

Digitising Boardgames: Issues and Tensions

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ABSTRACT

In this paper, we discuss the different ways in which modern European boardgames (“Eurogames”) are converted for digital play. We review digitised versions of three popular tabletop boardgames: *Puerto Rico*, *Agricola* and *Ascension*. Using these examples, we demonstrate the tension between the interaction metaphor of the original analogue medium and the metaphor of a digital game. We describe the importance of housekeeping chores to gameplay and position them as a form of articulation work, which is typically hidden by digital implementations. Further, we demonstrate the types of information that are created through digital play and discuss how this influences game play of both digital and physical boardgames.

Keywords

Board games, interaction metaphor, articulation, theorycrafting, informing

INTRODUCTION

Boardgames, traditionally played in their physical format using boards, cards, dice, playing tokens and the like, are increasingly being translated to digital form for devices such as smartphones, computers, videogame systems and tablets. To date, little attention has been paid to how and the degree to which this digitisation affects or transforms the experience of play. There is growing tension between the desire for digitised boardgames to be true to the interaction metaphor (Sharp et al. 2007, 58-63) of the original medium and the desire to extend the game to explore the potential of the digital medium. Importantly, digitisation of games can change the gameplay activities and the ways in which they are managed, including being hidden or made explicit. In this paper, we provide case studies of three representative boardgames and their digitisations. We demonstrate the tensions that arise between the analogue and digital mediums, in particular in the ways in which administrative management tasks are realised in the digitised game. Further, we show how different approaches to digitisation lead to different play experiences and informate (Zuboff 1988) the game, leading players to develop new strategies based on detailed statistical evaluation. Decisions about how to digitise boardgames can impact not only the play of the digital implementation but also that of the physical game, even for players who have never played it in digital form.

The games chosen for this study reflect our interest in modern European boardgames (“Eurogames” (Woods 2012)), a genre that is increasingly being digitised both to cater to

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the boardgame enthusiast and to attract new players. The selected games are representative of the genre: both *Puerto Rico* (Seyfarth 2002) and *Agricola* (Rosenberg 2007) have spent significant time at the top of the BoardGameGeek.com rankings and remain in the top 5 games. Each has been digitised several times and in different ways. *Ascension* (Fiorillo and Gary 2010) was chosen in counterpoint both as a representative of the popular “Deck Builder” genre and for the designer-publisher’s embracing of a semi-native digital format in parallel with the boardgame. Each of these games is largely deterministic, in that there is minimal uncertainty in the game, with player skill the paramount element. In *Puerto Rico*, there is uncertainty in the selection of player order and to the order in which plantation tiles are drawn; in *Agricola*, uncertainty arises from the drawing of occupation and minor improvement cards as well as from the (semi-programmed) order of Round cards; in *Ascension*, the deck is shuffled randomly but players choose which cards to “buy” or attack from a tableau. This focus on luck minimisation or mitigation is a core element of the Eurogame genre (Woods 2012, 113) and is in opposition to other styles of game, which rely more heavily on random elements.

The approaches to digitisation that we describe in these case studies are typical for the Eurogame genre. The digital implementations reviewed generally offer players the chance to play against one another rather than against an AI opponent, with the exception of one particularly influential early implementation (the *Puerto Rico Evolver* (Mitton 2005)).

Data for this study has been derived from online forums at BoardGameGeek, play-Agricola.com and Ascensiongame.com, as well as from the physical and digitised boardgames that we discuss. Rather than providing a separate literature review, the relevant literature will be discussed throughout the paper.

PUERTO RICO

Puerto Rico was the seventh published game by designer Andreas Seyfarth, whose game designs have twice won Germany’s critically-acclaimed *Spiel des Jahres* (Game of the Year) award. Seventh in the popular “big box” line by German publisher Alea (an offshoot of Ravensburger Spieleverlag), in 2002 the game won the prestigious *Deutscher Spiele Preis* (German Game Prize) award for best family/adult game, as well as the coveted *Essener Feder* (Essen feather) for best-written rules. Other awards followed from Japan, USA, Germany, France, the Netherlands, Poland, the Czech Republic and Spain. Seyfarth himself says that it was with the design of *Puerto Rico* that he finally achieved his goal of developing a game that would fill an evening, with an appropriately-themed setting and long-lasting challenge (Aleaspiele.de n.d.). *Puerto Rico* was the highest-ranked game on Boardgamegeek for six years.

