ROLE INITIATIVE: A DIGITAL TOOL FOR A PHYSICAL GAME

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Abstract

Tabletop games like Dungeons & Dragons (D&D) feature several natural inefficiencies due to the adaptable and sandbox nature of D&D campaigns and the game's wargaming roots. One of the core failings of Dungeons & Dragons' Fifth edition, according to users, is slow and disengaging combat. It is my belief that digital tools can be added to Dungeons & Dragons in such a way that their implementation does not limit physical gameplay while providing a variety of new tools to players. This paper proposes a tool that can avoid these pitfalls while improving combat and gameplay flow.

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1. Introduction

Dungeons & Dragons (D&D) has been a cultural icon for decades. Over the years the game has become nearly synonymous with nerd culture. While not necessarily the first tabletop role-playing game (TTRPG), D&D has defined the understanding of what a TTRPG is. Thanks to the work of media like *Stranger Things* and the events of the Satanic Panic it has become impossible to separate the game from the nostalgia of the 1980s (Haberman, 2016; Manganiello, 2018, pp. 1-2.). Yet, in the year 2019, the game has never been more relevant. D&D is selling more merchandise than ever before (Alimurung, 2019), and, perhaps more interestingly, the players are watching and listening to D&D as well.

The digital media world is rising and Dungeons & Dragons is not immune to this. Some of the most popular podcasts in the world feature D&D and Critical Role - a popular Dungeons & Dragons live stream - is streaming weekly to tens of thousands of viewers and playing shows in some of the world's most respected theatres to packed audiences. Yet in spite of this rise in online popularity the game is still stuck in an analogue world.

D&D is widely available to be played online through sites such as Roll20 or the computer game Tabletop Simulator. There are even a wide array of Discords (a gaming-oriented voice over internet protocol) dedicated to playing using bots to roll dice and calculate combat. Yet, if you sit at a table you are likely to see a truly analogue game, played with pencil and paper. There are a variety of reasons for this but fundamentally there are three. The first reason is that there is no supported native solution for D&D. The only widely available first-party digital tool for running the game is D&D Beyond, a web-based character sheet and campaign tracking solution. The second reason is that the perception of these tools can often be negative - digital tools are seen as a distraction from the game rather than as an asset. The third reason is a problem with the game itself. D&D is incredibly complex and has many of its own issues, primarily with its rules framework surrounding in-game combat. These issues are vast but can be broken down simply so combat doesn't feel good due to pacing and complexity. Yet I believe there is a way to develop a tool that will provide the solutions for issues with combat without distracting players or drawing focus from the physical gaming space. This paper will describe my approach to prototyping and testing a solution for these challenges.

2. Context

2.1 What is D&D?

Dungeons & Dragons is a role-playing game which was originally created in 1974 by Gary Gygax and Dave Arneson (Witwer, M, Newman, Peterson, & Witwer, S, 2018, pp.9-19.) The game was built upon the popular hobby of wargaming and used another game designed by Gygax, *Chainmail*, as the basis for much of its system (Witwer, M, et al., 2018, pp.9-19.). The game originally had a print run of 1000 copies which could be ordered by mail from the back of wargaming fanzines. This version of the game consisted of three small brown booklets containing all the basic information a player would need to know. It would be inaccurate, however, to say that these books were the entire game. Certain portions would require items from more traditional tabletop games to play such as the board from *Outdoor Survival* being used for overland travel (Witwer, M, et al., 2018, p.37.).

The original version of the game and the version being published at the time of writing (Fifth edition) are vastly different from one another in design process and methodology, but the core remains the same. Players, in groups, will explore dungeons, slay dragons, advance in power, and gain treasure. All play is moderated by someone referred to as the Dungeon Master (DM) who acts as a referee of sorts to the crew of adventurers.

The game is filled with a variety of races, character classes, and items for use by players, and provides rules for most actions within the game world. These rules allow players to cast spells, intimidate enemies, sneak, steal, and all manner of other actions. Any actions without rules may be given rules by the Dungeon Master. The current version of the game's core design is inherently built upon collaborative storytelling and player freedom and interaction. The game is not without grounding in its wargaming roots though. It prominently features combat as a core and necessary part of play, but it is no longer the core purpose of the game. We will discuss further the design methodology and philosophy of Dungeons & Dragons' Fifth edition in the literature summary portion of this paper.

2.2 On Players

Any participant in a D&D session that isn't the Dungeon Master is considered a player. Players each embody a single character created within the bounds of the D&D world. These characters have races, genders, classes, and backstories dictating their social, financial, and, at times, political standing. For many players, these characters are an identity which they attempt to adopt throughout the game much like an actor performs or embodies a part.

The player's primary job is to act and react within the world presented by the Dungeon Master. They are to improvise within the established rules as their character would: solving problems, fighting monsters, and, at times, making moral decisions. Each player generally has at their disposal: a character sheet providing the information required to play and understand the basics of who the character is and what they are capable of according to the rules, a pencil and paper for taking notes about what is going on, and a set of 7 dice. These dice come in a variety of sizes ranging from 20 sides to 4. These dice, along with the dice and narrative of the Dungeon Master, present the results of player actions. High numbers generally correspond to good results and low numbers the opposite, however, this is not always the case.

A D&D table will generally consist of a single Dungeon Master and multiple players. It is not impossible, though, to play a game of D&D with only one player and one Dungeon Master, though this is not the most common arrangement. These groups of players are generally referred to as parties and will have to work together should they wish to solve or, at times, survive the world the DM presents.

2.3 On Dungeon Masters

As stated previously, the Dungeon Master serves a key role as a referee-like figure to the players. The role can be executed in a variety of ways and every table has their own method for how to handle the role. Some Dungeon Masters act as a god: concretely planning events in advance and intervening conspicuously and often to keep the gameplay and story "on track", other Dungeon Masters adopt the role of a guide: providing rulings and information as needed but allowing players a great deal of freedom, and other Dungeon Masters might play as

improvisers: simply acting as another character within the world while they tell the story collaboratively. The role of the Dungeon Master, while defined within the *Dungeon Master's Guide*, is up to the interpretation of each individual Dungeon Master to determine.

As the role of the Dungeon Master is up to interpretation, so are the styles of games they might facilitate. Some DMs run a published campaign from books released by Wizards of the Coast or an independent publisher but, many prefer to “homebrew” their own. These campaigns, especially homebrews, can take place in a variety of different settings and feature vastly different game styles. There are campaigns that operate as open-world sandboxes, where players may feel free to explore: finding adventure in any corner of the world. Likewise, there are games that may feature a more guided or even “railroaded” game, where players are forced to follow a set path and act within the options this path provides. There are also games that are titled “West Marches” campaigns, where a rotating group of players will explore a vast expanse of wilderness from one location - this style of campaign can feature tens of players and, at times, multiple DMs.

At its core the role of the Dungeon Master is simply to present the world to the players, beyond this it may be changed and adapted in whichever way the DM chooses. For the purposes of this project, we will be dealing with a standard referee/storyteller DM. This style of Dungeon Master provides rulings and guides the game as needed controlling combat and the world/characters that the players find themselves interacting with.

2.4 Why D&D?

As a player, Dungeon Master, and a designer I have a personal connection to Dungeons & Dragons. Despite that fact, the game is, in my personal experience, fundamentally flawed in that it misunderstands what many players seek and dislike in Dungeons & Dragons. When I run D&D I am there to tell a collaborative story and to engage in a world of imagination with my players. The game's Fifth edition, or 5E as it is commonly known, addresses this in many ways and heavily supports homebrewing or adaptation to allow for the game to be played as you like; however, combat remains a constant problem in my games and the games of others I have observed and spoken too.

Many players, some of whom I spoke to as participants over the course of this study, come for the story, with combat serving as a secondary - or even tertiary - piece of the game. Despite that fact, unlike the rest of D&D, the method for handling combat is rigid and places a significant amount of work upon the DM and the players. As it stands there are few functioning solutions to this problem and it is not a problem I have been able to solve at my table with the existing options.

This is why I chose D&D for the purposes of my MRP. There is a problem I am aware of and have been attempting to solve and I know others experience this problem too. There is an issue that users want to be addressed and as a user myself I feel equipped to understand and execute upon this issue.

3. Literature Summary

The following section will provide a summary of works that were used to design the methodology of this research, inform an understanding of the game, and provide a basis for design choices and principles implemented in its course.

3.1 The Effect of Digital Tools Upon Social Interactions

When designing a solution for Dungeons & Dragons, there is concern about the possible barriers presented by introducing a digital tool to an analogue social setting. At the beginning of user testing, several Dungeon Masters expressed to me their concerns about the implementation of digital toolsets due to people's inclination to become "glued" to their phones. It has long been theorised that technology, such as cellphones, inherently negatively affect social interaction through their existence in what has been called the "mere presence" effect or "mere presence" hypothesis (Misra, Cheng, Genevie, & Yuan, 2016, p. 281.). This theory posits that simply by possessing such objects, humanity has changed in the way we interact with one another and that these interactions shift based upon their mere presence. There is often a tendency to treat these powerful objects as a hindrance, yet there is also promising evidence to suggest that it may be the perception of the devices causing the issue, not the devices themselves (Allred & Crowley, 2017, p.29.).

Several attempts have been made to determine whether the use of digital tools decreases the value of social interaction. Results have repeatedly shown to be inconclusive as to whether smartphone or social networking use provides a net positive or negative effect according to Jones (Jones, 2017, pp.10-15.). In light of this information, it is unlikely that a conclusion can easily be drawn on whether the impact of digital tools on social interaction is positive or negative. As such, it is the intent of this research to take these factors - and the opinions of users - into account when developing solutions to ensure the tool does not cause distraction or fundamentally change user communication.

Despite the fact that clear lines of positive and negative effects cannot be drawn, there have been several successful studies on the emotional response of others to smartphone use. In *Cellphones in public: social interactions in a wireless era*, Humphreys concludes that the use of cellphones in public settings causes others to interact differently with the person using the device (Humphreys, 2005, pp.827-829.). This evolution of social interaction is a natural occurrence and development of etiquette when a new form of communication is introduced (Humphreys, 2005, p.811.). Yet while this process is not a net negative it could change the way players interact at the table in a D&D game with not only their Dungeon Master, but also one another. Speaking anecdotally, it is not uncommon for a moratorium to be placed on Instagram or Twitter at a TTRPG table due to a player seeming distracted or disconnected from other players at the table.

