GGTANKERS

Business Analysis

National College of Ireland
4th Year - Technology Management
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1. Introduction

World of Tanks is a free-to-play, team-based, MMO tank battle game developed by a Belarusian game company, Wargaming, that features combat vehicles that existed during the 20th century era including World War 2 and Cold-War era of tanks. It focuses primarily on player versus player action gameplay where players can control vehicles in their arsenal to duke it out with one another to win rewards such as experience and credits so that they may be used to unlock additional combat vehicles for play.

The game keeps tracks of relevant user statistics along with their vehicle statistics such as wins, losses, battles played, average experience per battle, average damage per battle, and more, and also presents these information, albeit to a limit extent, to the player so that they, the player, can see how well they have improved from their beginnings to the current time, what tank, or type of tank, they have become most skilled with, or to simply brag their stats to others.

Several websites have also appeared which utilizes these data (through the use of Wargaming's developer API) so that they may be presented to the player(s), and to the lesser extent, the general public, in a more comprehensive, and detailed manner, with each website specializing in their own fields, such as Tomato.gg which focused on player and vehicle statistics and displays them in several different forms (tree map, bar charts, line graphs, etc.), and tanks.gg which focus on vehicle characteristic and to a lesser extent player statistics.

This project will primarily be focusing on conducting research study through the utilizing of several different elicitation techniques to identify whether there is room for the development of a new application that focuses on displaying to the user every single public information with regards the player's performance, no matter whether the information would actually be of any use to anyone.

This should allow users to see information that they have previously not seen, allowing them to better understand how they perform in their battles, along with other statistical data that can be used to humour each other, e.g., how many trees they have knocked over, along with being an important opportunity for the researcher to further develop their elicitation technique skills and coding skills with these new technologies.

The project would also focus on developing the new application by utilizing new technologies such as ReactJS and its list of available libraries, that many other websites were not designed

around or based off of, which should give it the advantage of being more flexible, more efficient, more feature rich, and easier to work with.

An important note to consider is that throughout the report there may be mentioned referring to 'WOTPlayer' and 'GGTankers'. The former is simply the initial name of the application that was used pre-midpoint, but was replaced with 'GGTankers' during the last week or two on February due to it rolling off the tongue better and being more synonymous with 'tomato.gg', an application similar to the idea put forth in this report.

The website and blog format of the report whereby I explain the processes and actions undertaken to shape how the application will be designed both visually and with regards to what it can do or the functions of the website, can be found here (note that too many traffic can result in the website being locked for a period of time): GGTankers – NCI Final Year Project (atwebpages.com)

2. Business Need

World of Tanks has seen a large growth of popularity, from it's release over 10 years ago to today where it is not uncommon to see daily users of 50,000 in Europe alone. Over the years, with the increasing number of players, and an increase of different vehicles, game modes, and other features incorporated into the game, along with features that were removed, there has been an ever-increasing amount of information that has to be processed by websites developers to display these information to the user on a daily basis.

This has resulted in an increasing amount of computational power and/or time required to do such processing, which has encouraged many of these website developers to simply focus on presenting only the data that is useful to the majority of the player base, meaning that the rest of the information that serves little to no purpose gets left behind.

Many of those websites have also been around for a long period of time and were developed using older technologies and present these data in an outdated UI not does not fully utilize the free space around the user's screen which makes data presented in a less ideal manner, especially if they were not designed for the increasing popularity of mobile devices, which several of them were not.

There is also the potential issue for Clan Members (those who belong to specific groups within the World of Tanks Community for the purpose of competing in events to win special rewards) with regards to their recruitment processes whereby they may try to seek those with a specific

set of skills or those who meet their minimum performance requirements, but find that many of those websites may not be able to fulfil their needs of aiding in the screen on potential applicants as they may lack certain statistical data that could assist them in identifying whether a specific person is suitable for their clan.

3. Business Case

The decision to research and develop this application was done by myself, the sole researcher and developer of this project, for numerous of reasons; I have a vested interest in World of Tanks and wish to contribute towards the game and its player base, as well as being a prime opportunity for me to utilize all of the techniques and knowledge I have gained during my work placement at Dell Technologies and other modules at NCI.

The application will be designed to allow users to easily search for a particular player's username, whether that be their own, their friends, or others, and for them to view the statistical data in an appropriate and comprehensive manner through the use of tables, grids, graphs, or other forms of displaying information.

The justification for why this particular project is being purposed, in the perspective on the financial incentives or benefits for this project, can be attributed several different factors with the primary being that Wargaming, the studio behind World of Tanks do not own or operate any sort of fully-fledged website based application whereby users can view data presented in an intuitive manner. The only method of viewing data that is officially operated by Wargaming is through the World of Tanks application itself, albeit limited severely as it only displays specific 'useful' information rather than everything, along with all of the data being scattered in several different areas.

Where this plays a part financially is that this application could be developed and sold to Wargaming or alternatively, partnering with Wargaming could be an option whereby Wargaming could provide support financially, and in exchange, Wargaming could redirect users that want a website that functions similarly to tomato.gg or others, that is officially supported by Wargaming themselves. It could also become a place whereby users can request specific data to be gathered such as average shell travel time, total amount of credits spent on consumables for a specific tanks, etc., that are not collected by Wargaming but could be once garnered enough attention.

Alternatively, other websites that offer similar functionally can acquire, partner, merge with the developer of this application which can bring about financial compensation, although not to the extent as Wargaming due to the smaller size of the development team behind those similar websites.

Back onto the topic of developing this application, for this to become a reality, I will be required to develop the application from the ground up to take advantage of modern technologies such as ReactJS and its large catalogue of libraries to provide the users with such features, such as ApexCharts for the purpose of displaying data in several different forms of graphs.

However, before I can conduct such development, I will be required to understand the needs of the users which can be accomplished through the use of several different elicitation techniques – Benchmarking and Market Analysis, Brainstorming, Business Rules Analysis, Collaborative Games, Concept Modelling, Data Mining, Data Modelling, Document Analysis, Focus Groups, Interface Analysis, Interviews, Mind Mapping, Observation, Process Analysis, Process Modelling, Prototyping, Survey or Questionnaire, and Workshops, but of which only a certain few of these techniques is appropriate to be conducted due to the nature of the project.

When conducting these elicitation techniques, certain measures need to be taken to ensure that the participants are kept anonymous to ensure that information gathered cannot be used to trace back to the participant(s), and each elicitation techniques may slightly differ in the method to enable the participants to remain anonymous, some require a simple toggle to disable recording of emails or names, while some may require slightly more effort.

4. Supporting Technologies

- **ReactJS –** ReactJS will be the foundation of the prototype that will serve as a tool used to illustrate to the participants, as well as other stakeholders concerned, with how the application is expected to look and operate.

  It will include several features put forth by the participants, as well as designed to be dynamic, meaning that a singular webpage is required and any content that the user would like to see they would simply need to click a button or two to have it displayed to them without requiring them to be redirected.

  ReactJS also allows the installation of third-party libraries to enhance the capabilities, or functionality of ReactJS, and in turn, the application such as allowing data gathered to be presented in a graph form when utilizing the ApexCharts library, a library that

will be used during the development. Other libraries may be used but have yet to be identified.

ReactJS will also be built alongside other coding languages or markup languages including:

- **HTML –** Used to define the structure of the webpage or define where everything will be laid out, so if I wanted to have a search bar on the top, and have a chart displayed on the right side of the page, I would type it so in the HTML.
- **CSS –** Primarily used to provide styling to a webpage or it's content, such as giving a certain element a specific colour, size, or other effects. Can also be used to provide structure to an element, meaning that if I wanted an element to be specific size, I would use CSS to do so.
- **JavaScript –** Vital in allowing the webpage to become dynamic and interactable. It will primarily be used to hide or show specific content specified by the user but can be used for other purposes that may or may not be obvious to the user.

- **GitHub/GitHub Desktop –** A website, and desktop application respectively, that will be used when designing the prototype as it allows the uploading and downloading of the application's source code online and onto the desktop. Its purpose is to simply allow lecturers within the National College of Ireland to view the code (as long as they are added as collaborators), and to serve as a backup in the event that the desktop that the prototype is located on is lost. It will also be used to hold multiple versions of the prototype with vastly different design changes for comparing to one another so that a decision can be made in regards to which options will ultimately be selected and built upon.
- **Visual Studio Code –** An application developed by Microsoft to allows users to code their applications in a simple and efficient manner. It provides features such as auto completion and debugging, as well as allowing the developer to install third-party tools that can improve the coding experience by providing them with additional options or features such as auto indentation or formatting.
- **Office 365 –** A suite of tools that provide a wide range of functions including:

- **Word –** For the purposes of type up reports or documents required, such as monthly reflective journals, and project proposals, and additional features or tools for formatting to ensure easy readability or grammar correction.
- **PowerPoint –** Allows the creation of PowerPoint presentation slides for the mid-point presentation and any other subsequent presentations.
- **Forms –** To design a survey or questionnaire for users to participate in for the purpose of research and study. Provides useful features such as allowing the users to remain anonymous for ethical reasons.
- **MS Publisher –** For designing diagrams such as the Use Case Diagram in a simple manner not possible in Word.
- **Excel –** Allows the creation of a simple, and crude, Gantt Chart, as well as reviewing responses collected by MS Forms in Excel format which is easy to read and allows for sorting of responses and representing it in graph format.

- **MS Teams & Outlook –** Primarily used to communicate with the supervisor on matters relating to the project, as well as attending lecturers (MS Teams only) pertaining to the project which may contain information on how to properly conduct the report, structure the documents, or general advice to improve the overall quality.
- **Wireframe.cc –** A website that allows the designing of a simple, non-interactable concept on how the prototype, or application, would look like. Used to ensure that the stakeholders understand how it would be designed and allow for feedback that may prove useful to ensuring that the design of the application is of good quality.
- **OBS Studio (Open Broadcaster Software) –** Sole purpose of recording myself in presenting work done, such as the mid-point presentation.
- **DaVinci Resolve –** Used to edit recording videos carried out on OBS to remove unnecessary parts, or to combine several short recordings or segments into a singular video, although this may not be necessary.
- **YouTube –** Used to host recording videos that are set to unlisted. Allows the creation of special links that will provided to the supervisor and lecturers for marking.
- **Moodle –** To upload submissions required as per the requirement of the module/course.

- **Edge & Chrome Brower –** Allows the viewing of the application that is running on the local machine for testing, general researching purposes such as wireframe designing on wireframe.cc, as well as general internet of things such as visiting social media platforms and evaluating which platform would be suitable for posting surveys, in this case it was Reddit.
- **Discord** – To host meetings with interviewees for the purposes of researching through the use of various of elicitation techniques such as Interview, Prototyping (Testing), and Observation.

5. Limitations

5.1. Time Constraints (Pre-Mid Term Presentation)

Due to time constraints imposed by having to participate in six (6) modules, including Computing Project, during the first semester of 2022, along with the projects required for each of the module, this leaves myself less time to conduct my activities pertaining to the project, primarily the elicitation techniques and reporting, especially the prototyping.

However, this limitation should only apply up until the mid-point of January whereby the number of modules should half, down from six (6) to three (3), which should free up valuable time, providing additional flexibility and so that more attention could be given to the project which should allow for more detailed analysis to be conducted, and the development of additional features put forth by the participants of the research study to be carried out for later versions of the prototypes.

5.2. Complexity / Lack of Feature Richness

Due to the complexity of working with new technologies, amount of data that needs to be processed, amount of features to be incorporated, researching, documentation and reporting that needs to be conducted, as well as the time constraints that has been imposed on this project due to the amount of assignments assigned by several different modules, there is a restriction on how many features that can be properly developed and incorporated into the application meaning that only the most essential of features can be incorporated while less important features will either be scaled back, or ignored completely until additional time is made available.

5.3. Limited API Requests

When utilizing the API for the purposes of retrieving the most up-to-date statistical information with regards to a player, one of the main restriction with the usage of the API is the limitation that the developers have placed when calling the API, specifically 100 requests per second, and surpassing this limit has the potential for the project owner to have their developer account, which is required to use their API, registered with Wargaming to be revoked access to their API, effectively preventing them from accessing the core data vital to the success of the project, which is very easy to achieve when accidently creating an infinite loop when coding.

However, there is also the opportunity to request for an expansion to how many requests can be made with the API by emailing Wargaming for additional permissions, with reasons as to why this is needed, and there might be a possibly that if your account has its permission to use the API revoked, it may be possible to have the permission reinstated if valid or sufficient reasoning is given.

5.4. Lack of Specific Data

Several users have put forth during the survey that they would like certain data to be presented that are currently not collected by Wargaming e.g., no. of premium shells fired compared to standard or HE shells. This makes it impossible for the application, whether a prototype or a public release version, to display such data, thus, imitating the types of data that the application is able to display to the user.

It is possible that in the near or far future additional data will be collected by Wargaming, such as the data mentioned previously, which would allow developers to access such data through the use of Wargaming's API and present it to the user, however, there is no guarantee that this will happen, and so we must develop with the data we have been allowed to utilize.

5.5. Automation Versus Hard-Coding

Unfortunately, due to the difficulty in developing with a new technology, specific parts of the application is either automated such as the vehicle tiles which automatically generates new tiles based on the vehicles in the user's possession meaning if a player has played a new vehicle, a new tile will automatically be generated, or hard-coded such as the types of data collected for each game-mode, meaning if the API returns a new type of data such as average shell travel time, the developer must hard-code such piece of code into the application as the application was not designed to display new data collected for each game-modes.

This ultimately means that additional time will need to be spent verifying each lines of code, as well as typing / copying-pasting long pieces of similar yet not-identical pieces of code, reducing the amount of free time that can be put in other aspects of the project or application.

6. Project Timeline

Due to the length of the Gantt Chart surpassing the size of the page available, only the task name, duration (days it will take to complete the task), start, and finish date will be display in the report. To view the full chart including the list mentioned and a bar chart representing the duration of the tasks completed and in progress, visit this link: GGTankers - Gantt Chart.xlsx

The Gantt Chart will also be continuously developed and updated as I progress though the project.

6.1. Overall Project Deliverables

Overall Tasks	Duration	Start	Finish
Project Deliverables	243	Sat 1/10/22	Wed 31/05/23
Project Pitch Video	9	Sat 1/10/22	Sun 9/10/22
Project Proposal	29	Sat 1/10/22	Sat 29/10/22
Project Ethics Form	61	Sat 1/10/22	Wed 30/11/22
October	30	Sat 1/10/22	Sun 30/10/22
November	30	Tue 1/11/22	Wed 30/11/22
Project Monthly Report	192	Wed 19/10/22	Fri 28/04/23
October	13	Wed 19/10/22	Mon 31/10/22
November	30	Tue 1/11/22	Wed 30/11/22
December	28	Thu 1/12/22	Wed 28/12/22
Janurary	29	Sun 1/01/23	Sun 29/01/23
Feburary	28	Wed 1/02/23	Tue 28/02/23
March	28	Wed 1/03/23	Tue 28/03/23
April	28	Sat 1/04/23	Fri 28/04/23
Mid Point Submission	81	Sat 1/10/22	Tue 20/12/22
Final Submission	145	Wed 21/12/22	Sun 14/05/23
Project Showcase	1	Wed 31/05/23	Wed 31/05/23

6.2. Main / Other Tasks

Main Tasks			
Survey or Questionnaire	51	Tue 1/11/22	Wed 21/12/22
Design Questions	43	Tue 1/11/22	Tue 13/12/22
Evalute Platforms to Post Survey	17	Sat 1/10/22	Mon 17/10/22
Post Survey	3	Mon 12/12/22	Wed 14/12/22
Wait for Responses	4	Wed 14/12/22	Sat 17/12/22
Collect Responses	1	Sun 18/12/22	Sun 18/12/22
Document Results	4	Sun 18/12/22	Wed 21/12/22
Prototyping	217	Sat 1/10/22	Fri 5/05/23
Identify Technologies to be Used	30	Sat 1/10/22	Sun 30/10/22
Register for API Key	1	Sat 1/10/22	Sat 1/10/22
Continiously Update API IP List	243	Sat 1/10/22	Wed 31/05/23
Design Wireframe v1	3	Sat 1/10/22	Mon 3/10/22
Design Use Case Diagram	5	Sat 1/10/22	Wed 5/10/22
Design Wireframe v2	1	Fri 5/05/23	Fri 5/05/23
Design Initial Main Page	13	Sat 1/10/22	Thu 13/10/22
Implement Initial Stylings	5	Tue 11/10/22	Sat 15/10/22
Develop System to utilize API	6	Sat 1/10/22	Thu 6/10/22
Develop Features	131	Tue 4/10/22	Sat 11/02/23
Player Username Search Bar	5	Tue 4/10/22	Sat 8/10/22
Region Selection	5	Tue 4/10/22	Sat 8/10/22
Game Mode Selection/Filter	2	Thu 13/10/22	Fri 14/10/22
Redesign Main Data Section	3	Thu 23/02/23	Sat 25/02/23
Implement Various of Graphs using Data Collected	5	Sun 26/02/23	Thu 2/03/23
Bar Chart	5	Sun 26/02/23	Thu 2/03/23
Radar Chart	5	Sun 26/02/23	Thu 2/03/23
TreeMap Chart	1	Tue 7/03/23	Tue 7/03/23
Vehicle List	6	Sat 4/02/23	Thu 9/02/23
Loading Status	1	Sat 11/02/23	Sat 11/02/23
More Info on Tank Tile Click	5	Sun 26/02/23	Thu 2/03/23
Continious Testing	205	Sat 1/10/22	Sun 23/04/23
Continious Design Refining	205	Sat 1/10/22	Sun 23/04/23
Continious Styling Refining	205	Sat 1/10/22	Sun 23/04/23
Continious Optimizations	205	Sat 1/10/22	Sun 23/04/23
Interview (w/ Prototype Testing and Observation)	#VALUE!	Tue 25/04/23	-
Design Questions	2	Tue 25/04/23	Wed 26/04/23
Conduct Interview (1)	1	Tue 9/05/23	Tue 9/05/23
Conduct Interview (2)	1	Sat 13/05/23	Sat 13/05/23
Conduct Interview (3)	#VALUE!	-	-
Design Website	#VALUE!	Wed 24/04/24	-
Design Poster	#VALUE!	-	-

7. Stakeholder List

7.1. Project Owner

This project owner, which would be referring to myself in this context, would hold the responsibility of ensuring that the requirements of the project laid out to them during the early stages of the project timeline and the requirements listed within the grading rubric has been fulfilled to the best of their ability, as well as ensuring that no vital information is left unanswered to ensure the 'completeness' of the project.