Puerto Rico is a game for three to five players in which players develop the island of Puerto Rico. They can raise crops, construct buildings (which enable crop harvesting and also confer other in-game benefits) and ship goods back to Europe in exchange for Victory Points (VP). Each round, players take turns to select a role; each role allows all players to take a particular action, but confers a benefit on the player who selects it. A player who selects the Captain, for example, receives one extra VP for shipping, but allows other players, in turn, to ship their goods; a player who selects the Craftsman allows all players to produce goods but receives one additional good as a bonus.

An expansion to *Puerto Rico*, comprising 14 new buildings, was released through German gaming magazine *Spielbox* in 2002. Another, which introduced “nobles”, was included in the *Alea Treasure Chest* – a collection of small expansions for games published by Alea – in 2009. A limited anniversary edition published in 2011 included both of these expansions as well as new artwork and redesigned components including metal coins, together with the 2-player variant rules which had previously been published on the Alea website. The game was controversially re-released in 2013, with new artwork and both expansions, as game 16 in Alea’s Big Box series¹ - although to date only in German, Italian and Hungarian. *Puerto Rico* also inspired the card game *San Juan* (Seyfarth 2004), which designer Seyfarth has said he prefers to *Puerto Rico* (Vasel 2006).

Digitising *Puerto Rico*

There have been several digitised versions of *Puerto Rico* across multiple platforms. Two are particularly interesting due to the choice of platform and audience.

The *Puerto Rico Evolver* is a spreadsheet that “plays” *Puerto Rico*. At its core is its “evolution” of new opponents: “Computer-controlled players are created randomly and can then play many, many games against each other. The winner of each game survives and has offspring (via a type of sexual reproduction with other successful players). The losers die.” (Mitton n.d.). As at September 2014, the *Evolver* had been downloaded from Boardgamegeek.com nearly 60,000 times. The *Evolver* is designed “to evolve reasonable players of the game from a random start” (Mitton 2010b) and has remained popular due to the strength of its opponents and ease of play. “From a pure efficiency of the game, what’s the best port of Puerto Rico? It was an Excel version (Puerto Rico Evolver) that showed the info in easy to compare columns. Sure it sacrificed the beauty of the game, but the efficiency and richness of info was perfect. It even had shortcuts so I could play an entire game in 10-15 minutes.” (S. 2011). With neither graphics nor rules explanation included, its audience is the purist; those players who are happy to play a game distilled to its core mechanisms against increasingly competitive opponents. The *Evolver* has no official status – it was not approved by the designer or the publisher – and has not been licensed or promoted.

A different approach was adopted by the programmers of *Brettspielwelt* (BSW), a web platform created in 1998 (Zbiek n.d.), where users can play multiplayer boardgames in real time against human opponents. Through its “meta-game”, registered users of BSW can organise into cities, which function as administrative units and have much in common with *World of Warcraft’s* guilds in that they “frame a player’s social experience” and ‘put “social pressure” on their members to play longer’ (Ducheneaut et al. 2006, 5), as well as into guilds, which function as a fan club for an individual game, promoting its play across BSW by running tournaments, learning sessions and special events. On BSW, all implementations are officially licensed – publishers engage in a commercial relationship with the platform in order to have their games featured, with games increasingly released simultaneously on cardboard and in digital form. Strong relationships with publishers and BSW’s narrow focus on boardgames ensure that the games are implemented precisely according to the rules as written, although variants are sometimes allowed as options. BSW’s reputation is recognised by its formal relationship (since 2001) with the German Board Game Team Championships; from 2015, between one and three teams will be able to qualify on BSW (rather than through regional tournaments) for the tournament’s finals (Janshoff 2014).

After a period where *Puerto Rico* was withdrawn from BSW after the sale of its electronic rights (Madmax 2007), it returned in 2010 (Maloney 2010). BSW's *Puerto Rico* implementation offers players the choice to play with the base game, the first expansion or a combination of the two. Although the interface uses the game's original artwork, the interface to BSW itself is clunky and dated, with a reliance on user-customised menus and command line interfaces. Real-time text-based chat is available through "channels" including one for the user's home city, as well as through the game room itself. BSW maintains basic statistics on players' games played, win rates and opponents, but not on in-game events such as roles selected and buildings purchased.

