Networked Participation sets the Game Free – Warhammer 40k on Tabletop Simulator

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ABSTRACT
This study compares analog *Warhammer 40k* to the way the game is being played on *Tabletop Simulator*. It focuses on properties of analog and digital gaming as well as player participation in creating both the game and its community. The study uses participant observation and an interface analysis and is based on more than a year of weekly games and participation in analog and digital tournaments. It concludes that the digital version of the game de-emphasizes crafting and making which leads to a reduced barrier of entry. Social interaction is not the same online, but there are moments of collective narrative building. The interface of the game is leveraging the possibilities of digital media and goes in the same direction as design research for table-top games. The biggest difference of that the digital version is networked player creativity that makes it possible to play this game online and improves it.

Keywords
Digital board game, participation, game community, crafting, competitive play, interface analysis, hybrid games, Warhammer, Games Workshop, Tabletop Simulator,

INTRODUCTION
Playing *Warhammer 40k* (hereafter 40k) (Games Workshop, 2012; hereafter GW) on *Tabletop Simulator* (hereafter TTS) (Berserk Games, 2015) is a strange experience. A game that otherwise revolves around the physicality of miniatures gets played in a space where the physicality of the tabletop is only simulated. Painstakingly assembled and painted miniatures from personal collections are replaced with digital models readily available for download. Instead of the social experience of meeting at a local gaming store or traveling to a tournament and shaking hands over a gaming table, players meet on a discord server. The lockdown during the Covid pandemic has led to the explosion of the 40k community on TTS. 40k had been growing quickly both in terms of player number and sales during the pandemic, possibly a consequence of players escaping into crafting their armies during lockdown. However, the pandemic had then made it impossible to meet and play which meant that platforms like TTS became one of the only viable alternatives for actually playing the game. Especially competitive play has grown quickly on the platform where one now can find some of the biggest tournaments and own leagues, even games between national teams (of sorts). This development offers the opportunity to study how an analog game like 40k translates into a digital environment, both in relation to the change from an analog tabletop to a digital simulation, and even with regard to the way the game is played and how the culture around the game develops.

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This study compares analog Warhammer 40k to the way the game is being played on Tabletop Simulator. The aim of the comparison is to learn about the properties of analog and digital gaming as well as about player participation in creating game communities and gaming culture.

PREVIOUS RESEARCH

There are a number of areas of previous research that have been either exploring 40k or investigate digital, analog, and hybrid games and design for them. This section will briefly discuss previous research and use the perspectives and results that have shown to be salient and useful.

Relevant previous work has been aiming to understand how and why people are playing 40k. One of the core findings of this kind of work is that 40k can be understood as a pastime and hobby (Carter, Harrop, et al., 2014). This means that playing 40k pleasantly occupies the player, for example through building army lists, planning and assembling the army, or painting miniatures. The hobby aspect that is connected to preparing the physical miniatures, posing them during assembly and painting them to look nice in the vitrine as well as on the battlefield, is a central aspect of 40k (Meriläinen et al., 2020). Meriläinen et.al. (2020) identify crafting as the other core aspect of the game, next to actually playing. Besides miniatures, also, terrain, gaming tables, and even panoramas for presenting miniatures can be included under this heading. This paper then will use "crafting and making" as one of the categories for the analysis.

An aspect of the physical game that is discussed by Tobin (2018) is the use of true line of sight in the game. This means that in order to determine if a unit can shoot at an enemy, it needs to be possible for the physical model representing that unit on the table to draw a real line of sight to the model that represents the target. Here, the physicality of the models on the table is central. How a model is posed during crafting can then make or break a game. In practice this means that players will often bend down to look "over the shoulder" of their model to check if it can establish line of sight to a prospective target. Tobin (2018) stresses this experience of the players which "allows the miniatures to look along with the player" (Tobin, 2018:2) and lets them become even more a kind of presence on the battlefield.

Another feature of the analog game that is the physicality of the dice. During a game of 40k, players will roll hundreds of six-sided dice. Previous work has shown that these dice rolls are an element of the game that players not only enjoy but use to build tension and narratives (Carter, Gibbs, et al., 2014). Instead of automating the process by using digital tools players seemingly like the feel of the dice in the hand, the sound they make being rolled, and the collective experience of tension while they are rolling and the outcome of the battle (or this part of it) is out of anybody's hands. The physicality of the miniatures and the dice here establishes that "physicality" needs to be a category for analysis as well as creating a "narrative" at the table.

As mentioned before, the collective experience of waiting for the dice to stop rolling and the handshake over the table point towards the point that the "social" dimension is central. This is also supported by previous work here both in relation to the game as a pastime and as an angle point for creating a cultural space with likeminded gamers (Carter, Gibbs, et al., 2014; Meriläinen et al., 2020). Previous literature suggests that online play de-emphasizes the social aspect of gaming (McEwan et al., 2012; Trammell, 2010). That said, Kankainen (2016) has in his work comparing digital and analog *Blood Bowl* (Games Workshop, 1986), a game that is similar to 40k in relation to miniatures being used, concluded that the social aspect is also central in digital

gaming. Kankainen (2016) also found that some of the fictional elements and the creation of a narrative do translate to digital games, albeit requiring extra effort from the players. Additionally, he highlights that accessibility is a relevant frame and that the digital version of a game can be more accessible both in terms of relieving the need for crafting in preparing the physical miniatures and making it easier to connect to and play with others. This means that "social interaction" and "accessibility", are the next two relevant categories for the analysis.

