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Information architecture and User Experience in First-Person-Shooter (FPS) video games

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Abstract

This paper aims at exploring the collaboration between the two fields, Information architecture (IA) and User experience (UX) which are placed into the entertaining environment, more specifically, the First-Person-Shooter video game genre. In the beginning, they are being studied separately, and later, they are combined together and put into the video game field. The literature provided guidance on how much research has been done so far, but the literature where the two fields are placed together within the FPS video games is lacking. Therefore, IA provided a process overview that started with the *research phase*. In this phase, IA provided guidance on planning the necessary research for gathering data within the information environment for context, content, and users. In addition, IA supported the evaluation of the game through the four main components provided by IA to establish what parts of the game are successful and what can be improved in order to deliver the best experiences to the users from the IA perspective. The process of research has been closely supported by UX, complementing IA when the IA started to lack methods and tools. The usability has been evaluated and tested based on users' needs, behaviors and users' personal thoughts based on their feedback. This stage provided a steady build for the *strategy phase,* which consists in highlighting the findings from IA and UX methods and tools that can be considered beneficial points for improving the user experience in Ion Fury.

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1. Introduction

This project aims at exploring and understanding how Information architecture complements user experience in theory and how they can be used together as complex tools for evaluation and in practice. Therefore based on the results, I will look into how these two fields help in delivering the best experience to the users.

In order to explore the two main fields- Information architecture and User experience -, within FPS video games more in-depth, I will actively explore new trends and available information, analyze and observe users playing the First-Person-Shooter video game called: ''Ion Fury''.

The foundation of the FPS genre was primarily based on three games from the early '90s: DOOM, Duke Nukem 3D and Quake. The main reason for choosing Ion Fury as the basis of this thesis, is the fact that Ion Fury is built as a spiritual successor to the games which established one of the most popular video-game genres in the world - The First Person Shooter genre (FPS) ('The 10 most influential games in FPS history', n.d.). Ion Fury will, therefore, serve as an example of a modern game, which at its core, is based on the foundations of the genre. However, Ion Fury is using combined technologies, old and new ones, in order to make it **feel** and **look** like the games mentioned above, which have been available for the public since the 90s ('Ion Fury on Steam', n.d.). This research will explore how the release of such a game is embraced by the users and how the information environment is adapted to the present day, by keeping the retro style.

The project is done in collaboration with 3D Realms, which is a video game company and publisher since 1987. They became popular in the 80s and 90s under the "Apogee" name for popularizing the ''shareware distribution model for video games'', known as DEMOs, by realising short playable episodes of games and giving people a taste of what the game is about, therefore people could decide later, if they wanted the full version of the game, or not, when the game was ready for full release. They are mostly known for the First-Person-Shooter (FPS) franchise, such as Duke Nukem ('3D Realms is back!', n.d.). According to WePC.com the most popular games in the world are considered to be the action genre in which FPS is part of ('2019 Video Game Industry Statistics, Trends & Data', n.d.). 3D Realms continues within publishing and fully supporting their back catalog of older titles, alongside the support for the future generation of developers.

The focus is to explore and evaluate in-depth, how the information has been shared in 3D Realms' video games, more specifically, Duke Nukem 3D; how the information architecture has been available and visible for the users, and lastly, find out how the process of available information in Ion Fury can be improved in order to best suit the needs of the users. The research also require additional data gathering from users to better understand how they perceive certain elements within Ion Fury, and their needs and interests based on their interaction with the product.

Looking at the two fields, information architecture (to analyze the ease of navigation, amount of data presented and what kind of information is missing in order to help the user go through the game) and user experience (to evaluate the gameplay that fits the users' needs). I believe that the experience could be better understood and analyzed by following the components and guidelines of the two mentioned fields.

1.1. Problem formulation

In order to have a clear overview of how the research will be conducted, a research question must be initiated. According to Bryman (2012) its importance is extremely valuable, *"having no research questions or poorly formulated research questions will lead to poor research"* (p. 10). The lack of a clear and specific research question could lead to an unfocused research and unfitted results.

Having such a rich area for the study that stands within the entertaining environment, I have developed an interest in exploring how information architecture, (a key element in developing structured and organized web systems for users) will suit a larger industry while aiming at delivering the best user experience to the users. Therefore, this research represents my journey into exploring the elements of information architecture in Ion Fury.

Based on the guidelines provided by Bitsch Olsen & Pedersen (2005) and Aalborg University's requirements for the Information architecture master's program, I have formulated the following question, which will be answered by following suitable methods and theories later in the project:

What is the effect of Information Architecture (IA) on user experiences in a game like Ion Fury?

Moreover, the following sub-questions will support the main research question during the process of research:

Sub-Questions:

- *How does UX complement IA?*
- *How can the quality of user experience be measured in FPS video games?*
- *What makes users stay engaged in playing FPS video games for an extended period of time?*

2. Theory

The following chapter will start out by describing the two main fields that the project is following, information architecture and user experience, and how they complement each other in the process of research. In addition to these two fields, I will also discuss the current research that has been done so far and elements that can be used from each field in order to empower the research and solve the problem statement. In order to empower the research, a description of the chosen methods for collecting and analyzing data will also be presented. Lastly, to ensure a better understanding of the process, a framework of how the project has been conducted will be described by presenting a visual overview of the project.

2.1. Literature review

To ensure a suitable research to the study, a literature search has been done. The main purpose of this stage in the process, is to better understand where the two main fields for this project, Information Architecture (IA) and User Experience (UX), stand in the field of academic research and available information, therefore to find out what has previously been discovered, what steps have been followed and what there is left to find. Lastly, it is important to find out how the two fields can be compared to each other or how they complement each other for better results.

Looking into Golash-Boza (2015) and Bryman (2012), I will follow the guidelines presented by them which consist of several steps on how to conduct an effective literature review. The study is based on a rather narrative review approach than systematic review, due to the fact that I am looking for the existing literature and

research in the field. Thus, I am trying to add knowledge to my research through the research that is already existing. The first step suggested is based on deciding the area of research and staying focused on it by choosing only the books, articles, journals from the chosen area of interest, even if there might be temptations in getting distracted by other books, articles or journals that are similar to the chosen subject.

The next step is based on taking notes while reading and looking for keywords that can be used later in the process. Based on the identified keywords which are connected mainly to the research question, a check throughout the suitable databases such as: ACM Digital Library, Google Scholar, AAU's Library is the next step. Further, a check of abstract and conclusions in regards to the research would be followed in order to check their relevance for the study. Lastly, during the writing period of this process, it is vital to always look for updates: new papers, publications, and journals in the field, in order to have the latest inputs. For this case, Youtube and online platforms such as Steam, represent powerful research tools due to a powerful community, where people tend to be on top of the latest news within the entertaining environment, where my area of interest lies.

The process is beneficial in improving decision-making skills while conducting the research, as well as fulfilling and adding knowledge within the fields. Furthermore, the main goal of this section is mainly based on comparing fields of the two chosen subjects individually at first.

Lastly, I will address the current research that has been done based on the combination of the fields as working together, in a combination to my understanding of both fields within the subject, and how the IA and UX fields working together could, or are delivering the best experiences for the users.

2.2. History of technologies

Being a key part of the change and evolution to these days, computing technologies have helped humanity evolve from one day to another. Their purposes are meant to help us store tremendous amounts of data into systems, create digital materials that can reach a tremendous amount of people from all over the world in a short period of time within just one click ('The evolution of technology: past, present and future', n.d.). They have helped humanity improve communication, create new challenges, curiosities, creative ways of thinking and so on.

However, the entertainment industry focused on video games, has a longer history which started in the 1940s, with a system created by mathematics teachers ('The history of gaming: An evolving community', n.d.). The game followed simple rules of mathematics with the focus on take-aways, and it was mostly designed on home systems, representing physical objects such as matches. Later, the gaming industry started growing and implementing new technologies and systems such as Atari, Nintendo, SEGA, and of course, the Personal Computer (PC). As home gaming became a trend, the gaming industries were booming as well. Since the early 2000s, the possibility of choosing what computer processor to use, the graphics which constantly evolve, as well as the gameplay, the colors or the gamification process are now limitless.

The internet has given access to a completely new world of wonder and possibilities. Using the internet as a base, the technologies have discovered new ways of reaching out users while delivering platforms and consoles were designed to suit their preferences ('The history of gaming: An evolving community', n.d.). The emerging technologies reshape the education, face-to-face interaction, the way we think, observe and act, leading to cognitive depth, meaning that nowadays we are able to observe, analyze and understand how users interact with the products, their reasons, understandings, feelings, etc.

Having an understanding of how computing technology was created and how it helped humanity evolve, the next step would be focused on Information Architecture and User experience as individual fields and later, how the fields are used together in video games, mainly, the First-Person-Shooter genre.

2.3. **Information architecture***.*

The term: *information architecture* has been used for the first time by Richard Saul Wurman in the mid-1970s, with a high focus on the design of information (Resmini & Rosati, 2011). However, information architecture has represented a high interest in research, but under a different context which was focused on studying systems and it was defined as: *"the conceptual structure and functional behavior, distinguishing the organization of data flows and controls, logical design, and physical implementation"* (Resmini & Rosati, 2011, p. 34). According to Amdahl, Blaauw, & Brooks (1964) information architecture has gone through many different stages of development and identity during the years, and it was formed of key parts of information in organizations since it has been created within multiple fields such as: information science,

management theory, knowledge management, object-oriented methodologies etc. (Evernden, 2003).

In their book, *"Information architecture for the web and beyond",* Rosenfeld, Morville, and Arango's (2015) understanding of IA is that it *''represents the combination of organization, labelling, search and navigation schemes within websites and intranets''* (Rosenfeld et al., 2015, p. 4). Its structure and purpose is focused on facilitating the best ways to task completion with an intuitive manner, therefore the needed information can be found easily with the minimum effort and in a short period of time.

Moving on to the next important area of research, user experience is the other tool used in conducting the research in this project. The user experience (UX) term has been used for the first time by Don Norman with the purpose of covering a full experience between the user and a system, including, design, graphics, interfaces, physical interaction and more (Norman, 2014).

"I invented the term because I thought human interface and usability were too narrow. I wanted to cover all aspects of the person's experience with the system including industrial design graphics, the interface, the physical interaction and the manual. Since then the term has spread widely, so much so that it is starting to lose its meaning." - Don Norman, 1988 ('Where Did the Term "User Experience" Come From?', n.d.)

Following the trends, the term UX is still not well defined in its area, remaining a concept open for more studies and analysis. However, the main focus within the majority of the researchers and practitioners is based on the interaction between systems/products/concepts and users. For better results in identifying potential problems in time and deliver the best experience for the users, Nielsen (1994) had come up with a series of principles regarding UX by providing guidelines on how to lead a suitable evaluation of the product. The 10 heuristics are focused on the evaluation of the usability of a product, and they represent *rules of thumbs* which are not necessary based on strict rules (Nielsen, 1994). According to Budd (2007) the heuristics provided in the 1990s have been in need of improvement due to their lack of understanding modern technologies. Keeping the 10 heuristics provided by Nielsen in the '90s as a solid base, the new heuristics have been updated and improved, in order to better adapt to the new technologies (Budd, 2007). The heuristics will be used later in the project to conduct an evaluation of Ion Fury, while using the expert evaluation approach. The scope is to find information architecture elements while using UX principles, and understand their influence on the user's decisions.

Getting more in-depth within the two fields, there is a visible relationship between them: information architecture and user experience with technologies and users, indicating that the two fields could work together as a tool in providing the best experiences for users while providing full transparency and the best usability options.

Keywords and relevancy

Slightly adapted, the keywords for each subject were as follows: **User Experience (UX), Information Architecture** and **User experience in video games**. The results were very mixed and only a few papers have mentioned the 3 areas together. The search was mainly intended to find existing studies while putting together the two main subjects of the study IA and UX, and understand how they complement each other.

The following section will describe better the findings and how the subjects mentioned above work together as well as their relevance within video games.

2.4. Findings

It is important to mention that the found literature is mainly based on the perspective of website technologies, which shows how information architecture is adopted by the user experience principles, and how it provides an understanding of where information architecture stands in the process of user experience.

Information architecture has been identified as a priority for many organizations in the '90s, due to its revolutionary involvement in strategic and fundamental planning of information, resulting in effective systems (Brancheau & Wetherbe, 1986). According to Teng, Kettinger, & Guha (1992) information architecture is seen as: "*a high-level model of a set of databases configured to support the organization's value-adding business processes. The tabular, or narrative form and is independent of technology and current organizational structure*" (p. 83). It is understood that Information architecture represents a key point in developing information systems that ensure the performance and the effectiveness of a system.

When it comes to user experience (UX), there are multiple studies that are trying to define the subject as being complex and at the same time a vague concept (Hellweger, Wang, & Abrahamsson, 2015). UX has been understood as being subjective according to numerous experiments and it is considered to be "as *something* desirable, *though what exactly something means remains open and debatable*" (Law, Roto, Hassenzahl,

Vermeeren, & Kort, 2009, p. 719). Since the user experience field is malleable in its flexibility for adapting to different stages of research, UX becomes a subjective approach for studies which are based on the researcher's background and interests, mainly because UX is adopted in numerous exercises where the goal is to deliver the best experiences for the users (Hellweger et al., 2015).

In most research papers and reviews, when it comes to UX, *users, product and interaction* are often suggested, due to the process between these three dimensions. Having them working together under specific conditions and contexts, can influence how the user interacts with the product and how it evolves in the future (Hellweger et al., 2015).

I have looked into J. J. Garrett's (2010) "set of decisions" which provides a structured and visible figure or skeleton of how different elements can be put together in order to deliver quality products that meet the intended scope. J. J. Garrett's (2010) skeleton of five layers presents a process for the user experience development process, arguing that "*no aspect of the user's experience with your site happens without your conscious, explicit intent*" (J. J. Garrett's, 2010, p. 21), meaning that every step in building a system/product must be carefully designed and thought of.

The skeleton is formed of: surface, skeleton, structure, scope and strategy which supported a conceptual framework for creating and talking about user experience problems and the tools used in order to solve them. Each stage is dependent on the previous one creating a strong relationship between the different stages.

In the first stage, the Strategy Plane (see Figure 1, p. 13) consists of "strategic concerns" that aim to fulfill user's needs while using a product. The goal is to focus on understanding what users need and finding the right balance between them and the goal for the business.
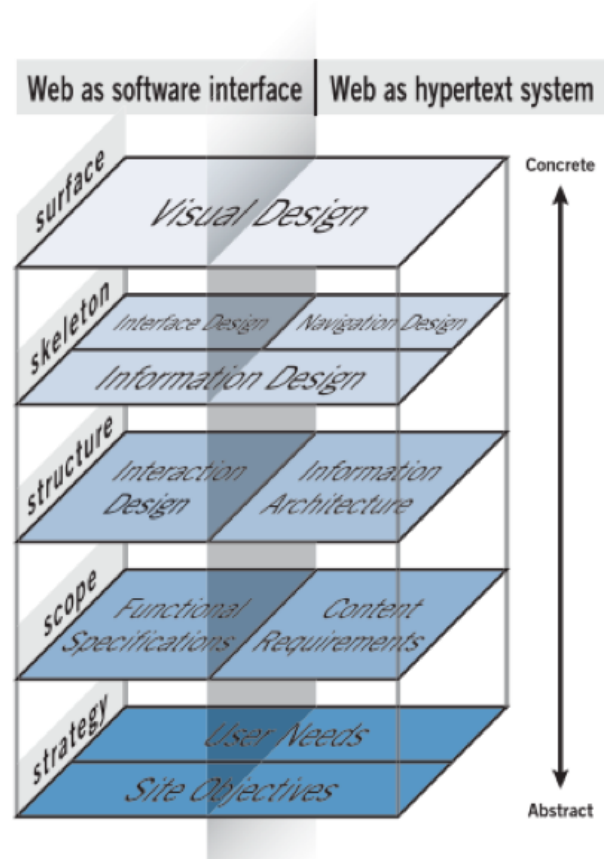
Figure 1- The five planes for UX, J. J. Garrett (2010), p. 33

I find it relevant also to mention the three circles diagram where the circles represent the users, content, and context within an adaptive information ecology (see below, Figure 2).
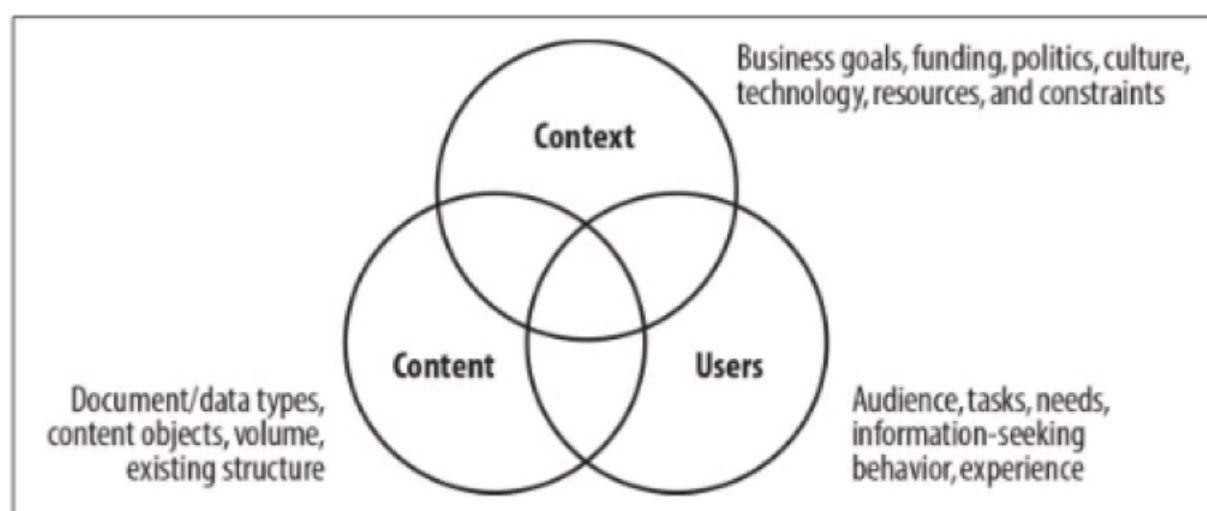
Figure 2 - Information ecology, Rosenfeld et al. (2015), p. 32

Information ecology allows the creation of a structured process of research; *"Good research means asking the right questions"* (Rosenfeld et al., 2015, p. 315). Information ecology shows how the elements presented by IA are also present in creating the

strategy plan which also extends to the next stage, The Scope Plane where the content requirements are being chosen. The three-circle diagram will be described in detail later in the project. Next, the Interaction Design and Information Architecture represent The Structure Plane, representing how the system should react to any commands sent by the user and how information is structured on the site while taking the four main components into consideration: Navigation, Labeling, Organization, and Search Systems. The process will be discussed in detail in the Process Overview.

Moving on to the next stage, the Skeleton Plane breaks down into three components: information design, interface design, and navigation design. The elements are more specific and more focused on defining each element that could deliver the best experience for the user while interacting with the product. Lastly, The Surface Plane represents the final design and interface where the user will make use for creating a full experience.