An iOS version of *Puerto Rico* (Codito Development Inc 2011) was released in August 2011. Like the BSW implementation, this uses game art to deliver a visually similar experience to the original boardgame, borrowing its colour palette and fonts. It adds a tutorial, as well as "help" and "hint" functions and seven different AI players across three levels of difficulty.

AGRICOLA

The first "big box" game by designer Uwe Rosenberg, *Agricola* (Rosenberg 2007) was released in German at the *Spiel* game fair in October 2007. Recognised for its engrossing gameplay and tight integration of theme and mechanic, *Agricola* uses the "Worker Placement" mechanic, where players' pieces are used to select an action that only that player may perform during the current round. Designer Rosenberg has written of his desire to approach the narrative complexity of a computer game (Rosenberg and Jensen 2007); the rich theme of the game is strongly tied to the potential actions that are available. Having taken and held the top ranking on Boardgamegeek.com from *Puerto Rico*, *Agricola* is currently ranked fourth out of over 70,000 (10,081 ranked) games and has won more than 20 critical and popular awards including the *Deutscher Spiele Preis* for best family/adult game and a special "Complex game" award from the *Spiel des Jahres* jury.

Agricola is played by 1 to 5 players, who assume the role of farmers in 17th century Europe. Players start with two tokens, representing a farming couple, but may later increase the size of their family to a maximum of five tokens (each providing one action per round). There are 14 rounds in total before the game ends, with players scored for the diversity of their farm: the presence of pastures containing up to three types of animal, ploughed fields with grain and vegetable crops, a renovated clay or stone house rather than the initial wooden shack, and of course a large farming family to help with chores. This growth seems organic, although slow at first: players must collect wood in order to fence pastures before they can hold animals, and must collect grain and plough a field before they can sow it, harvest it, and bake it into bread to feed their family. The limited number of turns makes each action valuable, particularly as players come under pressure to produce crops, gather resources and breed animals before the end of the game.

Agricola is supplied with three decks of cards, although it can be played in a simplified form without these. At the start of the game, players collaboratively select a deck or combination of decks (E – entry, I – interactive, K – complex) and are each dealt 14 cards. They play these cards during the game, which costs valuable actions but delivers other benefits that will, ideally, outweigh the action cost. These cards introduce additional randomness to the game, and there has been considerable discussion of how this can be mitigated, including suggestions of card drafting and a "draw 10, discard 3" rule, both of which increase the chance of obtaining cards which can be combined for exponential

benefit. Although *Agricola*, like other similar European-style boardgames, lacks direct player interaction (Woods 2012, 104), players must monitor not only the frequently complex interplay between cards but also the indirect interaction on the common action spaces (for example, another player taking the "build fences" action or "shoe shopping" by taking an accumulated supply of resources (Rosenberg 2009, para. 92)). Many decks of cards have been published as expansions, and one larger expansion was released in 2009. A 2-player game, *Agricola: All Creatures Big and Small* (Rosenberg 2012) was released in 2012, and *Agricola*-themed small card decks for popular games including *Skat* and *Memory* have also been produced.

Digitising *Agricola*

As the popularity of *Agricola* grew, its fans began to look for opportunities to play it online. Fan Chris Deotte launched play-Agricola.com, justifying the availability of its 6 (now 20) online game rooms as format-shifting of his own copies (Deotte n.d.)². The site is unusual in that it does not programmatically implement the administration of the game (e.g. the "restocking" of spaces at the end of a round): as in the physical game, the players must move the required resources onto the available spaces. The site allows players to use variant card drawing rules including a draft where players select the number of starting cards and then each draft 7 cards.

In 2013, developer Playdek released an iOS app for *Agricola* (Playdek 2013)³, offering both online and offline play, including pass-and-play for both the simplified (card-free) Family game and the base (E-deck) game, as well as solo play including the "Solo series" challenge. Additional decks were added later as low-cost in-app purchases. The app allows players to choose variant card drawing rules, including the "Draw 10, discard 3" variant. Key elements of the game's artwork have been animated, with the boardgame's action cards shown as buildings in a village rather than as physical cards, but the overall appearance of the game has remained true to the boardgame's visual design and uses Klemens Franz's original artwork. The app has gained acclaim both from players of the boardgame and from those who came to the game through its digitisation: "*Agricola* is a superlative port of an equally exceptional game." (Eklund 2013), "This is truly one of the best, if not the best, board game apps you can play on your iDevice." (Neumann 2013).