In order to better understand this change in interaction, we must understand the commonality and intensity of the reaction to cell phone use in the non-cell phone user. A study of undergraduate students conducted in 2015 found that a vast majority of respondents believe that their social interactions are negatively impacted by technology (Drago, 2015) and this same belief can be seen across much of mainstream media. Furthermore, it has been suggested that the negative reactions, as found in the aforementioned study, are more likely to be based on a preconceived perception of cell phones rather than the act of technology use itself (Gonzales, 2016.). This implies that, regardless of the actual effect of the app on social interaction, there is a possibility of users believing the app is negative regardless due to predetermined opinions of technology.

The results of this portion of my research have found that while cellphones and other digital tools do not inherently have to have a negative effect upon communication it may cause others to perceive the interaction negatively. It is possible that the mere presence of these devices may make a fundamental change to the table environment, though these claims are contested. As such, great care must be taken when designing around introducing digital tools to the gameplay table to ensure that physical interactions between users are not perceived negatively by observers or by the users themselves.

3.2 Human-Centred Design & Don Norman

When researching human-centred design (HCD), it is paramount to mention the work of Don Norman, who in many ways laid the foundation for modern design in his work *The Design of Everyday Things* with his principles for user-centred systems. This work has influenced much of IDEO and design thinking models which will be discussed throughout this section of my literature summary as well as the following section on design thinking.

The basis for Norman's method is put simply by him in the opening pages as "an approach that puts human needs, capabilities, and behaviour first, then designs to accommodate those needs, capabilities, and ways of behaving." (Norman, 2013, p.8.). Norman states that there are two core principles to designing for human methods of thought: affordances and signifiers. An affordance is what an object allows you to do, an interaction that may occur between yourself and an item (Norman, 2013, p.8) such as sitting upon, lifting, or stacking a chair. A signifier is how this affordance is communicated (Norman, 2013, pp.10-19.). According to Norman, the prominence of signifiers is far more important than the provided affordances, as without these signifiers users will not know how to access the affordances.

Norman further details the importance that a designer craft a pleasurable experience as, according to him, experiences are how humans remember interactions, thus creating intense emotions. As such, designers must craft around both "cognitive understanding" and "emotional understanding" (Norman, 2013, pp.47-55.). These interactions are built around a seven-step process of taking actions which require users to have a strong conceptual model (an interpreted understanding of the process) of how to complete the action (Norman, 2013, pp.55-59.). This

seven-step process has three core phases which Norman identifies as goal setting, execution, and evaluation. Users must be able to set clear goals, understand and plan how to complete an action, execute the action, and receive feedback so that they are able to evaluate their actions.

Norman also speaks of how to understand and guide human problem solving and communication using four constraints: the physical, the cultural, the semantic, and the logical. Physical constraints are limitations placed upon people or items by their physical creation such as Norman's example of a square peg not fitting in a round hole. These constraints are best used when they are obvious at a glance (Norman, 2013, pp.125-128.). Cultural constraints make up a wide variety of problems users may have performing new interactions. These constraints vary based on the user's background and their society's teachings. New devices may exist outside of the teachings or systems established within cultures and as such may confuse users who wish to interact with them (Norman, 2013, pp.128-129.). These constraints are ever-evolving. Like cultural constraints, semantic constraints are ever-changing due to the fact that they are based around meaning. Meanings, and meaningful interactions, are not ensured in the future and may change as time progresses (Norman, 2013, pp.129-130.). Finally, there are logical constraints. These constraints are based upon the user's conceptual model and the feedback loop of cause and effect. Logical constraints help users consider what actions to take and examine the result of those actions as well as to evaluate future actions. It is important that your conceptual model, and thus the logical constraints, of the design match. Otherwise, users may become confused (Norman, 2013, p.130.)

In order to provide quality human-centred systems and interactions, designers must consider and utilize affordances, signifiers, and constraints alongside one another (Norman, 2013, pp.132-141.) Understanding a user's constraints helps the designer to craft better signifiers. In doing so, designers present the user with a better conceptual model and allow them to efficiently and accurately assess the affordances provided. Misunderstood constraints, especially of the cultural variety, can lead to disastrous miscommunications between the user and the designer (Norman, 2013, pp.130-132.).

The final major consideration of human-centred design is the capacity for errors. Errors occur frequently, yet in situations of human-computer interaction, we tend to blame the human

for the error (Norman, 2013, pp.162-163.). Norman suggests this is an incorrect placement of blame, stating that this is not a human problem, it is a design problem (Norman, 2013, pp. 162-163.). This final piece of human-centred design theory is vitally important when considering the human experience first. If humans are regularly making errors, it is illogical to place the blame solely on the humans making the errors and not the design. Designers and researchers must seek out the core reasons as to why these errors were made and correct the issues within the design causing them.

In order to address these necessary portions of HCD effectively, Norman has crafted what he calls the “Iterative Cycle of Human-Centred Design” (Norman, 2013, p.221.) This process involves four steps and is not intended to be completed linearly, unlike more traditional design processes which follow a step-based system. The four portions of this cycle are: observation, idea generation, prototyping, and testing (Norman, 2013, pp.221-232.). These steps form much of the basis for the design thinking model and as such will be covered further in the following section, Design Thinking.

In summary, human-centred design is the process of placing human experience and thought at the foreground of the design process and designing around user needs, capabilities and behaviours. The process of doing so requires signifiers which communicate the affordances available to the user by the object, machine or system. These signifiers and affordances must be understood by designers in relation to the constraints of the user physically, culturally, semantically, and logically. In order to execute upon this, designers must operate in a constant cycle of observation, idea generation, prototyping, and testing to ensure they have correctly addressed the problem and the needs, capabilities, and behaviours of their users.

3.3 The IDEO Method & Stanford d.school Design Thinking

Design thinking and HCD are inextricably linked. Design thinking has evolved from HCD and out of places like IDEO that have been deeply affected by designers like Don Norman, who has been a fellow within IDEO since 2010. As such, much of this section will be deeply connected to Don Norman’s method of human-centred design both directly and indirectly.

In *Change by Design* IDEO CEO, Tim Brown outlines the three core stages that IDEO utilizes in their design process: inspiration, ideation, and implementation (Brown, 2009, p.22.) Interestingly, these three steps also make up the core sections of IDEO's popular work *The Field Guide to Human-Centred Design*. These core steps make up IDEO's version of Don Norman's iterative cycle. Inspiration focuses upon setting your initial design challenge as well as observation of users to develop an understanding of the user base, their challenges, and their behaviours (IDEO, 2015, pp.29-69.). Ideation is the period used for the generation of design solutions and re-identifying design challenges and core problems the team is trying to solve. This period also consists of prototyping, testing and iteration (IDEO, 2015, pp.75-127.). The implementation phase consists of further work within Norman's prototype and testing phases, this is where designers will work on building and utilizing solutions as well as receiving feedback from users. Additionally, in the implementation phase defined by IDEO, this is the time for selling the idea through pitches, partnerships and release of the final product (IDEO, 2015, pp.103-157.). Similar to Norman's cycle, this method is non-linear and may be pivoted or reimplemented throughout its course.

In addition to these phases, IDEO also identifies three key constraints within which designers operate: feasibility - what is possible currently or in the near future, viability - whether it is likely to become profitable and scalable, and desirability - whether it makes sense to people and if they will want it (Brown, 2009, pp.24-26.). According to Tim Brown, a focus on any one of these three constraints may cause the downfall of a project or company. As such, it is imperative, in his opinion, that projects be completed with design ensuring all three constraints are balanced equally.

Interestingly this IDEO method is not the only popular design thinking method. The Stanford design thinking model has also gained significant recognition in both the academic and design worlds. Once again, it is important to note that these two methods of design thinking are inextricably linked just as they are to HCD, both by clear connections between staff members and principles present within Stanford's d.school and IDEO as well as by the process of design evolution.

In *An Introduction to Design Thinking PROCESS GUIDE*, the d.school presents their five step method of design thinking, a variation upon Don Norman and IDEOs version of the same process. This version consists of five phases listed as: Empathize, Define, Ideate, Prototype, and Test (Stanford, 2010.) This model, like all other mentioned variations of design thinking, is meant to be completed in an iterative process.

Figure 1. Design Thinking Model. (Both, T, 2013, p.1.)

The Empathize phase takes over for observation and inspiration phases of the Norman and IDEO models respectively, once again centered on conducting interviews with users, observational studies, and focus groups in an attempt to understand and identify their needs and points of friction (Stanford, 2010.). Define is, unlike in the IDEO method, where you define your design challenge and the problems met by your user, as well as issues in other available solutions (Stanford, 2010.). This is the first of the design thinking methods mentioned to separate this phase from the initial phase of observation and user interaction. Ideate, Prototype, and Testing all follow the same core principles as the remaining steps in the IDEO and Norman methods.

The clear similarities are important to note between all three presented design thinking methods, especially the connection to HCD. Yet, perhaps the most important feature is the difference the d.school creates by separating the define phase and the empathize phase, removing judgements from the interview and observation process of design. This is interesting as it presents a greater interest in identifying and understanding the users first before seeking out design challenges. Of the three methods, the d.school appears to be the most concerned with developing clear definitions of each phase and separating different design processes.

3.4 User Experience Research

The user experience (UX) research process is outlined in a variety of different texts and variations both strict and loose exist across several interpretations of HCD. The inspiration section of *The Field Guide to Human-Centered Design* focuses greatly on how to conduct good user research. In light of this, I will be looking at methods presented both by IDEO and that of Tomer Sharon, a former leader within the Google LaunchPad UX program and one of the most prominent UX research voices in 2019.