Based on my personal perspective and approach to the game, the frame of "competitive play" will be relevant here. Competitive play has been a crucial backdrop of the pastime of 40k (Gibbs, et al., 2014). Competitive gaming as one of the two cores of 40k (Meriläinen et al., 2020) is also a relevant element of *Blood Bowl* leagues described by Kankainen (2016) and both accounts seem to indicate that competitive players are somewhat less interested in the crafting part of the game. My approach to the game is that of a competitive gamer, meaning that I participate in tournaments and play to win. This is just one way to play the game and this approach does color my data collection and analysis. However, it is a central perspective. Similarly to other spaces, in 40k competitive play has a lot of visibility in the community and is worth studying.

The two final categories are the "digital interface" and "participatory creation". The digital interface is naturally a relevant part of the comparison of the analog and the digital game. Design research in the area of hybrid games or digitally enabled table-top gaming is relevant here to an analyze the what the digital medium changes or where it offers opportunities (Bimber & Raskar, 2005; Dolce et al., 2012; Hinske & Langheinrich, 2009). Participatory creation is a topic that I have been working with in the past which means that I was more likely to look at my play through this lens (Prax, 2015, 2016, 2019). This includes perspectives on the importance of fans and player creators as well as the marginalization in terms of ownership and legal standing (some of the foundational texts here are: Banks, 2013; Sotamaa, 2007; Wirman, 2009). That said, this category did also push itself into the analysis because of the central role that the game community is playing, both in terms of creating digital assets and tools to make the game playable and as a social and cultural setting.

That means that the analytic categories based on previous work here are:

- Crafting and making
- Physicality
- Social interaction
- Accessibility
- Competitive play
- Digital Interface
- Participatory creation

METHOD

This paper combines two methods, participant observation and interface analysis. The advantage of participant observation here is that it does grant insight into also the culture of the game and the way it is being played (Boellstorff, 2006; Lammes, 2007). This is difficult to do without participating in the game and the community oneself and without playing the game (Aarseth, 2003). Participant observation has been widely used in games research for example to study game literacy and learning in tabletop RPGs (Garcia, 2020), online communities (Boellstorff et al., 2012), and even competitive play (Taylor & Witkowski, 2010), all of which are areas that are in different ways similar to competitive 40k. Especially going through the process of

learning how to play the game on the platform of TTS, mustering an army, and competing in tournaments, is offering insights that would not have been possible to gain only through interviews or observation. Using the interface of TTS while trying to compete and play the game is exactly what has been enabling the analysis.

In practice, this means that I have been playing 40k first casually for two years and have then taken the step to competitive play just before the pandemic lockdown in the spring of 2020. I have participated in two bigger tournaments, one of them being the biggest event in Sweden, and a number of smaller local events of analog 40k. Since the fall of 2020, I have been participating in competitive events on TTS playing roughly one game per week except for breaks during the holidays. I have been taking field notes during play as well as pastime activities. I have taken screenshots and notes during play (with the consent of the opponent, should their miniatures or screen name be visible), and have been taking field notes in connection to the screen shots to contextualize them. Especially early-on when I was learning to use the interface of the game, documenting it has been a central aspect of data collection. This is why the study also uses the method of interface analysis (Consalvo & Dutton, 2006). The figures in this article are part of the data collection.

The notes were in some incidents augmented with quotes from my opponents, again with their consent. While I learned to play the game, the focus of my notes shifted from the interface to the social interactions with other players and to the way the game played. During play, I have been learning both about competitive 40k and about TTS as a platform and the player-created tools that are used to facilitate play. Learning about these tools was a larger part than originally expected and their importance for online play is reflected in the analysis later.

RESULTS AND ANALYSIS

Crafting and Making

The first category here is crafting and making. This is the area where digital version of 40k is considerably different to the analog game. It is not possible for players in the same way to model, pose, and paint their own miniatures. As digital objects, they can be copied and pasted, deleted and multiplied. Models for any army in the game can be found on the community workshop of the Steam platform or be downloaded from GitHub, a platform for collaborative work on programming tasks. While it is possible for players to make their own models or modify existing ones, here crafting requires the skilled us of digital tools.

A key difference between crafting in digital and analog is ownership. Miniatures in the analog game are owned by the player. For players on TTS who use models made by others, they are typically indistinguishable from the models that everybody is using. If players create their own models using digital tools for 3D modeling, then they can be the only ones using them. However, even exclusive models in TTS could be copied while in a game with the player who is using them and then be made available to everybody. Ownership of models is thus not possible in the same way in TTS

The emotional relationship to models is different in TTS as well. One space where this becomes visible are the rules and conventions surrounding touching the models of other players. While it is still not acceptable to touch the models of the opponent because of gameplay reasons and the possibility of cheating or nudging them over, there is not the same stigma connected to that in comparison to the analog game. Analog miniatures are valuable and fragile. Players can be emotionally connected to their miniatures. They might have put hundreds of hours into making them. They can be regarded as pieces of art and self-expression. Having put effort the painting and assembly of miniatures myself, I can understand that perspective.