They will be required to interact with their supervisor on a somewhat regular basis to keep them informed on their current status with regards to the project as a whole and bring to their attention concerns that they, the project owner, may have with regards to the project itself that is in need of further clarification to ensure that confusion or misunderstandings are resolved. It is also to be expected that they would need to ensure that the concerns or questions brought forth by their supervisor and course co-ordinator has been answered in a timely fashion and at a satisfactory level, and any changes required/requested/encouraged to be made are done so adequately.

In terms of carrying out the project itself, the project owner will be involved in most, if not all of the steps or activities that has been, or will be mentioned throughout the report, including but not limited to; the conducting of interviews, designing of wireframes, development of a functioning prototype with changes done through the project's life span, along with other activities, as well as documenting the relevant activities where appropriate.

7.2. End User / Participants

The main role of the end user to use the application as it was intended in which it simply requires the user to input a valid player name that was registered with Wargaming so that a informative list of statistical data pertaining to that specific user is displayed in the more appropriate way – graphs, tables, grids, lists, etc., so that the user may view the most relevant information, or the most useful information to them at the moment.

Another important role of the end user with regards to the project itself being developed, is that they are necessary in generating useful data by answering survey or questionnaires, attending interviews, and interacting with functioning prototypes for the purposes of experiencing, and/or gathering knowledge on how the application should function so that they may generate feedback, which is then passed on to the project owner so that they may make changes to the

application so that it may fulfil the requirements set out by the end user during the conduction of the elicitation techniques.

7.3. Video Game Company (Wargaming)

Wargaming provides to the public free access to their API, as along as you register on their website, along with a documentation on how to use their API, as well as the rules that must be followed to ensure that they, in this case, the project owner can continue to be granted access to the API with little to no restrictions, other than the 100 API Request per second limit which when surpassed has the potential for the developer to be punished by having their access to the API revoked.

The data from the API is updated on a daily basis and grants the developer an enormous amount of information to be processed ranging from the player's overall performance, specific performance of each of the player's vehicles, performance in certain game modes, along with other miscellaneous information, as well as private data that will not be reported on, nor will it be involve with throughout the project development due to the possible ethical issues associated with handling such information.

7.4. Course Co-ordinator

To ensure that the project owners are able to conduct their project in a manner that is expected of them, as well as ensuring that they, the project owners, understand what is expected of them and how their work will be graded and graded based on what aspects or segments of the work and among others, the course co-ordinator hosts meetings on a weekly basis, every Monday, to provide information that is relevant to the project owners as well as providing them with the opportunity to ask questions or request clarifications to ensure that the project can be carried out with clarity.

The course co-ordinator also, albeit infrequently, provides other lecturers within NCI with the opportunity to provide the project owners with additional information that may not be covered necessarily to a great extent by the Computing Project module, such as how to reference, how to avoid plagiarism, among others.

7.5. Supervisor

The supervisor serves as a assistance to the project owner by providing advice and recommendations and how to improve various of different aspects of the project without

explicitly stating how one would go about doing so. They are also there to provide clarifications or answers to certain questions that one might have with regards to the project.

They are also tasked with reviewing the monthly reports submitted by the project owner along with reviewing the Ethics report, and any subsequent reports after the initial submission, to ensure that no issues with regards to ethics and morals such as data retention or collecting become an issue, along with encouraging best practices and affirming that actions taken by the project owner is permitted.

7.6. Moderators (Reddit)

The role of a moderator, or moderators if multiple are involved, is to provide the project owner with the permission(s) necessary to allow them to bypass specific rules, specifically the rule whereby posting survey links is forbidden, so that they, the project owner, can conduct one, or more, of their elicitation techniques.

In this case, permission was granted to me by a moderator for the World of Tanks forums through their built-in messaging system, to create a post with the survey attached to it along with a message stating precisely what I should do to ensure that the users of the World of Tanks forum understands the purpose of the survey, as well as who are the people that this study is primarily aimed towards so that everyone would understand the purpose, and that it is not a spam.

In the event whereby my post begins to break one of the rules through my actions or the actions of those who post their comments within the post, the moderators would be responsible for ensuring that I, or the commentors, following the rules, otherwise I would be punished and/or the commentors, which ever is more appropriate.

7.7. Web Hosting Services

If a decision is made to host the application on a web hosting service, whether it is still in it's development stage or whether it is ready for release is irrelevant, it is required that a suitable web hosting service is identified to ensure ease of access to the application, as well as providing features that may be required, etc., a database to store data if need be.

A web hosting service that is both free and supports ReactJS are primary candidates for hosting the project online.

A web hosting service is also requirement in order to host a website that contains the journey that the project owner has went through in a blog format, elaborating on the processes they have conducted to allow the project to reach its final stage.

7.8. Elicitation Techniques Participants (e.g., Interviewees)

While conducting certain elicitation techniques such as Interviews, Prototyping, and Observation, relevant participants will be involved as I conduct these techniques that have some sort of relevance to World of Tanks, whether that user is a community contributor, moderator, developer, or most likely a player in World of Tanks.

The reason for their involvement is for the sole purpose of researching what is it that they find lacking in other applications already existing similarly to the one being developed as part of this project, as well as what are the ways that the application could be improved, essentially asking for feedback from the participant(s).

These participants of course will be required to sign a consent form for that they are told upfront what data I am collecting, for what purposes, how will it be used, and what will it be done after it is no longer necessary, among other requirements as part of the project.

8. Requirement Elicitation Techniques & Results

8.1. Survey or Questionnaire

The link to the responses made by each of the participants can be found by clicking on the link (Excel format): [WOTPlayer - World of Tanks Study (1-41).xlsx]

8.1.1. Questions & Responses

41	03:40	Closed
Responses	Average time to complete	Status

1. What website do you use as your main source of viewing player data for yourself, or for others.

tanks.gg	15
Tomato.gg	30
WoTLabs.net	7
In-game	14
Other	4

2. Does your selection above meet your requirements? (Does it do what you want it to do)

Yes	27
No	2
Sometimes	12

3. Has the website function properly or as intended in the last few months for you? (approx. 3 months)

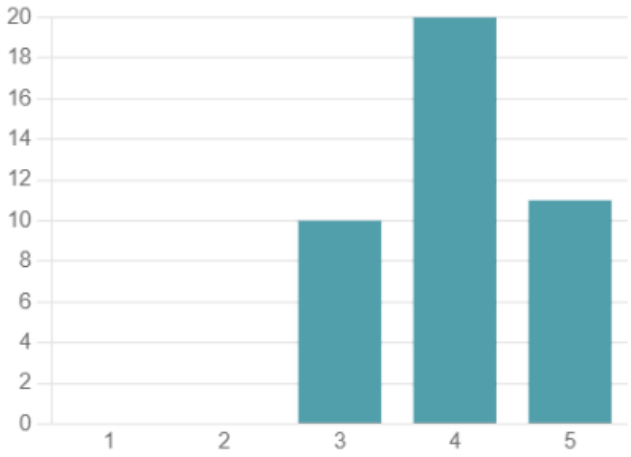
Yes	34
No	1
Sometimes	6

4. Do you/have you used this website on your mobile device in the past year?

Yes	22
No	19

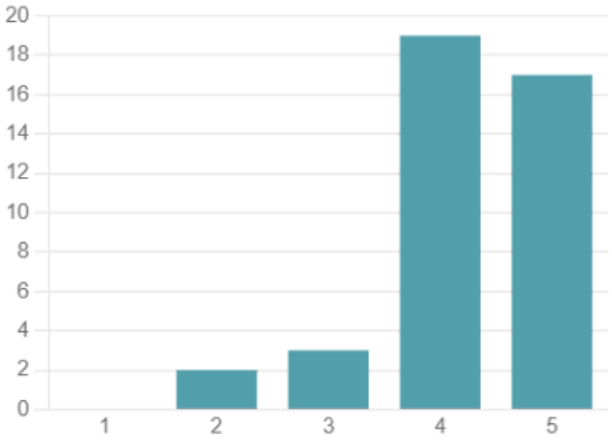
5. How would you rate your main source of information with regards to the availability/detail of information? (Does it show you everything you want it to show you)

4.02
Average Rating



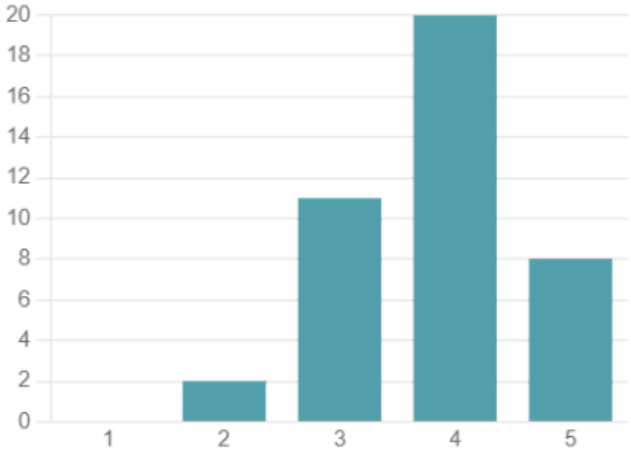
6. How would you rate how the information is presented to you? (How clear is it)

4.24
Average Rating



7. How would you rate the design of the website itself? (Color scheme, resolution of images, etc.)

3.83
Average Rating



8. Is there is too much information that is not user-data focused on the website? (E.g., latest videos from content creators, reviews, etc.)

Yes	4
No	17
Does not bother me/don't care	20

9. Do you see value in having a website that displays **ALL** user information, even if it contain irrelevant/useless information?

Yes	31
No	10

10. If you had to name some of the features you would like to see the developer implement, what would they be?

41
Responses

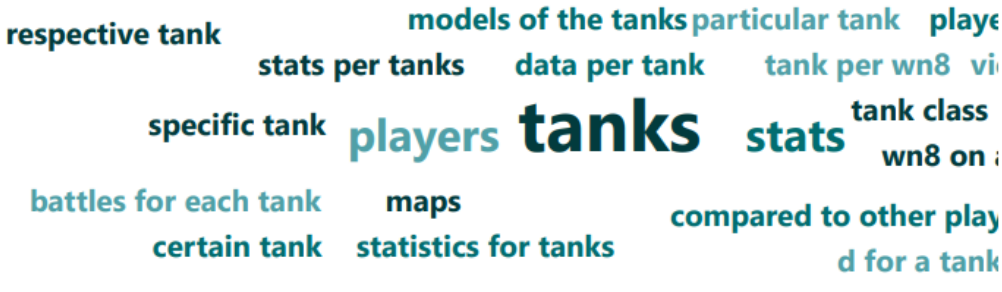
Latest Responses

"Seeing where the modules are"

"I like trivial stats like trees destroyed etc."

"ability to ban more maps"

14 respondents (**34**%) answered **tanks** for this question.



11. **[Optional]** Is there any additional comments or feedback you have with regards to the website?

4

Responses

Latest Responses

12. Do you worry that the publicly available information can be used against you, the player, in-game or outside of the game?

Yes	3
No	35
Maybe	3

13. **[Optional]** What improvements can be made to these sorts of surveys for future reference for myself

8

Responses

Latest Responses

"Don't 'require' any question that needs a typed answer, allo...

Update

4 respondents (**50%**) answered **question** for this question.

8.1.2. Conclusion

The survey was published, with the approval of the appropriate moderations for the World of Tanks subforum on Reddit, on said platform, for the general player base of World of Tanks. It was conducted over the span of 3-4 days and no more due to the nature of Reddit whereby posts are typically interacted with or 'lively' within the first few days or hours of the post being published and shortly becomes dormant past this initial jump in interactively.

Of course, there are exceptions to this occurrence, primarily if posts were created by moderators, developers of World of Tanks, high public figures (particularly if they are community contributors), or posts that are highly subjective, controversial, or created in reference to a large event or sensitive situation that has occurred within the past several days or weeks. The post conducted by myself fits none of those criteria and thus would become dormant after several days and therefore I did not see any reason in continuing to gather responses past this short period of time as it would be very unlikely that any additional responses would be made.

The results of the survey have indicated that there is value in pursuing the application that this research or study is based on, whereby 31 respondents (approx. 75%) stated that they do see value in having a website that displays all user information, even if it contains irrelevant or useless information, while 10 respondents (approx.. 25%) state that they do not see any value in pursuing such idea.

Results that focus on the design/presentation of the website and its data designed by other developers, such as the availability/detail of information, how the information is presented, and the design of the website are rated relatively high with 4.02, 4.24, and 3.83 are given respectively. Despite this, participants have provided some feedback on how they would like those websites to be improved, especially when it comes to additional information that they would have to be presented such as game/chat ban history, percentage of the usage of one type of ammunition to another, better historical trend data, and more. A very important to note here is that some of these features may be impossible to implement as it relies on the data gathered by Wargaming themselves as I merely present the data in another way, or display additional data that is provided, but has not been utilized by other website developers.

It is important to note that with regards to some of the questions, particularly Question 10 where a question was presented to the participant and the word developer was used, the question did

not specific who the developer was, official developers of World of Tanks, or the developers of similar websites as the one being investigated and developed by the project owner.

This has led to some confusion whereby some respondents may have understood that this was in reference to the developers of said websites, but some misinterpreted that this was in reference to the developers of World of Tanks. This was poorly written and is reflected by one of the responses by a participant, however, the majority of responses have been answered as anticipated and still have value and thus can still be utilized in a way to improve future prototypes that would be in development.

There is also a question that is not relevant to this research (question 13) but is useful neither the less from an improving questions for future research and survey standpoint.

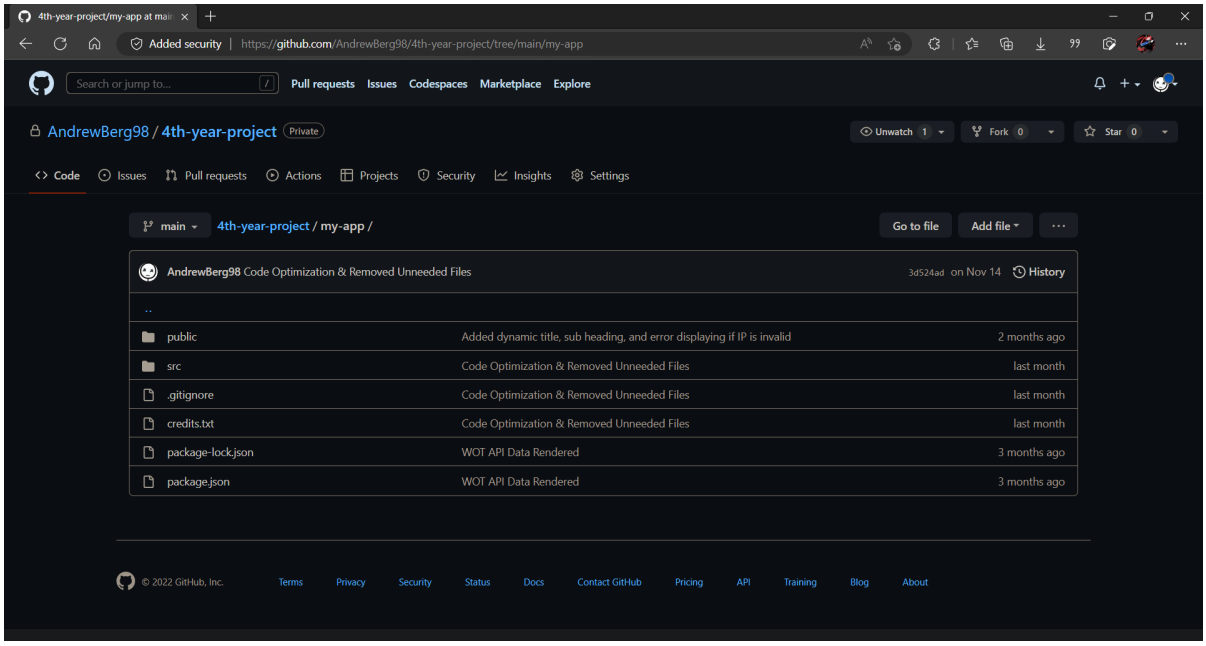
Overall, the survey has provided with some interesting, and unexpected results, most of which has value, especially when it comes to designing the prototypes as I can incorporate ideas put forth by others, as well as solidify the fact that individuals do see the value in the research being pursued. I will also need to learn from the mistakes I have made with regards to the different aspects of the survey so that future surveys conducted would be better designed, and more relevant to the topic at hand, as well as being precise in what is being referred to.