Having the elements of a system design well defined is crucial. However, as it was mentioned before, the stages of development of a product are dependent on each other in order to create a consistent flow of information. Flow has been identified as a crucial point, not only in web designs, but also in video games, especially FPS's. According to Nacke & Lindley (2008) the term *flow* together with *immersion* and *presence*, "*lack well-accepted common meanings*" (p. 81). To understand better what flow stands for in video games, a look into Csikszentmihalyi (1990) is required. According to Nakamura & Csikszentmihalyi (2009), being "*in flow, is the way that some interviewees described the subjective experience of engaging just-manageable challenges by tackling a series of goals, continuously processing feedback about progress, and adjusting action based on this feedback*" (p. 90). It is most probably adopted by each player, and its subjective state depends on finding the balance in completing a task and spreading challenges that have a low or high difficulty in completion.

I see *flow* as being the result of a good relationship between IA and UX and it could be the outcome created by the harmony between the two main fields of study: "*During flow, attention is freely invested to achieve a person's goals because there is no disorder to strengthen out or no threat for the self to defend against*" (Csikszentmihalyi, 1990, p. 3).

2.5. Conclusion

It has been seen before in multiple researches and experiments how the two fields complement each other in the process of building systems and delivering the best

experience to the users while taking into consideration guidelines suggested by both fields. I see information architecture being a strong and strategic base for UX elements and guidelines since information architecture provides clear steps and questions by using information ecology. I am inclined to believe that UX is still in need of more research and clarity since its subjectivity and flexibility could be always questioned and doubted by researchers.

However, combining the two fields together based on clear goals and guidelines could definitely deliver products that users expect. The performance, efficiency, and usability of a system could aim at reaching its users without encountering many obstacles such as system failure, missing information, wrong design elements, etc. The suggested literature helped me in identifying the advantages of using the two fields together for when one of them comes in short and can not proceed with methods and tools.

Having a deep understanding of how information architecture and user experience complement each other, it seems necessary to investigate how they are used in the video games industry, more specifically, in the First-Person-Shooter (FPS) genre. The rather limited availability of information where the two fields work together within the field of video games shows that there is a need for more research in the area. My goal will be to explore and observe how elements of IA and UX influence users in FPS video games.

3. Methodology

The following section aims at identifying suitable research that leads to data collection, analysis and interpretation of the gathered data. The importance of methodology can be crucial since it is constructed on strong beliefs and values that lead the researcher into following specific guidelines where the research approaches are established (Guba & Lincoln, 1994). According to Arbnor & Bjerke (2009) methodology helps in defining the paradigm concept which is based on "*basic philosophical assumptions that are of importance to practical research*" (p. 16) representing "*a conception of reality* (vision of the world), *a conception of science*, *a scientific ideal and ethical/aesthetical* aspects" (p. 16).

Following the research conducted by Mackenzie & Knipe (2006) it is understood that the reason for establishing the grounds of research is mainly to avoid pitfalls during the analysis conducted based on the research. According to Mackenzie & Knipe (2006) in their paper "Research dilemmas/Paradigms, methods and methodology" they describe

this process as: "*The theoretical framework, as distinct from a theory, is sometimes referred to as the paradigm*" (p. 2) which is based on Mertens (2005) and Bogdan & Biklen (1998) resulting into how the research is interpreted and understood later in the process. Therefore, the term can be defined in many different ways depending on the path of the research. The most known terms are represented by: research methodology, epistemology and ontology, knowledge claims, positivist (and postpositivist), constructivist, interpretivist, transformative, emancipatory, critical, pragmatism and deconstructivist (Mackenzie & Knipe, 2006).

According to Tracy (2010) a focus on how to improve the research quality has been in the centre of academia for years, based on a question that Lincoln and Guba (1985) asked twenty-five years ago: *"How can an inquirer persuade his or her audience that the research findings of an inquiry are worth paying attention to?"*(p. 290). However, it all leads to the well-known selection of research approaches: qualitative research, quantitative research and mixed-methods research (Cresswell, 2014; Maxwell, 2013).

The distinction between approaches is undeniably valuable due to how the research is influencing the study. Therefore, qualitative research is represented by an inductive strategy which is based on the amount of details provided by the interviewees and it can not be completely accurate due to its subjectivism implied by the responders. It relies mostly on interviews, open-ended questions and observations. Furthermore, quantitative research is keen to show precise and valid measurements that are key points in assessing the quality of the research. This could lean into generalizing the research by using methods and theories such as: questionnaires, statistics, indicators etc. (Bryman, 2012).

Creswell argues that the mixed-methods research is a suitable way of combining the two methods into creating a better understanding of the study and the problem. The mixed-methods research helps in avoiding limitations from both types of research by putting together data collection, data analysis, data interpretation and validity methods that suggest a suitable outline for the study (Cresswell, 2014).

In their research, Mackenzie & Knipe (2006) mention a multiple number of theoretical paradigms that are used in literature for defining the purpose of the research, such as: *post-positivism/positivist*, *interpretivist/constructivist*, *transformative* and *pragmatic* paradigms (Cresswell, 2014).

Looking into the different research paradigms, it is understood that the *postpositivist* paradigm is inclined into using quantitative methods for gathering data and analysis,

while in the *interpretivist/constructivist* the predominant approach is based on qualitative methods and theories. Lastly, *transformative paradigm* and *pragmatic paradigm* extends into having multiple opportunities for when it comes to research; such as: multiple worldview assumptions, qualitative methods, quantitative methods, therefore combining the two methods will lead into having mixed methods for the study. Nevertheless, methods and theories from multiple approaches are combined in order to find the answer to a problem (Mackenzie & Knipe, 2006; Tashakkori & Creswell, 2007).

For this study, I find *pragmatic paradigm* suitable due to the multiple choices for data collection, analysis and interpretation of the gathered data that will be used in order to find the answer to the problem. The chosen paradigm supports the mixed-method approach, elimination of boundaries and limitations provided by quantitative/qualitative research as individual methods. This could help in better understanding and solving the established problem (Cresswell, 2014).

3.1. Process overview

Choosing a framework for the project helps both in outlining the bigger picture and in providing guidelines into how to reach the settled goal, which in this case aims at finding out *the effects of Information Architecture on user experiences in video games.* The process can be long and painful and it requires careful planning, meaning that it starts with a phased approach where information architecture will be constantly refined and iterated due to the consequences and conflicts that IA meets when it deals with the real world (Rosenfeld et al., 2015).

In their book, *"Information Architecture: for the web and beyond"* , Rosenfeld et al., (2015) provide a clear and effective process overview which consists of different stages in the work process. The process shows the whole agenda upfront which provides clarity at early stages and helps in keeping the focus on what should be done in the future, leaving room for reflections and changes in the process of research (see Figure 3)
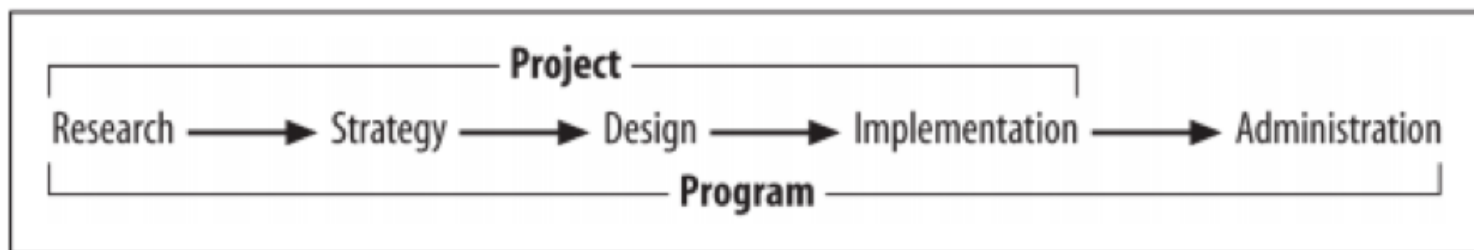
Figure 3 - The process of information architecture development, Rosenfeld et al. (2015), p. 313

The presented process consists of five different stages: *Research, Strategy, Design, Implementation* and *Administration*.

Being an agile model with no clear and definite lines between the stages, gives the possibility to adapt the model to only the necessary stages. Therefore, for this project, only the first two stages will be used out of five and they are represented by the: *Research* and *Strategy*. The first two stages aim at visualising and understanding the connection and the effects of information architecture in users experiences in the already existing FPS video game, Ion Fury, rather than designing, developing and implementing a new highly functional prototype for a website or video game.

The last three stages of the overview are represented by *Design*, where the focus is on designing sitemaps, wireframes of the product getting the product ready for *Implementation*. However, *implementation* and *administration* are both focused on testing the design as the system is being built and constantly evaluating and improving new errors, troubleshooting etc., focusing on delivering an effective and "*a good information environment*" (Rosenfeld et al., 2015, p. 315), using the user's feedbacks and inputs.

Research

Research in this project is represented by understanding the current situation on the market including trends and new developments, together with the company's goals and visions. The stage aims at understanding not only the business context and background materials but also the existing audience and their needs and expectations while using the product. In order to get more in-depth, there is a need for *information ecology*, which is defined by Nardi & O'Day (1999) as "*a system of people, practices, values, and technologies in a particular local environment*" (p. 49). Therefore, Information ecology helps in defining the content, context and users for the research stage by creating a

constant balance research approach created by the choice of various mixed methods (Rosenfeld et al., 2015).

Strategy

The second stage in the process takes into consideration outcomes from the research and analysis and provides a foundation for the future development of an information architecture strategy. However, the phase of strategy in this project aims mainly at underlying and highlighting how the components of IA affect the user's choice and experiences while playing FPS.

As stated before in Research, *information ecology* represents a key point to the research phase. As Rosenfeld et al., (2015) stated: "*Good research means asking the right questions.*" (p. 315) In order to do so, the three-circle diagram provided by Rosenfeld et al., (2015) helps in finding a balanced approach to the research by organizing and finding the tools and methods needed in order to achieve the answer to my problem. Figure 2 (p. 13) represents the model suitable for "*practicing effective information architecture design*"; it also helps to "*illustrate the interdependent nature of users, content, and context within a complex, adaptive information ecology*" (Rosenfeld et al., 2015, p. 31).

Starting with the **Context**, it represents the organization's goals, mission, and vision, but also includes the staff, the culture of the company, the budget, ethics and so on. It is important to understand what makes them unique and appreciated by the users. In this case, the Context is based on how the company started and evolved since the 80s, following their unique strategies into keeping the users interested for so many years into the same genre, retro FPS. This stage is aimed at looking into reviewing existing material such as, sales, online mentions, understanding their community and meetings with the Vice President of the company. Alongside existing material provided by 3D Realms, there was a need for implementing benchmarking of a very important and iconic FPS game that was representing the start of the company and creating a trend that many people remember and cheer even today. The research meetings with the VP have provided insightful information about the history of the company, their target audience, goals and reasons for why creating and keeping an old style for their video games in such a competitive area of development.

Finally, the context represents an important key in my research, and understanding its unique points will help in preparing the strategy in finding a suitable answer to my problem.

According to Rosenfeld et al. (2015), **Content** is defined by *"'stuff' that makes up your sites and apps"* (p. 35). In this case, it is adapted to the content in video games, and it includes documents, images, audio, maps, applications, schemas, metadata etc. It is important for an information architect to understand the existing content and find a suitable solution for users in order to provide findability of the needed information since it represents a tool for tasks that supports the stimulation of the user. In order to proceed with the research in finding out more about the Content, some techniques were used, such as: *heuristic evaluation* for Ion Fury and *benchmarking*.

When it comes to the **Users**, they are the ultimate judges of the information environment provided for them (Rosenfeld et al., 2015). It is important that the built product reaches their needs and curiosities in an effective way and in a short time, otherwise frustrations might appear and the user will go someplace else or they will not buy/use the product. For my project, there is a specific target group which forms a strong community both online and offline which I studied in order to get more insights in regards to their needs and online behaviour when it comes to playing FPS games. This part of the research is based on the previous steps, Context and Content. It is important to follow the previous stages since they are dependent on each other in delivering the best outcomes for the research. There is a need for involving both qualitative and quantitative research methods, such as: interviews, questionnaires, and playthroughs where I can observe users playing, meaning that I can identify their needs while performing a FPS gameplay, and therefore, what thrives a good user experience.

Looking into the three-circle diagram and analyze the content, context and users in the information environment, provided the research unique and valuable information which is used in finding the answer to the risen problem.

Information ecology served as providing a better understanding of the research when it comes to people using a digital product that can be a success or a failure, depending on how aligned and balanced the three circles are.

3.2. Information Architecture

The following section describes the information architecture components, which are also called *"systems"*, and they are: organization systems, labeling systems, navigation systems and search systems (Rosenfeld et al., 2015, p. 23). Every system represents an important part in creating good information architecture. Information architecture is

not visible at all times but without it, a system is most likely to fail. The four systems are used mainly for creating the best web pages, applications, e-commerce sites etc., however, the four systems are adapted to my project which is based on FPS video games. They help in better understanding the importance of information architecture of a digital product which aims at delivering the best experience to the users by helping users find excitement, motivation, and reach their objective once they interact with the product.

Organization systems

The organization system represents the way information is organized and classified within a bigger system. According to Rosenfeld et al. (2015): *"We organize to understand, to explain, and to control"* (p. 97) which also gives context to users, helping them in finding and understanding the information easier. However, there are many challenges encountered when doing the organization of the systems, not from design perspectives, but also because information is represented by words, and words can be understood or have different meaning for each person, therefore developers must consider these facts when developing the menus for example, or saving areas, general options, settings, challenges in the tasks, levels of difficulty. etc.

There are two important parts in the organization systems, organizational schemes and organization structures. The difference between the two is that the organization scheme is focused on finding a logical grouping of items, alphabetical, chronological, geographical, etc. and organizational structures are defined by the relationship between the content and users (Rosenfeld et al., 2015).

The organization system helped in identifying the structure of what the game is built on, a simple and clear hierarchy that keeps the user under control by not offering too many options at the same time, avoiding confusion. And finally, the organization schemes are identified to be ambiguous due to its subjectivity, in the game is represented by the names of the episodes which are identified as a different location with different tasks, showing that the content was built by topic, identified here as *action level*.

Labeling systems

The next information architecture component is represented by the labeling system and its main purpose is based on describing the content in the information environment. Labels represent the obvious way of how the information is presented to the user by making sure that the information is clearly presented and sent in an effective way

towards the users. It helps the user to both: understand the information quickly and help in making a radical decision if they want to click on something or not, whether their needs are met by the specified categorization (Rosenfeld et al., 2015).

Labeling represents the direct connection between organization systems and navigation systems; it ensures an effective way by communicating the process of the information environment clearly. However, the chosen language must take into consideration the user's familiar terms when it comes to language and the understanding of a system in order to ensure the success of the system and help users anticipate the information the system is sending (Rosenfeld et al., 2015).

Labeling systems are categorized into two types of labels, *textual* and *iconic;* usually *textual* labels are found in many different variations, such as: headings (describing the content), contextual links (*hyperlinks* to send the user to another page with information), navigation system choices (creating different options that can be used for navigation, and index terms (keywords, text, taxonomies, controlled vocabularies, etc.) (Rosenfeld et al., 2015). When it comes to *iconic* labels, they are more present in the phone applications or websites with too much information available. Its purpose is to reduce the amount of information shown to the user, eliminating confusion and overwhelm. A suitable method in finding out what users prefer and if they understand the chosen labels for the game, when it comes to labels in FPSs, is through observations of the users while they play the game (Rosenfeld et al., 2015).

Looking into labeling systems and its specific requirements, helped in identifying the type of labels present in the game. Ion Fury consists of both textual and iconic labels for presenting the information environment. The labels are used very strategic and help the user by keeping a minimalistic and clean design of the game. Since the game is an FPS on PC, PS4, Xbox and Switch, both types of labels are equally important for the user to identify. Therefore, heuristic evaluation and observations represent the best method in gathering information on how users perceive the existing information/options available for the play.

Navigation systems

The navigation system represents a more technical component compared to the other three. Its purpose is to help people navigate successfully within the information environment which has already been prepared for the users. Compared to the sitemaps and online websites, in video games in order to ensure a good navigation system, it

requires available maps of the levels as an option to help the user go through the game successfully (Rosenfeld et al., 2015).

When designing the navigation layout for a game, an important factor to take into consideration is the different consoles that users prefer. According to Rosenfeld et al., (2015): *"Different operating systems provide standard mechanisms that define how people get around inside apps."* (p. 179) and in this case, it is adapted to how people get around inside the different consoles.

The navigation systems have been a key point in understanding what methods and tools could be used in order to deliver the best experiences and a good flow of the game. The available map during gameplay gives valuable insights of how users could explore more in the game and reduces the multiple options in reaching the end of the game which could create confusion.

Search systems

Search systems represent the findability of the wanted product through searching. It is a powerful tool when it comes to having a lot of information available. However, this tool requires a lot of technicalities when it comes to indexing large amounts of data. Difficulties start showing up if the chosen words/labels do not match the indexed product, then the system will show zero results. There are different ways of solving the problem, such as creating information based on algorithms, numerical, alphabetical, topics, popularity, etc. (Rosenfeld et al., 2015).

However, this component does not represent a high interest in this project since this component is more suitable for a website where the information could be overwhelming for a user or representing a shortcut in finding a specific product in a large database.

The importance of information architecture components is based on their unique aspects on better understanding the user's needs and how their experiences could be improved during the gameplay.

The four components from which I use three, created a clear guideline on what must be taken into consideration for evaluating the existing information environment. The tools and methods which are used for evaluation of the information environment have been briefly mentioned within the information architecture components section and they will be presented and discussed in the following chapter in a more detailed manner.

4. Methods

The following chapter aims at explaining why the chosen methods have been selected, how they helped in getting closer to finding the answer to the stated problem, their contribution to my research and their outcomes. The methods have been carefully selected to guide me through the process of finding suitable results in my research and then make further decisions upon and interpret the data that has been gathered during the research process.

4.1. Heuristic evaluation

According to Rajanen & Rajanen (2018), heuristic evaluation is considered to be an inspection technique employed during the design process in order to evaluate the usability of a system or user interfaces. The evaluation involves a set of evaluators that have the right expertise and experience in judging the interface and its compliance according to usability principles. Usability is defined as *"the extent to which a product, system, or service can be used by specified users to achieve specific goals with effectiveness, efficiency, and satisfaction in a specified context of use"* (Rajanen & Rajanen, 2018, p. 159).

The heuristic evaluation can be performed by a single evaluator to find usability problems in an interface, since the inspection must be done individually in this case. The individual evaluation eliminates biased results and aims at unique results, leading to having more discovered problems. Using heuristic evaluation as a single evaluator is time and money-saving. However, when the evaluation is based on a single evaluator, there is a chance that the evaluation results in just a few outcomes compared to when the evaluation is done by 3-5 evaluators (Nielsen, 1994).