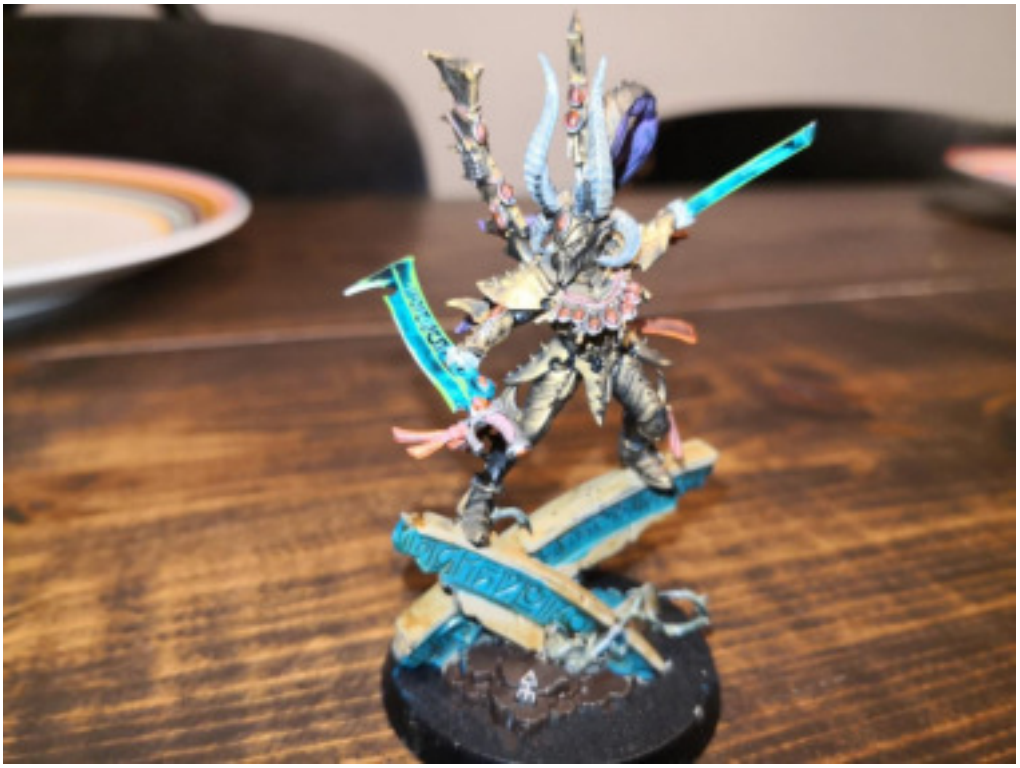

Figure 1: Drazhar, my favorite self-painted analog 40k miniature. (own photography, 19/10/2021)

Touching them without asking permission first is not accepted. As a newcomer to the game, this was something that had to quickly be learned and the reactions to missteps have been quite clear. In TTS, miniatures do not have this revered status. It is still a good idea to ask for consent before touching and moving an opponent's miniatures, but this is mostly to prevent nudging or cheating. This indicates that there is a considerable difference between 40k on TTS and analog in the areas of crafting and making that is related to ownership and changes the emotional relationship to and cultural importance of miniatures.

Physicality

The physicality of the table in TTS shares some elements of the analog game, but it also has its own attributes. The importance of line-of-sight for example is something that both variants have in common. The look over the shoulder of the model that Tobin (2018) is describing for the analog game is also a central part of playing on TTS. Here it means moving your camera right behind the relevant model to be able to see what it sees (Figure 1).

Figure 2: Establishing line-of-sight by looking over a shooting model in TTS. This model can for example see the enemies hiding on the second floor of that ruin on the left.

Other elements connected to the physicality of the models are not represented in the same way. Models in TTS do typically not have activated collision. That means that they do not check if they overlap other models or terrain like ruin walls in 3D space. That means that a player need to clearly state where they intend a model to be placed and opponent needs to consent that this model placement is possible (and legal according to the rules, but that is the same in the analog game). Issues with terrain having too large collision areas can make it impossible to place models properly and require play by intent. Lag in the game can lead to problems like dice disappearing or some objects only showing for one player. Manipulating the physicality of this digital table also comes with a set of skills that need to be learned. Arranging miniatures in rows, keeping them close to the ground in multi-level ruins, flipping miniatures over that have died, and maintaining unit coherency can be done in TTS, but it requires the player to learn combinations of hot keys and other techniques. The game can for example automatically measure the distance a model has moved when it was picked up which makes it considerably easier to move models quickly. The distance is also visibly displayed to the other player so that they can verify that the movement is legal. These features improve the game and make things possible on the virtual tabletop that are missed when returning to analog.