Beginning with the IDEO UX research method as presented throughout *The Field Guide to Human-Centered Design*, there is already a variety of different approaches available for different research purposes. However, the IDEO method is certainly very tied to the HCD method of interviews. IDEO recommends beginning with defining your design challenge so as to focus your research on key goals (IDEO, 2015, p.31.). From there, research can take a variety of forms with possible routes of individual interviews, group interviews, and expert interviews. Each of these types of interviews serves a very different purpose than the other. Individual interviews are recommended for getting to know a single user more intimately and understanding them individually, while group interviews are recommended for understanding communities of users (IDEO, 2015, pp.39-43.). As expected, IDEO also recommends vetting any recruited interviewees to ensure that whoever you speak with is within your user base and capable of answering your required questions. Interestingly, while group interviews recommend neutral space, individual interviews recommend utilizing the users home as the setting so that they might feel more at ease (IDEO, 2015, pp.39-42.). Experts are utilized to inform system-level views of situations, challenges, and communities. They provide key insights into past successes and failures as well as systemic complications (IDEO, 2015, p.43.).

Following the interview process, IDEO recommends defining your user base into a specific category followed by the creation of a community map: a list of users you are interested in targeting and everyone tied to them considering their connections and values, as well as any sceptics that you may need to convince (IDEO, 2015, p.44.). IDEO suggests seeking out extreme users in addition to your average user so that you can understand the outliers that exist within

your problem and how those extremes change their situation in relation to core users (IDEO, 2015, pp.49-51.).

The final research recommendations include immersion, co-creation projects, and resource flow analysis (IDEO, 2015, pp.52-69.). Through immersion over the course of days and up to a week, the designer can gather insight into the day-to-day life of the person they seek to help and observe how the user interacts with possible challenges. Co-creation allows users to work with designers through a variety of creative activities to help inform designers about their wants and needs, as well as how they think. Finally, resource flow analysis approaches design from a more business centred concern for the viability and desirability constraints by analyzing the user's income and resource allocation and flow. This includes any money, labour, or other key resources that enter or exit the home. This is done to see how the designer might optimize their product to fit into, change, or otherwise diversify that allocation (IDEO, 2015, p.69.).

The IDEO method of UX research is overall a very pragmatic approach at analyzing users and understanding core problems. The purpose of the approach appears to be optimized for product design and scalable business opportunities as opposed to mere problem-solution fit. However, it also appears to be lacking in the development of key design thinking artefacts such as user personas.

In *Validating Product Ideas*, Tomer Sharon forms his method of education of user research around eight core questions: What do people need? Who are the users? How do people currently solve the problem? What is the user's workflow? Do people want the product? Can people use the product? Which design generates better results? How do people find stuff? (Sharon, 2016.). I have excluded Sharon's final question "How to find participants for research?" because while it is valuable, it is more practical knowledge on recruiting than research methodology focused. Each of these questions is framed as if it were being said from a user researcher with the piece clearly positioning itself as a guide book for user researchers from a user researcher. The book also frames the development cycle slightly differently from design thinking models, preferring instead to use the strategizing period, execution period, and the assessment period of development. It is not noted within the book whether Sharon believes this

process to be cyclical, though it certainly fits within the model of previously identified design processes.

The first five questions within the book all frame the basis for initial discussion and research with users while the final three should be asked throughout prototyping and release of the final product. This method is still very much based in HCD, but appears to be tied less to one specific method of design thinking and instead provides a more malleable form of conducting research which Sharon refers to as “lean research” (Sharon, 2016, p.viii.). This method, like the others previously mentioned, also falls in line with the essence of HCD’s high value on empathy for the user. However, unlike the other methods of research, this method is devoted to testing an existing hypothesis and validating whether the suggested solution is valuable (Sharon, 2016, pp.iv-xxiv.). This method still works within design thinking; yet, it is certainly quite different from the two previously discussed as it allows the validation of a hypothesis in the early stages rather than simply seeking out a problem.

For each question presented in the book Sharon provides a variety of options for viable research methods to answer it. Examples of methods include: experience sampling, interviews and personas, observation, diary study, fake doors, online usability testing, A/B testing, and first-click testing.

Based on the scope of this project I have eliminated the diary study, first-click testing, as well as A/B testing from further discussion. While these options are valuable forms of assessment both first-click testing and A/B testing are designed for projects that have already undergone significant design and are primarily for assessment of the product and its marketing strategy and as such were not relevant to initial UX research (Sharon, 2016, pp.205-275.). The diary study, while a viable strategy for answering the user’s workflow is less viable due to the fact that D&D is not generally a daily occurrence and there is already significant notation on the part of the players and DMs during gameplay. This reduces the viability of such a study’s implementation. Furthermore, I also removed experience sampling - a process in which users are repeatedly asked the same question at a variety of different times of day and week used to create a large volume of data points on user experience (Sharon, 2016, pp.4-26.). This was eliminated, similarly to previous eliminations, due to the required number of interruptions to participant lives

and the nature of D&D as something users are unlikely to experience each day making many data points less valuable than others. After my initial eliminations, I was left with four of Sharon's key methods to assess for my initial user research methodology: interviews and personas, observational study, fake doors, and online usability testing.

Sharon recommends using interviews and personas to determine the answer to the key question: who are the users? This process should be undergone during your initial research and the strategizing period of development as well as the assessment period if further user bases or features develop (Sharon, 2016, pp.33-36.). In his method, Sharon suggests that an initial "BS persona" (Sharon, 2016, pp.40-43), be created before interviews which states your assumptions of who you believe your user to be. You then interview users to validate whether the hypotheses stated in your "BS persona" was accurate. Sharon recommends this method as interviews provide a direct dialogue between the researcher and the user, encourage empathy between the two, build the credibility of the project with qualitative and quantitative data, as well as challenge design perceptions and hypotheses with a variety of user experiences and methods of problem-solving/thought (Sharon, 2016, p.38.). Sharon also recommends the creation of a Google Forms screener to ensure all the participants you interview meet clear and set criteria. This Google Form will also provide further data and future demographic opportunities. Sharon also provides a variety of guidelines for creating high-quality interview questions to gather different types of information as well as methods to remove biased or leading questions. Following the interview process, it is imperative that one return to the pre-interview "BS persona" and reassess and edit it based upon interview data to create a real persona that is informed by the data you have collected.

When attempting to answer the question of how people currently solve a problem, Sharon recommends the observational method (Sharon, 2016, pp.73-78.). He suggests that there are five key pillars to conducting an observational study: observing, listening, noticing, gathering, and interpreting. Utilizing these five pillars, one can: learn from observed experience, notice key behaviours, find comparisons across observations, and attempt to develop reasoning behind user choices. Sharon also states that this method is valuable for determining whether a product is even needed, learning the language/jargon of users, and understanding specific features or pain points that may need to be addressed. Observation should be conducted over the course of several hours

with minimal observer interference. This process may include a single or multiple subjects and should be ideally conducted in a location familiar to the user if possible within the bounds of the study (Sharon, 2016, pp.73-103.).

Fake doors experiments are a clear way of answering one of the most important questions throughout the entirety of the design cycle according to Sharon. Fake doors allow you to answer whether users want your product quickly and effectively with quantitative data. A fake door experiment can be conducted at any point in the design cycle and utilizes an MVP (minimum viable product) designed to get users to sign up for a beta or to purchase or another call to action (Sharon, 2016, pp.144-147.). This is generally done through a landing page in which users are tricked into believing a product or app is available now when it is still in development. Clicking the download now button may or may not reveal to the user that they were tricked and offer the option to sign-up for updates on the project. The fake door is effective at answering the question of whether users want the product as it allows the developers to get quantitative data on the percentage of site visitors that attempted to answer the MVP's call to action (Sharon, 2016, pp. 146-147.). Furthermore, it can also provide data on the overall number of possible users from site visitor numbers.

The final method of user testing covered in-depth by Sharon that is valuable to this project is online usability testing. Online usability testing is used to answer the question of whether users can use the product. This question should primarily be asked during the prototyping and ideation phase of design thinking or - under Sharon's method - the execution phase (Sharon, 2016, pp.174.). Usability testing can be used to gather both qualitative and quantitative data dependent on the research questions and the number of participants. For qualitative data, even five participants are likely sufficient to recognize key trends whereas quantitative data may require several hundred users to become apparent (Sharon, 2016, pp.182.). Usability testing may, in theory, be conducted in-person or online, Sharon merely recommends online for dealing with high volumes of users or remote users. It can also be cheaper and removes any need for a professional moderator of the testing. Sharon also presents a variety of different usability questions and which method of testing - qualitative or quantitative - is best for answering the variety of research questions. When conducting usability tests there are core

questions that should be asked of users which they may rate from strongly disagree to strongly agree. These questions should be asked after each task: This task was easy, I am confident I completed the task successfully (Sharon, 2016, pp.183-188.). These questions should be asked after each session: Were there any aspects of the product you found particularly challenging to use? (describe), Were there any aspects you found particularly enjoyable? (describe), as well as have the participants rate how likely they would be to use the product again or to share it with others (Sharon, 2016, pp.183-188.).

Overall, much of user research appears to have a lot in common. Sharon's key guidelines and step-by-step format as well as the malleability of methods, however, make a far easier method of research to follow than the broader but seemingly less informed methods available from design thinking outlets. In particular, the ability to validate the solution to a possible problem based upon assumptions prior to developing further understanding of the user through interviews is an interesting and valuable tool enabled by Sharon's lean research method. This method seems to allow for the most initial assumptions based on pre-existing knowledge, yet still allows researchers to enact design thinking methodology to validate and complete projects.

3.5 Dungeons & Dragons' Fifth edition Design Philosophy and Methodology

As mentioned previously, Dungeons & Dragons is a game with a forty-five-year history and in that time it has changed greatly from edition to edition - so much so that multiple attempts have been made to chronicle the history, design philosophies, and art styles of the various editions of the game. These histories include a series of four books titled *Designers & Dragons* that cover the series from its inception in 1974 to its state in 2009. This series utilizes interviews with players and designers in order to better understand why the various editions feel so unmistakably different. The most recent work in this genre is the first party licensed *Art & Arcana* which covers, in-depth, the game's design and how the art style of various editions has influenced play. This piece, published in 2018, bears more relevance to the current Fifth edition of the game, as *Designers & Dragons* was released prior to the release of the latest edition in 2014. As such, this summary will focus primarily on the research of *Art & Arcana* as well as information that can be gleaned from the game's "core rulebooks", namely: the *Dungeon*

Master's Guide, the *Monster Manual*, and the *Player's Handbook* in addition to *Xanathar's Guide to Everything* - a supplementary book intended to be read following the core rulebooks, released three years later in 2017.