According to Nielsen (1994), a single evaluator is able to find approximately 35% of the usability problems in an interface. A single evaluator aims at running the evaluation of the interface multiple times in order to ensure the best results. When evaluating a system or an interface, the evaluator follows a set of guidelines (the heuristics) and note down encountered problems or issues. When finding an issue, the evaluator must be as specific as possible on why the encountered problem represents an issue. An important

aspect of the method is based on its flexibility of running it, since it does not require specific resources, making it easier to adapt it to a variety of products such as systems that detect errors. However, the heuristic evaluation is not a method designed to generate ways on how to fix the usability problems, but more to support and encourage a revised design that follows simple and intuitive interface principles (Nielsen, 1992; Nielsen & Molich, 1990).

The heuristics still represent a new evaluation method in video games development in general when it comes to the user interface, that requires the heuristics to be adapted to a mass market that is immensely valuable to the entertainment industry (Thomas, Schott, & Kambouri, 2003). The heuristics provided by Nielsen (1994), are highly criticized due to their broad view of how they could be applied on systems and interfaces these days. Furthermore, the method is not necessarily following the same guidelines that were provided in the '90s, but they have been adapted and improved to the video game industry where usability is crucial to ensure game acceptance, enjoyability, positivity reviews from the players, and ensuring the best user experiences (Rajanen & Rajanen, 2018). For this project, I will follow the heuristics provided by Budd (2007) where he has improved the heuristics according to the new technologies.

However, this evaluation method being changed and adapted to a new environment has represented a challenge for information architecture elements suggested for this method. Therefore, the elements of Information Architecture will be used to some extent to complement this evaluation.

4.2. Benchmarking

Benchmarking is what Rosenfeld et al. (2015) defines to be involving "*the systematic identification, evaluation, and comparison of information architecture features of the stuff in your information environment, such as websites, intranets, or apps.*" (p. 330) Therefore, it is a tool that helps in comparing two or more systems, products, business strategies, time that takes to achieve certain results to different tasks, etc.

The comparison can have results suitable for both qualitative and quantitative research based on what approach the researcher will take at this stage in order to get closer to the answer to the stated problem. Therefore, benchmarking can be *competitive benchmarking* and *before-and-after benchmarking*. The *competitive benchmarking* is based on looking at the competitors to what they are doing right, and adapting their strategies to your solution. It can be information architecture elements,

interactive design elements, UX strategies, new system approaches, etc. On the other hand, **before-and-after benchmarking** forces the researcher to look over a single system or information environment in order to evaluate and highlight the improvements that have been done in time. There are multiple advantages coming with this approach since it makes only what is important to stand out and look for improvements (Rosenfeld et al., 2015).

Even though both approaches represent unique aspects of evaluating a system and improving it, for this project I consider **before-and-after benchmarking** a better approach due to what 3D Realms based their most recent project, Ion Fury on, the BUILD engine and what made them popular in the 90's, by using old and unique elements such as: interaction with elements (broom, vending machines, chairs, toilets) that the systems back in the days were not able to support at a high performance.

4.3. Questionnaires

Questionnaires represent the approach that is taken usually by researchers in order to conduct a research process including: research objectives, choosing the right target, collecting data, analyzing data and interpret the gathered data (Bryman, 2012). Questionnaires are considered to be a quantitative method due to the type of information that can be gathered from them, such as: statistics, graphs, etc. According to Cresswell (2014) qualitative data consists of: *"predetermined methods, instrument based methods, performance data, attitude data, observational data and census data, statistical analysis and statistical interpretation".* (p. 45) Questionnaires can be very powerful if they are used correctly, due to the fact that they can be done online and reach a very large amount of respondents from many different parts of the world.

The method requires that the researcher has very good knowledge in understanding, calculating and interpreting data. However, according to Techo (2016) the qualitative method can be used as a strategic tool in studying the subject more in-depth and eliminating weak variables and better understanding how the results affect and help the research to achieve the main goal. Thus, questionnaires represent a method by which hypotheses can be tested (Bryman, 2012).

In this project, the questionnaire has been applied with the purpose of gathering general information of a specific target group, how users perceive FPS video games, what their understanding of a user experience in video games such as FPS is and how important elements of information are for them. The questionnaire was mainly distributed to

gaming online communities such as: Steam and Discord channels. It represents a particularly good method for reaching out to a high amount of users that enjoy playing video games. The target group is having a clear understanding of what matters in a video game in order to deliver the best experiences. With a well-established purpose in getting insights from users (their preferences for video games, their understandings and possible what matters and what does not really matter in a video game to be considered fun and enjoyable) the questionnaire followed close-ended questions, helping users choose answers from already existing options and open-ended questions where users could complete a question with their own words and thoughts. This method is preferred by most responders since it does not take too much time to complete and it does not require people to come up with complete and structured answers all the way through (Preece, Sharp, & Rogers, 2015).

Cresswell (2014) argues that the "*The choice of methods turns on whether the intent is to specify the type of information to be collected in advance of the study or to allow it to emerge from participants in the project*" (p. 45). Thus, for this specific project, the questionnaire helped in getting a deeper understanding of the users, completing the circle in the information ecology mentioned earlier in the project. It also provided me with a unique aspect that leans toward information architecture and user experience in video games, and it will be explained later in the project.

4.4. Observation

Observation is a method considered to be part of qualitative research due to the amount of knowledge that can be achieved during the research by observing people's behaviors and actions in certain environments and performing certain actions. According to Cropley (2002) qualitative research is seen as: "*defining differences among people in terms of "standard" variables that apply to everybody, measures how much of each variable different people have, and seeks to establish the existence of cause-and-effect relationships among the variables*" (p. 2). Therefore I have adopted the method during my research for a better understanding of how users interact with the product.

The method has been applied during Gamescom in Cologne where I have had access to a large number of people that wanted to try out the game. Gamescom is one of the biggest games events and trade shows in the world at the moment where gamers, press, and business are coming all together for trying different video games ('About ', n.d.). The method has been applied to a large number of people followed up with a few

questions when needed. The process consisted of taking notes and spending large amounts of time observing players during their gameplay on Ion Fury.

The method has proved to be valuable to the research since it brought into light unique aspects of the gameplay affecting users' experience while playing it. Thus some of the encountered potential problems have been discussed already with the team, some of the problems could be made on purpose by the developers that had a focus on how the build engine and the technology used to work in the 90's.

During observations, a few aspects that could help in solving the main problem for this project may have been encountered and they will be discussed in the next chapter of this project.

4.5. Interview

An important data collection method used for empowering the user and company's perspective about the matter is represented by the structured interview method. The method is considered to be a qualitative method due to the interaction between researchers and individuals, providing insights about their experiences and thoughts to the given subject. It helps the researcher build in advance the ground of the research and what the interview aims at achieving. It started as a structured interview with basic questions that help in gathering the necessary information for the study. However, during the interview, there was a need for adopting a more open-minded approach since the study requires to have as much information as possible (Bryman, 2012).

Therefore, the interview adapted a semi-structure approach, allowing me to have follow up questions to the interview when needed, encouraging the interviewee to give as much information as possible. The importance of follow up questions is to have a long conversation with the interviewee on the matter, compared to what a structured interview stands for (Bryman, 2012).

Finally, the process of this step has been prepared for the Vice President of 3D Realms that is a leader in game developing and publishing video games, in this case, Ion Fury. The interview was planned in time and the purpose of the interview has been clearly communicated to the interviewee. The method for carrying out the interview was approved by the interviewee ahead and it was carried out by using audio devices. The interview will be therefore transcribed and added to the appendix (p. 63) for reference.

The interview is then used for data analysis where an understanding of what the company stands for, their goals and values in general and for the chosen video game in this project, Ion Fury. It had also provided information about their target audience and their way of gathering valuable insights from their fans/customers, providing me with insights of the strong relationship that has been built during the years, VP's point of view on what is important in FPS's video games and not only, but also what people consider a good game experience which added to the research, it represents a supplementary data to the already gathered methods. Furthermore, the method added value to the research by getting in-depth information of the company and its target audience, fulfilling the three-circle diagram of users, content, and context.

4.6. User Experience (UX)

Lastly, user experience theory is taken into consideration for this project due to its flexibility in helping other methods fulfill their scope while delivering the best experience to the users. It has been stated earlier in the literature review that UX is in need of more research and studies. Therefore, in this project, it represents a key element in helping Information Architecture succeed in FPS video games research, such as Ion Fury.

The skeleton (Figure 1, p. 13) consists of five planes: Surface Plane, Skeleton Plane, Structure Plane, Scope Plane, Strategy Plane. This skeleton is useful not only for a website, but it has also become useful for a broader category such as concepts, principles, multiple services, etc. Nevertheless, this project is not focused on concepts but more finding out how information architecture can deliver the best experiences in video games. The skeleton is integrated into this project in order to understand how UX complements IA in Ion Fury and what other elements are needed in order to deliver the best results, such as: immersion, flow, and gameplay.

Finally, UX is applied in this project as a method that complements information architecture while offering a possibility to look outside the box for more opportunities that can make the project more empowering. The method provided new ways of looking at things and helped to establish an understanding of what is needed for delivering the best experiences, which can not be done by only one method or theory from a single field. It is focused on finding out more tools that complement each other if they are put together, ensuring a path onto the answer to the problem.

5. Analysis and Data collection

The following section presents the relationship between the information architecture phases and conducted research. A key element that has been prepared earlier in the study, *information ecology* is used to better interpret and describe the three-circle diagram: Content, Context, Users. Nevertheless, in this section, the main focus is mainly on the data that has been gathered during the research, interpretation, and outcomes of the collected data. Finally, the research findings lead the way to discover how Information architecture influences the user experience in video games. Therefore the research findings lead toward a strategy development where highlighting the importance of information architecture serves as a transition for better understanding the user experience in Ion Fury.

The best way to present the importance of information ecology is by starting out with the elements presented in the three-circle diagram. The first stage consists of **Context Analysis.**

5.1. Context

This is a strategic phase where unique information about the company's goals, mission, and vision are being well explained. It helps in getting a better understanding of where the company stands today compared to where they were a few years back and how they have evolved by still retaining their old target audience, while gaining a new one at the same time. Understanding the importance of all the unique elements that the company achieved during these years is important because based on that, the strategy of highlighting the importance of information architecture will be built. This will be achieved through looking into what made them popular back in the days meaning a look into one of their first FPS game, Duke Nukem 3D must be done, since they use the same engine and to strengthen the Context analysis, an interview with the Vice President of the company will also be conducted.

"The Build engine was truly the pinnacle of the 2.5D game engine period, which was kicked off with Id's Doom engine. Build went well beyond the features of Doom, with sloping features, partial looking up & down, rooms above rooms, and several other innovations." ('3D Realms is back!', n.d.)

Further, it is important to understand that the company's success, in general, is always based on the group of people that support the company's vision, mission and values. Therefore, the groups become strong communities where the same values are shared amongst companies and communities. For Wenger (2004) the communities represent: *"the group of people for whom the domain is relevant, the quality of the relationships among members, and the definition of the boundary between the inside and the outside"* (Smith, Hayes, & Shea, 2017, p. 211), meaning that a company such as 3D Realms has evolved tremendously by staying true to their core audience and by delivering products where people find themselves, where their childhood memories are coming back to life and where they feel nostalgia for the years that are now long gone. The community of practice is also involved in the process of development where they get to test the product in a preview campaign that is held long before the game is out for the public. The community of practice is part of the innovation process and contribute with knowledge in domain using their experiences within video games, that according to the VP, this happened during development in early access.

Interview

The interview represents a key tool in getting valuable insights within the context of the company's values and mission and everything else that is considered valuable through the interviewee's interpretation in regards to the subject of study. The interview was taken with the Vice President of 3D Realms who is also the executive producer and partner. The interview was following the classic structure at first, where the questions were prepared beforehand, ensuring a cursive flow for the interview which aimed at gathering insights about the company, target group, and Ion Fury. However, during the interview I adopted the follow-up questions, only when it was needed in order to get more in-depth information, leading to changing a structured interview method to a semi-structured interview method. It is however recommended by researchers to adopt a semi-structured interview method due to a more in-depth approach and helping the interviewee remember and reflect on certain aspects they do during development (Preece et al., 2015).

The interview helped in establishing the fact that 3D Realms was focused on releasing games that are based on retro shooter genre, First Person Shooter since the 90s when they launched Duke Nukem 3D, a very controversial and retro style FPS game. The company has not changed its style when it comes to retro First Person Shooter during the years, on the contrary, their core audience has grown playing these games.

According to the VP, Ion Fury brings back the nostalgia of the old games that represented a golden era for many children that are now grown-ups with families most probably.

Next, the interview established the fact that Ion Fury is associated to one of their most loved video games, Duke Nukem, where they chose to have the same technology, using Build engine, the same as Duke Nukem 3D, but adapted to the modern technologies where players can relate to the old video game styles, but adding more elements that increase joy in players, such as: more secrets, larger variety of enemies and weapons, more interaction with the environment etc. However, in a modern world where the competitors are more focused on the "wow" factor for their users, 3D Realms is focused on the *gameplay,* which was one of the key aspects of video games in the '90s.

Frederik Schrieber*: "The most important aspect is, in our opinion, the* **gameplay***. But these days most story-driven FPS are linear and non-multiplayer shooter as ours. They seem to focus much more on the story and the cinematic aspect of it and way less on the gameplay, which means how fun it is to play is not necessarily the main purpose. It is more about how extravagant they can make the visuals look and so on to make people say "WOW! This looks impressive!", but they don't really feel any fun playing it. It is just that they play through it and throw it away and then wait until the next game."*

Being part of an FPS retro shooter style, the Vice President of 3D Realms considers that Ion Fury should follow the same characteristics in what makes the game challenging and fun at the same time. According to the Vice President, there must be a natural flow in the game that ensures the best experiences for their players.

Another important element discovered is based on how 3D Realms is creating and conducting research for their games: "*I would not say that we did any scientific research or theoretical research…we were our research, we are the most dedicated fans of this genre...we just looked at ourselves and that is the beauty about a genre like this and industry like this…".* This indicates that there might be an opportunity for improvements that are focused on the user experience that is added to today's expectations. The research for this matter will be continued in the Content analysis later in the project.

However, it is worth mentioning that 3D Realms is having an early release on Steam where most of their core audience is present. Steam is a digital distribution platform from where you can buy games, organize them according to your preferences and not

only, but you can be part of communities that have the same interests as you ('Steam, The Ultimate Online Game Platform', n.d.).

In early-access users are able to play an unfinished game and give feedback accordingly. The company is involving their core audience in the early development in order to ensure a stable future for the product by listening to the user's feedback and making the necessary changes before the complete release of the game.

As an outcome to the interview analysis, I understand that there is a strong relationship between 3D Realms and their core audience, where people are strongly hit by nostalgia for the sake of the old days that they considered to be golden days. Nonetheless, understanding what the company is focused on when it comes to video games and the unique aspects of Ion Fury as a successor to Duke Nukem 3D from the 90s into these days, helped in establishing a solid ground for the Context stage that included the company history until the most recent release, Ion Fury. Another outcome of the interview consists of doing groundwork in analyzing the game and highlight the user's needs when it comes to ensuring and delivering the best experiences.

The interview has not only given a solid ground and understanding of the history of 3D Realms and what and how the company is running and creating their products, but it provided my research with valuable and unique elements that lead the research to the next step which is focused on the Content, out of the three diagram circles.

5.2. Content analysis

Moving forward to the next stage in the process of analysis, Content represents *"the stuff in your information environment"* (Rosenfeld et al., 2015, p. 323). In this section, an investigation upon the game itself is conducted by using Heuristic evaluation in order to find out what type of information is there missing that could improve the user experience. This stage is empowered by running before-and-after benchmarking on the first 3D video game, Duke Nukem 3D.

Heuristic evaluation

Aligning the findings and interpretation from the Context analysis, there is a need for employing an analysis of Ion Fury. This method is considered to be quick and cheap that helps evaluators follow a set of usability principles in order to find mistakes in the

running product that consist of usability and information hierarchy matter (Preece et al., 2015).

It is considered to be one of the most straightforward evaluation methods due to its simplistic approach and clear steps on how it is supposed to be used (Preece et al., 2015). The method, in this case, is used for an already finished product that is used already by the public. However, the method could be used also for products that are in development as well. Here, the heuristic method provides value to the research by getting a deeper understanding of what can be improved in order to deliver the best experiences to the users.

The method does not necessarily require users to be involved in the evaluation, therefore I am adopting the expert evaluation to evaluate Ion Fury and understand the information environment better. Compared to the classic evaluation method, this one does not require the evaluator to have an in-depth understanding of the users, context, etc. in order to be performed. The evaluators performing this method, adopt some heuristics that are not essentially assigned issues to specific problems. It is encouraged to use more than one evaluator in order to find a larger amount of error in the product or make evaluators debate their findings and argue about potential issues.

However, the expert evaluation will be run by me in order to find usability problems during gameplay and observe how the elements of information architecture are present and how they affect a move in the game.

As it is stated in the Context analysis some minor errors might be there on purpose due to the Build engine system that has been used in the '90s, but also because the gameplay back in the day was very basic and mediocre compared to nowadays technologies. During the evaluation, these elements will be kept in mind. Thus, the heuristics provided by Nielsen (1994) does not represent a good fit for this specific research, I have adopted the heuristics provided by Budd (2007) that bring a fresh and innovative approach to new technologies and they aim at better reflecting the current landscape. Due to their subjective nature, these heuristics have been adapted to a video game evaluation instead of web application development.

The heuristics are applied on Ion Fury where elements of gameplay, UX, IA and UI (user interface) are taken into consideration for improving usability and ensure the best user experience to the target audience. As Budd (2007) provided new and improved heuristics, I will create a table where the nine new heuristics will be used for the evaluation.

It is important to mention that the heuristic evaluation has been applied on Ion Fury Version 0.93 and the released version is 1.00. Improvements and small changes have been made from the time I made the evaluation to the time of its release. Therefore the evaluation will stand for the previous version based on the time I applied it and then reported some of the encountered issues to the team.

1. Design for user expectations	
2. Clarity	**X**
3. Minimize unnecessary complexity and cognitive load	**X**
4. Efficiency and task completion	
5. Provide users with context	
6. Consistency and Standards	
7. Prevent errors	
8. Help user notice, understand and recover from errors	**X**
9. Promote a pleasurable and positive user experience	**X**

The heuristic principles that have been marked with red cross do not fulfill the design principles or there is room for improvement which could improve the user's experience during gameplay. However, the heuristic principles will be presented and discussed in the following paragraphs, including positive and negative findings.

1. ***Design for users expectations:*** aims at having features and functions that the target audience is most familiar with and are comfortable with. Nonetheless, the user interface should help the user not to get lost in the gameplay or have the elements of Information Architecture (Labeling especially) misleading the user into choosing an option they thought would do something else. Ion Fury is doing a great job at designing for user expectations due to its '90s look and feel, but not only, the limitations of an old technology such as BUILD ENGINE in 2019 where technologies have evolved tremendously for having such old technologies, still.

The choice, of course, has been made intentionally, aiming at bringing back memories and nostalgia to those growing up playing Duke Nukem 3D; Shadow Warrior, etc.