8.2. Prototyping

The objective behind prototyping is to allow participants of the research study to ‘test’ or interact with a functioning application that this study is based on so that useful feedback may be generated by the users as to allow for said application to become more relevant or reliable for the player base of World of Tanks.

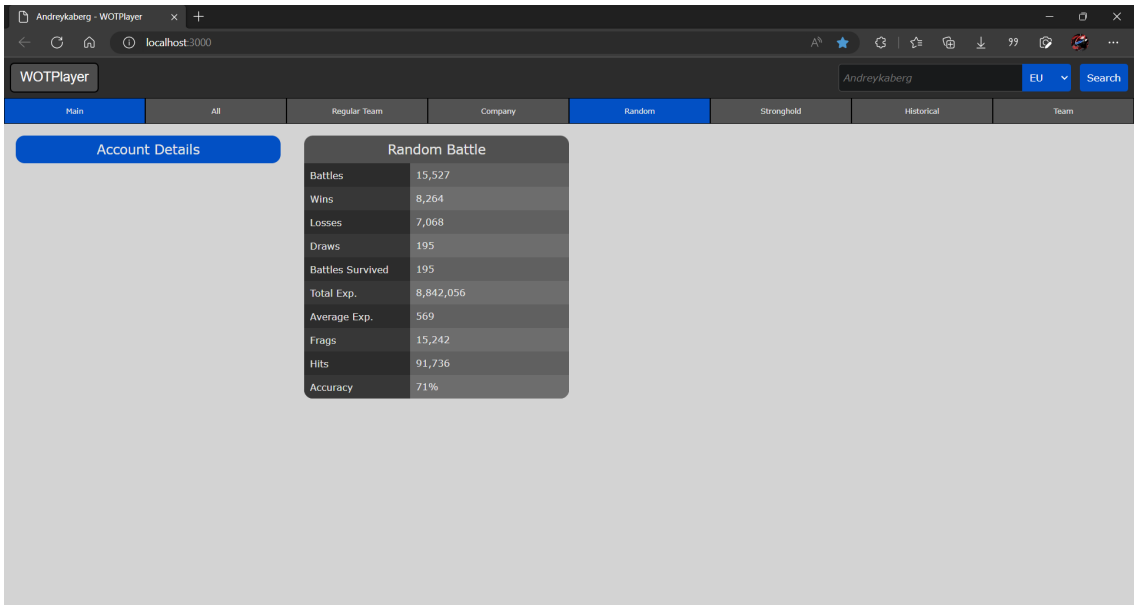
It also serves as indicator of sorts on the usefulness of features or designs incorporated early in the development whereby users could identify a feature that has little to no value to the user so that it may be discontinued or shelved as to prevent further inefficient use of time and resources on a feature that brings a bout little to no value for the user. In addition, it can be used to identify design changes that could be incorporated into the application as to allow a more efficient representation of data in a manner that is more easily readable or simply more coherent.

An interview will be hosted after the completion of the prototype whereby interviewees will be provided access to the prototype to generate feedback, which will serve as the foundation for further development of application if it is decided that further development of said application is viable and beneficial.



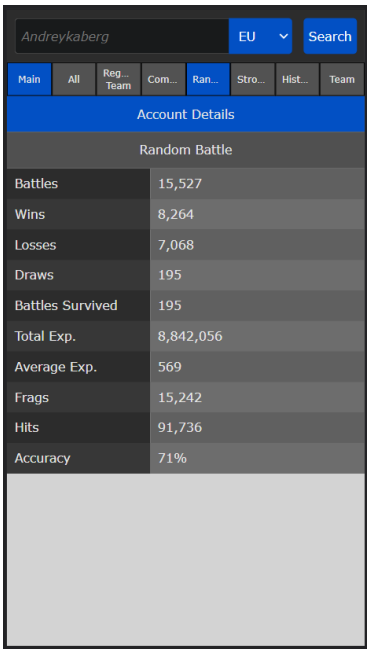
Any information displayed on the prototype images presented below is the information pertaining to the project owner and does not contain any sensitive information that they themselves would not want to be made public. It is very unlikely that the information itself can be used to link to an individual's real-life profile unless the individual themselves use their real name, although the chances of pinpointing that specific name in a region with the player in question is borderline impossible. To view the code of application, visit this link: [WOTPlayer Code], and to allow the running of the application, open the text file labelled 'READ ME – Important.txt' and follow the instructions (not applicable post-mid point as the code should have been made public on GitHub: https://github.com/AndrewBerg98/4th-year-project).

8.2.1. Pre-Mid Point



This version of the prototype is to simply test whether it is possible to utilize the World of Tanks API in ReactJS, and if so, what is the best method of doing so. Due to it being the initial version for testing purposes, this prototype does not completely conform to the wireframe design that is outlined under the 'Wireframe' heading under 'Interface Analysis' but will likely be do in the next iteration of the application. The following are the features or aspects of the prototype that are functioning and can be used with relative success:

- Searching for players on the EU, RU, NA, and Asia realms and displaying their associated information*.
- Filtering which data the user may be interested in e.g., 'Main' heading shows only the most valuable information, 'Random' shows details that are associated with the random battles game mode.
- Displaying the information comprehensively on smaller screen devices such as tablets and mobile devices with success.



** Currently the data displayed on the images are outdated JSON files that contain the data on the day it was collected. This is to avoid issues where a loop is accidently generated that would have voided my API Key as there is a limit to the amount of requests I could generate, as well as restricting my access to Wargaming's API if I had not requested information from the JSON file instead. Gathering information from the API does work but is effectively unused for the aforementioned reason until I am able to ensure that no looping would occur accidently, whether due to my improved experience or due to a mechanism that was put into place to prevent looping.*

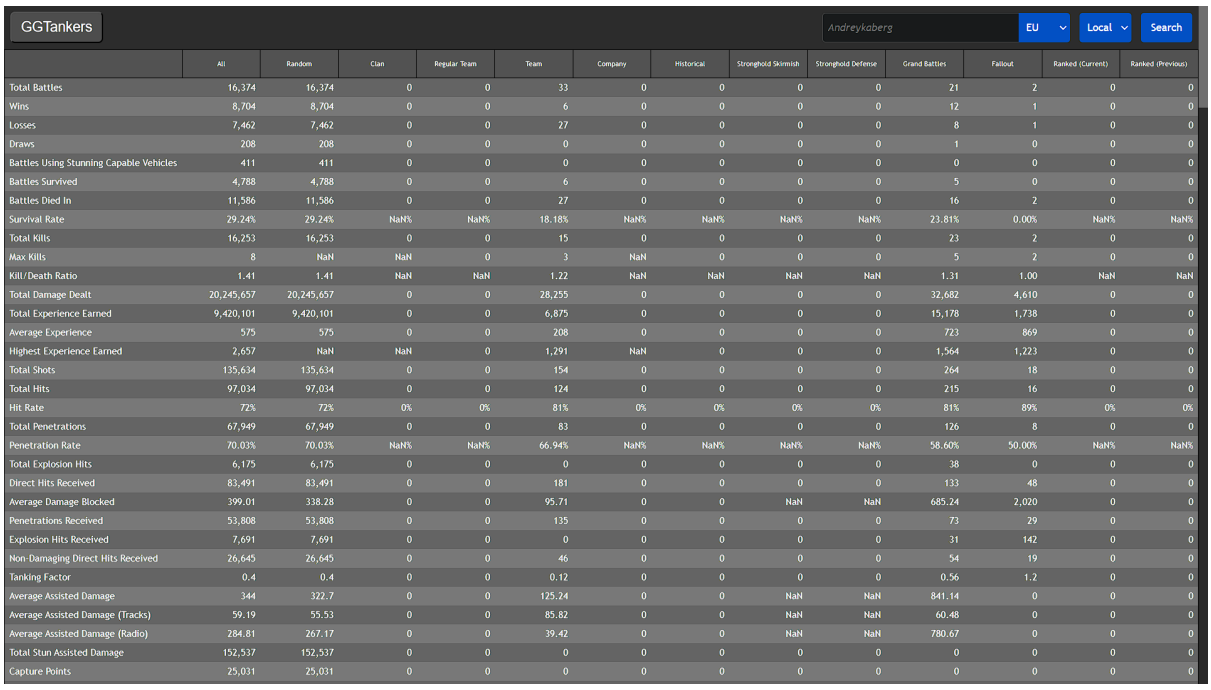
Note: The heading for both images is blue due to the heading being 'focused on' or due to being 'clicked/tapped' on for both desktop and mobile devices respectively.

When the development of the prototype commences again, the priority would be to ensure that the design conforms with the wireframe designed, afterwards, ensure that each headings have some sort of data associated with it so that it may provide myself and other participants with a more complete knowledge of the functionality of the application and how it may function in the future.

Another important feature or aspect to implement would be to display the data in a graph form where applicable as it may be easier for the user to understand the information in this format, rather than having all of the statistical data to be presented in a text format which can be considered lazy, boring, difficult to read at times, or simply inefficient at getting the information across to the user as humans are better as reading and remembering graphs and simple texts.

8.2.2. Post-Mid Point

During the development of the prototype, and the time spent contemplating on the most efficient design in displaying the relevant information to the user, I have decided to revamp or redesign the concept behind how the data will be presented. Rather than displaying the data in tiles, I have displayed the information in a table format, use other forms such as tiles used in other areas of the application, in particular the tanks associated with the user's account.

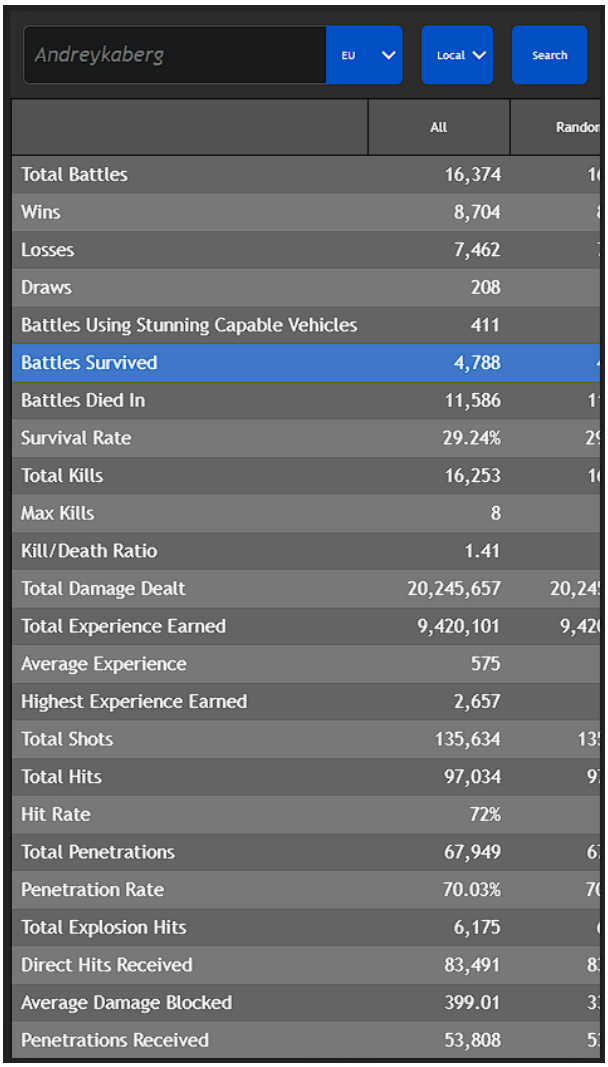

GGTankers

Andreykaberg | EU | Local | Search

	All	Random	Clan	Regular Team	Team	Company	Historical	Stronghold Skirmish	Stronghold Defense	Grand Battles	Fallout	Ranked (Current)	Ranked (Previous)
Total Battles	16,374	16,374	0	0	33	0	0	0	0	21	2	0	0
Wins	8,704	8,704	0	0	6	0	0	0	0	12	1	0	0
Losses	7,462	7,462	0	0	27	0	0	0	0	8	1	0	0
Draws	208	208	0	0	0	0	0	0	0	1	0	0	0
Battles Using Stunning Capable Vehicles	411	411	0	0	0	0	0	0	0	0	0	0	0
Battles Survived	4,788	4,788	0	0	6	0	0	0	0	5	0	0	0
Battles Died In	11,586	11,586	0	0	27	0	0	0	0	16	2	0	0
Survival Rate	29.24%	29.24%	NaN%	NaN%	18.18%	NaN%	NaN%	NaN%	NaN%	23.81%	0.00%	NaN%	NaN%
Total Kills	16,253	16,253	0	0	15	0	0	0	0	23	2	0	0
Max Kills	8	NaN	NaN	0	3	NaN	0	0	0	5	2	0	0
Kill/Death Ratio	1.41	1.41	NaN	NaN	1.22	NaN	NaN	NaN	NaN	1.31	1.00	NaN	NaN
Total Damage Dealt	20,245,657	20,245,657	0	0	28,255	0	0	0	0	32,682	4,610	0	0
Total Experience Earned	9,420,101	9,420,101	0	0	6,875	0	0	0	0	15,178	1,738	0	0
Average Experience	575	575	0	0	208	0	0	0	0	723	869	0	0
Highest Experience Earned	2,657	NaN	NaN	0	1,291	NaN	0	0	0	1,564	1,223	0	0
Total Shots	135,634	135,634	0	0	154	0	0	0	0	264	18	0	0
Total Hits	97,034	97,034	0	0	124	0	0	0	0	215	16	0	0
Hit Rate	72%	72%	0%	0%	81%	0%	0%	0%	0%	81%	89%	0%	0%
Total Penetrations	67,949	67,949	0	0	83	0	0	0	0	126	8	0	0
Penetration Rate	70.03%	70.03%	NaN%	NaN%	66.94%	NaN%	NaN%	NaN%	NaN%	58.60%	50.00%	NaN%	NaN%
Total Explosion Hits	6,175	6,175	0	0	0	0	0	0	0	38	0	0	0
Direct Hits Received	83,491	83,491	0	0	181	0	0	0	0	133	48	0	0
Average Damage Blocked	399.01	338.28	0	0	95.71	0	0	NaN	NaN	685.24	2,020	0	0
Penetrations Received	53,808	53,808	0	0	135	0	0	0	0	73	29	0	0
Explosion Hits Received	7,691	7,691	0	0	0	0	0	0	0	31	142	0	0
Non-Damaging Direct Hits Received	26,645	26,645	0	0	46	0	0	0	0	54	19	0	0
Tanking Factor	0.4	0.4	0	0	0.12	0	0	0	0	0.56	1.2	0	0
Average Assisted Damage	344	322.7	0	0	125.24	0	0	NaN	NaN	841.14	0	0	0
Average Assisted Damage (Tracks)	59.19	55.53	0	0	85.82	0	0	NaN	NaN	60.48	0	0	0
Average Assisted Damage (Radio)	284.81	267.17	0	0	39.42	0	0	NaN	NaN	780.67	0	0	0
Total Stun Assisted Damage	152,537	152,537	0	0	0	0	0	0	0	0	0	0	0
Capture Points	25,031	25,031	0	0	0	0	0	0	0	0	0	0	0

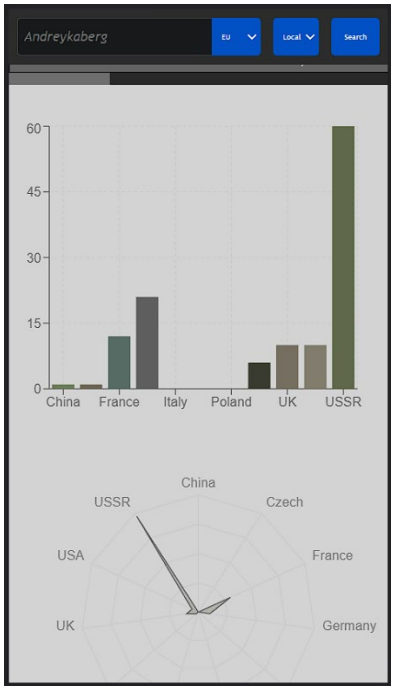
The reason for this design is due to it's simplicity in finding the information and due to it's space efficiency (image on the left is scrollable side to side). Another reason is due to the fact that having one tile per 'game-mode' i.e., account details, random battles, team battles, etc., was not pleasant to look at due to information being scattered in different areas of the screen which made it more difficult to find read, along with some tiles requiring more space than others which creates areas of empty space.