Besides the properties of TTS that come from the producer of the game there are also elements that of the game that are contributions from player creators. The table that is used in most games of 40k on TTS has been made by a player and has a number of features that need to be examine here. The table has ready scoring sheets that are updated and contain the information about secondary objectives and relevant rules. It has tokens to show active effects in game. It is also automatically keeping track of player turns, command points, and has a clock. A more practical chess clock is available as an added, player-created object.

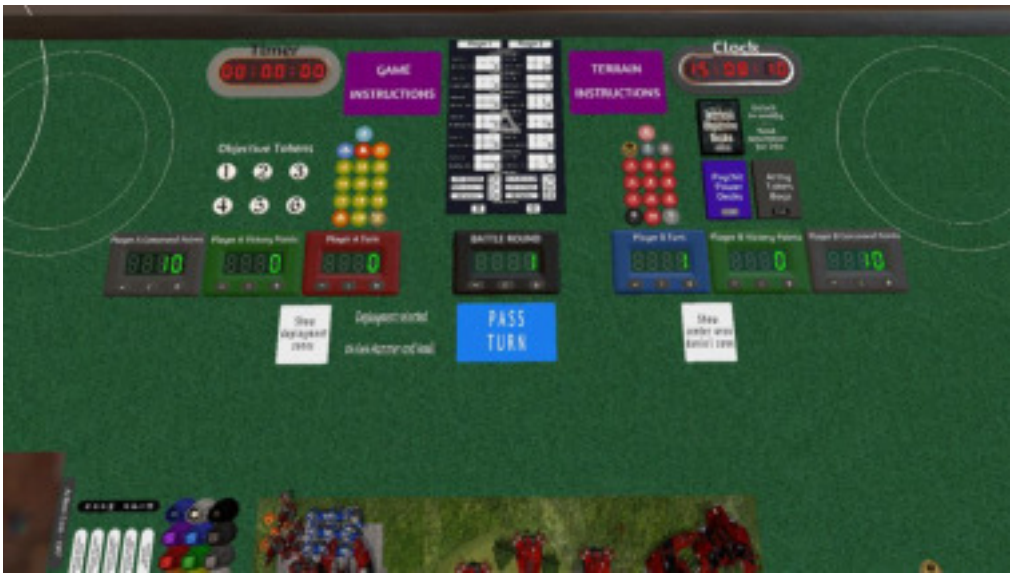

Figure 3: Score sheet, markers, and other meta-data in the TTS table for Warhammer 40k.

There is one feature that is especially interesting here, the dice roller. The dice roller is a kind of object on the table. Players can drop dice they want to roll into a small box at the top of the dice roller and the roller sorts them into ordered rows of rolled dice. This makes rolling dice considerably faster. It allows players to quickly delete certain results and re-roll for example all the shots that hit the target to see if they also wounded it. This tool offers the feel for the dice that is relished by analog players (Carter, Harrop, et al., 2014).

Figure 4: Dice Roller in the *Warhammer 40k* table for TTS.

The social creation of tension and narrative during play offers a connection to this category of analysis.

Social Interaction

There is a similar kind of tension in the air when a player has counted and now picked up the dice to roll them, waiting to find out what the faith of their centerpiece unit under heavy fire is going to be. This design of the dice roller means that in order for both players to see the results and share this moment of tension, they both need to, in the 3D space of the simulator, come to the same side of the table and together look at the dice. It has happened frequently that I was called over by other player asking if I could see the dice to make sure that I, together with them, witnessed the roll, especially if this was an impactful roll that could decide a part of the game. The player-made tool is preserving this element of the physicality of rolling dice together with the opponent. There is a similar social interaction around key narrative and gameplay moments in this

digital space as what is described in the analog one (Carter et.al, 2014). The creation of small narratives to accompany, decorate, or work through moments in the game is very common. Players often choose a MVP at the end of the game, a miniature that performed the best in their army in this game. When people explain how their army works before the game, they do frequently mention that some model or unit has been the MVP in their last games, re-telling the stories of their previous exploits.

While digital play means that players are not meeting face-to-face, they typically arrange a discord call or join a VoIP room on the discord server of the tournament that not only allows them to talk to each other but also makes it possible for other players on the server to listen in. Players can even stream their games here. Discord also makes it possible for tournament judges to come in if requested and resolve disputes. During bigger ongoing tournaments, it is frequently possible to watch live games being streamed several evening of the week. This is not the same as an in-person tournament, but the discord server does provide some kind of lobby and meeting place and the possibility of watching streamed games while in the same room and listening to the conversation of the players gives an impression of standing next to a gaming table and watching a game. The biggest tournament that I joined made it possible to watch several games every day, but also created a less personal community. The small, but long-running Swedish tournament group that as of the point of writing runs its 5th month-long tournament (with one game a week) is calmer, but also more personal. The community has grown from a previously existing analog tournament scene and the players are frequently veterans who know each other.

This means that 40k on TTS is at least emulating the social interaction and components of analog play. There is a feeling of standing at the same table and watching the dice rolling, hearing about the heroic accomplishments of a miniature in a past game, or joining one of a number of simultaneous streamed tournament games offers a similar shared and social experience to analog play.