2. **Clarity:** Aims at offering a clear system for the target audience which consists of meaningful icons, symbols, natural language, etc. Ion Fury consists of familiar language and labels that fulfill user expectations when using them. As it is visible in the following picture, the first interaction with an object there is a text providing information on what action is needed in order to move forward, but not only, it gives a hint that this button can be used on multiple objects throughout the game.

Image 1

An encountered issue for this Version of the game has been identified in the menu. The Game Mode presents four categories in which is understood that those are the four different areas you can play. Here, there is missing some clarity on what are the differences between the areas, more exactly the look of it and how they differ from each other: mission, purpose, goals, etc. (see Image 2)
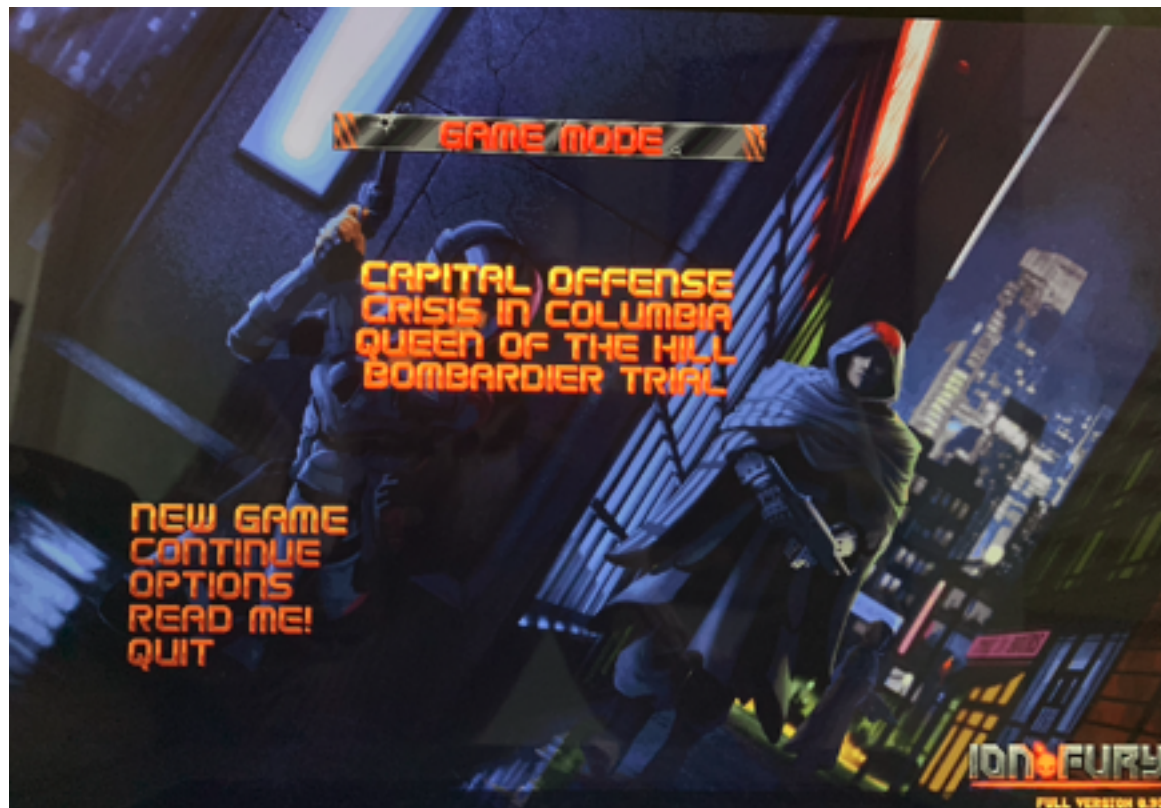
Image 2. Ion Fury: Game mode

The same goes with the "Select skill" menu page which is after choosing the mode you would like to try out. This does not represent the classic show of difficulty level which could lead the user being confused. The words selection aims at motivating the user to play different levels into the chosen mode of the game, but it does not make it clear that it represents the difficulty of the chosen level. (see Image 3)
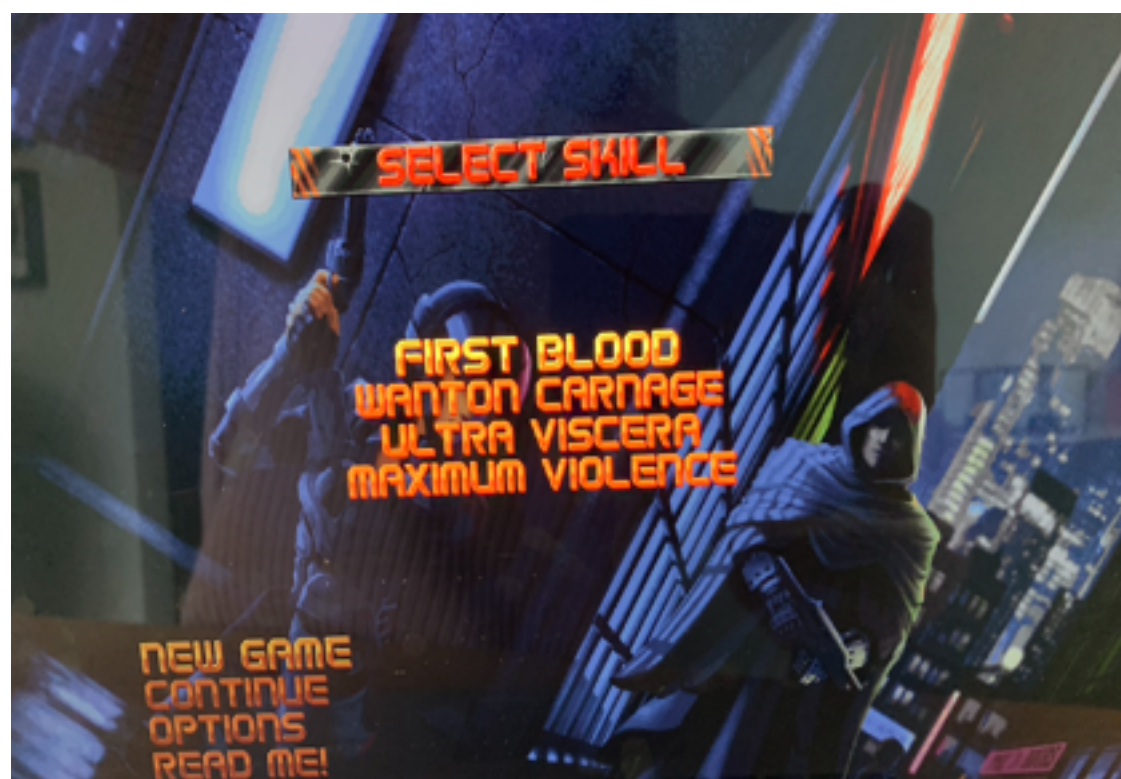
Image 3. Ion Fury: Skills (difficulty level)

3. ***Minimize unnecessary complexity and cognitive load:*** During this step, the focus is on the simplicity and minimum of information in order to help the user to accomplish a task. This can be done by using different colors, different sizes for objects or text in order to lead the user to the end goal. Ion Fury as it is shown in the first heuristic, had used one sentence that gives broader information on that a single button can be used to interact with the objects throughout the game. Due to its minimalist design and information architecture constraints, I have noticed that there is no information on how to effectively use the main gun, the Loverboy. It can be used to mark more than one enemy, thus when you shoot, all the marked enemies will be shot at once. Another effect of having minimalistic and limited information is that the health kit can be used in critical condition when you do not have much life left; it is not shown that by using the right click of the mouse you can use the health kit and survive in a critical situation.

4. ***Efficiency and task completion:*** This heuristic is focused on ensuring that the user is the one who benefits from a successful system. In order to achieve that, the system must offer flexibility to the user to make the necessary changes by making the default options, flexible enough for the user preferences. Ion Fury not only allows users to invert and change controls in a simple matter from a default version, or having autosave when going through a map, but it allows to manually save the game when the users feel the need to do it. Another effective aspect that Ion Fury delivers is based on Secrets. The walkthrough between the maps allows the game to inform the user how many secrets are left in the area they have just been through just in case that the user would like to find all the secrets. In case you find a secret, the game lets you know what secret have you found as shown below in image 4.

Image 4. Example of Found Secret

5. ***Provide users with context:*** This stage aims at providing the user with a sense of context and space. It is based on the system letting the users know what they can do and where can they go next. In a video game such as Ion fury, for this specific case there is an option provided for those who are more comfortable in using maps as an overview of the game, showing the discovered areas and giving a sense of where the user could go next. Another method is the way how the levels are built. They provide users with guidance on where to go, or what object they are missing in order to move forward in the game, for example key cards.

6. ***Consistency and standards:*** This step is focused on making sure that the system reacts in a predictable way such as common action as shooting, how to change weapons, selecting weapons, which Ion Fury does flawlessly due to its simplicity and retro style that users are familiar with already.

7. ***Prevent errors:*** aims at supporting the user with needed information in case an issue pops up. It can be done through informal text on what the problem might be or options for how to deal with the problem. In this case, Ion Fury has gone through QA protocols that have to be accepted ahead in order for the game to be released. Besides providing information for installation on Floppy Disks (with USB integration) and general information on Steam and Ion Fury webpage, there

is also a channel on Discord that is available for anyone that has found any bugs in the game and they can report it directly to the developers.

8. ***Help users notice, understand and recover from errors:*** this step compared to the previous one, helps the user recover from an error of the system or mistake in the game. Here I had the focus on flow in the game which aims at helping the user find their way back or forwards in the game in case they get lost. During the evaluation, I have noticed that the maps are carefully designed to get the user through the game towards the final boss, but it also gives space for exploration. This could confuse the user due to the large spaces and maps. In case the user gets lost, the game sends enemies in your way, helping you find the right way. Here a problem can be identified; if you spend too much time exploring or being lost, the enemies come your way and after you eliminate them, the path remains empty, making the user think that they have been in certain areas already. In this case, there might be a need for an extra tool that helps the user to completely recover from a situation where they got lost.

9. ***Promote a pleasurable and positive user experience:*** lastly, this step is mainly focused on making sure that the user's expectations are fulfilled, by delivering a product that the users wished for. Ion Fury could not be more than the '90s shooter retro style than this. The technology that has been used is the same as the classic Duke Nukem game; the enemies, design, and levels fulfill and bring back memories from the old times.

The expert heuristic evaluation has proven to be valuable to the research due to its strategy of leading the evaluation. It has provided me with a better understanding of the content of Ion Fury and what is valuable for successful gameplay that insures a coherent flow and ensures a standard product that achieves users expectations. However, this evaluation is not focused on technical bugs, but mainly at understanding and observing where information architecture has been applied, what is the use of it and how can it be improved in order to help the user, ensuring great experiences. The weaknesses of this evaluation consists of a lack of standard guidance on how to deal with encountered issues. Thus, I have used my knowledge in the field to address them and find suitable solutions for some of the problems and they will be addressed in the Strategy phase, later in the project.

Benchmarking

Having the heuristic evaluation applied on Ion Fury, there is an interest in looking for retro shooters that the game is based on, and that is Duke Nukem 3D. Benchmarking stands as a supporting tool for another system and/or product and provides opportunities for comparison or assimilation upon products, in this case, two classic first-person shooter video games. The tool provides an overview of how the information has been exposed to the users, the graphics, levels guidance, how much help had been offered in the old systems compared to the new ones and so on. There is a need to know how similar the games are and how Ion Fury has become better from an Information Architecture and user experience point of view.

For this step, I will make use of online articles from journalists, YouTube videos, Steam page, and playthrough for a better understanding of what the audience loved about Duke Nukem back in the 90s. The resources online are proven to be valuable by having credentials and experience within the field. A short gameplay has also been performed for getting the feeling of playing a retro first-person shooter these days, and of course, understand how the information has been shared and organized for such game. Another important aspect aims at highlighting the user experience while playing the game and usability.

Having a Duke Nukem 3D playthrough helped in getting an overview of a culture that has such a long history. Looking for elements of information architecture I have noticed that: **Labelling** is simple and clear, providing the user with the minimum information bun in an effective way. There is information provided when you pick up health kits (which type you pick up and how much health it is added), the guns you pick up and the loads for what type of gun you have just found. The minimum information, in this case, allows the user to eliminate the information load and stay updated on what is needed, for example: key cards, different colors for different doors. **Organization** of the information is made very strategically. It shows up only when needed, such as: informing the player what card they need for specific doors, and the information is shown only when the user is in front of the door. Another important and unique point is that at the end of a level, there is a result page where you can see how much time you have spent on this level, how many secrets have you found from the total number, how many guns you have had and so on. Moving on to **Navigation**, I am mainly focused on elements of the game that help the user reach the end goal, which is to finish the game. The levels are simple and straightforward, leaving a bit of space for exploration, such as, finding as many secrets as possible. Lastly, looking into **Search Systems**, for Duke Nukem 3D while avoiding any technical approaches, I have noticed a strategic element that is visible to the user at

any time, during the play (more imagines, appendix, p. 92). There is a bar that shows an overview of the play, keeping the user informed of health, armor, weapons including their loads, etc. (see Image 5)
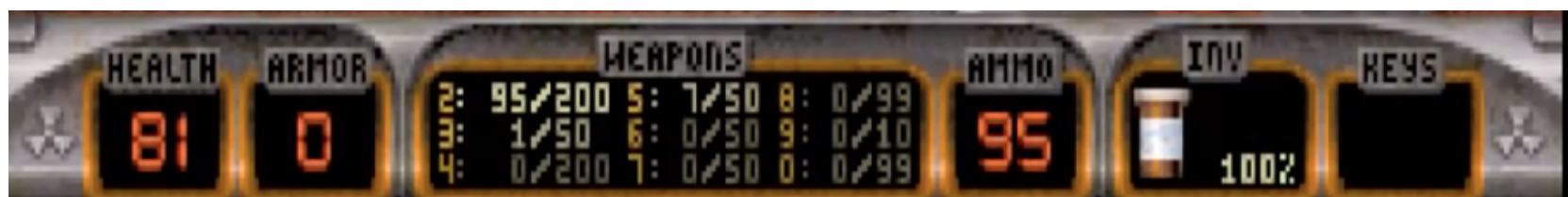
Image 5. Duke Nukem 3D, Inventory list

Making use of Before and after benchmarking between Duke Nukem 3D and Ion Fury, helped in understanding and getting a feeling of what it was like to try 3D video games with their unique features in the '90s. Before and after benchmarking had the focus on what makes Duke Nukem unforgettable and enjoyable for a large audience. According to Eurogamer, Duke Nukem *"it still feels fresh, so no wonder our badly-hair cutted selves were so blown away back in 1996"* ('Retrospective: Duke Nukem 3D', n.d.). Since Ion Fury is considered to be a direct successor to Duke Nukem, the assimilation is completely visible, but not only in the gameplay, there is also the humor, the challenges, the playthrough, secrets that are hard to find.

"What this game does extremely well, is delivering the real classic FPS feeling: from complex level design riddled with ridiculously hard to find secrets, retro graphics style, fast paced firefights, to tough bosses, Ion Fury is a true homage to the classics of old from start to finish, to the point of sacrificing almost all elements of modernity to deliver an uncompromising old-school experience. This factor will surely please nostalgics, but at the same time younger players might be discouraged by it." - **Steam review** ('Ion Fury on Steam', n.d.)

An outcome for this step is that it allowed me to put into balance what was unique in a retro first-person shooter game and what Ion Fury kept and improved from Duke Nukem in order to achieve and please the users from these days by delivering high performance of the game and a great user experience. As Rosenfeld et al. (2015) explain, a benchmark is made in order to provide valuable data for creating a good user experience afterward. The method provides the researcher with a flexible approach when it comes to combining methods, therefore, I have used information architecture components and design principles that aim at delivering the best experience for the user, which led me to discover unique elements that allowed me to better understand

the content and context in retro-style games while looking into old (Duke Nukem 3D) and new (Ion Fury) games.

Lastly, having an understanding of the context and content of the three-circle diagram, there is one circle remaining and it is focused on Users. In order to make use of the gathered data, real users have been involved in the process of research and the process will be described next.

5.3. Users Analysis

As stated by Rosenfeld et al. (2015) users *"they are the ultimate judges of our information environments."* (p. 333) Understanding how powerful the user is, it is necessary to take them into consideration early in the development, making sure that their needs, interests, and motivations are met when the product is finished. Since this project is done on an already done product that is available for the public, the adopted methods aim at better understanding how they interact with an existing and finalized product and what can be done in order to deliver the best user experiences.

The research has begun by gathering information from the company from their online forums and websites such as Steam, meetings with the target audience at events such as Gamescom in Germany, online sources, research meetings with the vice presidents in order to get as much data as possible and understand who the users are. The meetings have brought unique elements on what the target audience values most in video games such as retro first-person shooter. This stage of the project had to be seen through the eyes of the audience that is a fan for decades, ensuring the research with effective and valuable data for the later on phase, the strategy.

As it is seen in data collection, the target audience is not based only on the users that have been playing Duke Nukem as children, but also those who play it these days. Ion Fury aims at attracting a larger audience with a large variety of ages and this can be seen next in the analysis.

Questionnaire

The research for this project began with a questionnaire that aims at better understanding the users and getting a general idea of who they are, what their preferences are in the video game genre, how much time they spend on video games, what is a good user experience in their opinion, what they value the most in a video game, what their inputs are, into how much information could be considered enough. The focus of this method was to get insights into demographic data and users' opinions.

The questionnaire has been shared online on different platforms that consist of 3D Realms target audience and more. The online sources considered for this stage are Steam and Discord due to their popularity amongst video gamers.

I find it relevant to briefly explain what Discord is due to a new term introduced late in the project. Discord is the open channel where people with the same interest in video games can talk about events in video games, report problems and thoughts in regards to videogames. Discord has helped users to create strong communities where they share the same passion and thoughts.

The questionnaire has been carefully planned, representing the first round of data collection that aims at understanding the users and their understandings in the information environment, in this case, video games. The applied questions include the mixed-method approach that consists of closed questions where the user can just check boxes with a predefined answer and open-ended questions where people are encouraged to complete a question using their own words and thoughts. The reason for having a mixed-method approach, is that its aimed at reducing complexity and save time of some of the answers and allow users to focus on the questions that involve more in-depth answers.

The questionnaire extracted information from 23 responses about the target audience ages, which is in the range of 16-35 years old. The numbers could differ taking into consideration that the 3D Realms audience might not even be present on these online platforms, since according to the interview with the Vice President, some might work and have families, resulting in having not so much time left to spend on platforms such as Discord and Steam. However, the results show that 17 responders prefer FPS action genre, while the rest would consider adventure games and RPG as second choice, based on the results. Next, 21 responders prefer playing on their PC instead of other consoles such as: XBOX, PS4, Nintendo Switch, etc.

This information has created a solid ground for what the audience needs in terms of their preferences, creating a potential link to the fact that this audience could be interested in playing Ion Fury in the future.

The second step was to determine whether or not elements of information architecture considered by the player are important or not, what elements could be part of information architecture. The question allowed the responders to mark multiple answers.