The design philosophy of Fifth edition is wholly unique within the world of tabletop role-playing games (TTRPGS) and edition is in many ways the most reactionary of the many variations of Dungeons & Dragons (Witwer, M, et al., 2018, pp.391-396.). The launch of the game's Fourth edition (4E) was underwhelming as Wizards of the Coast (Commonly shortened to Wizards or WOTC) attempted to bring Dungeons & Dragons into the digital world. In fourth edition, spells and worldbuilding text were vastly simplified from earlier editions and a variety of new systems were brought into play to allow characters to become standardized. Unlike previous editions, 4E was not a revision, but a total rework of the game. The edition was planned to launch with a digital platform, allowing players to play with their friends across the world. This was a response from Wizards to the increasing age of original players and the desire to play games remotely over long distances as well as the rise of online RPGs like the MMO (massively multiplayer online) game *World of Warcraft* (Witwer, M, et al., 2018, pp.353-357.). This system was made to make the game more new-player-friendly: faster to pick up and become invested in and meant to allow players who had perhaps physically grown apart to play online with one another or with casual groups at the local game store or online. Classes were reworked into categories to encourage tactical combat rather than being independent of one another in classification and design (Witwer, M, et al., 2018, p.353.). Perhaps the biggest core failing of the system was that the online platform never exited beta, a feature that was set to define the new edition from all others (Witwer, M, et al., 2018, pp.353-368.). While fourth edition still has its defenders, many decried the game and in some cases abandoned the hobby entirely, citing 4E as too similar to a video game. In 2012 however the human-centred design process for creating D&D Fifth edition began and that would be something different entirely (Witwer, M, et al., 2018, p.387.).

In *Art & Arcana*, the authors discuss how after the failings of Fourth edition, the designers sought out playtesters for the future of the game. Over the course of two years, WOTC had more than 175,000 players participate in the D&D Next study which would eventually

become Fifth edition (Witwer, M, et al., 2018, p.387.). The designers of editionFifth edition also made a point to playtest every previous edition, looking to past design successes and failings before designing any mechanics or art for the newest edition design (Witwer, M, et al., 2018, p. 415.). Utilizing this research as a step ensures that Fifth edition is definitively reactionary to older editions of the game and the player reception of those designs.

“Fifth edition,” as noted in *Art & Arcana*, being used as the name for the product in this piece actually feels significantly at odds with the design and branding of the game, with the most recent iteration of the game holding only the name Dungeons & Dragons in any public branding (Witwer, M, et al., 2018, p.391.). This latest edition of the game was built to draw in returning and new players by standing apart from the popular media of the time. The Fifth edition of Dungeons & Dragons has been built with simplified systems for handling combat and proficiencies utilizing systems of advantages, disadvantages, and standardized resistances/weaknesses rather than complex mathematical equations or tiered modifiers for rolls and damage(Witwer, M, et al., 2018, p.391.) .Everything, including the art style of the world, finds itself more grounded in realism and storytelling in Fifth edition (Witwer, M, et al., 2018, p.404.). The world is built to draw players in and invoke their suspension of disbelief. The entirety of the design is meant to convey a sense of accuracy and humanity to the world rather than the cartoonish feats and personas presented by later editions of the game inspired by video games (Witwer, M, et al., 2018, pp.396-415.).

In Fifth edition, the focus on combat has faded away with a clear mandate devoted to roleplaying and social interaction (Mearls et al, 2014a, pp.4-6.). One need only briefly skim through the *Dungeon Master’s Guide* to understand the fundamental redesign that has taken place. Two-thirds of the more than three hundred pages that make up the rulebook focus upon storytelling, worldbuilding, and the designing of worlds rather than actual mechanics and rules (Mearls et al, 2014a.). The place of the Dungeon Master, at least in the eyes of WOTC, has been squarely planted in the role of storytelling. The choice to form so much of the Dungeon Masters’s role in the books as a storyteller and world builder is a fundamental call to storytelling and interaction. The opening paragraphs of the introduction label a Dungeon Master in the following order: an architect, a storyteller, an actor, and a referee (Mearls et al, 2014a, p.4.) This

design is clear to the reader: while Wizards of The Coast might restate repeatedly that all of these roles may take centre stage for different DMs it is very telling that more than two hundred pages have been devoted to the initial three roles of architect, storyteller, and actor.

The *Player's Handbook* is where a great amount of the rules are placed in the design of Fifth edition. It is intended to be used by both players and Dungeon Masters and its more than three hundred pages of initially daunting material would seem to run counterintuitive to the previously stated focus upon the storytelling aspect. However, there are a few key features of note in this book that would indicate otherwise. Firstly, there is the stated intent of the book. Unlike the *Dungeon Master's Guide*, this core book is intended to be a reference for which to draw from in gameplay and character creation, it is not intended to be read cover to cover - the book even states so in its opening preface. The lead designer of Fifth edition, Mike Mearls, writes in the opening paragraph: "What you need are two things [to play D&D], the first thing being friends with whom you can share the game... The second thing you need is a lively imagination" (Mearls et al, 2014b, p.4.). The game is about camaraderie and imaginative storytelling. The rules are even written in such a way as to remain in-world, describing spell actions as characters would see them as well as the effects of the attack mechanically (Mearls et al, 2014b, pp.211-289.). Everything written in the core rulebooks is written with a clear degree of lore and in-world storytelling, ensuring that even the descriptions are immersive experiences for the storytellers seated around the table. See figures 2 and 3 for a comparison of spell descriptions in Fourth and Fifth edition.

Magic Missile		Wizard Attack 1
You launch a silvery bolt of force at an enemy.		
At-Will ♦ Arcane, Force, Implement		
Standard Action		Ranged 20
Target: One creature		
Attack: Intelligence vs. Reflex		
Hit: 2d4 + Intelligence modifier force damage.		
Increase damage to 4d4 + Intelligence modifier at 21st level.		
Special: This power counts as a ranged basic attack. When a power allows you to make a ranged basic attack, you can use this power.		

Figure 2. Magic Missile spell in Fourth edition. (Heinsoo, et al, 2008, p.159.)

Figure 3. Magic Missile spell in Fifth edition (Mearls et al, 2014b, p. 257.)

Finally, I would like to address perhaps the most interesting of the items examined in this section of the literature summary, *Xanathar's Guide to Everything*. This book, like the core books, features a variety of different rules and additions to the game. Yet, unlike the core rulebooks, *Xanathar's Guide to Everything* is written as a supplement. The designers reiterate throughout the book that the “rules” included should be treated more as ideas (Crawford et al, 2017, p.61.) to be interpreted, added, and changed as the readers’ see fit at their own table rather than traditional rules. This is, of course, a matter of importance; but, more interesting still is the inclusion of Xanathar himself. Xanathar is a beholder, a highly intelligent floating eyeball within the world of Dungeons & Dragons. This book is accompanied by and, at times, narrated by Xanathar. Many pages, rather than being written as solely omniscient design and rulings from the creators, feature humorous and at times confrontational notes from Xanathar commenting on elements of the game and design. This is a clear intent to add character and even story to the act of reading a rulebook. This strategy falls deeply in-line within the previously stated design goals of Fifth edition; yet, somehow there is still another layer of design philosophy present in this book that reveals even more about the Fifth edition process.

On page 4 of *Xanathar's Guide to Everything*, the book notes that much of the content found within the pages of the book were published digitally to *Unearthed Arcana* first, a playtest version of Fifth edition (Crawford et al, 2017, p.4.). The book further notes that the articles published as part of *Unearthed Arcana* are iterated upon and chosen for official publication based on playtest feedback provided by readers and players. This factor once again presents a

key design process and philosophy in Fifth edition: human-centred design and design thinking. Design elements are presented to players in a prototype state, they are then tested and players are allowed to provide feedback, this feedback is then reflected upon and iterations and revisions are made throughout further testing until the final product is released (Crawford et al, 2017, p.4.). Those stages absolutely match the design thinking and human-centred design process - even if those words are not explicitly used. Those stages are also similar to the multi-year playtest process that led to the design of Fifth edition as previously mentioned. This leads me to believe that the development philosophy of Fifth edition - both in its reactionary development process, its early stages, and this post-development process cycle stated in *Xanathar's Guide to Everything* - has adopted a design thinking and HCD methodology.

The design of Fifth edition is built upon a fundamental and reactionary philosophy of placing storytelling, role-playing, and social interaction before mechanics-heavy combat in the level of importance to gameplay. This philosophy has allowed Fifth edition to flourish and allowed for the creation of a wide array of Fifth edition based content such as *The Adventure Zone* and *Critical Role* which have been allowed to grow and empower the game itself. Fifth edition, in light of these core design changes now boasts three times more players than fourth edition, with more than 8.5 million estimated players in America alone as of 2018 (Witwer, M, et al., 2018, p.415.).

4. Initial User Research

The following subsections will discuss the initial phases of the Design Thinking 5 step model through the UX research process, primarily those of the empathizing and defining phases. While I, as a player and Dungeon Master, entered into this project with an assumption of what the problems facing users were - primarily combat pacing - it would be in this portion of the UX research process that I would gain the knowledge necessary to determine whether my hypothesis was correct.

4.1 UX Research Methodology

My UX Research method focused on the d.school design thinking model as well as the UX Research process outlined in *Validating Product Ideas* which was previously discussed in section 3.4.

In following this method I initially focused on empathizing with and understanding my user through two different methods: a long-form survey and user interviews. The survey was posted online first with user interviews to follow, utilizing both the pool of participants in the survey as well as new individuals for a participant pool.