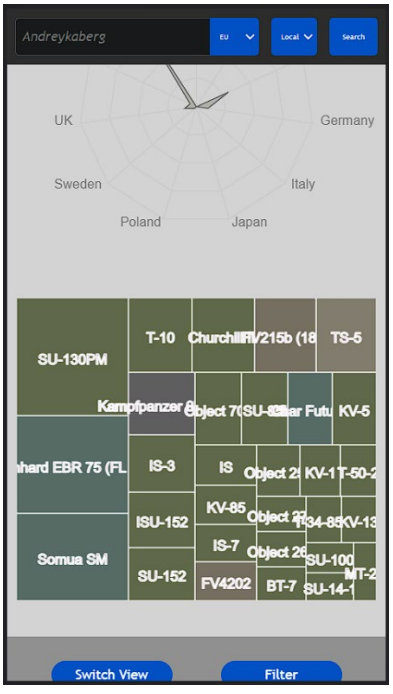
New options have also been added to the navigation menu, in particular the ‘Local’ option. This is simply where to search the data, locally, or through an API (for testing purposes).



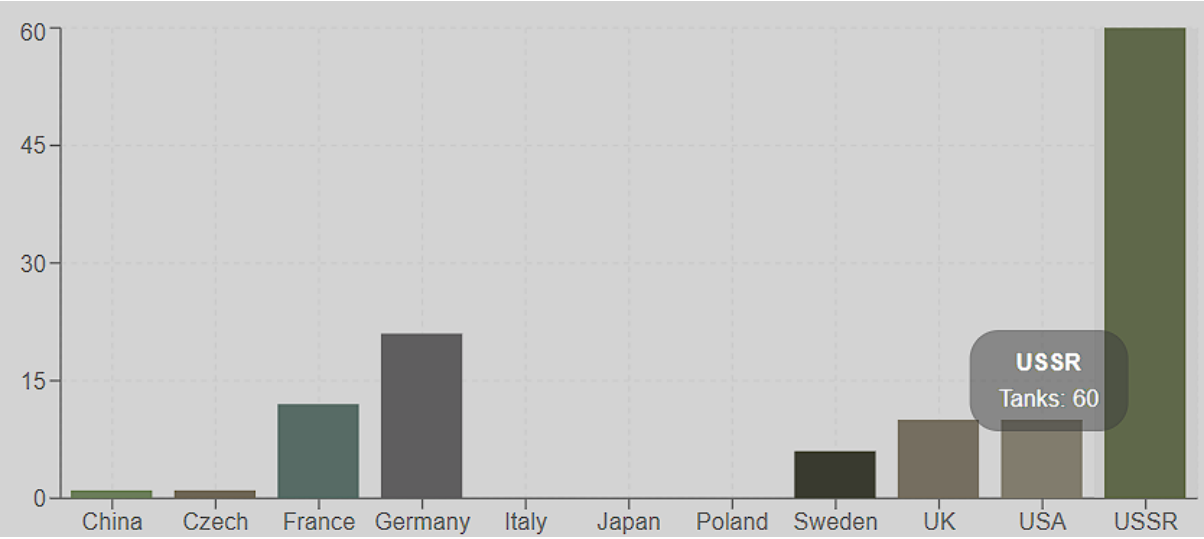
The image above presents on how the charts are displayed to the user where each chart displays different information that may be useful to the user such as (bullet point represents the particular chart presented with a number beside it):

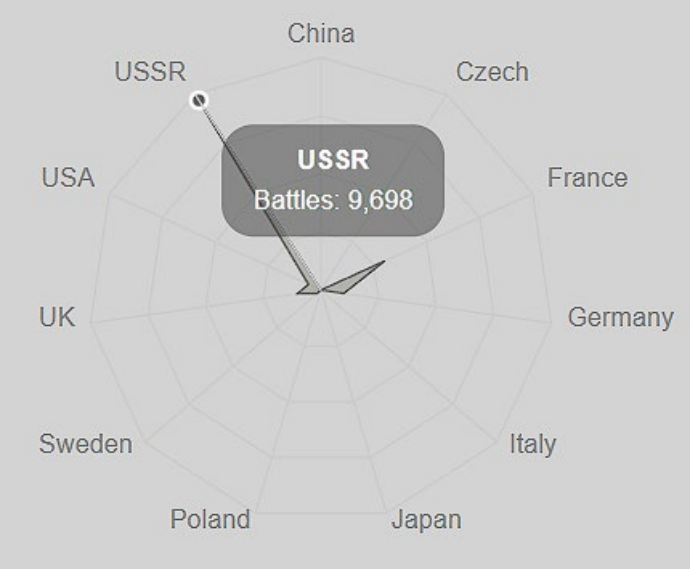
1. How many tanks a user has for each nation,
2. How many battles a user has played for each nation,
3. The top most played tanks whereby the number of boxes increases or decreases depending on how many tanks a player has (more tanks more tiles to a certain point).





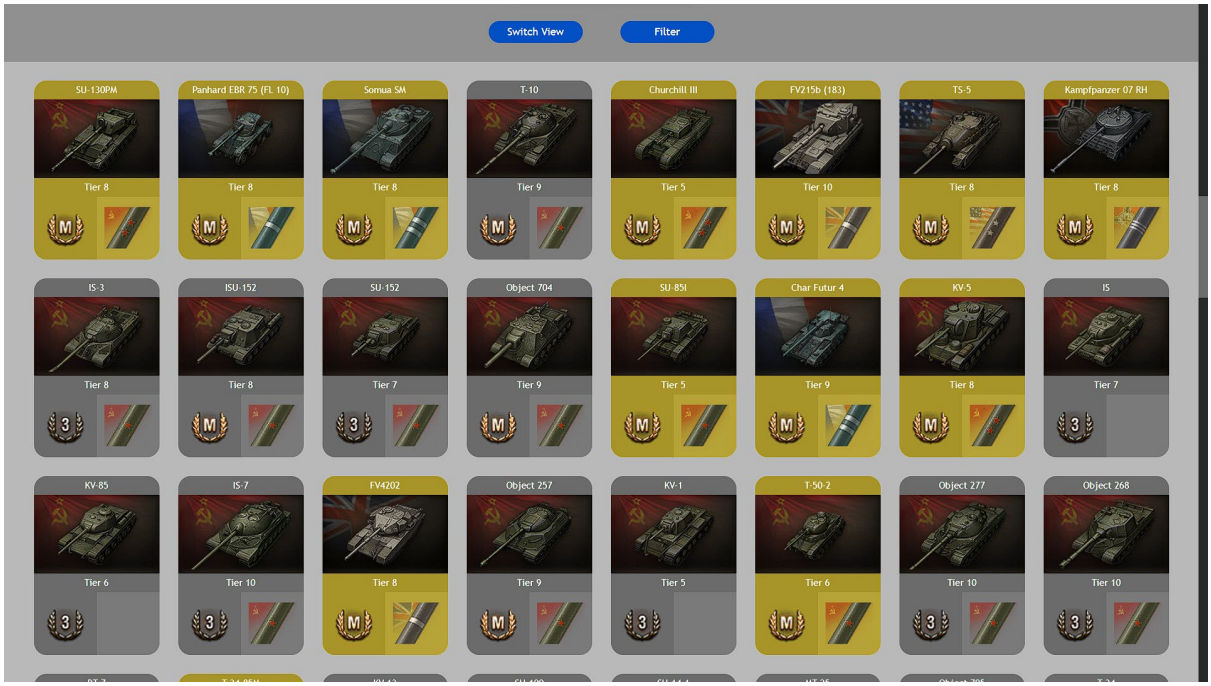
Hovering on each data of each chart specifies the value associated with each data in that chart, associated with that nation or other, as indicated below:





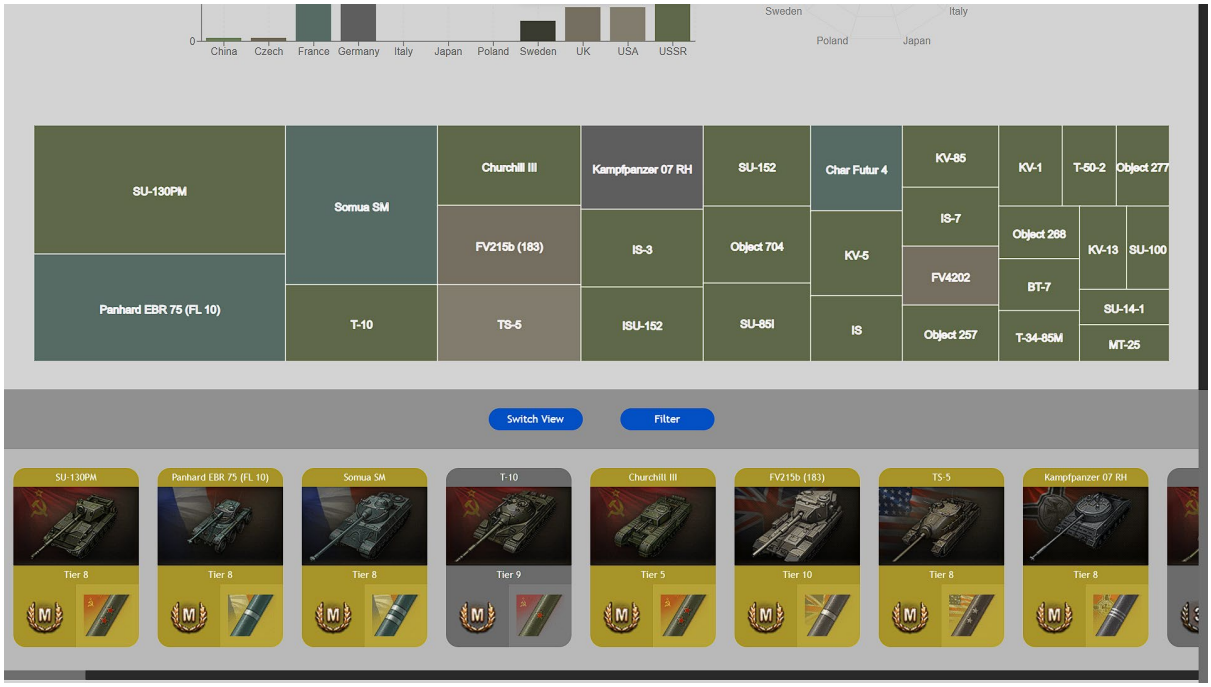
With regards to the colour used, they were selected based on the most common or pre-defined colours associated with each nation set by Wargaming, and understood by players, although it may be a bit difficult to read at times.

The radar chart (second image) also has it's colour change based on the most played nation.



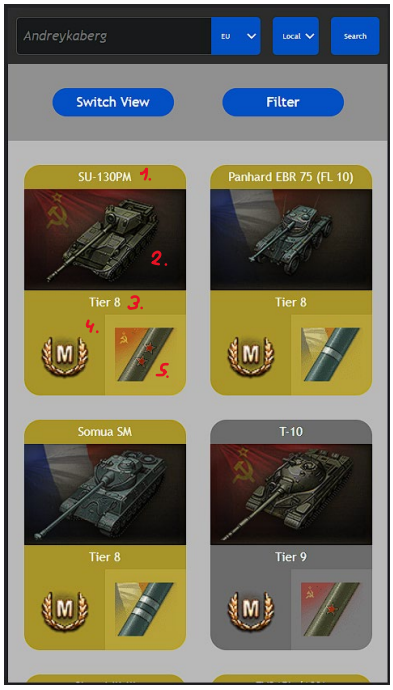
The image above displays to the user what tanks they have unlocked and played at least one battle in, and is displayed in a tile based format in the order of the amount of battles played.

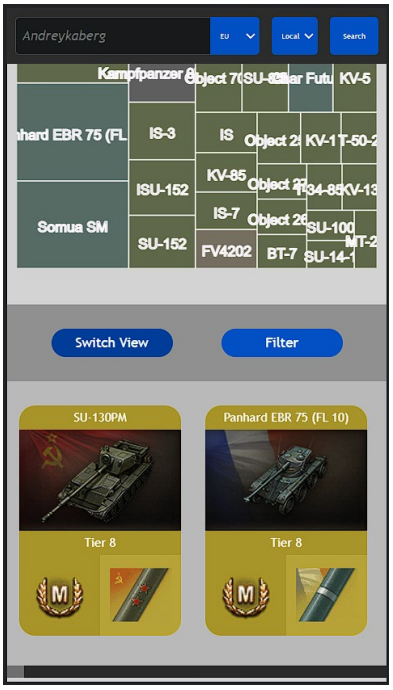
The user is given two options in how they would like to view the tank list, either having all of them presented to them whereby they are required to scroll down the view additional vehicles, or they can scroll left or right as indicated by the image below, by clicked on the ‘Switch View’ button (‘Filter’ button does not function) which was incorporated primarily for the mobile users as swiping side to side may be easier for some users rather than scrolling up and down.



Each tiles contain information regarding that particular vehicle the user owns (refer to the image below that corresponds with the numbered bullet points):

1. Name of the vehicle
2. The image of the vehicle and the nation flag behind the vehicle
3. The tier of the vehicle
4. Mastery badge (a badge representing the highest experience earned on that vehicle compared to the rest of the player base)
5. Marks of Excellence (three distinct marks representing, essentially, how good you are with that particular vehicle compared to other players).



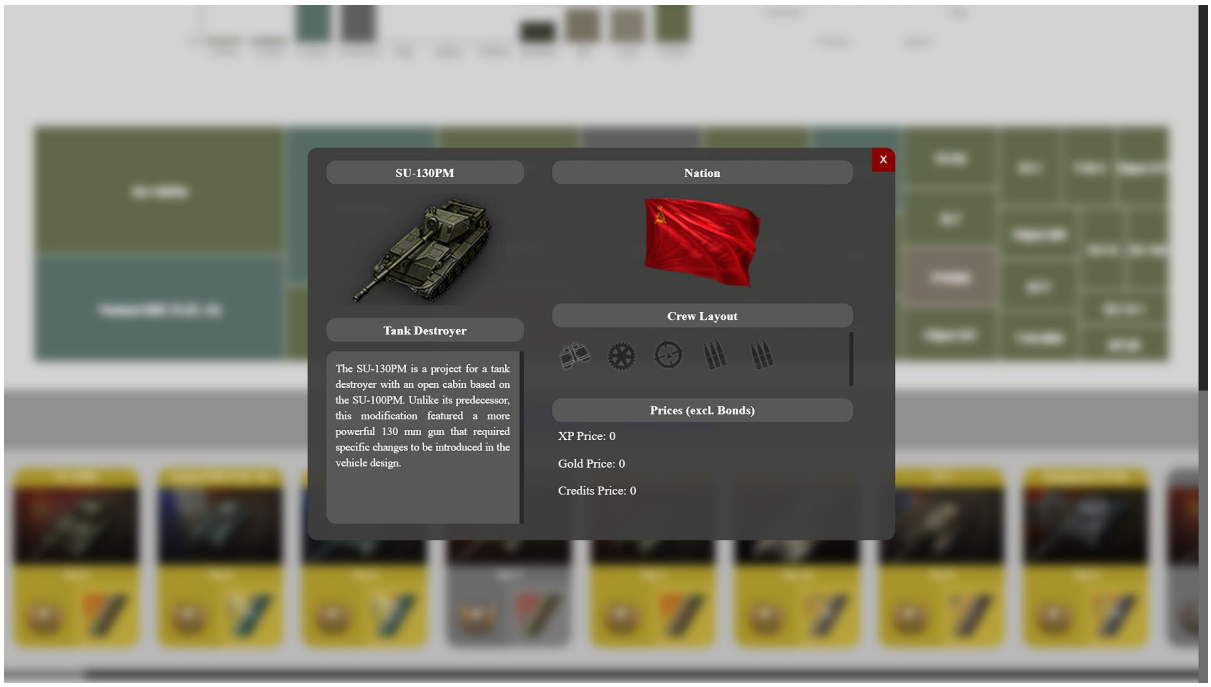


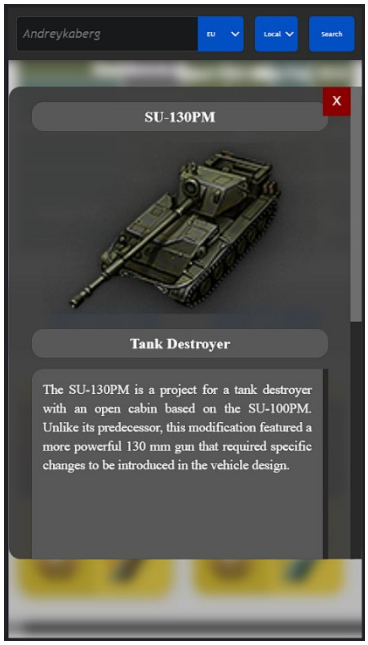
Some tiles are also represented in a golden or grey colour. This is due to specific tanks being considered premium and to easily distinguish between the status of each tank, I have given premium tanks a golden background, whereas normal non-premium tanks are the default grey.