8 What are the most important aspects of a game in your opinion?

23 out of 23 people answered this question (with multiple choice)

82.6%	Responsive controls	19 responses
52.2%	Usability	12 responses
39.1%	Graphics	9 responses
39.1%	The Story	9 responses
34.8%	Challenging experience	8 responses
26.1%	Availability of the information elements	6 responses
21.7%	Clear tasks	5 responses
13%	Other	3 responses

The question is therefore enhanced by understanding how users perceive some information that is offered to them in a game and how much importance they have upon it. Therefore, the highest number consists of 6 responses which consider that the importance of the information hierarchy is somehow relevant but not the most important aspect in a game. Then, with 5 responses, users consider that the information is very important.

9 How important is for you the hierarchy of the information provided in a video game? (eg. menus, loading screens, multiple choices, etc.)   Avg. 6.6

23 out of 23 people answered this question

0	1	2	3	4	5	6	7	8	9	10
0%	0%	0%	4.3%	13%	26.1%	13%	0%	21.7%	4.3%	17.4%
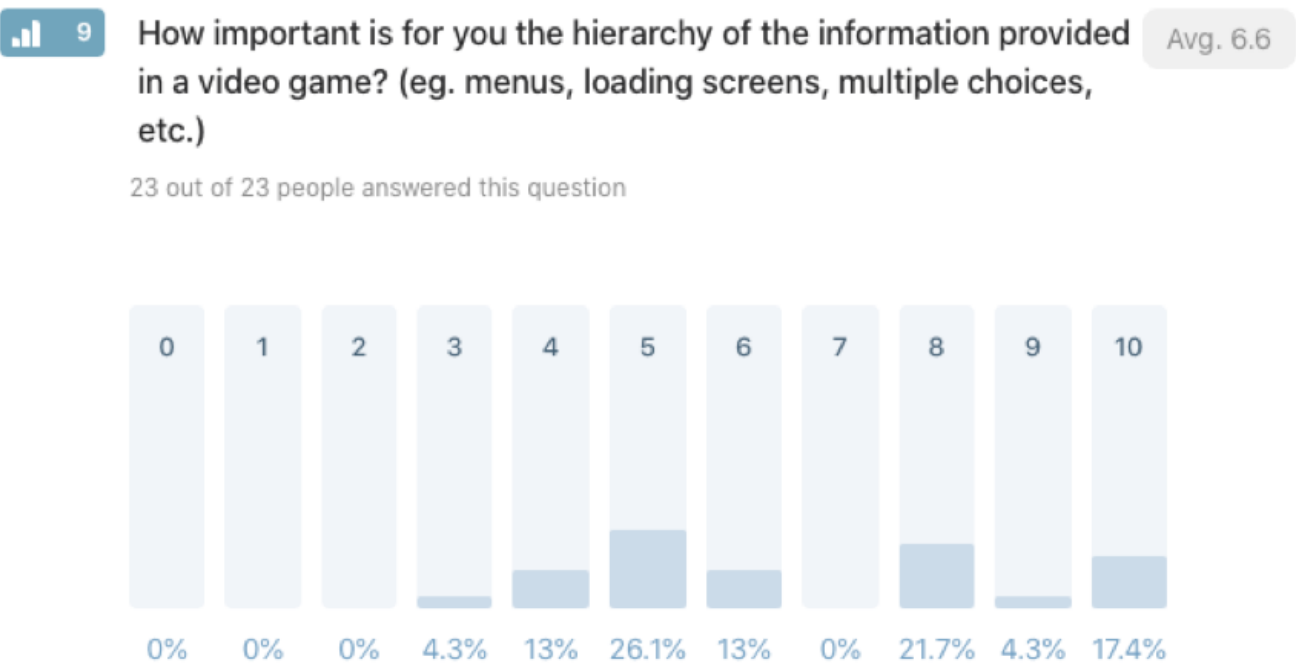
Moving on to the next step, it was important to find out what people's opinions and thoughts were, and what they considered a good user experience in a video game. For this question, responders have had the chance to answer with their own words where they can express freely their thoughts. The open-ended question encourages the user to give as much information as they feel in order to express and complete their answers. The responses can be visible in appendix, p. 73 or the digital questionnaire (https://andreeaburciu.typeform.com/to/VzXyvQ).

Some of the answers provide new insights and new knowledge in regards to what users need and what they consider to be a good user experience during gameplay. According to some of the responders, a good user experience consists of:

- *"World I like to explore, fun movement that lets me explore it, and some interesting enemy encounters with tight shooting mechanics"*
- *"Self-explained gameplay, challenging enough to motivate you, possibility to make the changes as pleased"*
- *"In my opinion a good user experience it's when a game it's easy to understand, and you actually get absorbed by it !!"*

The questionnaire gives value to the research since it brings new insights and new data that could be used for the information environments related to Ion Fury, therefore the information can be used in order to create a strategy for the projects that answers the problem for this project.

Observation

Another useful tool used in gathering qualitative data is based on the observations of the users on the playthrough of Ion Fury. The tool aims at observing people and listening to their thoughts and experiences after they have interacted with the product. The observation approach must be prepared carefully, based on what the purpose of the observation is. For this step, I have taken advantage of Gamescom, which was held in Cologne, Germany to adopt the Observations method on users that were interested in playing Ion Fury. The event allowed people to come to the booth and play as much as they liked.

There are multiple options in choosing what type of evaluation and observation should be used in different situations, depending on the goals (Driscoll, 2011). My goal for this step was to see how people interact with the game, see how they use their assets, observe how they react to different situations, their flow and lastly, what can possibly be

improved in order to deliver the best experience to the players. After observing them play, I have asked some of them to give me insights into how they think the game could be improved, and if something was missing in the game for them to perform at their best.

Therefore, the observation followed the "quick and dirty" approach as named by Preece et al. (2015). The approach gave me the possibility to see how users behave in their natural environments while taking notes of what I considered to be improved in the future in order to give more value to the game. Since the observing stage could happen at any time, I was present in the same booth with the users, which allowed me to casually help them if they were stuck, give tips on where some secret areas were or just to ask about their thoughts and gather feedback. The findings are based on some general aspects that I have observed during the four days of observing users play the game. I have created a table where I present my study process and general findings.

Criterion	Notes plus Camera	Findings
Equipment	Paper, Pencil and Camera	- People do not interact a lot with the objects (games-com can be a stressful environment since there are many people looking, waiting to play the game, moving all the time, loud and open spaces)
Flexibility of use	Very flexible	
Data completion	Taking notes only of what is important for the study	
Disturbance of users	Low	- users explore the areas, rushing through the game
Analysis	Rich descriptions can be produced for analysis and send feedback to the teams	- None of them opens the maps for getting an overview when they are lost

Criterion	Notes plus Camera	Findings
		- People do not use health kit because they get no info on how to use it and when
		- The swimming/sinking there is no info on how to do it
		- they did not know how to use the stick (the weapon) to generate energy and open doors
		- no one has used the multiple enemy selection for the Loverboy (the gun), they did not know about it
		- Pushing a chair is not that common for people to find secret areas
		- After you put the card over the machine, there is a need of extra move to open a door. It creates confusion since there is no movement or sign that you have to do something after you used the card
		- Some people get lost and they spend a huge amount of time in finding the right path
		- Some would jump off the building in the beginning of an episode just because the text provided is fun

The data has been collected in an open and public environment, however, the picture that I have taken of participants can be seen in Appendix p. 86. For privacy reasons, the pictures will show only their backs. Making use of the observation method, provided me with qualitative data that can be used to organize, categorize and then create a Strategy where user experience can be improved by making use of Information architecture elements. This step has provided an in-depth and rich understanding of the game while

playing Ion Fury. The phase has been supported with short conversations with the users, after they tried the game, providing an overview of how users perceive the game and what their thoughts are.

5.4. Overview

The following section is meant to give an overview of the findings from the applied methods and analysis throughout my research. Here, the challenges and the new knowledge that has been gathered during the research will be presented as well. Firstly, I have done the groundwork and literature research into finding out how Information Architecture is affecting the user experience in a video game such as Ion Fury. Later, methods and theories suitable for my research have been carefully selected in order to guide my research to achieve the end goal. Additionally, elements of information architecture and user experience have been used within the study in order to find out how the two individual fields can complement each other in order to give the best experience to the user while playing the retro first-person shooter, Ion Fury. Nonetheless, the unique elements that have been gathered throughout the research, will now be elaborated upon and presented with a potential approach that could improve and deliver the best experiences.

Before presenting a strategy that shows how information architecture affects the user experience in first-person shooter video games, of all the methods and tools that have been applied in this project in order to gather data. Analysing it will be the next step.

The first stage of the research has been focused on understanding the company's goals, vision, and mission. Thus, this has been part of getting an in-depth understanding of the Context and how Ion Fury has come alive. The interview provided insights that had to be kept in mind when making the next research steps due to how things have been used in the game, aiming at satisfying the core audience by bringing back nostalgia and memories from the '90s. The interview has also provided insights the target audience, their needs, and preferences in regards to retro first-person shooter video games.

Having a solid base of the Context, I have continued with my research towards Content, which is the second circle in the three circles diagram presented earlier in the research. The first approach in this stage was to apply the heuristic evaluation which established that Ion Fury followed nine new heuristics which were closer to the information environment I was studying. However, I discovered that only 4 out of 9 heuristics are present in the game, not necessarily missing completely, but they could be improved in

order to improve the user experience in the gameplay. Therefore, the encountered heuristics represent key parts in developing a strategy for improving the user experience in Ion Fury.

Moving on to the next step in creating a complex understanding of the Context, I have used the before and after benchmarking. The method was adapted to a new approach which aimed only at looking at information architecture elements, understanding the gameplay and what the nowadays retro first-person shooter, Ion Fury has kept from the first 3D game, Duke Nukem, since Ion Fury is considered to be a direct successor to Duke. The before and after benchmarking made it clear that not only a strategic information environment, a good story, information architecture elements are important in a video game, but also what the target audience needs and what they wish for. As Rosenfeld et al. (2015) stated, benchmarking is used only to deliver the best experiences for the target audience afterward.

Lastly, the ultimate circle is represented by the Users. They represent the most important step and the key element in my research. Looking carefully into what their personal interests, information needs, motivations in playing a video game such as Ion Fury, has led me to find unique data. This stage was supported by both qualitative data and quantitative data which ensured the best results for the research.

The first step in gathering information about the users was a questionnaire that aimed at getting answers from all over the world in a short amount of time. The questionnaire has brought a few general findings such as their preferred genre in video games, ages and how much time they spend on playing video games on average, which aimed at confirming the target audience declared by the company. Next, the questionnaire helped in finding how users perceive the information available on the screens for video games and how important this might be for them. Lastly, making use of open-ended questions and multiple answers options, helped in getting the users to use their own words and thoughts in what they consider a good user experience and what is important for them in regards to what is a good game.

Lastly, the observations represent the last step in delivering qualitative data for the research in regards to the users. By qualitative method, in this case, is referred to how the data has been gathered. The observations proved to be valuable to the research due to the fact that the observations have given insight on the users and their behavior, while playing Ion Fury getting in this way a new perspective upon the research and new knowledge into how users perceive the game. Observing users play the game, some issues have been encountered and noted down for further research. For more in-depth

answers, I have talked to some of the users to find out how their experience while playing Ion fury was, if they felt that something was missing, challenges, etc. This information has been essential for the strategy plan.

6. Strategy

In the following section, a representation of the learned lessons and data about the subject in the study will be presented in a comprehensive storytelling. Data can be presented in different ways, but the information must be clear and manipulated in an effective way for the readers and interpreters.

"Text is the principal method for explaining findings, outlining trends, and providing contextual information. A table is best suited for representing individual information and represents both quantitative and qualitative information" (In & Lee, 2017, p. 267).

Therefore, I provided my results in a table where the sections will show the problem I refer to on the under findings column and how could it be improved, will be presented in the *implementation* column.

Findings	*Implementation*
The game mode does not include clear information on the fact that the four choices provide different areas for playing (Heuristic evaluation)	The system should let people know how the four different game modes look like and what do they have to offer.
The Select Skill page does not give enough information to the user in regards to what it means or if it is the difficulty they choose (Heuristic evaluation)	A visual interpretation of the difficulty or expressing it by having the right labels

There is no information on how to use the gun (the main one, Loverboy) (Heuristic evaluation)	In case the main gun or other major elements could be used for more than basic shooting, there should be an implementation of tips and tricks into the menu which is more intuitive for users (health kits, multiple marks for shooting at once, swimming etc.)
Some users get lost and they spend a lot of time finding their way again. (Heuristic evaluation)	Implementation of section providing information on how to proceed forward or having the option to make use of helping tool, such as: steps to the next door, etc.
Overall information (Benchmarking)	Providing the user of its progress throughout the game after for a better overview of the game and how they evolved.
There is a need for extra moves for opening doors that is not always intuitive for the users (Heuristic evaluation)	There should be a light or text showing that something has happened after using a card or electric stick for the generator.
Users look for rewarding experience for progression on their platforms (Steam, GOG, etc.) (Steam community,appx. P. 89)	Implementation of options to combine old with new approaches. Old school games on new technologies and new platforms where users can benefit from getting rewards and improve their experiences.

This section helped in providing an overview of the main findings based on different methods and approaches that have been applied throughout the research. The multiple approaches have helped in leading the research to the point where I could create a strategy plan where information architecture elements meet new approaches and fields that help in delivering the best experiences in an entertainment environment such as video games.

7. Reflections

The employed methods have been a great help in better understanding the context and content of the chosen subject. However, the industry represents a successful and desired environment by many users these days, meaning that technologies evolve from day to day. Not only technologies must improve, but also designers, programmers, storytellers, level designers etc. The demand for better, faster, and special games is becoming higher and higher. Therefore, looking into the interview with the VP of 3D Realms, a unique point had stood up and that is: "*We only make games for ourselves which is so cool. We don't look at which target demographic would like a certain feature in the game or a certain type of game, we only think of "WOW! We would wish that this game existed when we were kids, so let's make it*". (Frederik Schreiber, VP of 3D Realms, see appx., p. 66) Thus, the entertainment business is flexible and open for creation, the meaning of the video game has high importance in how it will succeed. Another important aspect discovered from the interview was based on what would be the most important aspect to consider when delivering a game, and according to Frederik Schrieber, it would be the gameplay. (see appendix p. 63)

Being mentioned multiple times in my research, I find it relevant to explain more about it here. Therefore, I have got to understand that immersion, flow, and gameplay aim at denoting the quality of a specific game.

When referring to *immersion*, Nacke & Lindley's (2008) study – based on Ermi & Mäyrä (2005) developed three stages: sensory, challenged-based and imaginative immersion, meaning that users can get to feel connected with the game at a high level if the present elements aligned with users' expectations. Therefore, *flow* is developed. Based on Csikszentmihalyi (1990) flow is described as: "*holistic sensation that people feel when they act with total involvement*" (p. 4). This stage is based on users' skills in being engaged in a task and completing it, including the user's skills, what task is to be performed, how challenging are the tasks, feeling of enjoyment, difficulty of levels, etc. (Nacke & Lindley, 2008). Lastly, there is the *gameplay*, which is based on how people interact with a computer game. For a successful gameplay, Walther (2003) explains that many elements must be put into balance, such as: strategies, interactions that will, therefore, reward the user with joy and suitable challenges throughout the game. The following figure shows how Gameplay is the result of good balance and complementary stages between immersion and flow in a video game. One cannot exist without the other due to the fact that Gameplay is formed out of both, immersion and flow.
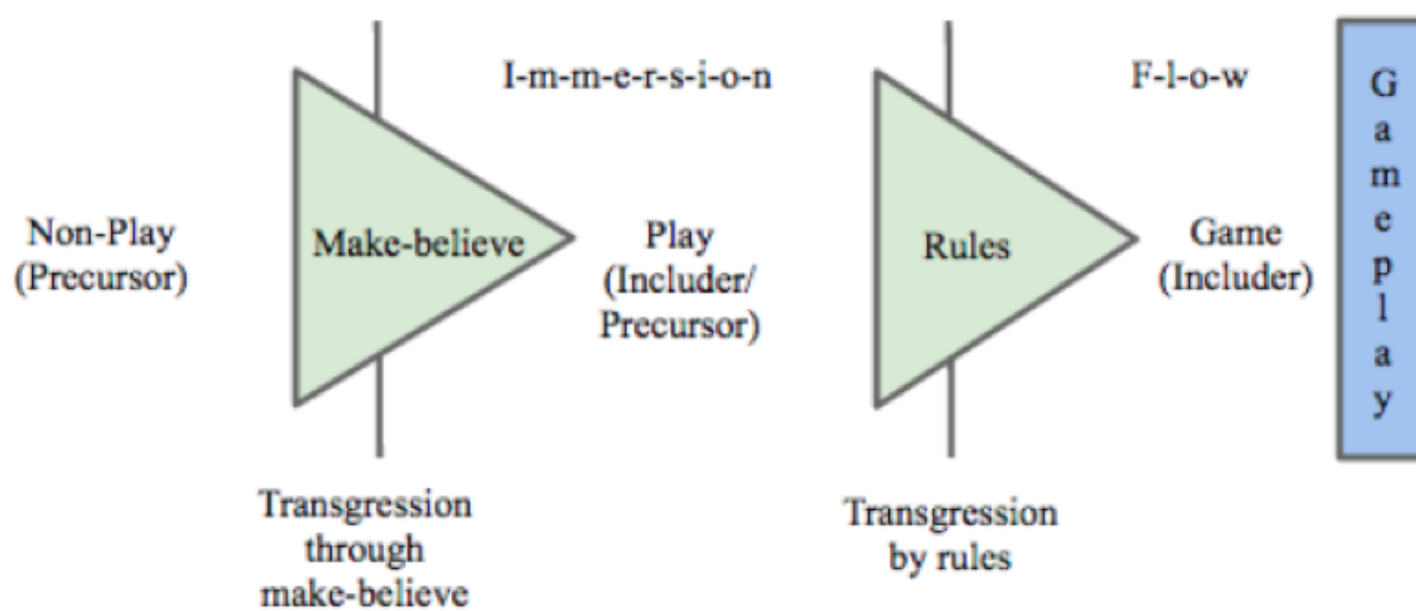
Figure 4- Gameplay in Otzen, 2015, p.5

Nonetheless, performing heuristic evaluation on a video game such as Ion Fury, has brought to surface the fact that more expert evaluators might have discovered more problems. The experts might have had experience not only in usability problems but also into how the technology works, its limitations, how well can it perform or different PCs and help in improving the user experience. The evaluations for video games are in need of more development on developing guidelines on how and what should be followed during the evaluation. Due to the subjective relationship between a user and a video game, evaluation could follow more in-depth, immersion, flow, playability, what makes it fun for the user, engagement, challenges, and so forth (McAllister & White, 2010).