Accessibility

Playing the Game

Players need to learn the interface of TTS quickly while already dealing with the mental load of playing in the first place. For me this has been a somewhat steep learning curve despite my gaming literacy and affluence in the use of digital environments. Some of the idiosyncrasies of TTS and of playing this kind of game in such a space remain challenging even for expert users who literally aim to study and understand them. The flipside of this coin is that the game is also more accessible for anybody who might have to deal with barriers to access for analog play. A player who is sitting in a wheelchair might not easily reach the middle of the gaming table in an analog game, but in TTS they are on the same footing as everybody else.

Getting to Play

Kankainen (2016) indicated that digital play is more accessible because of the ease of opening a game and finding players. While the same remains true here and it is possible to find a game from home every night, there are also considerable barriers to entry. Finding the necessary modifications, maps, and the up-to-date gaming table can be tricky. The naming of the files is confusing, largely to avoid legal action about IP infringement from GW, and there are numerous outdated files online. Most of these issues are resolved by downloading the updated and curated package of mods and maps from GitHub. This link is available on the dedicated discord page for 40k on TTS and also frequently shared by tournament organizers or gaming clubs, but nearly invisible otherwise. That means that preparations for playing a game involve first joining the

competitive community and then, once one is on the discord server, learning how to best play the game.

Battle-ready armies

In analog games there is a requirement for competitive play that models are "Battle-ready". This means that they have to display their equipment visibly on the model. This rule is called "What-you-see-is-what-you-get" and it is meant to make it easy to see what units can do on the game table. Furthermore, to be "Battle-ready" models are expected to be painted with at least three colors and are supposed to be based. If an army does not fulfill these requirements, it will lose 10 victory points out of 100 and start the game with a considerable disadvantage. These requirements can be experiences as quite strict and stressful. When joining the first competitive event, I had to scramble to get the models painted in time, even for just a minimum standard. I still ended up gluing stones from the street outside to the bases of some models at the event venue to technically have a proper base. During a game, a player from another table still commented on just these stones in a way that was meant to intimidate or ridicule. This was no big issue for me, but it was remarkable that it happened during an ongoing competitive game where otherwise it is not acceptable to just pop over and make fun of one of the competitors. The point is that the crafting requirements are enforced as a barrier to entry. In TTS, armies are typically understood as "Battle-ready" when they have been scripted with a tool called “Battlescribe to TTS”. The tool allows models in TTS to display their rules in the game (see figure 5 and 7), another affordance of the digital game that makes it both faster to play and more accessible. This functionally replaces the requirement for "What-you-see-is-what-you-get" and takes over the role of painting and preparing models for analog play.

Figure 5 A model in TTS, scripted with “Battlescribe to TTS”, displaying the summary of its rules when holding the mouse over it.

Financial Cost as a Barrier

Another relevant barrier to entry is the financial cost of the models. This is an element that has surprisingly not been discussed in much of the previous research on 40k. The cost of assembling an army of the relevant size for the vast majority of competitive play, 2000 points, varies depending on what kind of army and models one wants to field. I estimate that buying an army new would cost at least 400 Euros as the lowest

possibility. My current army would run around 700 Euros, which is by no means the high end. This does not include buying rulebooks, colors for painting, carrying cases, additional crafting materials, or the costs of traveling to and attending tournaments. This amount of money will also only buy one single design of an army. Rules frequently change. So does the meta-game. This means that maintaining a competitive army that enables a player to participate as a somewhat serious competitor in itself is no small feat.

The availability of models for free on steam and GitHub it means that playing not only one competitive army, but trying any army or army composition out there, is financially completely free. The players still need to learn and know the rules of the game, meaning that they need to keep up with rule releases and the evolution of the meta-game. They need to create their army list and then script it onto their miniatures using the tools, but this is considerably less of a barrier to entry and not an eternal to-do list like preparing and maintaining and army of physical miniatures. During the time playing 40k on TTS I have been able to try a large number of armies and factions most of which I do not own physically and where this kind of experimentation in a competitive format would have been all but impossible. I have made armies for my children to play with. Their digital armies are ready to be deployed. Making physical armies with miniatures for them will be on ongoing project for the next years, for better or worse. All that said, of course TTS requires a computer able to run the game, a calm place to play, and a stable internet connection that also allows for VoIP communication, which in turn excludes potential players along the lines of economic class.

In summary it can be said that 40k on TTS removes crafting (and the associated labor) as well as financial barriers to access to a point where it even offers new ways to experiment and freely play with different kinds of armies that is virtually impossible in the analog game. It makes it possible to participate in games from home, even during a pandemic. However, it does require a set of skills in manipulating the interface as well as a stable internet connection and a computer. TTS also has issues like the lack of collision, or sometimes too much collision, that make it necessary to play by intent and to communicate with the opponent clearly about the game state.