Hovering over premium tanks also causes the tiles to shake slightly, whereas non-premiums simply zoom out a bit. This is to simulate how some games animate a special cutscene or special effect for rare collectibles, or other, that was unlocked by the player.

Clicking on a particular vehicle image on each tile displays a popup that shows additional information about that particular vehicle, namely:

- Name, image scaled up, type, and description
- Nation
- Crew layout
- Cost of the vehicle (some values are 0 due to not purchasable with those currencies in-game, rather, through an external store hosted by Wargaming)





The code of the application will also be made public nearing the completion of the application as to allow third-parties and examiners to review the code, which can be found on GitHub:

https://github.com/AndrewBerg98/4th-year-project

8.3. Interviews

Note: During the interview the participants will be asked a series of questions, which is then followed by the interactive and testing phase whereby the participants can interact with the prototype to generate feedback, and ending with an observation on how those participants currently utilize similar so that it may serve as a form of feedback to better understand how these applications are being used in the real world by the intended audience so that it can be used to further improve future prototypes.

Responses are not word-for-word or quoted, but rather they are the summary of what the interviewee has responded to the particular question.

Results and findings from the observation will be added in its own separate heading labelled 'Observation'.

The interviewee was made aware that the interview was recorded solely for the purposes of accurately documenting the findings onto the report, and will be deleted after 31st of May.

Preliminary clarifications to each of the questions was conducted prior to the actual interview to ensure that the interviewee was not confused by the questions.

8.3.1. Interview One: World of Tanks Player

Participant: World of Tanks Player (Since 2013, 10+ Years)

Interview Location: This interview took place on the VoIP and messaging social platform, Discord, and was conducted through a one-to-one call.

Date of Interview: 9th May 2023

Time of Interview: 3:04 am – 3:20 am. Lasted approximately 16 minutes.

Objective of the Interview: The main objective of this interview was to get an understanding on the perspective of how a 'veteran' or 'experienced' player of World of Tanks would utilize the application undertaken in a manner that a newer player may not have considered.

The reason for why a veteran World of Tanks player was selected was simply down to their experience whereby the longer they have played World of Tanks, the more likely they are to have experienced with applications similar to what is being developed, thus meaning they would be more knowledgeable in the areas or data that a veteran, or new, World of Tanks player would be most interested in, leading to the increase in the likelihood of the application being more relevant or useful to both veterans and newcomers alike.

8.3.1.1. Conducting the Interview & Summary

8.3.1.1.1. General Questions

[Q] Do you see value in a website that shows all information, even if it serves no useful purpose, or would you rather only the most important information to be presented?

[A] The question is difficult to answer as what information is considered useful is different to each individual persons. Some users may find a piece of information interesting, useful, or informative, while others do not. Therefore, it is better to include all information as each piece of information may be useful to one or more persons.

[Q] How many other data showing websites for World of Tanks such as tanks.gg, do you use and what are your favourite features from each of the websites?

[A] Tanks.gg is the only website that the individual uses as it offers everything that the individual need to know with regards to World of Tanks, in particular its vehicles. Their favourite feature is the ability to view each vehicles 3D model live whereby they are able to view the armour effectiveness in certain angles.

[Q] Do you or have you used these websites mentioned on a mobile device such as smartphone or tablet, and have you used it in the past year?

[A] No, they do not own a tablet, nor do they use the website on a smartphone.

[Q] Would you prefer to have all of the information shown on one page but divided into sections, or have a dedicated page for each type of data i.e., a page about person's achievements, another page for vehicle list, etc.?

[A] As long as the information is not overwhelming, and is divided or placed into their respective sections, then having everything placed into a singular page is sufficient.

[Q] If any, what features would you want these websites to implement that would be useful for you?

[A] An option for tanks.gg to allow the user to log into their World of Tank's account so that the website is able to gather the player's current loadout to allow the user to read on how effective their setup is, and how their effectiveness would change when switching to a different loadout.

[Q] If any, what changes would you make for those websites?

[A] Slightly different navigation menu or altered homepage as it is not immediately obvious where to check up characteristics of vehicles as it currently takes up a very small amount of space despite providing such crucial information.

8.3.1.1.2. Prototype Testing Questions

[Q] From a readability standpoint, how would you describe the readability of the content?

[A] It is overwhelming as they are presented with a lot of information that is irrelevant for them such as the 'Historical' heading as it contains no data, and 'Grand Battles' as they do not play this particular game mode and thus are not interested in it. They would prefer if they are able to have certain columns hidden and have the table shorted so that not too much data is shown at once.

[Q] The way in which the content is arranged i.e., table on top, followed by charts, and ends with vehicle list, is appropriate, or would you rearrange it differently?

[A] The individual approves of the arrangement of the content, they like how it is arranged, and would not alter it in any way.

[Q] Would you prefer the option for the user to be able to hide each individual game mode, rather than having all displayed?

[A] Yes, refer to the 'Readability Question'.

[Q] Should additional information be displayed per tank card or tile such as vehicle type or other and if so, what information?

[A] Having a symbol or icon which represents what type of vehicle each vehicle is i.e., Heavy Tanks equals three stripes, Medium Tanks equals two stripes, etc., which is already in use within World of Tanks.

[Q] Each chart data i.e., bar and tree map, are coloured in a way to represent the nation and its associated colour e.g., blue for the French. Do you find it difficult to differentiate between the colours?

[A] It is easy enough to differentiate between the colours, however, some colours are too similar to one another such as between UK and the USA, Czech and the UK, so having them standout more from one another would be ideal.

[Q] Should any chart that has 0 or empty data e.g., 0 Chinese tanks owned, be hidden or should it remain visible but empty?

[A] Prefers to have the label or data visible, even if the data itself is empty.

[Q] Would you prefer infinite scrolling for tank tiles, or limited to 2 or 3 rows, that you can scroll left and right, or both?

[A] Much prefers limiting the rows to 3 rows and the ability to scroll left and right as it may become tedious to scroll to the top if on the bottom of the page.

[Q] Is there any improvements that can be made in terms of the design of the pop-up window when clicking on each tank tiles?

[A] They like the design but noticed that the background is plain, boring and are identical to one another and suggests that there could be some sort of a colour scheme to improve its design, such as matching the background colour with the nation's colour i.e., blue background for the French.

[Q] Is there any other comments, feedback, or suggestions you would like to put forward?

[A] The ability to filter the list of vehicles based on various of characteristics such as nation, type of vehicle, premium status etc., as well as having the column heading of the table follow the user as they are scrolling as it can become difficult to identify what data belongs to what column, requiring the user to constantly scroll up in its current iteration.

8.3.2. Interview Two: World of Tanks Player

Participant: World of Tanks Player (Since 2018, 5+ Year*)

* This player created their account in 2018, but only started to play the game 'properly' or more in-depth in 2022.

Interview Location: This interview took place on the VoIP and messaging social platform, Discord, and was conducted through a one-to-one call.

Date of Interview: 13th May 2023

Time of Interview: 1:29 am – 2:04 am. Lasted approximately 35 minutes.

Objective of the Interview: The main objective of this interview was to get an understanding on the perspective of how a newcomer or inexperienced player of World of Tanks would utilize the application undertaken in a manner that an experienced player may not have considered.

The reason for why a 'new' player was selected was down to their inexperience with World of Tanks and similar applications that display statistical data as a fresh set of eyes may allow for improved designs of the application to be developed that an experienced player may not have considered as they have become used to existing layouts or designs on existing applications, leading to improved readability or data interpretation.

8.3.2.1. Conducting the Interview & Summary

8.3.2.1.1. General Questions

[Q] Do you see value in a website that shows all information, even if it serves no useful purpose, or would you rather only the most important information to be presented?

[A] Believes that having access to all information can be a valuable tool as long as it is presented in a clear and concise way.

[Q] How many other data showing websites for World of Tanks such as tanks.gg, do you use and what are your favourite features from each of the websites?

[A] skill4ltu Index – loadout recommendations from other users

tomato.gg – general tank statistics e.g., win-rate of a particular vehicle on a server

tanks.gg - general tank statistics and characteristics, effectiveness of loadouts, and the model of tank, along with armour effectiveness at certain angles.

[Q] Do you or have you used these websites mentioned on a mobile device such as smartphone or tablet, and have you used it in the past year?

[A] Not in the past year but attempted to use tanks.gg on a mobile device in the past, but does not work well. They believe they would use the website more often if it functions properly.

[Q] Would you prefer to have all of the information shown on one page but divided into sections, or have a dedicated page for each type of data i.e., a page about person's achievements, another page for vehicle list, etc.?

[A] Have different types of information in different pages as it makes it easier to find specific information, but done in a manner whereby the user can sort the information in the primary page.

[Q] If any, what features would you want these websites to implement that would be useful for you?

[A] Suggested loadouts and crew skills / perks for a particular vehicle. In addition, new player guide of sorts whereby recommendations are made for new users that advise on various different aspects such as specific tech-tree to follow and which particular branch sorted in accordance to general difficulty.

[Q] If any, what changes would you make for those websites?

[A] Having the information made more clearer and concise is one such change as many of these pages hit the user in the form of a spreadsheet which may be overwhelming and very non-user friendly. Equipment suggesting for each of the websites, and breakdown of tank statistics on a per region basis done in a manner that a new user can understanding quickly and get the most of it.

8.3.2.1.2. Prototype Testing Questions

[Q] From a readability standpoint, how would you describe the readability of the content?

[A] Overall the information is clear for them as they are familiar with this sort of information displaying format, however, the over-processing of information and lack of breakdown can be difficult for new users and tough on the eyes.

[Q] The way in which the content is arranged i.e., table on top, followed by charts, and ends with vehicle list, is appropriate, or would you rearrange it differently?

[A] The arrangement of the content is acceptable, however, as mentioned previous, there is an overwhelming amount of processed information, and having data from different sections linked with one another may be an option to pursue or investigate.

[Q] Would you prefer the option for the user to be able to hide each individual game mode, rather than having all displayed?

[A] Prefers to select which game mode is view is preferable as some game modes contain no data and shouldn't be included.

[Q] Should additional information be displayed per tank card or tile such as vehicle type or other and if so, what information?

[A] Yes, having information about the type of vehicle would be useful.

[Q] Each chart data i.e., bar and tree map, are coloured in a way to represent the nation and its associated colour e.g., blue for the French. Do you find it difficult to differentiate between the colours?

[A] Colours are very dry or bland, and some colour choices are odd. Some nation colours are too similar e.g., China and the USSR and should stand out more. Recommends replacing the colours with the flags of the nation and only Germany's colour is concise as most Germany vehicles are grey.

[Q] Should any chart that has 0 or empty data e.g., 0 Chinese tanks owned, be hidden or should it remain visible but empty?

[A] They should remain visible as if a user doesn't own a particular vehicle or other, it should reflect this information.

[Q] Would you prefer infinite scrolling for tank tiles, or limited to 2 or 3 rows, that you can scroll left and right, or both?

[A] Doesn't have a particular large liking to the infinite scrolling due to the amount of information, prefers the 3 or 2 row format.

[Q] Is there any improvements that can be made in terms of the design of the pop-up window when clicking on each tank tiles?

[A] Prices should be changed i.e., 0 for price is odd and should be replaced with 'N/A' as it is more accurate. Other than that as a whole is it very clear and nice on the eyes.

[Q] Is there any other comments, feedback, or suggestions you would like to put forward?

[A] Price changes from 0 to 'N/A', improved colours for charts, and other changes and feedback mentioned previously.

8.4. MoSCoW Analysis

The MoSCoW Analysis will aid in the development in the application by prioritizing the features or aspects of the application that **Must Be**, **Should Be**, **Could Be**, and **Won't Be** incorporated into the application during the project's timeframe. Features identified by the stakeholders have been put forth through participation in various of different elicitation techniques conducted throughout the project's timeline by providing feedback or other methods.

Feedbacks that contradict with one another, such as one requesting the design to be clean and minimal, while another feedback requesting the page to contain as much information as possible compacted, will be evaluated and selected based on the decision made by the project owner. The factors that the owner may base their decision on varies, but the main guidelines are that one feedback has gained the majority of approval from the stakeholders and/or complies with the main objective(s) of the application more appropriately than the other.

M

MUST HAVE *(Represents non-negotiable needs for the project, critical and no-substitution)*

- Search bar to search for a specific player
- Region selection to select which region the player's account is associated with
- All data presented in some form
- Dynamic pages rather than static pages

S

SHOULD HAVE *(Initiatives that should be implemented, as they may add significant value, but not vital for the project)*

- Mobile display support
- Filter to view specific information from selected game modes
- Modern design (clean, simple, intuitive)
- Different forms of data representation where appropriate (text, table, grid, charts, etc.)
- Ability to compare multiple players statistical data/performance
- Multiple colour options for those with certain colour blindness

C

COULD HAVE *(Nice-to-haves, not needed for the core function of the project. Less impact than Should-haves)*

- Light/Dark mode colour schemes
- Ability for the user to download their information in the form of a JSON file
- ~~Performance colour coded background (e.g., Firepower Related = Red Background)~~
- Nation colour coded backgrounds (France = Light Blue, British = Tan, China = Dark Green)
- Popup tooltip on specific data hovered on (hover over average damage to view average damage trend over a timespan)
- Save snapshot of data onto the browser, reducing the need to search again (unless it is a new day)

W

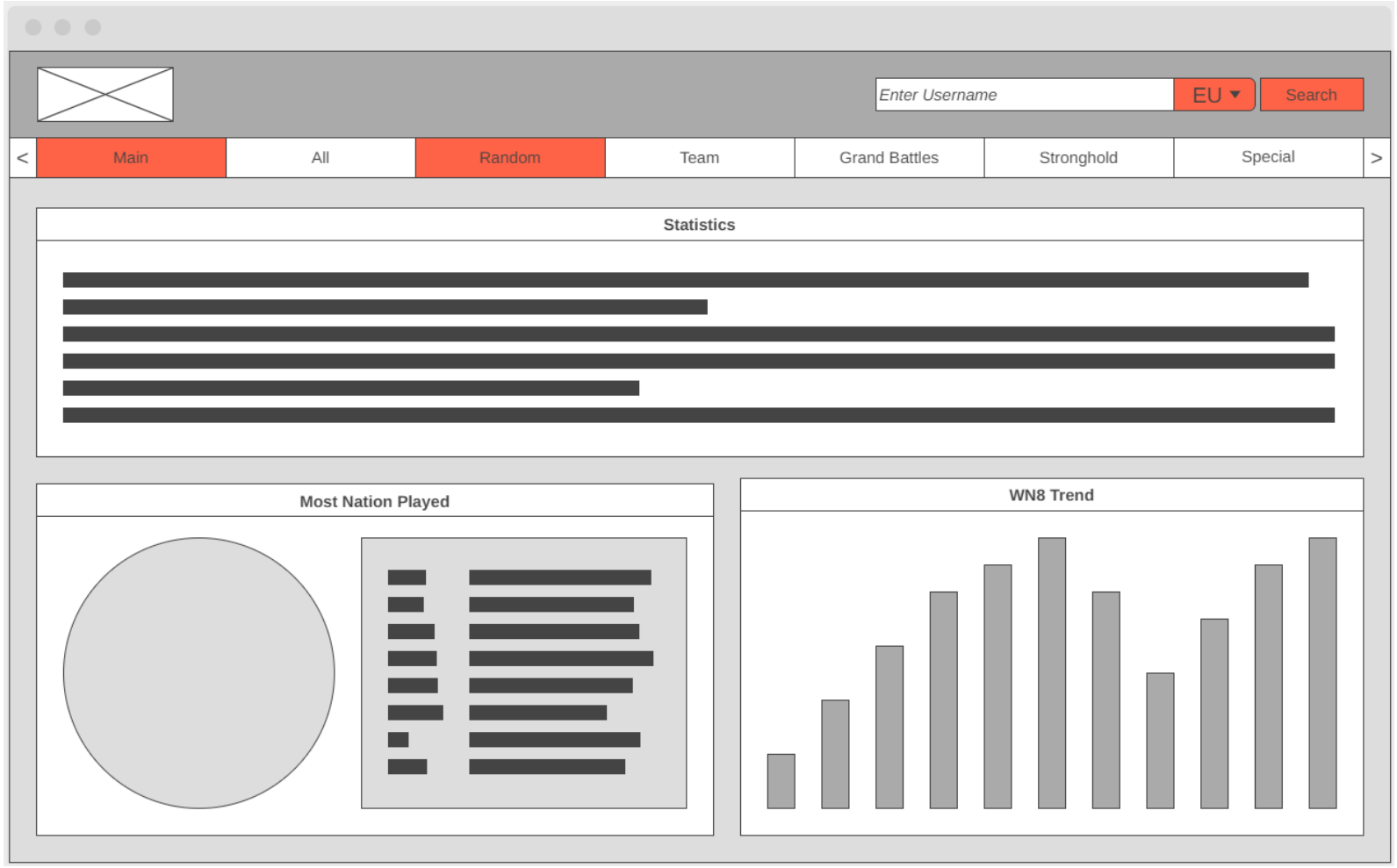
WILL NOT HAVE (WISH TO HAVE) *(Initiatives that are not a priority for the time frame specified, may be implemented another time)*