ASCENSION

*Ascension: Chronicle of the Godslayer*⁴ (Fiorillo and Gary 2010) was released in 2010. A deck-building game, it was designed by a group of *Magic: The Gathering* (Garfield 1993) Pro Tour champions. Like *Magic*, *Ascension* has a complex and largely unrealised backstory rooted in epic fantasy which is revealed piece by piece as new decks are released, but is very much secondary to the gameplay: "The story never really came into play during my time with *Ascension*, and I'm perfectly fine with that. ... If I wanted to read a novel I'd download one. I just want to play cards." (Fahey 2011). *Ascension*'s gameplay is straightforward, and similar to other deck-building games: Draw a hand of 5 cards, play some or all of them to gain points, use those points to acquire other cards, discard any remaining hand cards and draw a new hand. In its most basic form, *Ascension* allows players to gain two types of points: Runes build strength to acquire new cards, Power builds strength to kill monsters. "Construct" cards, when played, remain in the player's tableau and confer a permanent ability. Players accrue Honor (Victory) Points throughout the game (For a detailed review of *Ascension*, see Nealen 2013).

A series of expansions adds not only new cards but also new gameplay elements and contributes details of the backstory. Each can be combined with other games or played as

a stand-alone 2- (small expansion) or 2-4-player (large expansion) game; rules are provided for combining the different sets. This adds what has been called “development uncertainty” which keeps the game fresh by regularly adding new content to the existing pool (Costikyan 2013, 68) and builds on the proven success of *Magic: The Gathering*’s regular release cycles (Planet Money 2015).

Cleverly, each new two-game storyline “resets” the franchise, rather than simply building on the extensions of the previous block. Thus, *Ascension: Rise of Vigil* (Gary 2013) introduces new features rather than directly building on those introduced in *Ascension: Storm of Souls* (Dougherty et al. 2011) and *Ascension: Immortal Heroes* (Dougherty et al. 2012). Selected features are re-implemented, but the designers have wisely chosen to focus each new release on two or three major features, ensuring that the game does not become overly complex or intimidating: “As a game’s card pool grows unchecked, its metagame begins to stagnate, and the game falls apart under its own weight.” (Fantasy Flight Games 2014). To play *Ascension* with all six decks would be unwieldy, with an unacceptably low chance of achieving the special combinations that make gameplay exciting and give players the feeling of having done something clever or unexpected.

Digitising Ascension

Publisher Stone Blade Entertainment has embraced the digital medium. Its second game release, *SolForge* (Garfield 2013), is a digital trading card game by the designer of *Magic: The Gathering*. The company has a single website for the digital and physical games of *Ascension*, and its central website presents *Ascension* and *SolForge* side by side. All of the official *Ascension* expansions, as well as selected mini promotional expansions, are currently available on the Playdek iOS app, which has been acclaimed as an outstanding digitisation of the game. “The digital implementation of the real world card game is really pretty top notch. The layout on screen is clear, which to be honest I was a little surprised by since there’s a lot of information that needs to be conveyed.” (Zuccarelli 2011), “Combining the graphic design of collectible card games with the fast pace and accessibility of a board game, the iOS version of Gary Games’ *Ascension: Chronicle of the Godslayer* is a godsend to fans of card-based gaming.” (Fahey 2011). Interviews with gamers support this claim, with several noting that they prefer the digital version over the cardboard original, while also noting that they use it to fill in time, as “almost a mindless activity”.

THE BOARDGAME METAPHOR

Although for many, online play is a distant second to playing the physical boardgame – “I’d rather play face to face, but if I want to play *Magic*, and there’s nobody around, I play online.” (Trammell 2010, 17) – its proponents recognise that online play can increase opportunities for play and for learning. Woods (2012, 167) has shown that social interaction is critical to players’ enjoyment of the boardgame experience; Stenros et al. (2009) demonstrate that sociability occurs not only within digital games but also around their play, with even single-player games incorporating a social element. This desire to play – and to enable play – and the recognition that the game is the same (but maybe a little different) is fundamental to the digitisation of boardgames.