Competitive Play

For competitive play, this freedom of experimentation also means that the meta-game adapts faster than for analog competitions. An army list that just got very strong because of a recent rules change will be played on a table in TTS the day the rules get released, long before an analog army has been assembled and painted. Extreme armies with exotic or expensive models can be assembled and tried out easily. This also means that the meta-game on TTS can be harsher as players can build the most effective army without having to first acquire and craft the models. Another reason for that is that people who play the game for the crafting as indicated by previous work (Kankainen, 2016.; Meriläinen et al., 2020) could be less likely to participate in events on TTS than those players who come to compete. This self-selection also makes the competitive environment harsher. It is already a minority of 40k players who compete, and an even smaller subset competes on TTS. On the intersection of accessibility and competitive play, TTS allows clubs or organizations, even single players, to host tournaments and leagues without the need to own or borrow large quantities of terrain in order to equip their tables or other administrative requirements. This makes it easier to get events of the ground and start communities. One of the first tournaments I participated in was organized by a teenager from the UK from his computer at home. What this means is that competitive 40k on TTS is easier to set up and has a more responsive and harsher meta-game. The emphasis on competition over crafting might be the reason why

tournaments are so central to the TTS scene and why it might skew towards this style of play.

Digital Interface

One of the most important elements of the digital version of this table-top game is the digital gaming table. The gaming table offers a variety of functions. It presents updated scoring sheets that include all secondary objectives and their rule text. The table also allows for automatic placement of objectives, shows different deployment zones, and can highlight the table quarters or zones that need to be controlled for scoring. The table does not only contain amounts of information that in analog events players would have to carry several big books around for. It also makes use of its digital nature, loading in new deployment zones or re-arranging terrain with a speed that would be impossible in analog games, to elevate competitive play. It also includes the dice roller discussed above.

Figure 6: The gaming table in TTS. The red line shows that the opponent is moving a miniature and it shows the distance to both players. The white circles have been activated here to show relevant scoring area. The purple circles measure distance from models.

The miniatures, when scripted, show their short rules while holding the mouse over them (figure 5) and allow for a full read of the rules on the press of a button (figure 7). This digital layer of contextual information over the game simulation that one can pull up is offering transparence to the game as both players can look up rules freely. It goes even further than "What-you-see-is-what-you-get" by offering different levels of detail of the rules based on the needs of the players in the moment, just as envisioned by Hinske & Langheinrich (2009:103).

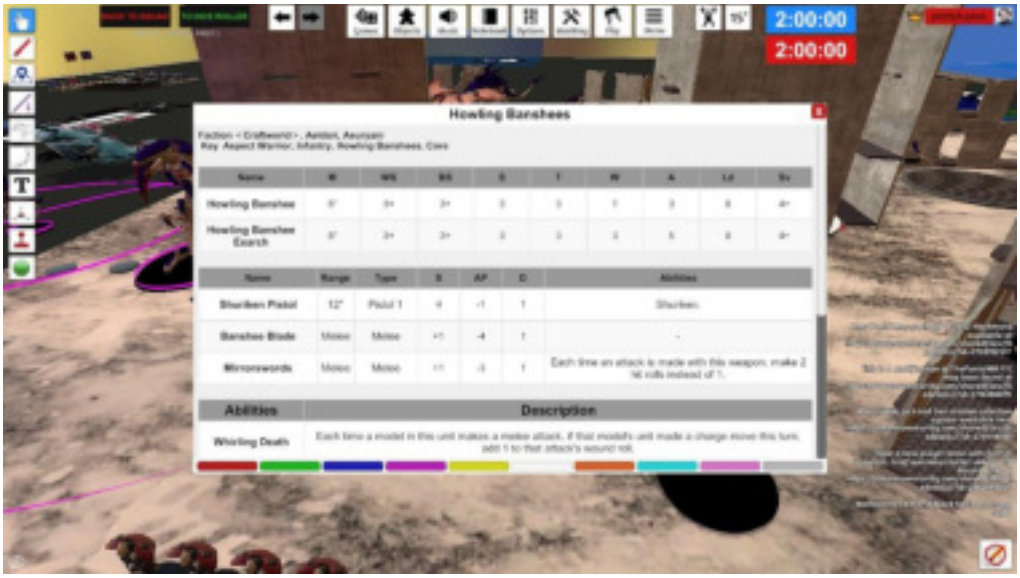

Figure 7: A model in TTS, scripted with "Battlescribe to TTS", displaying its full rules and weapon stats.

The scripted models also have other features that are of considerable use in the game. Units of models created with the tool can be colored to visually represent that they belong together. This is useful to maintain an overview over where one squad ends and the next begins. In the analog game, players sometimes accomplish the same thing by painting the rim of the bases. The tool then performs a coherency check on the unit, indicating whenever a model is too far away from its comrades to be allowed to be placed that way. Maintaining unit coherence is an at times tedious task in the analog game and players who run armies where it is an issue frequently bring special small tools to measure the 1- or 2-inch distance on the table. The digital version of the game automatizes solutions to these problems in convenient and sophisticated ways that achieve similar outcomes to what Hinske & Langheinrich (2009:103) attempt to do with RFID technology.

Figure 6: The colored outlines of models have been made with Battlescribe to TTS and show that a unit of models belongs together and that the models are in coherence.

The tool furthermore can display a circle around a model that can be adjusted for range (the purple circles in figures 5 and 6). Many abilities in the game have ranges and displaying them on the table is so useful that, since learning about this possibility, I have not played a single game without making frequent use of it. This tools is offers exactly what research on digitally augmented gaming tables using working on "Spatially Augmented Reality" (Bimber & Raskar, 2005) has been trying to achieve using projectors and experimental technology (Dolce et al., 2012: 45). What this means is that 40k on TTS leverages the affordances of the digital medium for improving the tabletop along the lines that also design research is exploring for digitally supported analog play.