- Specific data to be displayed as per requested from participants (that is not gathered by Wargaming)
- Real-time updates (seconds / minutes, rather daily)
- Ability to view player's private information by utilizing the player's private key
- Reference to content creators and their reviews or videos on specific tanks, events, or other related news

8.5. Interface Analysis

8.5.1. Wireframes (Pre-Mid Point)

8.5.1.1. Desktops / Laptops



8.5.1.2. Tablets

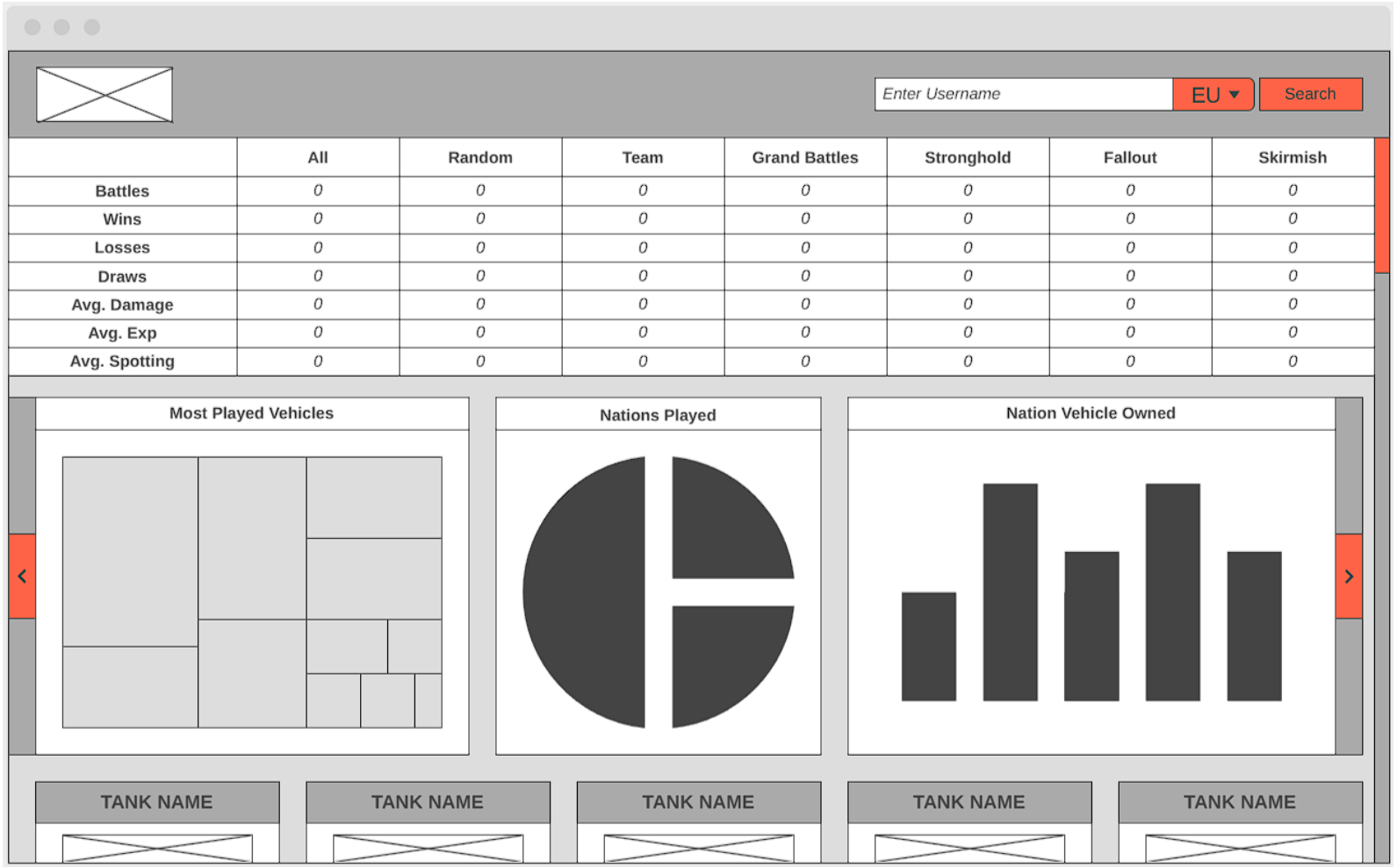
8.5.1.3. *Smartphones*

An important note to consider is that due to the dynamic nature of the application being built upon ReactJS, only a singular webpage is required, and additional content or data can be displayed within that singular webpage, shown or hidden as per the user's requirements.

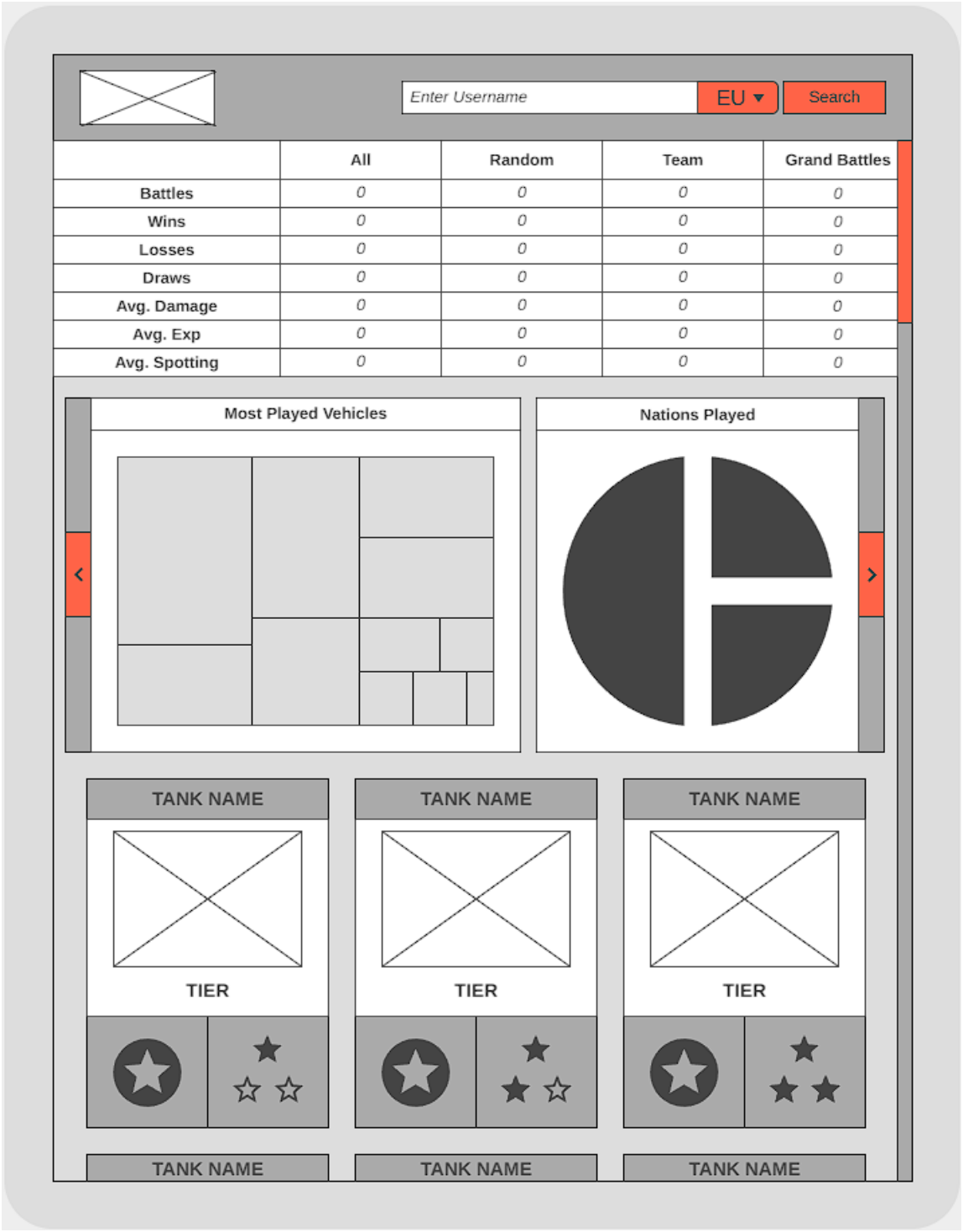
Any form of legal disclosures will not be implemented anywhere in the application as it is expected that during the early stages of development much of the effort should be put forth towards implementing features or design choices that the user would want, thus legal disclosures will effectively be shelved until towards the end of the application development if the application garners further development past the project expected completion date.

8.5.2. Wireframes (Post-Mid Point)

8.5.2.1. Desktops / Laptops

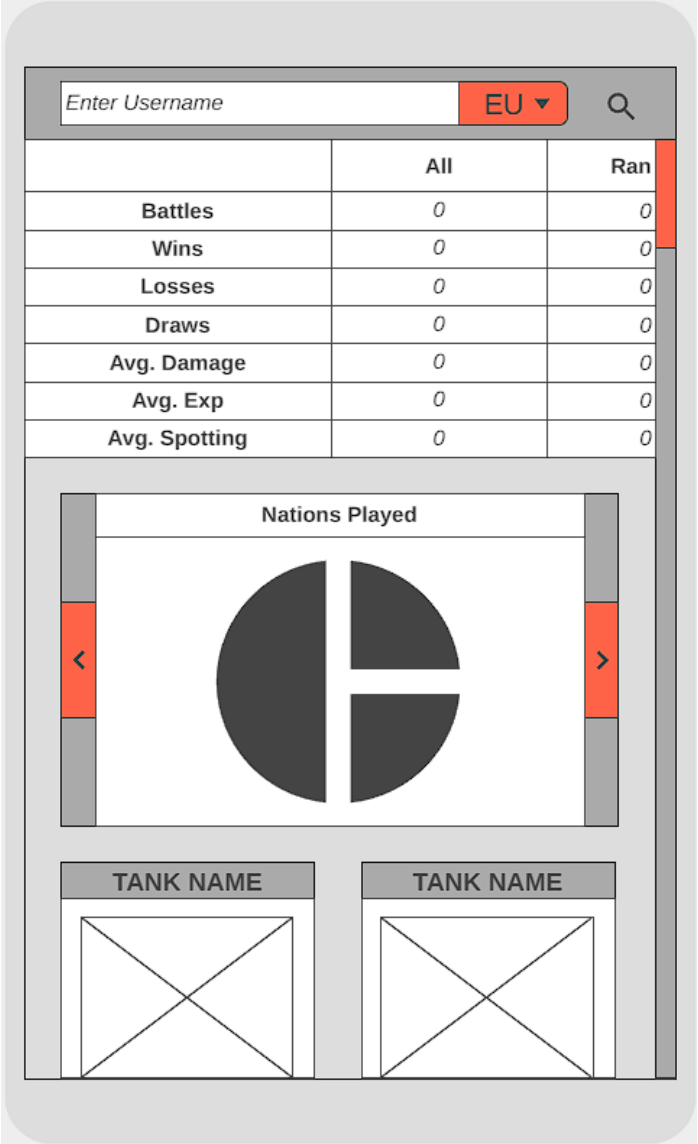


8.5.2.2. Tablets



Note: The statistical data above the charts should be scrollable left and right to view more information as displayed on the desktop display, even if no scrollbars are present. This also applies to the Mobile display illustrated below.

8.5.2.3. Smartphones

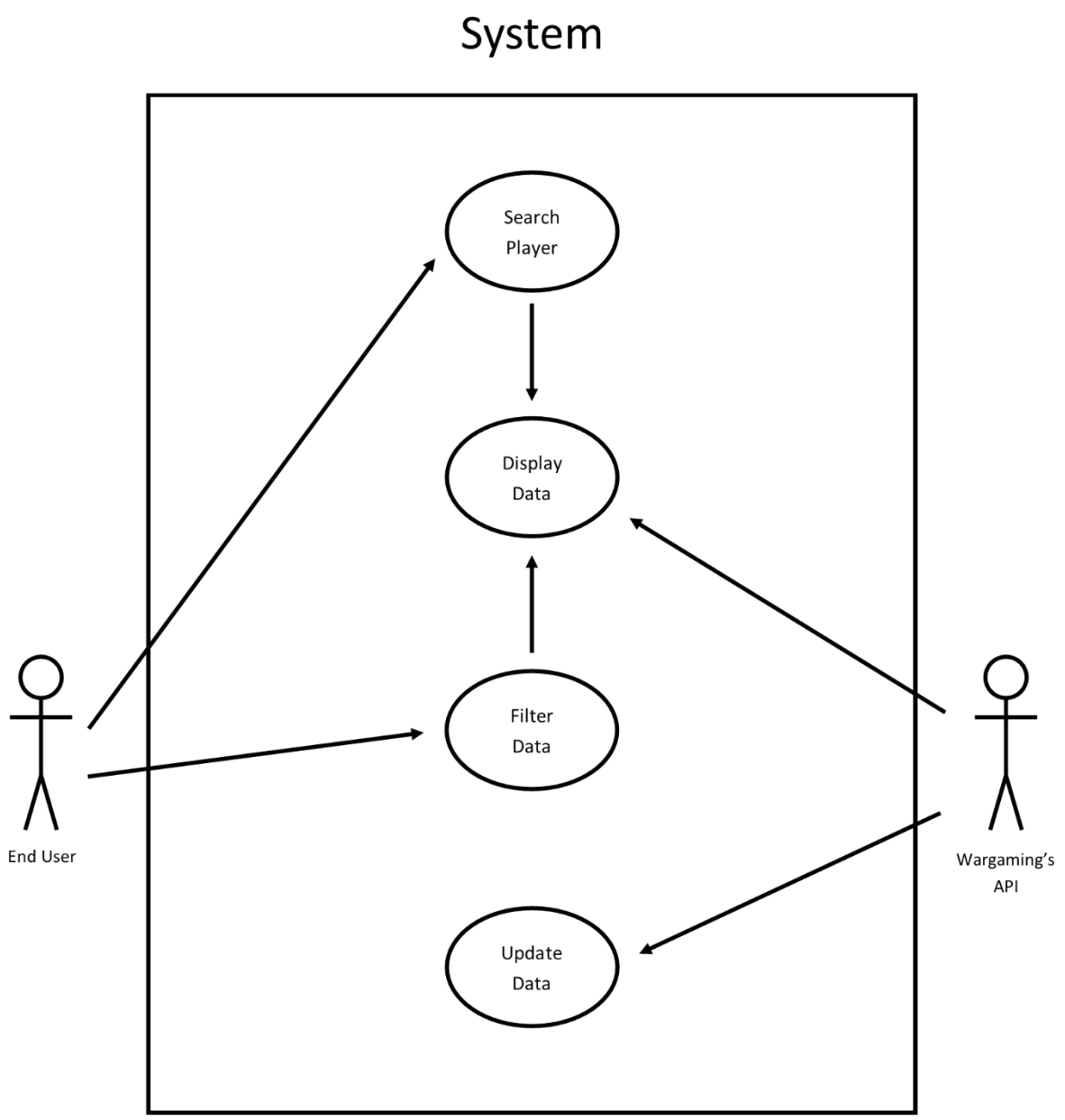


The new design should allow better utilization of the space available on the webpage as it allows more information to be displayed to the user and in a format that is more modern and clear, while keeping a simple and clean format that is vital in ensuring the readability of such a data heavy application.

Of course, these wireframes are still a work-in-progress, however, the bulk of the design has been more or less narrowed down, and thus is unlikely to deviate from the redesign post-mid point in any substantial ways.

In addition, there may be the potential for users to customize how the data is presented to them, such as having charts displayed on the top of the page, rather than in the middle, but this is simply an idea and there is no plans to implement it during early developments.

8.5.3. Use Case Diagram



The Use Case Diagram in this context illustrates to use how the user would interact with the application, as well as how Wargaming's API interacts with the application as well.

The user would search for a player by inputting the player's name, selecting the realm the account is associated with, and then it would display the relevant information.

The user can also opt to filter specific data so that only data that the user has selected to be viewable is shown.

Ideally, the API would, on a daily basis, pre-fetch the data on frequent users searched, as well as displaying the player data that the user has requested.

8.6. Observation

Observation involves reviewing how the participants utilize existing applications such as tanks.gg and tomato.gg, so that important features that are highlighted or used by the participant can be documented so that future iterations of the prototypes can attempt to incorporate similar features to improve the user experience.

8.6.1. Interviewee 1

8.6.1.1. tanks.gg

The interviewee visits the tanks.gg website and navigates to the page that lists out all of the vehicles within World of Tanks, through the use of the navigation menu on the top most of the page. They illustrates on how they select a specific tank by utilizing the filtering options on the left side of the page, and once a tank is selected it brings the user to a page dedicated to displaying characteristics data about that particular vehicle such as engine power, damager per minute, and more.

