitive load. Some sort of legend for the colours would be nice as it is not really clear right now. In Monitoring, the controller input isn't quite clear, how does that work?

*The idea is that time is horizontal and the amount of presses are vertical, so you can see at certain points where he presses a lot is right after a goal because he skips through all of the replays.*

That makes sense. The planning in the Calendar screen makes sense as well.

*How do you think you would use this, and why?*

If looking at a collection of matches, I think the Matches screen would be enough. For a single match the analysis screen makes more sense, where you can see the details like controller input.

*Would you change anything, and if so, what?*

Like I said, some extra context here and there would be nice. Maybe something like most effective tactic, skill moves etc. Having heat maps in the Overview screen with data of multiple games might be interesting as well.

## Appendix C: Interview eDivisie Esporter 3

*Could you use the dashboard and tell me what you are thinking out loud?*

From what I can see, all of the required functionality is present and the right statistics are on the right pages. It looks good. It's hard to fully judge the functionality like this, as it doesn't work and I feel like that's really necessary to get a feel for how it works. Highlights seem useful for a player's actions surrounding some interesting part of a match or a goal. Does mental well-being mean it gathers that from my play-style?

*No, most of the data on the Personal page have to be entered by hand, sleep might be automated somehow but mental well-being is entered by the user themselves.*

Alright, that makes sense.

*Do you think you would use this, and why?*

I would look at the eDivisie matches in more detail, other matches maybe quickly or just through the Matches screen.

*Would you change anything, and if so, what?*

I don't think it can be made clearer than this. Everything is in there.

## Appendix D: Interview Esports Health Professional

*From your perspective as an Esports health professional, what do you think about the current implementation of the Personal page?*

It looks very cool, everything is readable and the interface is nice and simple, and there are some nice visualizations in here already. There are some things missing though. Some sort of a legend might be nice, because right now it's not clear what data you are looking at. When gathering the information, you don't want to be too intrusive, smart watches are generally a big no-no for Esporters. You could look into Hexoskin suits for that purpose if you're interested in that.

*This information will have to be gathered from the Esporters daily, how do you think we can best ask for this information?*

It depends, how many times do you think they will enter the dashboard?

*That really varies, it could vary between only once per day to multiple times per day. We are trying to focus on at least once a day by providing a notification if users haven't filled in the information yet in the evening.*

Alright, if we go by once a day, all of the information has to be gathered at that single point. To avoid bombing the users with a bunch of questions every day when they enter the dashboard, you should probably limit the amount of questions to a maximum of ten. An example could be:

- 'How many hours did you sleep last night?'
    - Multiple choice: <7, 7, 8, 9, >9
- 'How much physical activity have you had today?'
    - Multiple choice: 0, <30, 30-60, >60
- 'How would you rate the intensity of this exercise?'
    - Multiple choice: Light, medium, heavy
- 'When was your last meal?'
    - Multiple choice: Within last hour, >3hrs ago, >6hrs ago
- 'How healthy would you rate your last meal?'
    - Multiple choice: Sugary snack, healthy snack, full meal
- 'How much liquid have you drank today?'
    - Multiple choice: <500ml, 500-1000ml, 1000-1500ml, >1500ml
- 'How would you rate your stress level?'
    - Multiple choice: 1, 2, 3, 4, 5
- 'How do you feel today?'
    - Multiple choice using smiley faces: 1 ☹, 2, 3 😐,4, 5 ☺

By setting up the questions like this, you still get relevant categories and interesting data while keeping it simply for the players.

The way the emotions are currently handled in the data acquisition screen is a mix of emotions like ‘sad’, and in general how you feel like ‘good’ or ‘bad’ which are not really emotions.

*Players don’t feel a strong connection between performance and their diet, sleep patterns or mental health. How can we best communicate this data back to the player so they actually use it?*

Keep it simple. Try to find correlations between the data points and give that back to your players in a nutshell: “You scored 20% worse on days where you slept less than 6 hours”, “Your possession is up 10% on days where you drink more than 1000ml of liquid”.

## Appendix E: Interview UTwente Esports Student Team member

*From a general point of view, what do you think about the current implementation of the dashboard?*

The way I see it, the focus would be on reducing review time for the players and the coach. They only do this for competitive matches from what I heard from the previous meeting I was at. One of the biggest things necessary for this is the performance trend, have you thought on how to determine this?

*No, this is purely speculative at this point and the focus here is on the design of the dashboard.*

It might be good to look out for ethical considerations here, as you might find yourself in a situation where a player lives terribly but performs well, which can be hard to ethically justify.

In StarCraft 2 and League of Legends, APM is a big performance indicator, which might also be interesting for FIFA. In League of Legends for instance, competitive players actively "warm up" beforehand by clicking around at the start of the match which might be interesting to look at. Trying to find the differences between good and bad players, finding those differences back in the data collected and presenting it through a dashboard like this would be the prime goal for the future I would say. Presenting it back to the dashboard user could be done by relating certain occurrences in data to keywords like aggressive, defensive, defensive after the first goal, tilting, etc. and trying to create some sort of player profiles. This might be hard to do for general play as you can't profile every random player without playing them several times which doesn't really happen, but it could be interesting for the competitive matches if you know who you're up against.

Stat-tracking that doesn't immediately show a one to one relation with performance can still be interesting for finding weak points for players to work on.

The current implementation looks a lot like op.gg, a similar website for League of Legends. Something else that could be interesting is finding patterns in wins and losses, as playing another match just after losing may have an impact on your performance. How strong this relation is of course differs per person, and this analysis can be performed on your own players but also on opponent players as preparation for competitive matches.

The dashboard itself looks good, it seems to provide the info required, since I'm not an expert on FIFA and there is no functionality yet I wouldn't be able to say how well it works but I don't seen any obvious flaws. You could try to work together with Blueshell or vv Drienerlo to maybe test this, I know Drienerlo has their own internal FIFA competitions so it might be nice to try the analysis system there.

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