Having the results and analysis from the heuristic evaluation which had already been improved to fit new technologies compared to the 10 heuristics provided by Nielsen (1994) and understanding what the steps are to create a gameplay formed out of immersion and flow in the game, a potential continuance for the research could be based on the players enjoyment in the game that could show how successful a game is according to high and low rated games. Sweetser & Wyeth (2005) provided a model for evaluating the flow in video games which could have been used in my project. Sadly, my focus was not only on discovering and identifying the flow in Ion Fury. However, the model could be a potential tool for further research.

A potential next step would be based on strategies on how to provide more help for the new users that have not grown up playing retro first-person shooter video games when the revolutionary Duke Nukem came as a 3D character. Here, as it is shown earlier in

the project under User Experience, it consists of different stages that help deliver quality products for the end-users. The 3rd step supporting the UX skeleton is formed by Information architecture and Interaction design which are key elements in helping users perform in a system and therefore reach their goal, which in this case is based on supporting the users and helping them find their way to the final boss while providing help when needed.

8. Conclusion

The main focus of this project was to identify key elements and explore two main fields of information architecture and user experience within video games, more specific, Ion Fury which is a retro first-person shooter. Moreover, during research, I have prioritized the understanding of how the two fields work together on the entertainment environments and within new technologies. In order to do so, I based my research on a simple and effective framework supported by information architecture that provided help with two stages, Research and Strategy. This framework was the base of the research, starting with a research phase that led to conducting and analyzing the context, content, and users within the information environments by using mixed methods for better results. This phase provided strong understandings of the successful and not that successful elements that are present in the game. Besides understanding the company's goals and mission to stand for the look and feel of the '90s, I have prioritized how users interact with Ion Fury which is a powerful image for 3D Realms at the moment. Understanding how users interact with the game, their behavior and their thoughts on it, had led me to the next phase, creating a Strategy that at its core is based on the outcomes from the research phase, aiming at delivering the best experience to the users that play Ion Fury.

This research has focused on answering my problem statement which was supported by three sub-questions with the main target at clarifying and lead the research through the necessary point in order to find the right answer to the problem.

What is the effect of Information Architecture (IA) on user experiences in a game like Ion Fury?

- *How does UX complement with IA?*
- *How can the quality of user experience be measured in FPS video games?*
- *What makes users stay engaged in playing FPS video games for an extended period of time?*

The following paragraphs aim at clarifying and elaborating on the findings from this project.

1. *How does IA complement UX?*

Information Architecture represents the solid ground in providing guidance on what steps must be taken into creating a product. However, for this project, IA has been used as a guidance tool for conducting the necessary research and gathering data in regards to the Context, Content, and Users. Nonetheless, IA has also provided the four main components from this field which was a support in conducting the research and better understanding how the information environment performs, how the information is structured for the users to be understood, and lastly, help users find their way through the game.

When it comes to UX, I see it as a bigger and more open field for research in which IA is part of. As it can also be seen in this project, UX provides support for IA to extend and proceed forward with research that is supported by different fields. Therefore, As J. J. Garrett (2010) has also shown in the skeleton plane, IA is a step within UX that aims at delivering the best products and experiences for the users.

It is my experience that supports the theory and practice used for this project where IA provides a solid ground for research based on specific guidelines for conducting specific research and then creating a strategy based on the outcomes, then UX takes over and supports the IA field with open theory and methods that align with IA outcomes.

2. *How can the quality of user experience be measured in FPS video games?*

Having the two fields working together and completing each other when the other one lacks information and strategies, provided my research with multiple methods which brought new knowledge and new approaches on how to evaluate the user experience in Ion Fury. IA has provided valuable information about the content, context, and users where I found out what 3D Realms are most appreciated for and how they became popular in the '90s, while supported by a powerful community that grew since the '90s as well. Therefore it is my understanding that not only technical and theoretical methods can help in establishing a good user experience in a video game such as Ion Fury, but it is also making use of user's needs and what brings joy to people. Having built a direct successor to Duke Nukem 3D in today's technology and competitiveness is based

mainly on providing a direct relationship that consists of a strong relationship between immersion and flow creating a perfect game flow that makes people feel involved.

However, methods from the UX field, such as heuristic evaluation and benchmarking have provided me with guidance in elements that must be taken into consideration for improving the user experience in different areas. The most powerful approach, however, was to make use of observation on people performing gameplay in Ion Fury. This step not only helped in establishing where UX lacks performance, but also brought new knowledge and challenged the other methods in growing and help improve the users' experience during gameplay.

3. *What makes users stay engaged in playing FPS video games for an extended period of time?*

As I have got to learn from the research phase, users are the ultimate judges of a product designed and meant for them to use. Therefore it has been established that Ion Fury must fulfill and align with the user's needs and help in bringing joy during gameplay by providing enough challenges, a strategic game flow for people to stay engaged with the game and perform until the end of the game. However, this process was well supported by the strategic elements provided by IA which provided a solid ground on what elements must be present in order to continue with the research. Then, when IA lacked information, UX supported the research with what was in demand in order to narrow down the amount of data. therefore, based on the outcomes, I was in need of more data which aimed at finding out how good gameplay is formed. Therefore, getting an understanding of how immersion and flow are valuable for delivering a good experience that is based on having good gameplay, has come as a result from the previous steps where the two fields were lacking information.

Having all these points exposed, Information Architecture proved to be a strategic tool in delivering the best experience to the user during gameplay for Ion Fury. The reason for being considered strategic is based on the fact that IA helped in holding together not only the information environment and the game's structure, but it has also provided guidance on how to proceed with the research by forcing UX into providing an extension while using more flexible methods. As far as this research goes, there is room for further research that could help find more arguments on how UX and IA are beneficial for working together in FPS video games.

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Appendix

Interview

1. **Can you please state your name and what is your role in 3D Realms?**

   A: My name is Frederik Schreiber from 3D Realms and I am the executive producer, partner and Vice-President.

2. **Can you talk a bit about what is 3D Realms doing?**

   A: So 3D Realms is a games publisher and producer and we basically take great game ideas from individuals who have great game ideas or studios and then we make sure they actually bring some to life. So, our expertise is putting together teams to make new games. Then we produce and publish those games. We have a very specific and narrow focus on what some people would call *retro style games*. We primarily do FPS and action games. We've been doing that since the 90s. That is what we still do, that is what our expertise is.

   2.1 Can you please talk about your target group (audience)?

   A: So, our audience...back in the 90s, our audience was probably teenagers who loved action movies, action video games and so on ,but nowadays 3D Realms is a very nostalgic brand and company, so pretty much everyone who buys our games are in the demographic of male between 30 and 40 years old.

3. **What are the most recent games 3D Realms has been involved in?**

   A: Three titles...So, 3D Realms shut down in 2009, after having had almost 20 years presence in the games industry and then, when we took over in 2014, we did our first game, it was called *Bombshell*, brand new franchise under 3D Realms, then we did Rad Rodgers . The reason we released Ion Fury which is another game in the *Bombshell*franchise and in a few months we will release the first version of a game called WRATH. So: Bombshell, Rad Rodgers, Ion Fury and Wrath.

4. **What is Ion Fury? You just released it, right?**

   A: Yeah! Ion Fury is a FPS that is basically built using the same technology as and art style as the game that put 3D Realms on the map. In 1996 we released a game called Duke Nukem 3D and it was one of the very first FPS ever released which is now one of the biggest genres in the world: Fortnite APEX, call of duty, all these video games are FPS and without Duke Nukem 3D many of these games would most likely never have existed. Uhm, so Ion Fury is basically a throwback to the very first game that put us on the map and it looks like Duke

Nukem 3D, it feels like it and plays like it but still with modern features to make the life of the gamer much easier than it was back then. You can play it on modern computer, it has a wide screen support, you can play with a game controller and so on. So, it is a throwback shooter that brings back a lot of memories people had from the mid 90s.

4.1 What is the purpose of Ion Fury?

A: In the game you play as Shelly Harisson, a bomb defusal expert and you live in NEO DC which is basically a future version of Washington DC. The city gets taken over by cyborgs and evil professor, it is a very typical 90s comic book plot and the purpose of the game is that basically you have to kill all the cyborgs and hunt down the evil professor and save NEO DC.

5. **What do you think it is the most important aspect in developing a FPS game these days?**

   A: WEll, the most important aspect is, in our opinion, the gameplay. But these days most story driven FPS are linear and non-multiplayer shooter as ours. They seem to focus much more on the story and the cinematic aspect of it and way less on the gameplay, which means how fun it is to play is not necessarily the main purpose it is more about how extravagant they can make the visuals looks and so on to make people say "WOW! This looks impressive!", but they don't really feel any fun playing it, it is just that they play through it and throw it away and then wait until the next game. That is one of the types of a FPS and then there is another type of FPS, games like *Fortnite* for instance which has no single player, no story mode, no campaign it is all about the multiplayer. Those games are treated more as a service, you know, you are going and you are playing everyday with your friends, see how far you can get on the leaderboards. Those two types of games are done in very different ways. Our game is more in the first category and for us, I think the most important aspect is the gameplay, that comes before anything else like how fun it is to play the game. Things like, Story is also of course important, you want a great story in the game..things like Cinematics and you know, visuals are also very important, but if none if it is fun to play, you kind of missed the point of making games in the first place.

6. **Can you mention what drives you and the team to develop/support/publish these types of games?**

   A: 100% our nostalgic memories of the 90s. We are so lucky that most of the people who played these kind of games when they were kids are now adults. They are done with their education, they have established a family, they have a nice job, they may have kids, they actually have money to spend on computers

and video games again. You know there is like a big period in between when you were probably in your early 20 and you start studying in university and your life starts coming together and you do not have time for video games. Once you hit mid 30s you start getting time for new hobbies again and many people start thinking back of the memories they had playing these games. So, we are those people! We only make games for ourselves which is so cool. We don't look at which target demographic would like a certain feature in the game or a certain type of game, we only think of "WOW! We would wish that this game existed when we were kids, so let's make it". So we make games for ourselves and hope that there is a large group of people just like us with the same taste and memories like us who would like the same games as us. It is not like a proven go-to-market to create things just for yourself and hope everyone else loves it. But it has worked great for us because our target demographic are these hundreds of thousands of fans of 3D Realms from the 90s. They expect when they think about "wow! I played Duke Nukem 3D as a kid, I wonder what this new 3D Realms game is about". They expect to get some of those same feelings that they got when they were kids, so we are just bringing back those warm nostalgic feelings you had as a kid.

7. **What do you think it is the best thing about Ion Fury?**
   A: The best thing is definitely that it takes everything that defines the genre, the FPS genre and improves on it. It does not change it into something it should not be, it takes all the elements from FPS and it makes them better. It is faster, it is prettier, it is more open scale, there are more secrets, more interactivity, more enemy types, more weapons, it is basically Duke Nukem 3D on steroids.

8. **Do you run some type of research during the development?**
   A: Uhm.. I would not say that we did any scientific research or theoretical research, we..all of us that worked on this game are hard core FPS fans, so we, ourselves were our demographic, we were our research, we are the most dedicated fans of this genre. Instead of doing market research in figuring out what our demographic wants, what do they like, what would make them convert into a customer, we just looked at ourselves and that is the beauty about a genre like this and industry like this; you rarely find anyone who works in it because they have to, it is a dream job for most people which means that most people working in it are also the people who will buy the game.
   8.1.: But you also have early access. Do you get some sort of insights from there or?

A: Yes. Early access is great because it is… well there are upsides and downsides. The upsides are definitely the ..when you release a game in early access, the game is not done which means that people are usually treating it really nicely in terms of reviews, because they know that the game is not done, that is the first positive aspect. The second positive aspect is that since the game is not done and people are treating it as if it is not done, they are evaluating the game based on its premise and what they think the game will turn out to be when it's done. So, if a game has kind of ambition in early access they are basically reviewing and evaluating the game based on "OK! This is something it could turn out to be. This is can turn out great in the future, so I will give a thumbs up or a great score because it could turn out great, ``so that is one thing. The other thing is in early access you get a large group of people that play an unfinished game. That means that when you get feedback from them you can implement it in the game before it is too late. Usually when you do a non early access game you do a product, release it and if people have feedback, once it is released you can't really change it, especially if it represents major thing in the game. But in the early access game you can get this feedback way early in the process and then you can actually make a change. So, the game production becomes this continuance evolving project where all the fans that already played along can give you a ton of feedback that you can implement. So, once the game finally comes out, it is a very polished and very finely tuned and balanced game. Of course there is also a step back from this, first of all, if you do an early access game, you have to live up to the hype around the game. If you do an early access and you tell people that "this is the early access version but there is going to be soo much more", if the game does not become so much more, you will have soo many angry people that bought the premise that was not fulfilled. You have to fulfil the premise in the early access.

8.2.: You are also present to so many events, especially in the USA where you can actually present the game and get feedback from fans as in face to face. Does the face to face feedback happens often?? Is it better?

A: Yes! Usually the cycle of the product in the games industry is that you announce the game, a certain amount until before the release date and then from the announcement of the game until release you take the game to different events and trade shows where people can play it before it comes out. That is why people go to these trade shows, it is to play the games that are not yet out and get an idea of what the game will be like. People going to these places get something that the others don't. Thy get to play games that no one else can. So, in this way you get insights there, of course. They play the game and then you ask them how it went and what they liked or did not like, that is also the purpose

from our end, to fix the stuff that are not reaching the target audience. Because there are people like us who like games like this and disagree with us on certain aspects, then we can take that feedback home and evaluate it and see if there is something we can do to change this without completely changing our artistic vision for the game. Of course you kind of get the same thing from the early access. People can also play the game before it is out, in the comfort of their own homes, but not everyone does early access.

9. **What do you consider important in a FPS video game for delivering best experiences?**
A: well...it depends!
9.1.: Let's talk about Ion Fury
A:In every game you have two paths you can take: 1. A game with multiplayer service where you can play with others and those are hundreds of games like that: Fortnite, League of Legends, APEX, call of duty, all these esport games are games you play with others and 2. the single player games, those are the games you play for yourself and those can be anything from candy crush, angry birds, tomb raider etc. . Ion fury is in that category, it is a Single player FPS. What is important, is completely different for those two types of games. Since Ion Fury is a FPS single player game, it is not a battle royale, fortnite multiplayer game, what is important for Ion fury is first of all that the whole experience from start to end feels great, that the levels feel large, expensive, that there are many things to play around with, great weapons, great enemies, great flow in the game that the difficulty add to how far you are in the game, so it starts easy and then the game teaches you that there are different mechanics all the way through the game so you are well equipped for when you reach the end of the game so it does not feel unfair. The story is important that you feel your progress through the story, there is a ton of aspects, it is almost constructed as a movie. You start as finding out who are you playing as, why are you doing what you are doing, then you learn how are the things in this world works and then you utilize them to get through each of the levels until you reach the final level and bit the final boss which is the villain of the game. That is how a single player works and that is what is important for us.

10. **And the last question, in regards to the general information about controls and how much information you provide. What do you think it is the most important thing for people to know and how much information is considered enough information in a FPF such as Ion Fury?**

A: It depends on how you define information because there are two ways of portraying information, one is does providing on the screen, straight up, is the information we want to give you, and the other way is giving you the information without having you read or see any User Interface (UI) or anything, and of course the whole goal of giving the player information they need is to give it to them in the most natural way possible. A good example is the classic video games such as: Super Mario. There is not a single UI element that will show you "Press this button". The only information that is portrayed on the screen is the bare minimum: how many lives you have left until the game can end and how many points you have. But everything else the information is portrayed in a very natural flow. In Super Mario if you have never played the game before and that is the goal (portraying information to the player) is only important for players that have never played the game before, because once you know how to play the game, the information the game is trying to show you on where you should go and how to control and what to do is kind of irrelevant because you are an expert in the game. You already played it many times and you already know what to do. Let's assume it is mostly important for new customers that have never played the game before. The way Super Mario shows information, is that they let you explore by taking the controller in your hands and start pressing buttons to see what happens. Super Mario has a very natural way of showing information for example if you press the arrow to the right, the character will start moving to the right. If you jump into a pit, you die and next time you know what happens when you fall into a pit. Having the most natural way is mainly the goal of how people should play the game. However if you have a webshop, where there is no text whatsoever and people would know what to do and where to press, that would be the perfect information architecture for a website but for now, you have to show people enough information so they do not waste their time in searching for it.

In Ion Fury we have designed the levels, the enemies and where the weapons are and how to use them. We tried designing all these onto a path where we need to portray as little information as possible by using text or UI. We try and portray as much as possible by user experimenting and learning. For example, right now we are having a demo out. In the demo we do have some text in there but we did not have in the beginning that says press this button to do this. The reason we had text is that the demo was used at the shows and there is not that much time for exploration. The example is part of the first chapter where you start as having a big blue door in front of you and the door is locked and then, very close to the door , you clearly see it there is a blue card, a key card. So you go to the door and the door is locked. The only option is to go to the blue card and then in your brain you just think that "Ah! Blue key card and blue door" so you

go back to the door, use the cards and the door opens. So, that is a natural way of getting the information: blue key opens blue doors, which would probably mean that yellow key cards open yellow doors and so on. That information is portrayed to you throughout the game. The other way of doing it is as text splashes on the screen that pops up in the beginning: "Blue keys open blue doors", you can write that. The information can be portrayed in both ways, but by doing it the way we are doing it in Ion Fury, the information is portrayed to the player by the player actively doing something, rather than reading something. And for us and Ion Fury that is the main goal of information architecture.

10.1.: So what you are saying that the small amount of information provided in Ion Fury is on purpose? With the purpose of not to challenge the player but offer a unique experience in playing it not on getting everything on a tray on how to play it. Is better to go out there and figure stuff by yourself.

A: Yes! There is also because the whole nature of video games is PLAY. When you sit down and play video games you are not in a rush to do something. When you sit down and play videogames is like when you sit down and watch a movie. Your purpose is now to sit down and enjoy one hour of playing some video games. We can allow a little bit of time for the player to experiment and learn by themselves through the game about the information they need in order to proceed in the game. It is very different on websites or apps, because if you go on a website there is usually a purpose, let's say you have a webshop and on the webshop you do not want people to play and figure out where to go. There you need as quickly as possible to convert the visitor into a customer. Here, the purpose is very different. You do not go on a website to just play around, it is to buy products and take them home. When it comes to video games, the purpose is to play. It is about having fun and enjoying a great time playing video games. Since in games we talk about playtime, we allow players to play around with things and from doing that they get the information on how to proceed from there.

10.2.: Do they ever get lost in the game?

A: They do. But our game is so cleverly designed into that; you might get lost for a very short moment but our architecture in the level is so distinguishable that you know how to find your way.

10.3.: So, instead of providing information you just build the levels in certain way to help the user?