One of the notable feature outline by the user is the option to view a tank in its 3D model whereby they are able to view how effective a particular armour is at specific angles which is one of the most popular feature with this user. Along side this feature, the user interacts with another important aspect of the website whereby they are able to customize the vehicle's characteristics by applying specific consumables and equipment that alters the values of the vehicle which is shown on the page.

8.6.2. Interviewee 2

8.6.2.1. tanks.gg

Identical in the manner in which Interviewee 1 utilized the application, therefore refer to heading *8.6.1.1. 'tanks.gg'*.

One notable difference in being that this participant utilized another feature of tanks.gg whereby they are able to view the tanks that have the highest damage, top speed, camo, etc., depending on what aspect of a tank they are most interested in at the moment.

8.6.2.2. tomato.gg

The user visited a page called 'All Tanks' which contained a list of all of the vehicles available in World of Tanks and, similarly to tanks.gg, narrowed down a specific tank by utilizing the filter options presented to them.

Once a vehicle was narrowed down and selected, the most valuable information such as battles played, win rate, and average damage is shown to the user, along with their performance curve in the form of a chart is also shown, which the user had a quick read up on.

Next, the user opted to review the 'Loadouts' feature of the vehicle page whereby a list of the most commonly used loadouts for that particular vehicle is shown, a feature in which the user has shown great interest in by investigating each aspect of that feature and expressing their opinions of the loadouts others have used.

8.6.2.3. skill4ltu.eu

When visiting the main page. The user scrolled down past the filtering options and selected a tank of interest and as it was recent released there was no need to filter for it as it was placed on the top of the list of vehicles.

When selecting the tank to view whether content for it was created, they have expressed how the application was designed in a manner that was aesthetically pleasing due to it being clutter-less and clean.

After selecting another vehicle, the user scrolled down and selected the 'Field Modifications' to review what modifications the user has selected on that particular vehicle, followed by reviewing the 'Marks of Excellence' tab to understand what is the average damage needed to be dealt for a period of time to achieve a certain rating, which was displayed in a clean and simple to understand manner.

9. IEEE Requirements

9.1. Purpose

The purpose of the IEEE Requirement Specification Document is to identify and list out key requirements, both functional and non-functional, that is vital in ensuring that the application meets the 'Minimum Viable Product' standard, or in other words, the document is designed to illustrate what, at minimum, should the capabilities of application be to ensure that said application is able to meet the minimum expectations of the user(s).

The requirements that have been gathered were selected and prioritised by the project researcher based on the usefulness or importance of a particular feature or design were identified by the interviewees and the researcher as gathered through the elicitation techniques conducted, as to ensure the relevance and reliability of the application in meeting the user's needs.

9.2. Scope

This application is nothing new, there have been others similar to it in the past and some that are popular and in use today. The main difference between this and others like it is in the information that is being presented, whereby other applications only present information regarding a specific area of World of Tanks such as vehicle characteristics, or player performance data, whereas this application would combine those two, and others, into one, while also displaying every single piece of information collected by Wargaming to be presented to the user, regardless on whether it is useful or not.

There are two areas that need to be addressed in order to meet the business needs set out by the researcher and the interviewees. The first area is the gathering of data through the use of Wargaming's API such as player's personal data, data regarding their vehicle performance, account achievements, and others. The second area is how the information is presented to the user, whether that be in the form of a table, chart, or other suitable forms of data presentation.

9.3. Functional Requirements

Functional Requirement 1	
Identification Code:	FR1
Title:	API Data Gathering
Description:	The application should gather the required player's data through the use of Wargaming's API, whereby
Location:	Application's Backend
Priority:	Must Have

Functional Requirement 2	
Identification Code:	FR2
Title:	Search Bar
Description:	The user should be able to search a player (case-sensitive) through the use of a search feature ideally a search bar.
Location:	Top-Most Page
Priority:	Must Have

Functional Requirement 3	
Identification Code:	FR3
Title:	Personal Data for Game-modes
Description:	The player's data i.e., battles, wins, losses, etc., should be presented in a table-format with each column representing the game mode.
Location:	Main Section
Priority:	Must Have

Functional Requirement 4	
Identification Code:	FR4
Title:	Personal Achievements
Description:	The achievements the player has achieved on their account should to presented to them on a grid-table-format with each grid containing the name, icon, and number of achievements earned.
Location:	Main Section
Priority:	Must Have

Functional Requirement 5	
Identification Code:	FR5
Title:	Player's Vehicle List
Description:	A list of vehicles a player owns should be presented in a grid-table-format so that it may be easily read and sorted. Each tile should contain useful information i.e., name, image, tier, mark of mastery, marks of excellence, and premium status.
Location:	Main Section
Priority:	Must Have

Functional Requirement 6	
Identification Code:	FR6
Title:	Battles Played per Nation
Description:	A suitable chart should be utilized e.g., Tree map, Pie Chart, or Bar Chart, to illustrate how many battles a player has played for each nation.
Location:	Main Section
Priority:	Must Have

Functional Requirement 7	
Identification Code:	FR7
Title:	Vehicles Own per Nation
Description:	A suitable chart should be utilized e.g., Pie or Char Chart, to illustrate how many vehicles a player owns for each nation.
Location:	Main Section
Priority:	Must Have

Functional Requirement 8	
Identification Code:	FR8
Title:	Most Played Tanks
Description:	Sorted by battles played, it should be presented in a suitable chart e.g., Tree map, as to allow ease of understanding in regards to the most popular played tanks in the player's arsenal.
Location:	Main Section
Priority:	Must Have

Functional Requirement 9	
Identification Code:	FR9
Title:	WN8 Rating and Performance
Description:	A popular method in gauging a player's capabilities that indicate as to how well they are as a played, as well as potentially, if predicting algorithms are utilized, predict based on current trends what is the future performance of the player.
Location:	Main Section
Priority:	Should Have

Functional Requirement 10	
Identification Code:	FR10
Title:	Additional Information per Vehicle
Description:	When clicking on a vehicle tile, additional information should appear such as their description, crew layout, price, modules associated with the vehicle, as well as other important information and videos or articles made for that particular vehicle by Content Creators.
Location:	Main Section – Pop-up on Vehicle Selected
Priority:	Should Have

Functional Requirement 11	
Identification Code:	FR11
Title:	Vehicle Armor and Module Layout
Description:	A detail image or 3D model of vehicle should allow easy identification of the Armor thickness, effective Armor, chance of ricochet, and chance of penetration, as well as where each modules are placed around the vehicle.
Location:	Main Section – Pop-up on Vehicle Selected
Priority:	Should Have

Functional Requirement 12	
Identification Code:	FR12
Title:	Light / Dark Mode
Description:	An option to select either a light or dark mode of the page
Location:	TBD – Navigation Menu or Bottom of Page
Priority:	Could Have

Functional Requirement 13	
Identification Code:	FR13
Title:	Customize Vehicle Equipment and Crew Skills & Perks
Description:	The user should be able to select a vehicle from a list of vehicles and configure it with suitable equipment, consumables, and customize crew skills & perks to calculate the improved or down-graded performance in one or more areas of the vehicles.
Location:	Main Section
Priority:	Should Have

Functional Requirement 14	
Identification Code:	FR14
Title:	Tank List
Description:	A list of all the vehicles that have been implemented in World of Tanks should be present as to allow users to select the vehicle they are most interested about, including filters to narrow down a specific vehicle or class of vehicle.
Location:	Main Section
Priority:	Should Have

Functional Requirement 15	
Identification Code:	FR15
Title:	Vehicle Tech Tree
Description:	Similar as to FR14, with the difference being that no filtering is allowed and the tech tree exists to mimic identically the tech tree that existing to World of Tanks, for those who prefer the more readily understandable format.
Location:	Main Section
Priority:	Should Have

Functional Requirement 16	
Identification Code:	FR16
Title:	Compare Vehicles / Customized Vehicle w/ Crew
Description:	The ability to compare different stock or customized vehicles of same or different tier, nation, or class would allow users to easily compare vehicles and gauge each vehicles capabilities.
Location:	Main Section
Priority:	Should Have

Functional Requirement 17	
Identification Code:	FR17
Title:	Tooltip
Description:	A tooltip should appear when hovering over specific aspects of the application e.g., mark of mastery, marks of excellence, parts of a chart, to reveal additional information such as the percentage bracket or rate they player is with regards to their Marks of Excellence.
Location:	Main Section / Beside Mouse
Priority:	Should Have

Functional Requirement 18	
Identification Code:	FR18
Title:	Option to Cache or Load from Fresh
Description:	User should have the option to cache searched players onto the browser that gets deleted when the date the data was gathered differs from the current date, to reduce repetitive loading of the same data.
Location:	Backend
Priority:	Could Have

Functional Requirement 19	
Identification Code:	FR19
Title:	Download Player's Data
Description:	A button to download the currently searched player's complete data excl. Private Data should be provided.
Location:	TBD – Top of Page or Bottom of Page
Priority:	Could Have

9.4. Non-Functional Requirements

Non-Functional Requirement 1	
Identification Code:	NFR1
Title:	Fast Vehicle Tiles Loading
Description:	The application should be able to load the entirety of the player's vehicle list within a set period of time i.e., no more than 15 seconds.
Priority:	Should Have

Non-Functional Requirement 2	
Identification Code:	NFR2
Title:	Loading Icon
Description:	While different aspects of the application is loading e.g., charts, a loading icon should play to indicate that something is loading so that the user should expect additional content to appear.
Priority:	Should Have

Non-Functional Requirement 3	
Identification Code:	NFR2
Title:	Disable Animations
Description:	Although it could be provided as an option for the user, by default certain aspects of the application, primarily the charts, should have their animations disabled to reduce the wait time for the user to be able to read the information as it serves no functional purpose.
Priority:	Could Have

Non-Functional Requirement 4	
Identification Code:	NFR4
Title:	Previous Players Searched
Description:	When searching for a specific player, the search bar should display the last five player searched as to reduce the time in typing the name of the same player.
Priority:	Could Have

Non-Functional Requirement 5	
Identification Code:	NFR5
Title:	Limit API Requests to 10 per Second
Description:	The application should not create more than 10 API Requests per second as to prevent breaking Terms of Use of the API.
Priority:	Must Have

Non-Functional Requirement 6	
Identification Code:	NFR6
Title:	Informative Errors / Issues
Description:	When loading a player's vehicle, useful errors should appear such as 'Unknown Tank Name' or 'Missing_Sherman.png' to narrow down the issue.
Priority:	Should Have

Non-Functional Requirement 7	
Identification Code:	NFR7
Title:	Ease of Navigation
Description:	Navigating the application should be easy, simple, and intuitive. Buttons should be clearly labelled such as a search button labelled 'Search' or replaced with a magnifying glass icon for smaller displays, and buttons should be placed in suitable locations e.g., search bar and search button on the top-most of the page.
Priority:	Should Have

Non-Functional Requirement 8	
Identification Code:	NFR8
Title:	Action Latency or Delay
Description:	There should be little to no latency or delay (no more than 0.5 seconds) when clicking a button and for an action or effect to take place e.g., clicking filter option to list out filter options.
Priority:	Should Have

10. References

[1] “Chapter 10: Techniques” (2015) in A guide to the business analysis body of knowledge: Babok. 3rd edn. Toronto: International Institute of Business Analysis, pp. 217–363.

[2] Puzhevich, V. (2021) Functional vs Non-Functional Requirements: The Definitive Guide, SCAND. Available at: https://scand.com/company/blog/functional-vs-non-functional-requirements/ (Accessed: April 27, 2023).

11. Appendix

11.1. Project Proposal

Objectives

The main objective that this project aims to achieve is to develop and assist in the development of an application that was conceptualized to help a specific group of users of a certain video game, World of Tanks.

This would be achieved by displaying those users a *complete list of unfiltered data** regarding those particular users, or others, public account information or data, such as their player rating, vehicle list, marks of excellences, and others, which would be of use to them or others.

These information would be collected through the use of World of Tank's API, processed (sorting under headings where they make sense for example) and displayed in a simple, yet elegant way that can easily be read by the user, whether that would be in the form of a table, or a graph, and would function dynamically, meaning users will not need to refresh the game every time they want to view more, or other data.

* a list of data that does not exclude any piece of information, *other than private user data that the user themselves may allow others access to through a use of a token, and to which I would refuse getting involved with due to potential ethical issues*, a core function of the application

Background

I primarily chose this project as I am an avid player of World of Tanks and I have used several different applications that function similarly to what I have envision for the past several months, even years, but have been left annoyed and left frustrated as many of these applications have one or several issues that I feel should be addressed, but, as it stands, have not rectified.

Those includes include A) application not updating dynamically which, although unnecessary, would allow the user to select which information they would like to view without needing to refresh the page, B) the lack of support for those with aspect ratios of greater than 16:9, C) and approach that all of those applications seemingly follow in that they would only show the main statistics (average performance such as average damage, average experience, wins, losses, etc.) and nothing more (e.g., trees fallen, stun numbers, direct hits that do no damage).

How I would set about achieving my goals is simple. I would develop a prototype that would be designed from the ground up utilizing modern technologies such as ReactJS, which would

allow me to display the website dynamically, and display the information onto the page for users to see and collect any feedback from them that would help me improve my application or further refine my idea. I would also use several libraries with ReactJS to further enhance the application, such as ApexCharts to allow the displaying of appropriate graphs to the user with the data it has to or has processed.

State of the Art

There have been similar projects that were developed, 'tanks.gg', 'skill4ltu Index', 'Tomato.gg', and 'WoTLabs' are among the most popular ones.

The key difference between all of those alternatives and my application is the information themselves, more precisely, the amount of information that will be presented to the user about themselves, the user, or others. For clarification, these applications, excluding my project, already function similarly to what I have envisioned, the displaying of information to the user, but they primarily focus on displaying either the main statistics of the user, vehicle statistics, a bit of both, and not much more.

For example, the main information would include the average damage, average experience, wins, losses, draws, while my project would include that information along with the less utilized pieces of data such as trees fallen, stun numbers, amount of battles played in a stunning capable vehicle, direct hits that do no damage, etc.

Another difference is that my project would utilize modern, powerful technologies such as ReactJS to allow dynamic website interaction which should allow users to view or hide any information at will, while those alternatives would use more older/less advance tech, apart from 'skill4ltu Index' and 'Tomato.gg' as they have been developed relatively more recently compared to the others and are seemingly dynamic which hints to the usage of more modern technologies absent from the alternatives.

Technical Approach

Fortunately, as a long-time player of World of Tanks, I have already knowledge of several different stakeholders that I may or may not have involved in this project to some extent, although the users/players/customers (any of which will be used interchangeably) will most definitely be involved as they are the core pillar to the research and development of the application as it is their feedback is what is needed the most. Of course, I will also be conducting research and reviewing their website, articles, YouTube videos, and identifying

what entity, or stakeholders, are involved, influenced, and impacted by Wargaming, developers of World of Tanks.

The requirements elicitation techniques that are under consideration are as follows:

- Interviews (one-to-one or one-to-many interaction with several of my contacts that are either veterans (long-time players/experienced) of World of Tanks, have either played it to the extent to know the main mechanics well, and those who know very little, and who also uses the type of application I am developing so I can get different, and fresh perspectives from different types of players.
- Prototyping – This will be essential as I will be developing a functional website so that I may receive feedback from my close contacts, or others (players) who may be interested, that have actually seen a live website in use and can interact with it, to some extent, and give proper, accurate feedback.
- Polls, Surveys, and/or Questionnaires – This will be used to gather large, hopefully, amounts of information from my contacts and the wider player base of World of Tanks. They will be designed in a way to request information on what they, the participants, require from similar websites such as my application, and what features, designs, or others, that they would like to see that has yet to be implemented, implemented correctly, or implemented by a small selection of similar websites.

Currently, I plan to break down the tasks to either a simple approach of headings on a document and complete it one at a time, or where I can write the most complete answers, or develop a Gantt Chart with a large amount of tasks, sub-tasks, sub-sub-tasks for both development of the website, documentation/reporting, and other relevant pieces of work.

Technical Details

As mentioned before, the focus tech that the project, or rather, the application would be built upon with be through the use of ReactJS. ReactJS is a JavaScript Library that I was introduced to and taught during my work placement at Dell Technologies (it was referred to as a framework by a co-worker, training video(s) but ultimately matters very little in this context). It is a tool that allows the ease of building of user interfaces for websites and applications. It also allows the use of external libraries (think of it as extra features developed by others) to enhance the capabilities of ReactJS so that it may execute code or process data in a way that it was unable to previous, e.g., render multiple different kinds of graphs.

Other technologies that will be used include:

- HTML – Used to actually design how the website will look or render to the user.
- JavaScript – Allow client-side behaviours or actions such as displaying or hiding texts or changing the colour of a heading based on what button is clicked.
- CSS – Defines the style of different elements of a page including colour, height, width, font size, font family, padding, margins, among many more.