Participatory Creation

From the miniatures that are created by players and made available in curated collections, controlled for the right size and scale, over the gaming table that offers support for setting up games within minutes and conveniently shows the relevant rules, to the sophisticated scripting tools that include innovative features from of hybrid table-top research into the game, participatory creation is what is defining 40k on TTS. In total, these features are not only improving the game and innovating in the areas of interface design. They are making the game possible and playable in this space in the first place. These participatory creations define 40k on TTS.

The tool that needs to be explained a bit more in depth is "Battlescribe to TTS", specifically with an eye towards how it connects different ecosystems of participatory creation. One such ecosystem of co-creation is the app "Battlescribe" which is used to organize and select one´s army. Playing with the setup and design of the army one is bringing to the table is a central part of the pastime of 40k. "Battlescribe" itself is a program that allows players to download libraries containing all the data for their army and to then create and army with these rules. The libraries are created and maintained by dedicated players who put in any new rule releases quickly, fix mistakes, and even create the code needed to express the logic of the rules of the game. "Battlescribe to TTS" does allow players to import their army data from the app "Battlescribe" into TTS. It does then save this data as descriptions of the miniatures in the game as a programmed script. What this means is that this tool connects the libraries for all the game rules that have been made by players to all of the digital miniatures that also have been made by players. It bridges these co-creative spaces and adds them together to something that is more than the sum of the parts. This connection and integration of collectively created, participatory systems for leading to innovation could be said to be the real impact of moving the game into digital media.

DISCUSSION

There is one area that was not central to the analysis here, but that still needs to be discussed based on the insights from the study: the barriers to entry for analog 40k. (Competitive) analog 40k has a barrier to entry that is not discussed enough in research. It does not only require a considerable investment of money and time to get started in the first place, but also has a high upkeep cost in both time and money. Without the means to buy miniatures or dedicate time and a corner in one's flat to crafting this can quickly exclude anybody who cannot afford to spend these resources. These limitations to access might be one of the reasons why the player base of at least competitive 40k is predominantly middle-class, middle-aged, white, and male. Playing the game in TTS and comparing it with the analog version has highlighted the extent of these barriers

and requirements. Moving back to analog play after the pandemic is something that I now experience as social pressure to get miniatures painted, a financial burden to buy new models that I could online freely play with, and a creative limitation in list-building. This means that the point that 40k is a pastime is correct, but it also naive and missing the critical and problematic aspects of this game and this kind of game design.

The intense work and resources required to just keep playing analog 40k mean that it can be argued to be a lifestyle game. This notion of lifestyle games is an addition or possibly corrective to the concept of the pastime. It offers a more critical, if experimental and game-design focused, approach that is discussed in game journalism but could be worth investigating in research as well (Williams, 2014; Extra Credits, 2017). It encompasses the more positive elements that highlight that a game can be a lifestyle, that it can inspire and gather a community of like-minded, and that it can give meaning. However, it also shows that games can take over peoples 'lives, demand time and engagement in order not to lose connections or be excluded from social circles, and can be designed to occupy players´ time not only pleasantly. Unpainted miniatures people have at home are commonly referred to as the "pile of shame". TTS has removed some of these elements and then in turn made them more visible when returning to analog play. Over-all, this study calls for a more critical engagement with the barriers for access to miniature gaming, both digital and analog, and it suggests as a corrective an investigation of the notion of life-style games.

CONCLUSION

This study set out to compare analog Warhammer 40k to the way the game is being played on Tabletop Simulator to both draw conclusions about gamed design and the properties of analog and digital gaming as well as about player participation in creating game communities and gaming culture. The paper used analytic categories from previous work and my own focus as an academic. It concludes that the digital version of the game maintains some forms of crafting and making, but somewhat de-emphasizes this aspect which also leads to a reduced barrier of entry for the crafting and painting of a battle-ready army. The financial and time requirements are reduced and there is less stigma or social pressure connected to insufficiently painted models. On the other hand, there is a barrier to entry in terms of learning the interface of the game and finding all the relevant player-created assets. There are also technical issues like lags that require even more play-by-intent. Social interaction is not the same online, but there are also shared spaces and moments of collective narrative building that otherwise have been reported as high points in analog play.

TTS is leveraging the possibilities of digital media to improve and innovate the interface of the game. It goes in the same direction as design research for table-tops and implements features that are indeed helpful to the point that they are sorely missed when returning to the analog game. Finally, the biggest difference from analog to digital 40k is that the digital version is connected to and integrated into infra-structures and platforms for player participation in cultural production. The digital game is defined by networked player creativity that not only makes it possible to play this game online with the freedom to put together any army within minutes and put it on a table. The player-created digital eco-system even features innovative tools that enhance the game to a degree that an army that is not using them is not considered ready to play. The biggest impact of the game moving onto a digital platform is networked player creativity.