Common to almost all these boardgame digitisations⁵ is the adoption of the metaphor of the boardgame. In interaction design, a metaphor “utilizes well-understood concepts or attributes from one domain to make points or provide insights about another.” (Hamilton 2000, 239): it is “a device for seeing something *in terms of* something else” (Burke 1941, 421). In the formal language of metaphor, a digitised boardgame IS a boardgame,

although there is tension between remaining true to the metaphor and providing enhanced functionality. The source (“boardgame”) provides a context for understanding the target (“digitised boardgame”) (Stubblefield 1998, 73). Whilst “interfaces strongly based on a well-known metaphor require very little explanation to users,” “magical” functions – which provide enhanced functionality that is not present in the literal interpretation of the metaphor – may require explicit explanation (Smith 1987, 61-63). At first glance, boardgame interfaces are extremely literal: digitised cards behave like cards; digitised dice are rolled to generate random numbers; digitised pieces are seen to move. An exception is in tracking players’ scores: whereas physical boardgames usually use a scoring track, known as a *Kramerleiste* (Kramer scale) (Eggert 2006), in digital boardgames this is simply represented as a number, which (magically) increments when a player scores.

For the experienced player, then, much of the interface is easy. Even to a player who has not played the physical game, the familiarity of the literal boardgame metaphor provides clues as to possible actions even in a digital environment. This metaphor has been extended to natively digital games (notably *Hearthstone* (Blizzard Entertainment 2014) and *SolForge*), leading one reviewer to comment that Playdek’s *Agricola* “is so convincingly themed and touch-friendly that an innocent soul could be forgiven for thinking that they were playing a iOS original with board game styling” (Eklund 2013). Games like *Hearthstone* echo the development of early MUDs and MMOs which built on the familiar experience of early Role-Playing games like *Dungeons and Dragons* (Gygax and Arneson 1973) by adopting its structure of experience points, levels, character stats and classes, as well as its familiar fantasy tropes of exploring dungeons, killing monsters and collecting treasure.

This use of metaphor extends to the game components and even its visual design. BSW’s *Puerto Rico* looks like Alea’s physical *Puerto Rico*; *Agricola* looks like *Agricola*, *Ascension* like *Ascension*. Digitised cards ARE cards, digitised cattle ARE cattle tokens. An exception is *Agricola*’s Round cards, which act not as a card (with a card’s affordances of being held, dealt or shuffled) but as an action space (where workers may be placed in order to take the corresponding action). Playdek have represented these cards as areas on a village green, choosing to reflect their function (action space) rather than their form in the digitised game. Similarly, the iOS *Puerto Rico* game represents colonists not as tokens on the board but by function: colonists enable buildings and plantations to produce, so adding a colonist to a building animates that building (Cummings 2011). These developers have adopted a new metaphor which reflects the function that the card plays in the game, rather than its appearance.

Arguably the most important part of the game is its rules. Evans (2013) sees rules as a form of participatory text, positing that games “are produced in the interaction between players, pieces and rules” and noting the importance of translation in ensuring that gameplay is consistent across different versions. This consistency is important not only across languages but also across modalities; Playdek CEO Joel Goodman has commented that, “our *Agricola* has to be completely, 100% literally true to the rules of the boardgame. Uwe [Rosenberg] wouldn’t allow us to change a rule or how anything was played.” (Faraday 2013). He continues, however, “from a Playdek perspective though, we’ll never do that again. We’re forging forward to create incredible experiences in hobby gaming but we’ll also take advantage of the platform. We make video games”. Goodman sees Playdek’s role not as a translator but as an interpreter: “you’re opening the doors to ‘non-hobby gamers’ — that’s a more appropriate term than ‘casual’ gamer for

who you're trying to reach." (Faraday 2013). Developers, it seems, would prefer the freedom to add magic to extend the game beyond a literal translation.

On the other hand, both Goodman and Chris Ewington of Codito Software, who created an iOS version of *Puerto Rico*, recognise that fans of a boardgame are "passionate" about the game as they know it (Faraday 2013, Nicholson 2012). There is an inherent tension in staying true to the boardgame while maximising the affordances of the digital medium.

ARTICULATING THE PLAY EXPERIENCE

The types of work required to negotiate and organise collaboration in team-based projects have been termed "Articulation work" (Strauss 1988). Articulation work is outside a project, "extraneous to the [core] activities" (Schmidt and Bannon 1992, 8). Accepting that "games are *social* in nature and therefore exhibit essential characteristics of cooperative work" (Crabtree et al. 2007), the concept of articulation work provides a useful framework for understanding the game's chores or "housework" – "the *work* necessary to make the *play* happen" (Xu et al. 2011, 3) – which enables the game but is not explicitly part of its play. Indeed, there are marked similarities between the two: "Insuring the flow of resources" (Strauss 1988, 166) relates to "manipulation of physical objects" (Xu et al. 2011, 7); "making arrangements about the division of labor" (Strauss 1988, 166) surely incorporates "discussion about turn taking" (Xu et al. 2011, 7); and "supervising delegated or assigned responsibilities for task performance" (Strauss 1988, 166) encompasses "enforcing and/or learning rules" (Xu et al. 2011, 7).