The survey was used to gather both qualitative and quantitative data on a wide variety of players and DMs both within Canada and abroad. As such this survey would serve to provide a scope of the average D&D player, so long as that player was accessible through online D&D groups. The design of this survey was made in such a way that the questions would provide opportunities to collect quantitative data on user age groups, gender, and financial class as well as qualitative data about D&D. This survey required that all participants had a minimum of 3 months of Fifth edition experience as well as being 18 years of age or above for ethics purposes. This was done to ensure that all participants were knowledgeable enough about the topic to properly engage with and discuss the points of friction found in D&D as well as their overall D&D experience,

The interview portion of the initial UX process focused on generating further qualitative data about Dungeons & Dragons' Fifth edition in the opinions of players and Dungeon Masters. This portion of the study focused upon asking questions that would evoke long-form answers from players providing context to their beliefs and experiences. These interviews required all players have a minimum of 4 months experience as well as being 18 years of age or above for ethics purposes. Much like the survey, this requirement was chosen to ensure interviewees had enough experience to speak knowledgeably about the topic.

4.2 UX Research Process

As mentioned previously, the user survey was posted online first with interviews following shortly after to help generate a pool of potential participants. This survey was posted both to my own personal social media accounts, which are active regularly in the discussion of D&D and the local D&D community, as well as to several Reddit groups including r/DnD, and r/DungeonsandDragons. These posts were also shared by a variety of individuals from global communities across Facebook, Twitter, LinkedIn, and Instagram. This process of posting to a wide variety of online sources allowed my survey to have a far more global reach attracting a wider variety of participants than might be possible recruiting in-person at a local games convention or comic shop. The request for interviews was shared much the same way as well as sent to participants of the study who had indicated their wish to be contacted for future research opportunities.

4.2.1 Survey

The survey began with initial questions asking participants about their gender identity, age range, and financial income. This information would later be used to generate a user persona, an example of an ideal user. These questions were necessary to help me better understand the context of who my user is and where they are coming from.

After gathering demographic data the survey then began to focus in on the participants as players, featuring questions about what edition they began playing in, whether they are primarily a player or a DM, and what, if any, existing first-party merchandise they have purchased. This data was necessary to understand the experience each participant has as well as the general experience of my potential user base. This line of questioning involved several short answer questions as well, allowing players to discuss the characters they play and what content they have played through.

The third major line of questioning focused on the play environment of each user's table. These questions centred around what digital and physical tools are used. Whether the players play homebrewed or published content or use miniatures and a battlemat (an erasable map of the combat encounter featuring a hexagonal or square grid) or simply imaginative description. Even

minor questions about whether snacks are generally eaten at their gaming table provide a deeper insight into what their gameplay environment is like. This information is vital for me to understand the setting in which my tool may be used.

The final line of survey questioning focused on user opinions. This section was devoted to asking participants about their favourite and least favourite parts of D&D, as well as their opinion on things such as digital tools and preferred Dungeons & Dragons related content. These questions were chosen for very specific reasons: to help me understand my users' frustrations and validate whether my hypothesis about combat being a problem was correct, to gain a better understanding of what draws these participants to the game, and to learn what content these users engage with. If I am to create a tool my user will enjoy, I need to know the problems they want solved and the things that they find enjoyable already.

4.2.2 Interviews

When approaching the user interviews I wanted to ensure that I would be gathering more in-depth qualitative data than on the survey. I based the interview script on a fluid approach, allowing conversation and lines of questioning to open up as seemed relevant based upon interviewee responses. Interviews were conducted in-person and over Google Hangouts, Discord, Facebook Video and additional video platforms. Each interview began with basic demographic questions, similar to those on the survey. These questions primarily served to ensure all demographic data was correct and stood in place of demographic data gathered through the survey for any interviewees that did not previously participate in the survey. These surveys also served as a good introduction to help put participants at ease. After this was completed, questioning would primarily switch to questions centred around the interviewee's experience with Dungeons & Dragons.

Initial Dungeons & Dragons questions centred around establishing a basic understanding of the participant's history and experience with Dungeons & Dragons, as well as other tabletop role-playing games. Examples of questions asked in this period include: What edition did you start playing in? Did you start as a player or as a Dungeon Master? Do you DM now? Do you primarily engage with homebrewed or pre-written content? etc. Following these lines of

questioning and any follow-up questions, interviews transitioned into discussing points of joy and friction. These questions sought to determine what parts of the game participants preferred and why they preferred them. Similarly, questions about points of friction and dislike were utilized to determine what the interviewees believe could be improved and where they encounter problems or moments of frustration or boredom. Dependant on the answers to these questions, participants were then asked about their specific points of friction, what they identified as problems in need of solving, and what steps (if any) they had taken to resolve those problems in the past. Based upon survey responses I also had additional questions pre-prepared regarding Fifth edition combat should the conversation of friction lead to such an area - these questions were not utilized if the participant did not mention combat as a point of friction so as to not lead or promote bias in interview responses.

The final section of interview questions pre-prepared was made to encourage discussion of tools and content currently being used or engaged with by the participant. All participants were asked what tools they use for playing D&D, whether any of their tools were digital, their opinion on additional digital tools, and what additional items were present at their table such as battlemaps or tiles, miniatures, music, etc. Participants were also asked their opinions on digital device use at the gaming table. These questions served to provide a better understanding of the gaming environment present at the participant's table and their level of openness to new tools being introduced.

4.3 Research Results

The results of this user research led to the creation of my user persona, Danny Dungeoncrawler. This persona is an artefact of UX design - representing the ideal user and their various attributes, demographics, feelings, etc. The results used to create this persona will be listed, explained, and evaluate in the following paragraphs.

4.3.1 Survey

The results of the survey presented verification of my initial hypothesis of Fifth edition problems, but they also presented valuable and, at times, unexpected information about my user

base. The online survey was completed by 88 individual participants with approximately 69% self-identifying between 18 - 30 years of age as well as 67% Male. More than half of participants who chose to share their income (44/80) identified themselves as living on \$40,000 a year or less, though the currency was not specified: ie. CAD, USD, etc. Interestingly, more than 60% of respondents stated that they were not exclusively a player or DM which is surprising considering the ratio of players to Dungeon Masters in a standard campaign. Another interesting insight includes the fact that the majority of participants were actively involved in more than one campaign at the time of response with the most common answer being 2 - this is likely the answer to the ratio conundrum stated above.

While all the information stated above is incredibly valuable demographical data it was the later questions in the survey that provided perhaps the most important data: 59% of respondents prefer roleplay to all other portions of the game with only 6.8% citing combat as their favourite portion of the game. In response to the question of the biggest problem within Fifth edition, 25% of participants cited combat, pacing and flow as their primary issue with an additional 15% citing communication of mechanics, rules, and player distraction/immersion as their primary problems. These responses confirmed that my hypothesis, that combat mechanics and flow were a primary issue within gameplay to more than a quarter of surveyed players.

What is your favourite part of the game?

88 responses

Figure 4. User response to “What is your favourite part of the game?”. 2019.

The final major insights I found were that more than 50% of respondents were already using the digital character management tool D&D Beyond and that 87.5% were open to further digital tools being added to the game with only 4.5% being categorically opposed.

With these answers in hand, I was prepared to make my first attempt at answering the core research questions posed by Tomer Sharon for this phase of development. These questions are: What do people need? Who are the users? How do people currently solve the problem? And what is the user's workflow?

What do people need? What people need is an interesting question as it fundamentally asks what is the problem people need solved? The answer to this question based on my results was that users need a way to improve combat flow and communication while encouraging player immersion. This answer forms the basis of my design challenge: to improve combat flow without distracting participants. I chose to reword this challenge to avoiding distraction from encouraging immersion as it is my belief that in improving combat flow, immersion will likely be improved as it will increase the opportunity for our users to get back to what they truly enjoy: roleplay.

Who are the users? This question is answered simply by my initial user persona. My users are mid 20s Dungeon Masters and players of Dungeons and Dragons' Fifth edition. These users make less than \$40,000 a year and are looking to improve combat flow and immersion. They are currently facing problems due to overwhelming and complex combat mechanics and player distractions. They are open-minded regarding digital tools and actively engage in the discourse surrounding the game - approximately 69% of these respondents use at least one of the many DnD subreddits.

How do people currently solve the problem? What is the user's workflow? These questions were largely unanswerable via the survey. While the survey provided a valuable glimpse into the demographic data of respondents and presented some qualitative data the majority of the answers provided primarily quantitative data as seen above. As such it was time to move on to another of Sharon's suggested methods, user interviews.

4.3.2 Interviews

User Interviews were conducted with a total of 11 participants. These interviews revealed primarily qualitative data in an effort to confirm the information presented by the survey as well as answer the further questions posed by Sharon's method of validation. While many of the questions in the initial phases of the interviews bore a great deal of similarity to those asked on the survey the only major change in data was presented by a shift in those who considered the issues of combat flow, mechanical communication, and immersion to be core issues. Within the survey, these issues were identified by 40% of respondents; however, in interview participants, 60% identified these problems as their primary complaints. This is especially interesting considering participants were recruited agnostically from their answers to the survey or whether they had answered the survey at all. This assisted in validating my hypothesis that this was what user's believed to be their core point of friction.

The previously stated confirmation was valuable; yet, more importantly, these interviews were conducted to provide the answers to the remaining research questions posed by Sharon: How do people currently solve the problem? What is the user's workflow? When participants who identified these chosen issues as their core problems were prompted for further information a wide array of answers came forth. Some users had developed specific methods for running combat: utilizing rules of required time to execute turns, requiring players to track their own initiative or turning to online tabletops rather than physical tabletops where much of the information was already displayed. Perhaps most unique of all though was a participant who did not cite combat as an issue. When asked how they handle pacing in combat they stated their party had homebrewed their own ruleset for handling combat encounters to keep them fast-paced and interesting to players. This version of combat the participant described involved using a house rule that would complete combat should the players appear to have won the majority of the fight, in their own words "when the tide turns so much that it's unnecessary to play through it is just resolved". This is a particularly interesting method as it is an example of attempting to solving a broken system with another broken system.

When I refer to the systems as broken it is accurate to say that judgement isn't entirely true. This system is not wrong. After all, obeying the rules is not a requirement of D&D

according to the designers, yet this patchworked fix presents a new problem. What is “unnecessary to play through?” Due to the random nature of the dice in D&D, any combat or fight could quickly become deadly regardless of the odds the players or the enemy are up against as attacks can be missed repeatedly and critical strikes can be dealt doing increased damage. This aspect presents a possible break in the system as it opens a whole new line of questioning. Is a fight where the enemy is statistically unlikely to kill the entire party worth playing? Is a fight where the enemy only damages the players worth playing? What do the odds have to be to constitute a fight that is necessary to play through? This method is certainly an answer, and has seemingly answered the problem for the participant as they didn’t cite the issues 60% of interviewees did, but is it good design? Perhaps for the participant but as it constitutes a fundamental change to the rules of Fifth edition I decided it could not be an option.