Other tools that will be used such as WordPress or Visual Studio Code to develop a prototype of the application, with the latter also being used to document my findings/work during my progress, MS Word to product reports and write up documents, Microsoft forms to develop surveys, polls, and other relevant measurement tools to collect user feedback, among others that I have not yet identified or have not committed to using.

Project Plan

This plan will essentially be an extremely simple and will not go to extreme detail as I this is just the project proposal, and I will need to gather my thoughts to plan a but more.

My first steps, excluding the project proposal and ethics report, would be to create a Gantt Chart on the tasks and activities that I will need to complete throughout the project life.

Once done, the next step is to review each application mentioned previously (tanks.gg, Tomato.gg, etc., among others) and to keep track of all of the features that I believe that users would want to see on the prototype or what makes the website appealing to users, and considering that I am one of those users, I feel I can make the initial judgement myself until I receive additional feedback.

Reason for why this is the next step is that the development of the application would take substantial time since it requires coding of the application with ReactJS as it's foundation, a technology I am still not well-versed in.

Once complete, I would conduct a recorded* interview with my contacts and ask them whether they use any of the websites mentioned before, what they like about it, dislike, and what would they like to see added, among other things.

Afterwards, I would begin the development of the application which can vary in terms of time depending on how much effort I am willing to put into it and how much features I am users to have initially, with the feedback from the interview I have received.

After the 'Alpha; prototype done (version 1.0 essentially), I intended to have my contacts interact with it thoroughly and provide me with feedback through the survey/questionnaire/poll (or all three, will also be referred to as simply survey questions), such as what they like, dislike, and would like to see next.

The feedback from that will be used to further improve the application, further refine the questions if any of them standout and being problematic, and afterwards I am left with two options, A) allow the wider player base to use the application temporarily and have them answer some of the survey questions, or B) design a new set of survey questions asking them various of questions and such amount the websites, features they like, dislike, etc., with no references to my application.

The decision has yet to be decided as I am unsure on the most suitable approach, and I will need to review the Terms of Condition of Wargaming's use of API to the public.

Validation /Verification

Verifying user requirements would be achieved simply by having those users interviewed to interact with the prototype and asking whether it satisfies some/most/all of the requirements that they put forth, and whether it satisfies any new requirements that they may have identified was not mentioned during the first interview.

Validating user requirements made by the wider player base will follow the same concept, however, considering that this would mean that I would have to involve a significantly larger amounts of participants, and considering that they all may have requirements that I may have overlooked/not have thought of, this makes validation trickier.

However, currently, I do not have a concrete plan and as mentioned before, I did not have a decision made on what approach I would take in receiving additional feedback from the player base.

Despite this, let's imagine that I will allow the player base to interact with the application, I would develop a set of survey questions, request that they would answer it, and after working on the prototype again, have them answer the same questions (very slight modification, mainly

asking whether it was an improvement compared to the older version and whether it has met the requirements), and with that conclude whether I have verified their requirements, but of course this is assuming that I plan to go this route.

Alternatively, I could simply ask the player base to answer the survey questions, design the prototype to meet those requirements, and judge myself, or with my contacts whether it meets the user's requirements from mine, and the contact's own perspective. This can be problematic as the participant who answered the questions may have a different perspective than we do, and thus why I prefer the former approach, although that too has its own issues.

11.2. Monthly Reflective Journals

11.2.1. October

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: October

What? *Reflect on what has happened in your project this month?* I begun working on my Ethics form for the month of October, along side the Survey/Questionnaire/Polls that will be used as one of my elicitation techniques. I have created the initial version of the Survey Questions and presented it to my supervisor for approval (a link within the Ethics Form), along with the Ethics Form itself. I have also briefly explored the 'Prototyping' elicitation technique (including very briefing coding on whether I can access the required API, although it is not strictly needed but does help with immersion) and thought up of ways in which I would go about approaching it, whether that would be having two versions, one prior to the results of the survey questions, and one after incorporating some of the feedback.
So What? *Consider what that meant for your project progress. What were your successes? What challenges still remain?* I received feedback with regards to the Ethics and was recommended some minor adjustments, primarily with regards to data retention. I was successful in designing a very simple prototype, or specifically, a prototype in API access/request. However, the issue I have encountered is that I would be required to share my API Key to individuals whom I will reveal the prototype to, which is not ideal, along with needing to update the API to allow specific IPs to access the API if I decide to simple share the prototype file to the individuals for feedback.

Another success is that the survey questions were approved and ready to be released, however, I want to spend extra time re-evaluating whether the platforms I will share my questions to are optimum, or whether other areas would be more suitable.
Now What? *What can you do to address outstanding challenges?* With regards to the Ethics form, I simply need to update with the required information/ For prototyping, either I will ask the individuals to sign up for 'World of Tanks Developer' and use their API Key for the prototype (should function exactly the same), otherwise I can simple give them my API Key as the individuals I will be interviewing are close contacts of mine and I trust them in handling my API Key with care and caution.

Student Signature	

11.2.2. November

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: November

What?

Reflect on what has happened in your project this month?

I progressed further into the Prototype v1 and was able to have the application display the data from the API in a crude and boring way, but there is still time for optimizing how the application displays its image.

After some thought, I decided that I would go ahead with my initial plan of releasing the survey questions onto Reddit as it was simply the more efficient way of accessing a large amount of individuals at little effort. I also designed an introduction for the project that I would post onto Reddit, along with a request stating that ages 18+ would answer the survey questions, along with stating that they may leave at any time.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

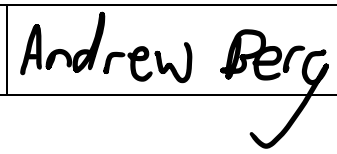
The main success was the application actually functioning relatively early in the project lifetime, however, the major issue was that I overlooked the idea of having the application in display not just one user information, but multiple and having the individual view their information overlap on a chart, for example.

Now What?

What can you do to address outstanding challenges?

There are three options presented to me.

1) Continue designing the application to display the information for only one user at a time

2) Option 1, but with the additional option for the user to view a pre-generated chart with 'fake' data of multiple users to serve as an example of how it may function. 3) Re-design the application from the ground up with multiple users in mind, an area I have not explored in React. Currently, I am leaning on option 2 but I may change my mind as time goes one depending on my workload and complexity.	
Student Signature	

11.2.3. December

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: December

What?

Reflect on what has happened in your project this month?

I begun working on my mid-term report, documenting the stakeholders, elicitation techniques, and well as the results that I have gathered from the survey that was posted, among others. I also attempted to move my prototype from one git repository to a brand new one as I had sensitive API Keys in the commits that I did not want anyone to be able to see, however, I cancelled the notion as I discovered that I simply had to delete my API Key and generate a new one, effectively solving my issue.

I also ran into the issue in how I was to present the prototype, and the code, without publishing the code publicly (I am unable to share it privately as I have no way of sharing it with third-party examiners without their email address), and uploading it onto OneDrive is not feasible as it takes a significant amount of safe.

I ended up resolving this issue by uploading the core files onto OneDrive, and creating a tutorial online on what commands need to be run to download the required files, what files to move, and other relevant actions, so that the prototype would be functioning.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

My main successes were successfully finishing my mid-term report, presentation (editing it so unnecessary bits are removed), and finding a method of sharing my code to the examiners in an effective manner without requiring the publishing of the code to the public.

The main challenges that remain are to prepare for future elicitation techniques such as observation, along with general coding of the prototype to include additional information useful for the user. I will also be required to redesign the prototype in regards to how content is displayed to more accurately match the wireframe illustrated in my report.
Now What? *What can you do to address outstanding challenges?* To address future elicitation techniques, I will contact, when I am free, the supervisor with regards with the different types of elicitation techniques and the methods in conducting them as I have various of questions such as whether I can use past-videos of users for the elicitation technique of 'Observation', or will I be required to view the usage in real-time. With regards to the prototype itself, I simply need to redo how the content is displayed. There is not much to it.

Student Signature	

11.2.4. January

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: January

What?

Reflect on what has happened in your project this month?

Unfortunately, due to the Christmas break, and the various of lengthy assignments that were due in close proximity to one another, up until the 14th, I was unable to conduct much of the project as I had hoped.

The only real progress I have made was contemplating on how each of the data will be presented on the prototype, further investigating how much data I will be required to display with the API, as well as whether it would be possible to display the data in a timeline (data for each day of the month). I concluded that yes, it is possible, however, it is far beyond the scope of this prototype, and thus, I will not implement any sort of timeline, instead, only displaying the most up-to-date information.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

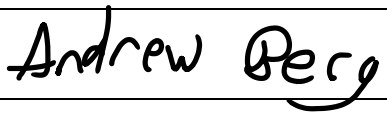
This monthly has only brought clarification on what are the next steps that I should be taking, rather than the actual steps taken. This, however, did bring about benefits as it helped reduce the amount of unnecessary features that I was going to pursue initially, as well as how I am to implement these features.

The challenges that still remain are the actual coding of such features, as well as the conducting of the elicitation techniques that I would like to pursue. Another challenge that I may or may not pursue is returning to the work done previously and reformatting/rewording a large majority of the text as there is inconsistency on how I phrased things, as well as wording things in first-person, and third-person.

Now What?

What can you do to address outstanding challenges?

To address the coding aspect, I simply need to design a small but functioning example of the feature I would like to implement, then scale it up or redesign it in a way that would work with the prototype in question, and in regards to the reformatting, this is still up to debate on whether I shall pursue this activity, or not. I may even leave it to the last week after the most important work is done.

Student Signature	

11.2.5. February

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: February

What?

Reflect on what has happened in your project this month?

For the past month most of the effort was on the prototype as major design changes were made which, from an information gathering viewpoint, is substantially better. This includes redesigning the page where player account statistics are detailed, as well and minor quality of life features.

Throughout the month, effort was put into improving the report by including feedback recommendations provided by comments on the report by the supervisor and the examiner/marker such as documenting the purpose of reason behind this project from a monetary viewpoint, or in other words, what is the financial benefit from pursuing this project.

I also started on designing the interview questions that will be brought up during the Interview elicitation technique that cover most areas that is of interest such as the prototype which most likely will be presented to the interviewee for them to interact with.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

My main success is the redesigning of the main prototype page as well as other features such as individual tank details, history, and other features that may be of usefulness to the user. Another major success was the successful implementation of a chart, specifically the radar chart to the prototype to display the most frequently played nation. I am anticipating that more charts will be added in the future, however, challenges with that has appeared that is preventing me from doing so.

My main challenge, in regards to adding additional charts, is that the documentation provided expects that the application is designing using a specific “tool” or coding style that is predominantly used in ReactJS. However, in my case I am using a different format which prevents me from easily implementing certain charts, if at all.

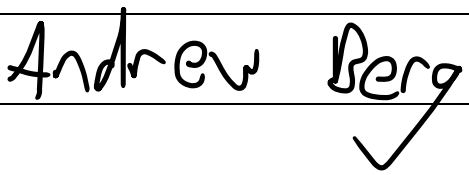
Another challenge, again pertains to the prototype, is how the data is collected and displayed whereby, in very simply terms, requires me to structured the code in a way which is very inefficiently such as excessive use of for and if statements, which is not inherently bad in itself, as well as excessive use of hard-coding in one specific area of the prototype, which ensures that there is no flexibility in how the data is presented.

Now What?

What can you do to address outstanding challenges?

Fortunately, or unfortunately as some may see, due to this being a prototype and not an actual product whereby I will simply illustrate roughly how things may function or look and whereas the performance is not necessarily that important, these issues can be ignored safety in my opinion, and thus, will be ignored.

I would also not consider it worth my time as there are other aspects of the report that needs to be worked on more urgently, primarily the Interview questions, conducting of additional elicitation techniques, and others, that my priorities lies elsewhere.

Student Signature	

11.2.6. March

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: March

What?

Reflect on what has happened in your project this month?

During the month I was conducting the final 'clean-up' stage of the prototype whereby I made minor adjustments and fixes that did not require much effort or new features to be added. I can state that the prototype is complete, thus, I can divert most of my attention to other parts of the project.

Additional time was spent on the report adding additional information that was previous missing or not added, and rephrasing of some sentences to more accurately get my message across. I expect during the first week of April I would be able to finish most workable sections of the report before moving onto new sections or elicitation techniques.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

Considering that the prototype has been finished successfully and more complete than expected, as well as taking up the majority of time and effort, this frees up substantial amount of time that could be put forth in other areas of the project that need to be worked on or started.

The main challenges as to ensure that the interview questions are relevant, useful, and appropriate to ask during the interview. Another challenge is the designing of the 'Consent Agreement' document as I have yet to begun on such document as I have overlooked the need of said document.

Next is to ensure that I have the appropriate time to conduct my interview with the participants as additional time will be required as I will involve the showing off and testing of the prototype by the participants, as well

as *possibly* observing how they would use applications similarly to what I have built as part of the observation elicitation technique, more queries need to be made with the supervisor with regards to this particular elicitation technique.

Lastly, I will need to start on the WordPress showcase as little to no work has been made to it but this will be done once majority of the work has been finalized.

Now What?

What can you do to address outstanding challenges?

Simply ask the course coordinator and supervisor for advice and assistance in designing of the interview questions and consent document, as well as approval so that I may begin on the next part of the report.

I will also free up some time on my calendar for a particular day to ensure that I may document my leftover elicitation techniques at one time i.e., prototyping, interview, and observation, and it makes the most efficient use of my time.

Student Signature	

11.2.7. April

Supervision & Reflection Template

Student Name	Andrew Berg
Student Number	19515926
Course	Technology Management
Supervisor	David O'Dwyer

Month: April

What?

Reflect on what has happened in your project this month?

Majority of the time was spent working on the report and as of the 28th of April, the only headings left to do is 'Interview' whereby questions will be asked in regard to the application overall, the prototype developed (that will be tested by the interviewees), and observation in regards how these interviewees utilize already existing applications.

The question that will be used during the interview have been created for each of the participants, which in this case is three (3) at a minimum, enough to cover different perspectives to provide valuable feedback during the interview.

The consent form has also been designed and finalized and is ready to be provided to the participants, which will be carried out around the 28th or 29th of April.

So What?

Consider what that meant for your project progress. What were your successes? What challenges still remain?

This means that there should be no setbacks or obstacles left in conducting the final elicitation technique, the Interview, other than setting the time in when the meeting will occur. However, two of the participants expressed that they are freely available, thus meaning I could conduct the interview when I am ready.

A major success that was not mentioned earlier what the success in being able to get access to the WordPress website that will be used as part of my final submission requirement. However, the challenge left is to finish the project soon so that most of the time can be spent on the website and the video presentation.

Now What?

What can you do to address outstanding challenges?

A plan has been created whereby two interviews will be conducted in the next three (3) days, and another one when the participant is available, preferably before the 7th of May.

Afterwards, I will send most of my time working on the website which should not take a substantial amount of time as I will be using the report as reference.

Another challenge that I need to address is with regards to the Gantt chart, whereby I neglect to update it frequently, thus requiring me to refer to previous works to actually reflect my actual start and end date, along with the tasks done, with regards to the project.

Lastly, the video presentation of maximum of 30 minutes is of concern, however I plan to minimize the issue of recording by recording each section individually and stitching together through a video editing software, DaVinci Resolve, allowing me to redo parts if I deem it as not up to standard without needing to redo the whole presentation.

Student Signature	

11.3. Consent Form

CONSENT FORM

Project Title: Business Analysis on the Business Need for an Application to Present Statistical Data for World of Tanks Users as Part of a Final Year Project at the National College of Ireland (NCI).

Study Overview: This study examines the viability and business need to develop an application to gather information pertaining to public user data with regards to World of Tanks through the user of Wargaming's API, and to present said data in a comprehensive and efficient matter to improve the user experience.

By participating in this study, which may involve one or more meetings i.e., Interviews, Observation, and Prototype Testing, you will be required to read and sign the consent form which may be reviewed by the supervisor, course co-ordinator or third parties for the purpose of compliance with the rules outlined by NCI or for marking reasons.

Afterwards, a time will be arranged between the participant and researcher to identify a suitable opportunity to host said meeting(s) which will be conducted through the use of an online video sharing platform or application i.e., MS Teams, Discord, WhatsApp, or others, and said meetings may be recorded for the purpose of documenting the conversations that was had.

Any recording or documentation held by the researcher (including the consent forms) will be deleted no more than one week after the submission of the project i.e., on or prior to the 21st of May, and the project will be hosted by NCI on the researcher's behalf and may not be deleted. The participant will also be made anonymous to ensure that the possibly of potential tracking is made impossible.

Declaration of Consent

1. I have read the statement above and understand the requirements and approve said requirements. [ ]
2. I understand that the conversation(s) and project may be reviewed by the supervisor and course co-ordination, and any third-party and consent to such data being reviewed. [ ]
3. I understand who will have access to the data collected during my participation, and that I will be made anonymous. [ ]
4. I understand how my data will be stored and what will happen to it after the submission of the project. [ ]

Signature (Researcher): Signature (Participant):