It is in these three types of articulation that digitised boardgames typically are distinguished from their cardboard counterparts. In all of the examples discussed, turns and turn-taking are managed automatically by the implementation: players are alerted when it is their turn. Some games even incorporate a log of actions, enabling players to see what happened on previous turns.

Manipulating objects and managing the supply of resources, however, is more complicated. In *Puerto Rico*, a player who takes the Mayor role has the opportunity to manage the number of tokens which will be available to the next player to take the role. Should she forget to do this, her opponents are permitted but not obliged to remind her: "forgetting" to remind the Mayor to restock is a potentially successful strategy, at least for novice and intermediate players. In the digital versions of *Puerto Rico* reviewed here, this restocking is performed automatically, removing this (arguably unsporting) feature of play. A similar, possibly more familiar, example occurs in *Monopoly* (Darrow 1936): players must explicitly demand rent payment from their opponents, who are not obliged to offer payment to an absent-minded landlord. In *Ascension*, significant articulation work is required to transform cards, change card values, monitor which cards have already been used in a particular round, shuffle decks and track Honour Points, Runes and Power – the iOS application manages all this, although arguably with an associated loss of granular control and oversight. In physical play, the restocking of an *Agricola* board between rounds ensures that players understand the cycle through which resources enter the game and become available for collection: at play-Agricola.com, this rules knowledge remains explicit as players perform the restocking themselves. Playdek's app automates the game's chores: "In the actual board game you have lots of moving parts, tons of bits, and you manage everything yourself. ... The iOS game is more of an experience." (Adams 2013). These administrative chores comprise "a rich source of social interaction" (Xu et al. 2011, 3) in analogue physical play, and play an important role in reinforcing players' understanding of the underlying systems of the game, whereas

in online play "things [may] happen automatically, instead of you knowing the rules." (Trammell 2010, 18). Echoing this, Wallace et al found that increasing automation of tasks affecting game state in a digitised version of the game *Pandemic* (Leacock 2007) could confuse players, "especially after complex events" (2012, 234). That "the system should make the underlying model accessible to users" (Schmidt and Bannon 1992, 20) is a tenet of articulation work. This sense that playing the physical game is more real or meaningful than the digital game, or that the work of articulating a game in some way contributes to learning it, supports the proposition that magical interfaces are harder to learn than literal replicas (Smith 1987). As a player we interviewed said, players on the *Yucata* game platform "still have to know how a game scores, whereas on the iOS implementations, I find you don't need to know as much."

Digital games are expected to enact and enforce the rules of the game. For example, there is evidence that the *Puerto Rico Evolver* is used as an authoritative source of rules, either to resolve disputes (Newman 2006) or as a learning aid, to improve the player's own play or practice (Jones 2013, Cheyne 2010). Digitised boardgames have become a pathway to the physical game rather than simply a tool for devotees (Alvaro 2011, Melby 2013). The inclusion of tutorial modes in the *Agricola* and *Ascension* iOS implementations explicitly recognises that it has become the role of the device, rather than of the players, to perform the essential role of teaching and enforcing the rules. Indeed, the language of developers at times suggests that they see rules as an obstacle to (rather than an enabler of) play: "Board Game Geek has a scary breakdown of how [the game] works, but we advise that you not look. The upcoming iPad version, as with all of Codito's awesome ports, will focus on cleaning up the experience and putting the rules in the background" says Codito Software's Chris Ewington (as cited in Nicholson 2012) of his company's digitisation of *Le Havre* (Rosenberg 2008), a successor to *Agricola*. Ewington sees the role of the digitised game as providing the magic rather than literally replicating each element of the experience – and it is the articulation work which is removed or hidden. "Our challenge is to take care of as much of the mechanics as we can and support the game experience without taking away from it. Let's get all the other crap out of the way so you guys can just have fun playing the game and have fun with the theme and figuring out how to kick your friends ass without having to remember all the rules and picking up all the pieces and sort them out" (Ewington, as cited in Nicholson 2012). Playdek's philosophy is similar: "In order to amass a huge 50-, 60-point score in *Agricola*, you have to get extremely good at the strategy. But just to get from one end of the experience to another and finish with 5 points or negative 2 points, you can still get there and have the experience of plowing a field, picking up sheep. At that point they're miles away from the true depth of the game, but that shouldn't be prohibitive to that player's enjoyment of the game." (Faraday 2013). Digitisation in the mass market has broadened the games' player bases and explicitly recognised that games offer enjoyment at many levels of play, with articulation work seen by players and researchers as an essential part of the play experience and by developers as an unpleasant chore that is best avoided.