What is the user’s workflow? This question posed a significant problem in identifying through the interview process due to the fact that a variety of participants play D&D in different methods. As such, I had to make a choice to support in-person play at this time. This is not to discount the value of online play, but the process is fundamentally different between the two and as such, I could only focus on one at a time. I chose the option I am most familiar with and the option utilized by the majority of participants: traditional in-person play.

Interview participants who play primarily in-person stated that they do not generally use digital tools for tracking combat encounters - though spell books were common. These users identified their general workflow as the following. A combat begins and all players as well as the DM roll for “initiative.” Each participant rolls a twenty-sided die, the DM often does this several times: once per each monster or in some cases pack of monsters. The results of these rolls are then recorded by the Dungeon Master from highest to lowest - including non-player characters (NPCs) - using paper and pencil. Turns are then executed in initiative order by each player and NPC until the combat is resolved. Turns involve movement, actions, and reactions. Dice are rolled when required and statistical changes including health lost from damage and any ongoing hindrances are noted by the individuals affected. Interestingly, there was no consensus on the use of miniatures with this group of interviewees with the majority of participants citing the use of miniatures or battlemaps or tiles as entirely dependent on the encounter and group. With

interviews completed, I had empathized with my users and had gained a greater understanding of who they are, how they solve problems, what their problems are, and the workflow they engage in when resolving combat encounters. With this information in hand, it was now time to begin defining and solidifying my design strategy.

5. Defining

Defining is traditionally the phase in design thinking where research information is reviewed and the design challenge is solidified. It is the intent of design thinking that one enters the process of designing the problem statement wholly open-minded and merely responding to the data provided in the initial research phase. With the addition of Sharon's method, the defining process had already become a portion of the research results and a hypothesis had already been formed. This choice to combine the two presented a simplified defining phase and additionally allowed me to adjust my research plans to ensure necessary information was discovered. As such, the following section will be significantly shorter than the research category and largely consist of clarifying and solidifying research responses.

5.1 The Problem Statement

In the research phase, I identified my user-base as Danny Dungeoncrawlers and discovered their concerns. These concerns were that Dungeons & Dragons' Fifth edition does not effectively communicate combat mechanics and rules information, combat is lengthy and lacks flow, and that players can become distracted or break immersion and engagement as a result of these issues. This is a complex problem as these issues present a cause and effect scenario. The problem of poor communication has led to lengthy combat that lacks flow and this, in turn, creates disengaged players during combat, likely exacerbating the problem. As such resolving this problem will mean solving core problems while also ensuring that the sub-problems caused by this issue do not occur while also keeping the statement broad to allow further ideation. In light of these complications, I constructed my problem statement as the following: Our user needs a way to improve combat flow as poor communication and lengthy combats in Fifth

edition are causing disengagement within their party. This problem statement encapsulates the core issues identified, while remaining neutral to the solution to be created to resolve the issue.

5.2 Engagement

While the previously mentioned problem statement is well constructed and communicates the issue clearly, I feel it is important to also define what I consider engagement to be. For the purposes of defining engagement within this project, I consider the act of being engaged to be: the action of being interested, attentive, and enthusiastically participatory in an action or event. This definition also presents the state of being disengaged as the following: to be disinterested, inattentive or reluctant in participation of an action or event. These definitions, like the research that has informed them, is definitively subjective and qualitative rather than quantifiable. This lack of quantitative value to engagement means that any use of engagement as a form of assessment will also be subjective to the participant's opinion and present a qualitative answer.

6. Ideation

In the ideation phase of design, I examined and considered a variety of possible ways of solving the problem I had set out to solve. These possible solutions ranged from Augmented Reality (AR) to physical tools, and multiple versions of an app. I will discuss the most prominent ideas considered in the following paragraphs.

6.1 Augmented Reality

My initial response to this problem was to take advantage of a technology I was becoming acquainted with at the offset of this project: AR. This idea focused upon solving combat flow and communication through augmenting the game board. In doing this I would place health bars, status markers, an animated world and a variety of other options on top of the battle map in AR. Players would also have submenus and the initiative order displayed on their devices. The problem with this solution is that it really didn't address the problem statement or my research findings correctly. This idea was largely approached because I thought it would be

unique rather than whether I thought it would be effective. Upon further examination, it quickly became apparent that this was not an effective solution and was merely handling a symptom rather than a core problem. Augmented reality might resolve the symptom of players being disengaged or lacking immersion in combat; however, it would also introduce a series of other complications. How would the AR handle 3d structures on the traditional 2d battle map? How many character-types can be covered for character models? How do I ensure that the map is exactly the same in location and scale for every single player and the DM? How do I let the DM control it? These are all massive hurdles; but, if the solution was right I could take them on but the biggest problem is simply this: How does this improve combat flow? It doesn't. How effectively can this improve communication of mechanics? Minimally. Fundamentally this solution wasn't a solution at all, it was a gimmick.

6.2 Analogue

After spending a significant amount of time thinking on how to make AR work I moved on to the consideration of other solutions. Physical solutions seemed interesting, but many already exist. Notebooks, spell cards, and initiative trackers already exist as do wet-erase character sheets and several other attempts to handle the problem with analogue tools. The core constraints of approaching this from an analogue perspective were three-fold. Initially, it was a feasibility issue due to a lack of experience/acquired skills in the fabrication and design of physical tools. Luckily with the prominence of 3d printing, maker spaces, and the wide availability of resources through the university, this could be overcome. This left two remaining problems for ideation in this vein: viability and desirability. Based on my research a significant portion of my users live on less than \$40,000 a year. While that is not necessarily below the poverty line it isn't incredibly wealthy either. With the wide array of upfront costs to Dungeons & Dragons: rulebooks, miniatures, dice, writing utensils, any other key tools, and snacks at the table - which I should note the vast majority of users did report having regularly - the financial barrier for entry can become quite steep. This would mean targeting a higher-income user or providing enough value that the added cost could be justified. The addition of an added cost will likely be problematic for any solution, but a physical tool would have decidedly higher costs per

product to produce than a scalable digital tool. This cost factor combined with the wide array of physical tools available also harms the desirability of the tool. With all these constraints in mind, it did not seem realistic to approach

6.3 Voice UI

Finally, I looked to app-based solutions. There were a variety of different app ideas that were considered with various different interfaces. A major consideration in the initial stages of the project was a voice-based UI system that could provide readable data to a users phone based on set commands. This idea was intriguing, especially considering the prominence of music at our user's table. This would likely require access to speakers including voice assistants like the Amazon Echo or Google Home. The core barrier to further consideration of the project was the requirement of set voice commands. Voice-based software is still very reliant on set commands and audibility. This would limit the kind of phrases/description DMs and players could use to cue up mechanics in combat but it would also mean that the tool could be impacted negatively by ambient noise, several players talking at once, or even music being played during the game. Issues with this system would only slow combat flow further and as such the idea was removed from my consideration.

6.4 App

The app idea that became the project Role Initiative originated out of the idea for a pared-down combat menu. A simplistic app designed with the minimum required information to play that would be accompanied by traditional character sheets. This version would present a combat menu with basic actions and would handle dice rolling and the timing of turns. This idea quickly ballooned out after consultation with colleagues suggested the integration of messaging and note taking as well as the full character sheet. This app would include everything needed to play the game similar to sites like D&D Beyond; but, it would also offer combat integration and in-campaign messaging. The app would integrate with other users over either BlueTooth or wi-fi to allow status effects, HP loss and gains, attacks, and turn order to occur across devices in real-time. Dungeon Masters were to be given admin control over players and the campaign as a

whole, working to extend DM influence onto the newly introduced screens. This was the idea that was selected to move forward into prototyping.

7. Prototyping

The following paragraphs will cover the many iterations the app underwent prior to official play-testing. Iterations due to the confines of ethics approval could not be shared with users at every interval so instead, this stage of the project relied on feedback from my colleagues as well as repeated analysis of the project in comparison to the problem statement and user persona. Each major iteration below had several sub-iterations used to make minor adjustments or add features. For the purposes of this paper, I will be handling primarily major iterations

7.1 Major Iteration One

Figures 5-7. (From left to right) The initial character sheet page one, page two, and the combat menu of iteration one. 2019.

The first iteration of the Role Initiative app was built in Adobe XD. The app features a black and red colour scheme and tried to mimic the design of D&D books by utilizing a

parchment background. The character sheet took up a total of two pages and served as the home screen for the app. The main page featured base stats, saving throws, and proficiencies as well as “armour class” (AC in the character sheet), speed, initiative and hit-point (health) indicators. This iteration was not only trying to mimic D&D books but it was also mimicking a traditional character sheet. It borrowed aspects of formatting and the location of information points from the official design. (See appendix for figure of a traditional character sheet)

Key usability features of this initial prototype include the crudely designed action bar at the bottom of the screen, which turns red to display the page you are on, page indicators on the home screen, and the hamburger menu to the top left. These features introduced the first levels of usability standards into the app. There is also a back button, though the placement and existence of the button is not standardized across sections, this is also true of page titles which appear across most screens at the top, but do not feature on the character sheet home page.

Very few things from the initial iteration have continued into later prototypes - largely due to its failure to address core usability standards and poor design choices such as the parchment background. Features that have remained though are those which focus upon combat. The combat menu, while it has changed significantly in design, maintains many of the core initial features including the four-button display for accessing the various aspects of a turn. The initiative bar is also present, indicating the turn order on the right side of the screen. In this first iteration, the initiative order is always on the right side of the screen regardless of the page the user is on. The combat menu also features a countdown timer in an attempt to encourage players to act quickly, with the intent being that the length of this timer would be controlled by the DM.