A: Yes. Subconsciously the user will...for example, a good thing is that ..let's say you have a room with three doors in it, and above one door there is light and the other two doors don't have any lights on. Consciously you will go to the door that has the light on , because that is just what people do and by doing that, we tell the player that: " this is the door you have to go through" but not actually telling them in text, we are not writing on the screen. So imagine that you do not have any light on, you would go to the first door,

then to the second one and you spend a lot of time here trying to figure something out. So, we subconsciously throughout the game, we try providing information. It is the same with the blue door that you have blue key for it and the information I get from this is that the Blue key work for blue doors. That is the way we design our games. Imagine that you have a puzzle on your table and you are trying to put it together but you had a manual that basically shows you where every single puzzle piece has to go, then you think that it is not that fun anymore. The fun part about the puzzle is that you look through all the pieces and you try and recognize a pattern and then you put them together. That is the cellange of the puzzle, if the puzzle will just tell you ..let's say that every wingle puzzle piece would have a number on the back from one to one hundred then you just knew that one-two-three etc. will go together. All will be about putting the pieces together by following the number and then you miss all the fun. I kind of compare that to showing information through text or letting the player figure out stuff through cleverly designed games. If you show it through text, the player basically fulfils a task list of do this, do that, go there etc. until the game is done which is NOT fun. That is the exact opposite of fun: fulfilling tasks without any benefit from it. The benefit is if you are not told what to do and then you subconsciously throughout the design of the game you figure out how things work and then you get that satisfaction from finally solving that puzzle. It is the same satisfaction you get from solving a real life puzzle because you and yourself figured out where the pieces had to go and you put the whole thing together not anyone else so now you get the satisfaction. If someone else solved the puzzle for you or told where every piece had to go you just felt like you were doing an autonomous task rather than actual creative thinking and play. That is how Ion Fury is designed and why we think is so important to portray information through the experience of the game rather than through text of other UI elements.

AB: Thank you very much for the interview and for your time!

FS: Thank you!

2. Ion Fury Steam Data before release (Previous name, Ion Maiden)
The name was changed because of a lawsuit
The following screenshots are results from the preview campaign where the game could be
played for less than 2 hours

Heatmap of steam sales by country

Lifetime total units	23,664	
Lifetime units returned	-1,594 (7.1% of Steam units)	
Current players	2 (view players by region)	
Median time played	1 hour 33 minutes	
Wishlists	84,815 ± (view detailed wishlist breakdown)	
Demo version	Ion Maiden Preview Campaign	
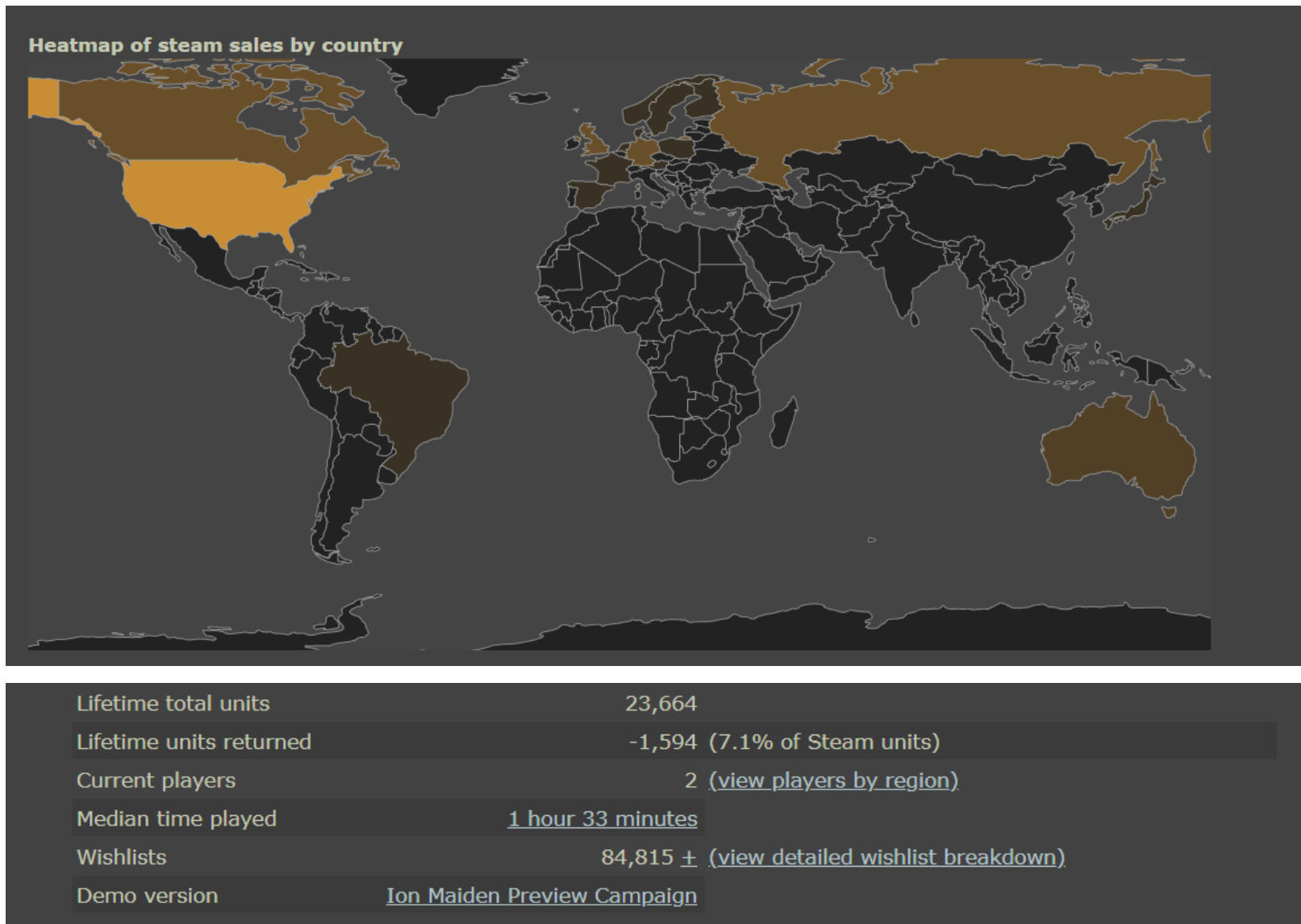
Lifetime play time stats: Ion Maiden

<< back to Ion Maiden

Lifetime users measured	21,737
Average time played	2 hours 38 minutes
Median time played	1 hour 33 minutes (compare to other games)
Time played range	23 minutes -
	4 hours 0 minutes (one standard deviation of playing time)

Minimum time played	Percentage of users
10 minutes	92%
30 minutes	80%
1 hour 0 minutes	65% (average as compared to other Steam games)
2 hours 0 minutes	39%
5 hours 0 minutes	11%
10 hours 0 minutes	2%
20 hours 0 minutes	0%
50 hours 0 minutes	0%
100 hours 0 minutes	0%

Users bucketed by time played

Sales and activations by region, all history

Legend:
- North America
- Western Europe
- Russian Territories
- Oceania
- Latin America
- Eastern Europe
- Asia
- Middle East
- South East Asia
- Africa
- South Asia

Country	Units	Percent of Units	Linux Units
United States	9,597	41%	218
Germany	1,898	8%	95
United Kingdom	1,723	7%	46
Russian Federation	1,656	7%	48
Canada	1,447	6%	32
Australia	1,031	4%	33
France	619	3%	24
Sweden	544	2%	22
Finland	449	2%	21
Brazil	344	1%	13
Other	4,356	18%	152
Total	23,664		704

73

3. Questionnaire
https://admin.typeform.com/form/VzXyvQ/results#summary

Key stats

All Devices ⌄

Responses
23

Total visits
38

Unique visits
30

Completion rate
76.7%

Average time to complete
04:29

✓ 1 How old are you?
23 out of 23 people answered this question

13%	16-20	3 responses
8.7%	21-25	2 responses
8.7%	26-30	2 responses
8.7%	31-35	2 responses
0%	36+	0 responses

Do you play video games?

2

23 out of 23 people answered this question

91.3%	Yes	21 responses
8.7%	No	2 responses

How many hours do you play videogames per week?

3

23 out of 23 people answered this question

26.1%	10-15	6 responses
21.7%	20-30	5 responses
17.4%	30+	4 responses
13%	0-5	3 responses
13%	15-20	3 responses
8.7%	5-10	2 responses
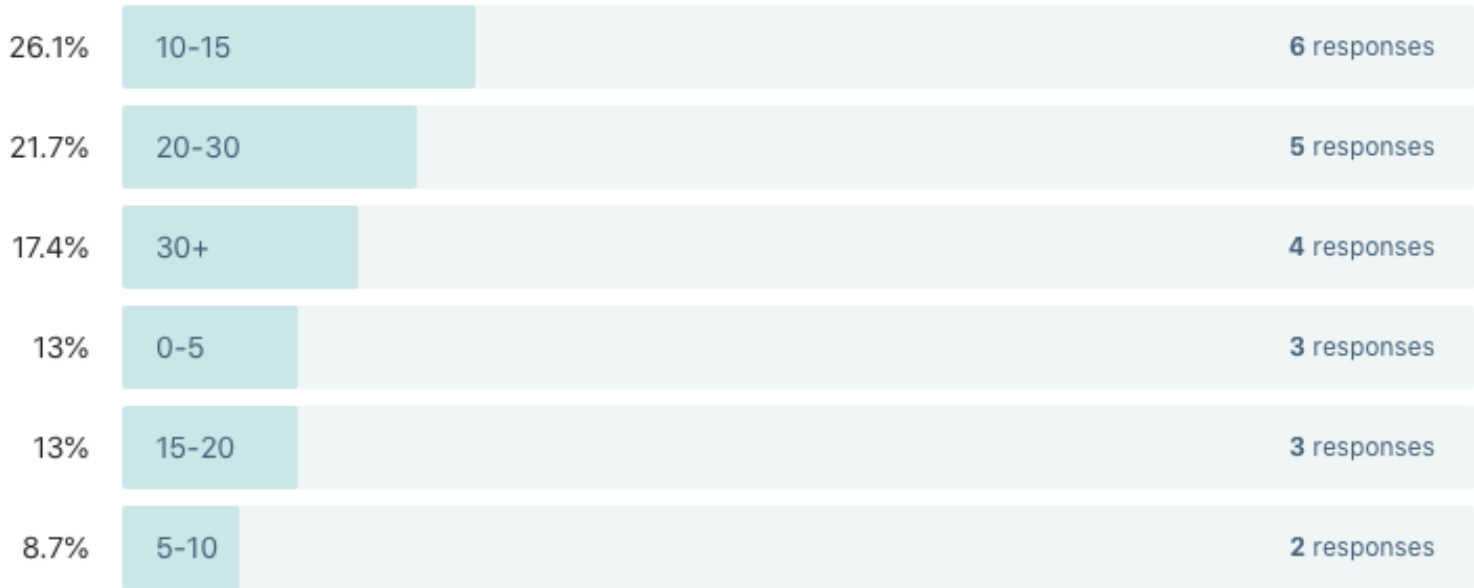
✓ 4 What is your favourite genre of game?

23 out of 23 people answered this question (with multiple choice)

73.9%	FPS	17 responses
34.8%	Action	8 responses
34.8%	Adventure	8 responses
34.8%	RPG	8 responses
30.4%	Casual	7 responses
26.1%	Other	6 responses
26.1%	Racing	6 responses
21.7%	Indie	5 responses
17.4%	Strategy	4 responses
13%	Sports	3 responses
8.7%	MMO	2 responses
8.7%	Sandbox	2 responses
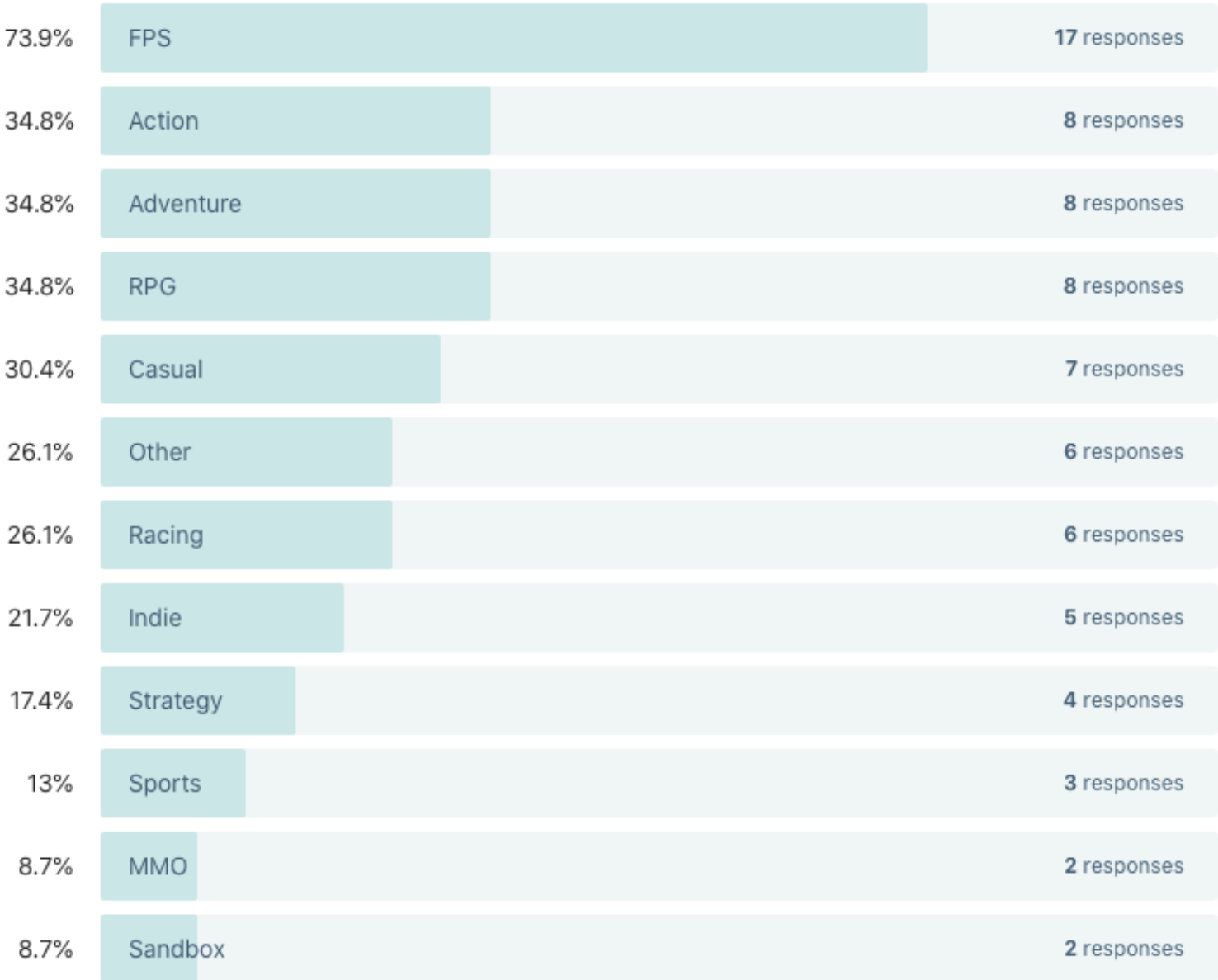
◑ 5 Have you played FPS?

23 out of 23 people answered this question

87%	Yes	20 responses
13%	No	3 responses
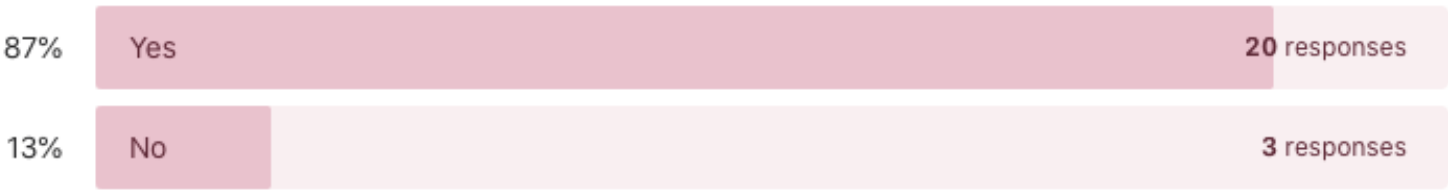
== 6 Which platform do you prefer?

23 out of 23 people answered this question

Pc

3 months ago

Xbox

3 months ago

PC

3 months ago

^ Collapse question

21 people out of 23 prefer PC compared to other consoles

7   What do you consider a good user experience in a video game?

23 out of 23 people answered this question

In my opinion a good user experience it's when a game it's easy to understand, and you actually get absorbed by it !!

3 months ago

Graphics, multiple players

3 months ago

Fun factor, good storyline, nice graphics (quite difficult to answer this question, because I am not exactly sure what you mean with good user experience)

∧ Collapse question

Self explained gameplay, challenging enough to motivate you, possibility to make the changes as pleased

3 months ago

Clear usability, strategic planning, good design

3 months ago

Good graphics, runs smoothly, replay value

3 months ago

Something that helps me develop myself in general

3 months ago

whatever keeps me entertained and motivated

3 months ago

Graphics and sound

3 months ago

Rewarding mastery of game mechanics along with multiple possible approaches

3 months ago

good gameplay

3 months ago

Fun?

3 months ago

World I like to explore, fun movement that lets me explore it, and some interesting enemy encounters with tight shooting mechanics.

3 months ago

No idea

3 months ago

A smooth gameplay with no major bugs and glitches.

3 months ago

minimal cutscenes

3 months ago

Replayability

3 months ago

Good optimization

3 months ago

Smooth controls, option to invert mouse (definitely a deal-breaker), HUD that doesn't cover the whole screen

3 months ago

Storytelling, engaging gameplay, no predatory microtransactions, and co-op. Also: NO handholding.

3 months ago

How important is for you the hierarchy of the information provided in a video game? (eg. menus, loading screens, multiple choices, etc.)

23 out of 23 people answered this question

Avg. 6.6

0%	0	0 responses
0%	1	0 responses
0%	2	0 responses
4.3%	3	1 response
13%	4	3 responses
26.1%	5	6 responses
13%	6	3 responses
0%	7	0 responses
21.7%	8	5 responses
4.3%	9	1 response
17.4%	10	4 responses

✓ 8 **What are the most important aspects of a game in your opinion?**

23 out of 23 people answered this question (with multiple choice)

82.6%	Responsive controls	**19** responses
52.2%	Usability	**12** responses
39.1%	Graphics	**9** responses
39.1%	The Story	**9** responses
34.8%	Challenging experience	**8** responses
26.1%	Availability of the information elements	**6** responses
21.7%	Clear tasks	**5** responses
13%	Other	**3** responses

9 How important is for you the hierarchy of the information provided in a video game? (eg. menus, loading screens, multiple choices, etc.)