In short, when playing 40k on TTS, the player community and participatory design is what makes your troops battle-ready.

BIBLIOGRAPHY

Aarseth, E. 2003. Playing Research: Methodological Approaches to Game Analysis. *Digital Arts and Culture*.

Ask, K. 2016. *LUDIC WORK: Assemblages, domestications and co-productions of play*. https://brage.bibsys.no/xmlui/handle/11250/2418295

Banks, J. 2013. *Co-creating videogames*. Bloomsbury Publishing.

Bimber, O., & Raskar, R. 2005. *Spatial augmented reality: Merging real and virtual worlds*. CRC press.

Boellstorff, T. 2006. A ludicrous discipline? Ethnography and game studies. *Games and Culture*, *1*(1), 29–35.

Boellstorff, T., Nardi, B., Pearce, C., & Taylor, T. L. 2012. *Ethnography and Virtual Worlds: A Handbook of Method*. Princeton University Press.

Carter, M., Gibbs, M., & Harrop, M. (2014). Drafting an Army: The Playful Pastime of Warhammer 40,000. *Games and Culture*, *9*(2), 122–147. https://doi.org/10.1177/1555412013513349

Carter, M., Harrop, M., & Gibbs, M. (2014). The Roll of the Dice in Warhammer 40,000. *Transactions of the Digital Games Research Association*, *1*(3), Article 3. https://doi.org/10.26503/todigra.v1i3.20

Christensen, C., & Prax, P. 2012. Assemblage, adaptation and apps: Smartphones and mobile gaming. *Continuum*, *26*(5), 731–739. https://doi.org/10.1080/10304312.2012.706461

Consalvo, M., & Dutton, N. 2006. Game analysis: Developing a methodological toolkit for the qualitative study of games. *Game Studies*, *6*(1), 1–17.

Cova, B., & Paranque, B. 2019. *Tensions between Value Capture and Value Slippage: The Case of Brand Communities*. https://doi.org/10.1002/CJAS.1484

Dolce, A., Nasman, J., & Cutler, B. 2012. ARmy: A study of multi-user interaction in spatially augmented games. *2012 IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops*, 43–50.

Garcia, A. 2020. Gaming literacies: Spatiality, materiality, and analog learning in a digital age. *Reading Research Quarterly*, *55*(1), 9–27.

Hinske, S., & Langheinrich, M. 2009. W41K: Digitally augmenting traditional game environments. *Proceedings of the 3rd International Conference on Tangible and Embedded Interaction*, 99–106.

Kankainen, V. 2021. The Interplay of Two Worlds in Blood Bowl. *Proceedings of the 13th International Conference on Advances in Computer Entertainment Technology - ACE2016*. Retrieved June 28, 2021, from https://www.academia.edu/48742301/The_Interplay_of_Two_Worlds_in_Blood_Bowl

Lammes, S. 2007. Approaching game-studies: Towards a reflexive methodology of games as situated cultures. *DiGRA Conference*.

Lankoski, Petri & Björk, Staffan. 2020. *Game Research Methods: An Overview*.ETC Press.

McEwan, G., Gutwin, C., Mandryk, R. L., & Nacke, L. 2012. " I'm just here to play games" social dynamics and sociality in an online game site. *Proceedings of*

the ACM 2012 Conference on Computer Supported Cooperative Work, 549–558.

Meriläinen, M., Stenros, J., & Heljakka, K. 2020. More Than Wargaming: Exploring the Miniaturing Pastime. *Simulation & Gaming*, 104687812092905. https://doi.org/10.1177/1046878120929052

Prax, P. 2015. Co-Creative Game Design in MMORPGs. *Proceedings of DiGRA*. http://library.med.utah.edu/e-channel/wp-content/uploads/2016/04/digra2015_PRAX.pdf

Prax, P. 2016. *Co-creative Game Design as Participatory Alternative Media* [Informatics and Media, Uppsala University]. http://www.diva-portal.org/smash/record.jsf?pid=diva2:923235

Prax, P. 2019. Is this still participation? A case study of the disempowerment of player labourers. *DiGRA'19-Proceedings of the 2019 DiGRA International Conference: Game, Play and the Emerging Ludo-Mix*.

Sotamaa, O. 2007. On modder labour, commodification of play, and mod competitions. *First Monday*, *12*(9), Article 9.

Taylor, T. L., & Witkowski, E. 2010. This is how we play it: What a mega-LAN can teach us about games. *Proceedings of the Fifth International Conference on the Foundations of Digital Games*, 195–202.

Tobin, S. 2018. *The Significance of True Line of Sight in Warhammer 40,000*. Extended Abstract Presented at DiGRA 2018.

Trammell, A. 2010. Magic: The Gathering in material and virtual space: An ethnographic approach toward understanding players who dislike online play. *Meaningful Play 2010 Proceedings*, 1–21.

Williams, M. 2014. Rise of the Lifestyle Game: Gaming as Your Second Job. *USgamer*. https://www.usgamer.net/articles/rise-of-the-lifestyle-game-gaming-as-your-second-job

Wirman, H. 2009. On productivity and game fandom. *Transformative Works and Cultures*, *3*, 8–8.