The purpose of this prototype, unlike later iterations of the app, was to tell core user stories. This prototype allows users to play out a single action in the combat menu in which the player may take the battle-axe attack action followed by an extra attack. In order to help the prototype function, better dice rolling screens instead featured equations to allow testers to complete the turn using analogue dice. This flaw would later become a core feature of future iterations. Other user stories included accessing and creating a note (despite XD not allowing testers to physically input information such as text); accessing tooltips to explain standard rules of “armour class,” initiative, speed, and health; finding the rules for the spell thaumaturgy in the

cleric spellbook; and accessing the group campaign chat for the Heart of Gaia campaign. While the breadth of features felt commendable, it was then that I realized that many of those features - namely note taking and chat - had little or nothing to do with my problem statement.

This prototype, while consisting of over 40 screens, presented very little in the way of combat information and acted as little more than a showreel of possible features rather than a tool that could be tested with users. This meant that it was impossible to test whether I had solved my chosen problem and that when I went to ask myself the next question posed by Tomer Sharon, can people use the product? The answer was a clear and resounding no. I could have perhaps excused this as it was a prototype, not a final product as the question might imply. But if a prototype can not be fairly tested and assessed by users, then what is its purpose? So after several sub-iterations, I moved on to the next major change: completely redesigning to answer this question and better solve the issues listed in my problem statement.

7.2 Major Iteration Two

The second major iteration of the prototype was rebuilt almost entirely from the ground up. The action bar was redesigned, and only the hamburger menu and initiative bar remained from iteration one. This version of the prototype was still built in XD. It attempted, however, to account for the weak points of the program and my failing to solve my chosen problem by paring back on features and adopting a combat-focused perspective. In observing my own play in D&D and through my knowledge of the game I noticed that the most change heavy feature of play across all characters was consistently health. Hit-points are regularly erased and rewritten throughout a session of play and, as such, occupy a position of key importance. This led me to the realization that much of the gameplay and decision making in D&D combat is fundamentally centred around health. I redesigned the home page to feature health more prominently with that in mind. I also split the character sheet apart so that information was tailored to player needs. The home page would still be the character sheet, but now the sheet was split into the in-combat and out-of-combat editions to declutter the screen of overwhelming information and better communicate what information was needed. Even on the out-of-combat character page,

information was pared down significantly. Inventory took its own place in the action bar alongside a details section which featured three pages of features, traits, proficiencies and skills.

Figures 8-10. (From left to right) The out-of-combat, in-combat, and attack menu options of iteration two. 2019.

Like the core character sheets, the combat menu was redesigned to take centre stage. Combat was no longer limited to just another icon on the action bar, but was now available through the in-combat character sheet. This change improved the character sheet itself as well as the combat menu by ensuring that combat flow solutions were integrated within the core page. Likewise, the initiative bar now remains on the combat pages, discouraging players from wandering or becoming distracted on others' turns. The timer was also removed as there was no way to make the feature function and upon examination of the feature, it was more dedicated to speed rather than combat flow and as such I no longer felt it reasonable to include.

Halfway through the designing of the various combat menus, I encountered Sharon's question once more, can people use the product? Once again the answer was no. My intentions of including health tracking, editable text, and dice rolling were simply not possible in XD. To test without these features would once again fail to answer this question and would not provide users

with the intended experience. It was at this point, which I should mention was four days before user testing, that another major iteration would have to be made.

7.3 Major Iteration Three

Figures 11-13. (From right to left) The out-of-combat, in-combat, and skills page of iteration three. 2019.

On the advice of my supervisor, I made a change of prototyping software in iteration three. This new software, UXPin, allowed for random number generation, equations, variables, changing states, and user inputs. This meant that this iteration would pass Sharon's question but I was short on time. I quickly translated the information from prototype iteration two to iteration three. I created four distinct prototypes for the purposes of the study each was designed for iPhone XS. Iteration three was largely a copy of iteration two with an expanded combat menu and user inputs. This change of software allowed me to create an onboarding experience that would let players name their characters as well as edit their health in the prototype. I completed the screens for each combat option but due to time constraints, several key features were not addressed for the playtesting studies. The missing features included the following: spell slot tracking and castable spells, dice rolling, and actions were limited only to basic attack options with no movement, reaction or bonus action options functioning at the time of testing.

This version of the prototype could test key user stories of taking a basic action, accessing the character spellbook, viewing features and traits, and retrieving player inventory information. This meant that while the prototype was not feature complete it was testable and therefore a circumstantial pass upon Sharon's question that had caused 2 redesigns. Yes, people can use the product.

8. User Testing

The process of user testing took place on two days in sessions that individually totalled five hours for a combined total of ten hours of user testing. These tests included eight participants separated into two groups: one Dungeon Master and three players per group. These sessions were primarily used as a chance to observe users play the game in a variety of methods as well as test the app against the competition. The following sections will detail the design of the user testing as well as the results.

8.1 User Testing Design

For the purposes of user testing, I decided to do a variation of A/B testing design. Rather than testing two variations of my prototype I instead opted to test three methods of playing the game: analogue pen and paper, D&D Beyond, and my prototype of Role Initiative. The testing process operated as follows: The DM would lead three players through Matt Colville's Delian Tomb adventure as published to GM Binder by Reddit user u/blaek_. The adventure would consist of roughly three hours of adventuring with methods of play being switched each hour. The first hour would be played entirely traditionally utilizing pen and paper, the second in D&D Beyond mobile, and the final hour utilizing my prototype. This adventure was chosen as it is intended to be a good entry point by new players, is completely free to use, and, based on my own playtests previously, has a minimum of one combat encounter per hour - guaranteeing that each method has a chance to be tested. After each hour players and the dungeon master were asked for their general opinion on the hour of gameplay, what made them the most engaged and disengaged, how they felt it compared to previous hours, and how they felt about the tool they were using, players were also asked to note if they encountered any points of friction in any tool

whether it be a bug, distraction, or design element. Players were given pre-generated character sheets of level 1 characters that are available directly from Wizards of the Coast. These character sheets were then duplicated in D&D Beyond mobile and into the prototype. As the DM tool for the prototype is not currently available nor does Beyond offer any tools for running the game, DMs operated entirely analogue.

As the primary researcher, I also observed each session, noting moments of friction in all versions of D&D as well as conducting all interviews and focus group sessions. Each session began with a player contract establishing the gaming table as a safe space followed by character selection and a briefing on how the day would continue. After each hour we took a 15-20 minute break for interviews and a final group feedback session was conducted after interviews following the final hour. No changes were made to the prototype or any of the available character sheets or information so as to keep the study fair and balanced. Players and DMs were divided into their groups based on experience, users with less than one year's experience of Fifth edition were considered new players and those with more than one year's experience were treated as veterans. No participants were paid, though refreshments were provided and each participant was given a set of 7 polyhedral RPG dice as a token of appreciation. The key testing measurements were learnability, efficiency and engagement and all data collected should be considered qualitative rather than quantitative due to the subjectivity of this topic.

8.2 New Player Testing Summary & Results

8.2.1 Hour One

New player testing took significantly longer to onboard than expected due to minimal experience. Once the game had begun however pacing picked up significantly and the game was able to complete on time each hour. In the first hour of gameplay, several issues arose regarding the analogue tools available. Players struggled with understanding how to read the skills section of the character sheet as well as the meaning of individual skills. The DM was also confused by the demands of managing certain mechanics, understanding some of the rules, and was unable to

find answers within the rulebooks. On multiple occasions they took several minutes to locate required information within the adventure and the *Player's Handbook*. Rules that caused confusion include “armour class” and how it impacts rolls to hit of equal value, the difference between the Insight and Perception skills, the use of “cantrip” spells in relation to other spells, damage modifiers, the relentless endurance trait of boars etc. Of note, the player of the wizard character was observed resorting to looking up spells on their phone rather than in the rule book due to confusion, despite the initial hour being designated as an analogue hour. In interviews following the first hour players found themselves overall engaged but noted friction and disengagement regarding the visual hierarchy of the character sheet and repeated rules dilemmas that took several minutes to resolve. The DM noted feeling overwhelmed by tracking initiative and damage in combat and felt they were often having to turn to Google or asking others for assistance interpreting rules.

8.2.2 Hour Two

The second hour began in an immediate second combat with players switching to D&D Beyond. This change posed significant issues with all three players having significant issues navigating the UI of D&D Beyond. Several players unintentionally added or removed things from their character sheets requiring them to edit inventory mid-game. Throughout the first combat, players were repeatedly struggling to find information regarding specific skills and proficiencies they wished to use during combat. Of particular note were errors with the navigation button utilized by D&D Beyond which confused many players and often left to repeated failure to access pertinent information. In the second combat of the hour, issues persisted and the wizard player resorted to searching online for a spell again rather than use Beyond's interface. Initiative order was also forgotten mid-fight and the paper containing the information could not be located and as such, it had to be rerolled. In the post-hour interview, all three players noted their dislike of the D&D Beyond mobile site: citing confusing navigation, distracting UI, and comparing the spells section negatively to available spellbook apps. All players also noted a dislike of the mobile version being reserved to a website as they found it annoying to not be in full screen and found themselves untrusting that the site would remain

loaded should they cease interacting with it. One player stated this hour as overall less engaging than the first while the other two cited DM confidence as a reason for a more engaging second hour despite issues with Beyond. The DM stated feeling increased confidence in this hour but also cited that they felt immersion and engagement with the players was decreased due to Beyond. All four participants stated that they would not utilize the service in the future.

8.2.3 Hour Three

Hour three began with a short onboarding to the prototype as each player made use of it. A key flaw was immediately found in the design of the prototype as those who did not have iPhone Xs experienced text and scaling errors due to the use of an apple only font in the design of the app and scaling issues based on screen size, this did not make the app illegible but did disable the ability to edit health. One player opted to switch to a laptop viewing the mobile screen in browser to get a better sense of how the app would look in practice. Combat and roleplay progressed with relative ease as players narrowly won the boss encounter within the dungeon; however, an issue was caused when a player picked up a different type of weapon and was unable to add it to their inventory due to the prototype state of the app. Players were unable to solve the riddle at the end of the dungeon leaving the final treasure hoard unlabeled but completed all other adventure objectives. In the interview session following the final hour all three players and the DM noted that the third hour was their preferred hour of the three. All participants noted an increased combat pace and flow and stated the action menu and spells section of the app as positive improvements to the game. All participants noted significant frustration with text errors and the inability to edit health. Participants were far less interested in providing feedback in gameplay in the third hour than the first two instead focusing on app feedback, though all noted they found themselves feeling more engaged in the third hour.