23 out of 23 people answered this question

Avg. 6.6

0%	0	0 responses
0%	1	0 responses
0%	2	0 responses
4.3%	3	1 response
13%	4	3 responses
26.1%	5	6 responses
13%	6	3 responses
0%	7	0 responses
21.7%	8	5 responses
4.3%	9	1 response
17.4%	10	4 responses
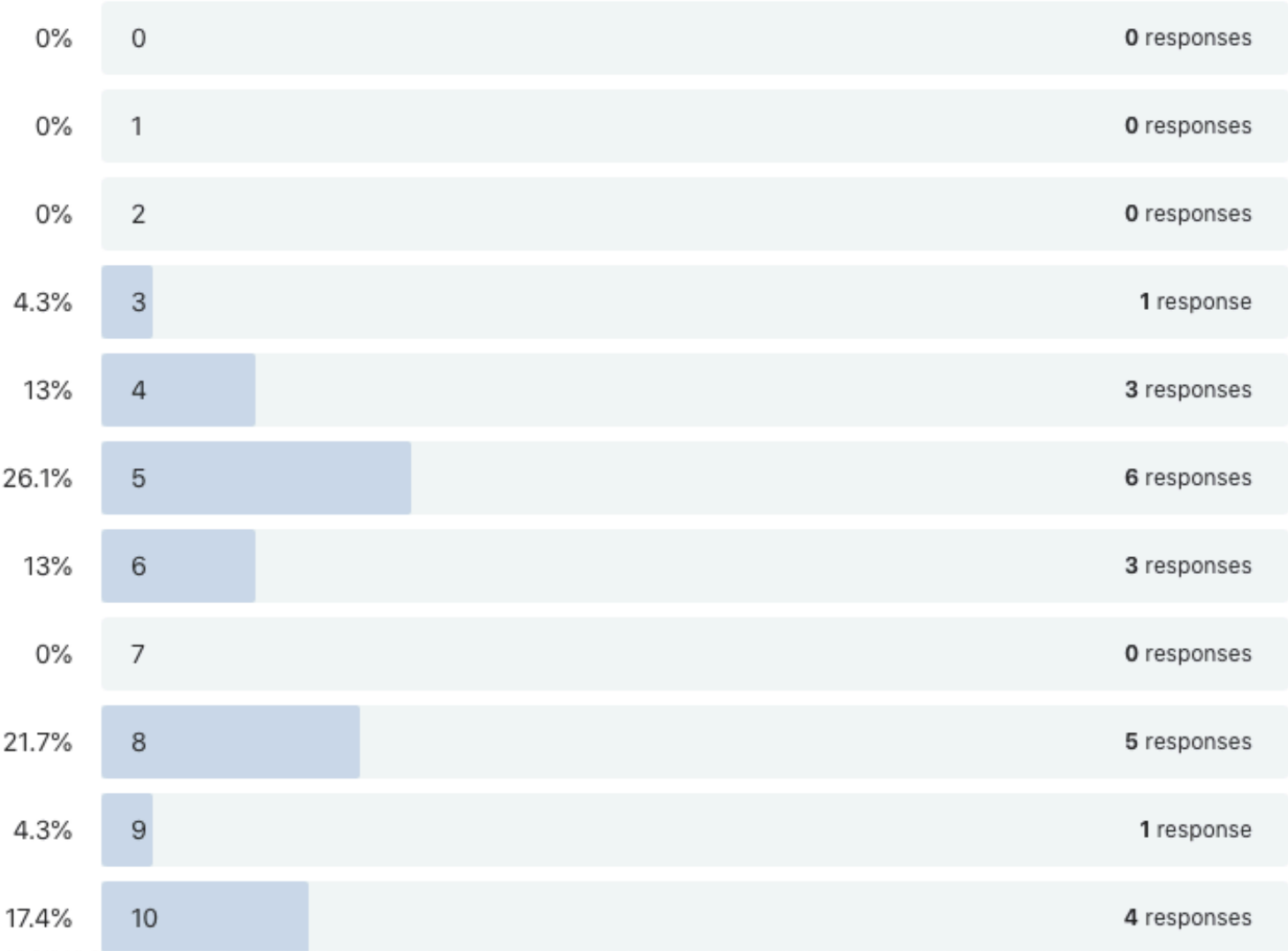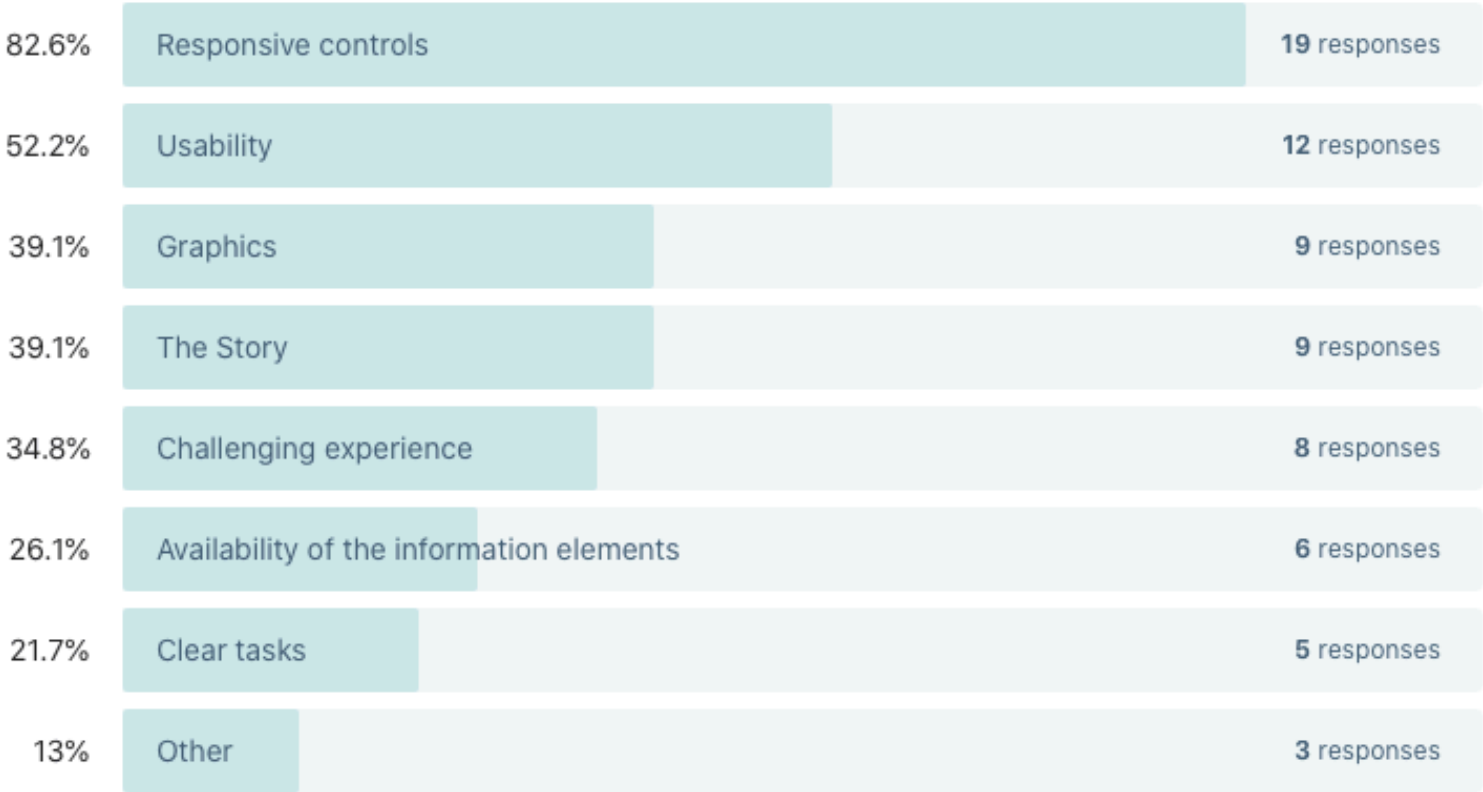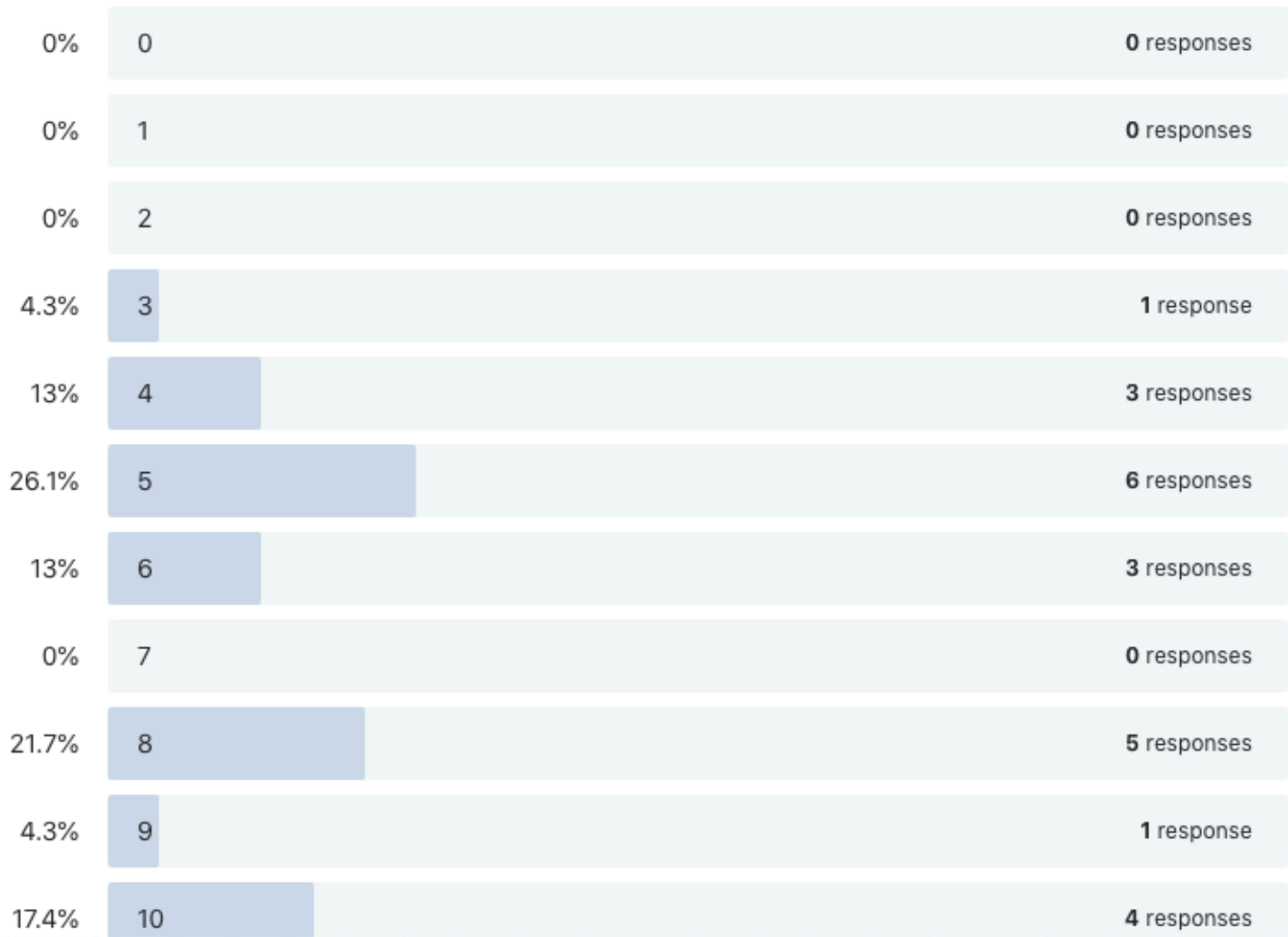
10 How do you think that playing video games affects the way people act on a daily basis?

23 out of 23 people answered this question

I think it affects our attention, we are able to stay focused on our tasks with less effort .

3 months ago

Dreaming

3 months ago

I am not sure what to answer here

3 months ago

Self reflexion, being part of communities with same interest, becoming more curious about technology etc..

3 months ago

It makes them more motivated to solving tasks, self control etc

3 months ago

Depends on the game. Games can educate people.

3 months ago

It makes them more social, open minded, curious and motivated into achieving goals

3 months ago

Improves agility in thinking by taking chances, ability to multitask probably, look for potential solutions in short period of time

3 months ago

Playing video games provides many people with a hobby to relieve stress.

3 months ago

The more you game, the less you know outside of gaming.

3 months ago

Depends if it makes them crazy with PTSD.

3 months ago

They affect people's lives as much as any medium, be it cinema, music, literature or art. In the end everything depends on the person themselves, their sensitiveness and susceptibility.

3 months ago

It progress enlightenment and understanding like all other forms of art

3 months ago

it doesn't

3 months ago

As video games can be and are mental exercises, I guess it could make you a little smarter and more atentious.

3 months ago

People who play games are more tired

3 months ago

socially

3 months ago

I notice a considerable difference in hand/eye coordination and fast paced decision making skills between people who play video games and those who dont.

3 months ago

If you realize that you spend more time in your room, play video games, and feel more comfortable with that rather than hanging out outside with or without your real-life friend, then video games may starting to affects you negatively.. Human is a social creature after all.

3 months ago

Sharper reactions, quicker reaction times, more likely to be "thinkers" and be good at solving problems so helpful when driving and being in a stressful job

3 months ago

It affects them like anything else does. It'll make them reference more items and may increase problem solving skills, etc etc

3 months ago

it helps them focus

3 months ago

4. User Observations in Cologne

5. Steam community and reviews

The goal for using steam was to understand the users' expectations in regards to this game, their thoughts on it and their experiences. I was mainly looking for things that can be improved or further looked upon.

accuracy is indeed rewarded. Circle-strafing while shooting, especially during closed arena fights and bosses, is fundamental to stay alive, while also using the right tool for the right enemy is important, as some weapons are just so much better versus specific for types. Most weapons feature a secondary fire mode that makes them act differently, and is paramount to know exactly how to employ each of them in the right situation. Of course a few weapons are simply stronger than all others, but ammo for said arms will be rare, so they are to be used sparingly against tougher foes. Overall the combat proposed in Ion Fury is really a throwback to another era, with all the good, and eventually bad sides that come with this premise.

🔧 **Performance Analysis**
Using a dated engine causes the game to have several slowdowns in more crowded situations or complex levels, no matter how powerful your hardware might be: it's an engine limitation, not one of your system. This sometimes is quite annoying but happens rarely overall and is just a minor annoyance all things considered. For the most part, the game runs well in 1440p, 144hz and has no issues to mention. [GTX1080, 16GB RAM, i7 4820K].

Final Thoughts
Ion Fury is definitely a true homage to the classic fps era, that any fan of the genre and/or nostalgic will enjoy fully and should not hesitate to grab in this very instant. For casual players or those who never played this genre, this might be a good starting point, but certainly not at the harder difficulty levels.

This product was reviewed using a free key provided by the Developers.

Follow our Steam Curator page, **OCG-Curations** if you like and want to see more reviews like this one.

Was this review helpful   Yes   No   Funny

12.37
◀ Search

● 4G

🔒 steamcommunity.com

☰ STEAM®

Ion Fury (previously known as Ion Maiden because reasons that not gonna talk about here) is a really nice game to give you a throwback into the always mentioned "90s FPS time", there are a few things that hold it back but overall is a good time.

Pros:
-Really nice map design that is almost non-linear with a lot of secrets and things to find out (easter eggs and so).
-Fast paced and responsive for the most part.
-Takes the Build Engine to it's limits and outputs a nice result (still has flaws but nothing is perfect).
-Adds new mechanics like headshots that were really rare on 90s FPS to make it more modern and different from the rest.
-Voicelines and puns are really good, giving back the vibe of 3DRealms from back in the day.
-Guns have a nice punch, even if they are just based on regular ones and just toned up a bit. Who doesn't like an 18-round revolver that shoots 3 bullets at the time?

Cons:
-AI can be really wonky sometimes getting stuck against walls or sometimes not even moving until you get up their nose.
-Map design can be a bit hostile for people that are not used to the style and can get lost easily or some corners are tricky to move into (few secrets).
-Enemy roster feels more generic if I compare it to other Build Engine games or previous 3DRealms games.
-A good part of the enemy activity is linked to map events like hitting a button or getting an item.

The game is still solid overall based on what technology is using so gets an 8/10 for me... Thing is tho, I will still drop a negative review on it because of 2 things:

1-AI and Enemy spawn was making it a bit more repetitive for me. Even if other Build Engine games did the same, it felt a bit more obvious in here because on how polished and fantastic everything else is.

2-The recent controversy that is around this game at the moment is also a big no no for me. It's leaving a bad taste in the mouth playing and getting asked everytime

STEAM®

Helpful?   👍 Yes   👎 No   😊 Funny

👎   DoomMaker   15.2 hrs

POSTED: 23 AUGUST

Coloured lighting. Seriously, ❤️❤️❤️❤️ coloured lighting. It singlehandedly ruins combat. Enemies are colour coded. So whose genius idea was to make them blend with the environment (as if view distance limits weren't enough)? Not only that, but distinguishing Ion Bow enemies from the low tier cannon fodder becomes harder.

Combat area desgin. Boring, repetetive, too long, annoying. Every time you think you dealt with all enemies, surprise, it's not the case. You usually get informed of this by getting shot in the back or from the dark.

Looping is nice, but not when I think it's a secret and Im missing only 1 mm from getting there and later it turns out I had to get there anyway.

Spiders. SO. MANY. SPIDERS. It's not fun to constantly fight them. It's fun like fighting mosquitos. Ask Daikatana.

Your arsenal. Shotgun is so nice to shoot, tight spread, decent damage, oh wait, you gotta reload. WHY. Analogical situation with Penetrator. Bowling bombs cannot be angled (still probably the most fun weapon in the game). No standout BFG-efyouall-like weapon.

Secrets are good. No complaints in this department.

Looks - great. Is this really on eDuke?

It's a decent game, but your money is better spent on any good old school shooter (Doom, Heretic, Strife, Hexen, Quake, holy Build trinity, etc... and I don't even like Build engine games (except Blood) that much) or Dusk, Amid Evil and Nightmare Reaper if you want something more recent.

Helpful?   👍 Yes   👎 No   😊 Funny

STEAM®

👎   **Not Recommended**

9.0 hrs last two weeks / 10.8 hrs on record

Posted: 21 Aug @ 10:28am
Updated: 22 Aug @ 5:31pm

tl;dr: I recommend buying the game in a sale.

If I had to summarize the game in one word, it would be "uninspired" which is ironic considering it heavily relies on nostalgia. Before getting into that though, let me explain what I really liked about the game:

- The game looks fantastic considering that the Build engine was used. The levels and sprites look detailed and there was a lot of work going into that.
- The length of the campaign is appropriate. I finished the game in roughly 10 hours on the normal difficulty (Wanton Carnage). For me personally, it was probably even on the long side considering the lack of variety (see points below).
- The game features fast FPS action and there was rarely any downtime.
- The game is full of references to other games and movies.

Here are the points I found the game lacking in:

- The weapons feel and handle pretty generic. I mostly used the revolver, the shotgun and the grenade launcher (and the uzis to a lesser extent). "Special" weapons are missing. An example of a special gun would be the gun that shrinks enemies in Duke Nukem 3D. There was never a moment where I felt like an overpowered badass.
- The enemy variety is low and some enemies (the spiders) are more an annoyance than fun to fight. I get that this game is heavy on the nostalgia, but you can't ignore certain industry standards that customers are expecting nowadays. This means that your playstyle will pretty much be the same after you get all the guns, which is pretty early on

Benchmarking
Ion Fury (2019) and Duke Nukem 3D (1996)

Always first in line on Orange Wednesday, that Duke.