8.2.4 Feedback

In the feedback portion of user testing, the group had a variety of suggestions and concerns to address in future iterations. These suggestions and concerns included: establishing a more distinct visual hierarchy, the assertion that the health indicator should not be as large as it

is, confusion regarding the action bar item simply being listed as Details, and that font issues and broken health editing must be addressed and corrected. Interestingly, the lack of dice rolling in-app became a point of contention among participants with half of the group requesting it and the other half stating they would not use the app were dice rolling to be included. Additional customization options caused similar disputes amongst the group with some requesting customization and others citing that customization would only add distraction. Overall the app performed admirably: being the preferred of the three methods and succeeding at increasing combat flow and efficiency while keeping players engaged. The prototype, however, did falter in learnability due to a poor visual hierarchy and was impeded by errors including font and health tracking issues.

8.3 Veteran Player Testing Summary & Results

8.3.1 Hour One

Veteran player testing began significantly quicker than the new player group. This group very quickly engaged with roleplay and the DM with little-to-no immediate issues with character sheets or rules. Mid-way through the first hour participants had a food spill mildly damaging a character sheet as well as comments on how much erasing and rewriting they had to do. The first hour, including the first combat, went by relatively efficiently with no key problems. Although, notably, only basic actions were utilized during this time, with minimal skill checks and no use of spells by any character. In interviews, all three players noted that roleplay and interactions with the DM were engaging but overall found combat dull, though it was noted as veteran players they found first level characters offered few options to make combat unique or complex. This is interesting considering the lack of use for any skill checks, non-attack actions, or spells. While players noted a lack of opportunity to execute interesting abilities, they also did not use the vast majority of options available. The DM felt that the pacing was a little slow and that overall story was on the less engaging side in the first hour. The DM also noted they found the first combat to be too easy, though they stated that is common in one shot (single session) adventures.

8.3.2 Hour Two

Hour two began, as it had with the new player group, with the initial switch to D&D Beyond. All members of the group had stated some experience with D&D Beyond though none use it regularly. Players immediately upon logging in stated confusion with the UI and had significant trouble locating pages of information they needed effectively. There was a great moment of delight in this hour in which one player discovered they had a flute which they had not seen on the initial character sheet. This caused significant laughter around the table despite the player noting that they would have liked to have that information presented better through Beyond and before they had already gotten into combat. Once in combat players were noticeably more engaged in tactics in this hour than the previous hour with several members of the party standing up from the table throughout the fight to act out actions or make combat suggestions. There was also increased use of non-attack actions, especially spells in this hour of gameplay. Combat was also laced with significant barks (roleplay/insults throughout combat). In the interview portion of the second hour, all players noted more engaging combat in the second hour but also lamented the design of D&D Beyond. Two players stated that they found themselves regularly being distracted from actions occurring in the game due to the many sub-menus and options within Beyond. All players stated that they preferred analogue to Beyond and some players noted that they were intentionally trying to engage in more roleplay and remember parts of their character sheet so they could avoid interacting with the confusing UI. The DM enjoyed the roleplay and the combat of the second hour more than the first and noted the moment of flute discovery as a particular highlight. The DM did state that they found combat tracking becoming more of an issue in this hour and noticed reduced efficiency in combat as well as distraction from players with their devices.

8.3.3 Hour Three

The third hour of the veteran play test held many of the same initial issues as the new player session. Once again, a player opted to switch to a laptop to resolve issues with the UI. Overall engagement throughout the study seemed to peak at the midway point of this hour with players seemingly only looking at devices when necessary. This may also have been caused by

an incredibly close final encounter in the adventure. Similarly to the new player group, veterans opted not to continue searching for treasure after failing to solve the final riddle of the dungeon - though it was stated that all players were mainly concerned about dying due to low party health rather than disengagement with the dungeon and were this session not a one-shot they would have returned to solve the puzzle. In the interview portion of the third hour, all participants stated that they felt the app made combat more efficient and that they preferred the UI and navigation to Beyond. Players also stated that they felt most engaged in this hour and did not find themselves distracted by the prototype.

8.3.4 Feedback

During the feedback portion of the test all participants stated several friction points with the app that would need to be resolved before they would consider continued use. These key suggestions and concerns were: the font issue needed to be resolved as it was annoying, dice rolling should not be added, uses of spells should be automated, the details section should be reworded to improve communication, base attribute values should be switched to saving throws on the in-combat character sheet, the addition of a back button, and customization opportunities, etc. Similarly to the new player user test, the prototype performed relatively admirably but was held back by significant issues caused by the rushed switch from XD to UXPin. The prototype was still preferred to Beyond and ranked well in engagement and efficiency by improving combat flow. Learnability was still hindered by the prominent text display errors and further efficiency increases would be appreciated before release.

8.4 Overall Results

The results of the user testing between both groups have demonstrated the following. In answer to Sharon's question of which design generates better results: based solely on my user testing and my user persona, the answer is my design over D&D Beyond. Users preferred the way information was communicated in Role Initiative to D&D Beyond. The prototype successfully improved combat flow and maintained engagement with reduced distraction in comparison to alternatives. While efficiency could still be improved with further prototyping and

error resolution the results of the user testing phase are promising. This prototype will continue into further stages of development.

9. Prototyping 2 - The Quickening

Figure 14-16. (From left to right) out-of-combat, in-combat, and spellbook screen of the final prototype. 2019.

After user testing, I went about answering the problems noted by my users. The first thing I did, and what was perhaps the most important lesson of all, was to switch all text to a neutral font - Arial - and increase textbox padding to accommodate for scaling issues in the future. I had originally designed for an iPhone X as that was what I had available to me; but, in order to allow users to test with their own devices, I had to ensure my design was usable on any device. Next, was the introduction of a back button to all pages excluding the home page, to improve the users' conceptual model of the page hierarchy and allowing for easy navigation. Next, I implemented a variety of simple requested changes including automatically applying modifiers to skills in the details menu, reducing the size of the health indicator on the in-combat page, improving visual hierarchy, fixing the health tracking error, and standardizing headings across all pages.

The major changes came in the way of implementing a variety of requested features that were already intended and required significant system logic. These major changes are as follows: upon reaching 0 hit-points death saving throws are now available from the in-combat character sheet. All spells are now castable with an automated spell slot tracking system. Players can now rest to regain health and spell slots automatically. Health changes now change the colour of the health bar in reaction to the percentage of health remaining. All actions, movements, bonus actions, and reactions are available. Turns can now be ended causing the initiative bar to move to the next participant. Additionally all variables: “armour class”, speed, etc. now track automatically.

One of the biggest changes made at the request of participants were changing the in-combat character sheet from displaying base stats to only displaying saving throws. This change vastly improves the flow of player information and provides better communication of important information when players need it. This process of only providing information at the times it will be used has proven to improve combat flow significantly based on my user testing and as such I’ve adopted it across the board.

Another major change that was garnered from user testing was to cancel plans to include a dice roller within the app. A major part of this design is to make something that doesn’t distract players from the game and for some players rolling physical dice is a key part of that game. Changing dice from a true physical object to a random number generator is too big of a change for some of my users and I feel it is a reasonable request. This isn’t about transforming the D&D experience but about assisting and improving combat flow and, as such, I can’t make a choice that takes away from the game rather than adds to it.

Overall, the latest iteration of the prototype is still fundamentally the prototype that was tested. The majority of the areas of friction have been removed where possible and the user stories available have been greatly expanded. Currently, these changes have only been enacted across one character sheet due to the sheer number of interactions required to perform this level of fidelity. Any further advancements to more than one character will likely occur in the fully developed version.

10. Next Steps

When approaching this project I had originally intended on attempting to build my solution in the time allotted to complete my MRP (Approximately four months). It is completely clear to me now that I was overzealous in my approach, and I would like to think that will not be the case in the future - though I am well aware my next steps are ambitious.

The future of Role Initiative relies on further user testing. While I was able to answer Sharon's design questions for the phases pre-release, I would like to gather further qualitative and quantitative data on the current iteration of the prototype. I anticipate multiple sub-iterations on this version would achieve an even better solution. Additionally, my next major project would be designing and testing the Dungeon Master facing side of the app, as this is a two-sided issue. While I may have found a clear solution from the player side of the problem, there is still another side to be explored from the DM's perspective. The DM's version would likely utilize a completely different workflow, allowing them to run their games efficiently as well as handle preparation for sessions.

Running alongside the testing and development of future prototypes my next steps also include finding a development partner to help me build the project into a functioning native app for Android and iOS. There is a significant back end that will need to be developed in order to test certain features of the app and to ensure that all the intended affordances are available at launch. While I am currently developing my programming and coding proficiencies, they will not reach the heights needed to achieve this scope of project anytime soon.

The next steps I have listed are a massive undertaking. But, based on my research, I believe that Role Initiative is a viable, feasible, and desirable option for D&D players. It is because of that belief that it is something I intend to continue in the future

Appendix

The following is an example of a standard character sheet as released by Wizards of the Coast.

DUNGEONS & DRAGONS®

CHARACTER NAME

CLASS & LEVEL

BACKGROUND

PLAYER NAME

RACE

ALIGNMENT

EXPERIENCE POINTS

STRENGTH

DEXTERITY

CONSTITUTION

INTELLIGENCE

WISDOM

CHARISMA

INSPIRATION

PROFICIENCY BONUS

ARMOR CLASS

INITIATIVE

SPEED

Hit Point Maximum

CURRENT HIT POINTS

TEMPORARY HIT POINTS

Total

HIT DICE

SUCCESSES

FAILURES

DEATH SAVED

PERSONALITY TRAITS

IDEALS

BONDS

FLAWS

SKILLS

PASSIVE WISDOM (PERCEPTION)

OTHER PROFICIENCIES & LANGUAGES

EQUIPMENT

FEATURES & TRAITS

Figure 17. Fifth edition Character Sheet. (Mearls et al, 2014b, p.317)

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