INFORMATING THE GAME

At the heart of these games' strategy is the player's own assessment of subjective probability: which of the limited available actions is most likely to bring the greatest reward? Digitisation has allowed for new data to be gathered and compared – it has allowed games to be informed (Zuboff 1988) to a degree far beyond what their designers or publishers might have envisaged. For many players, absorbing this data and finding ways to apply it has become a core element of the pastime of gaming (Carter et al. 2014): it is not simply playing a game that is enjoyable, but rather attempting to solve it.

The *Puerto Rico Evolver* provides raw statistics about its AI players in plain text, indicating the frequency that selected buildings were bought by winning “evolved” players at the end of Turns 4 and 10 and the end of the game. These data suggest that an optimal play strategy combines the Small Indigo Plant, Harbour, Customs House and Guild Hall and does not include the University; a player who memorises and acts on this information can expect to perform well not only against the AI but also against human opponents. At the same time, there are players who reject this “Groupthink”, but the success of the informed methods typically leads these players to reject the game itself rather than continue to play organically and sub-optimally.

Similarly, publication of cards’ statistical data at play-Agricola.com makes the relative strengths and weaknesses of cards and strategies overt. Play-Agricola.com creator Deotte (2011b) has suggested in his site’s forums that players can “use these (generated) statistics to win more”, whilst card designers can “use statistics like these on newly developed cards to balance cards”. In response, “Hala” comments that the statistics “could help you draft more powerful cards (whose power is not so obvious) and avoid cards whose stats prove they are “fooling”.” The experience in the natively digital game *World of Warcraft* is similar: “Instead of simply ‘playing’ a game, the goal becomes attempting to optimize one’s approach. In doing so, the game shifts from something where there are choices to make to one where there are clear rights and wrongs to follow.” (Paul 2011). Players are not necessarily improving their flexibility and skill at manipulating the game elements but are demonstrably increasing their ability to identify the most powerful cards and to implement them at the optimal moment in the game. For these players, subjective probability is replaced with objective probability, as informed by the learned game statistics.

A more overt example is seen in the digitised game *Carcassonne* (Wrede 2000), where players are able to view which tiles have or have not been played in the current game, and an X is displayed on spaces where no remaining tile will fit. Although some players are able to memorise the tile mix and are therefore aware of this state, they are a very small minority and are inevitably fallible; the digitised game provides concrete and definite information to inform play.

Even where this data is not explicitly published, collecting data about a game for the purposes of improving one’s play is a common activity: for example, players of *World of Warcraft* (Blizzard Entertainment 2004) engage in “theorycrafting”, using mathematical analysis to identify the “underlying formulae that govern *WoW*” (Paul 2011). This process can itself change the nature of the underlying game. By publishing this information, play-Agricola.com facilitates and even encourages theorycrafting, with a focus on the use of cards and combinations of cards, just as the *Puerto Rico Evolver* reveals statistics about buildings and suggests optimal strategies based on the buildings’ apparent relative strengths.

This theorycrafting is seen as a learning experience by players; a way to improve their own performance. In discussion in the play-Agricola.com forums (Deotte 2011b), user “treyalsup” notes that published card statistics have “already helped my game quite a bit for making me aware of many cards I was evaluating incorrectly. It especially made me look at cards I didn’t fully understand that are winners for others.” This mirrors “Brian’s” account of playing *Magic Online*, asking more experienced players for advice during a card draft and using that advice to learn more about the game and become a better player (Trammell 2010, 11). Like reading rules and managing game pieces, theorycrafting is

arguably another form of articulation work, occurring remotely from the game, outside the immediate play setting. In an apparent demonstration of the strengths of this method, play-Agricola.com creator Deotte claimed a victory for the site at the 2011 World Boardgame Championships (Deotte 2011a). Reporting on the results of the tournament, he noted that of 100 entered players in that tournament, the 25 semifinalists included all six of the entered play-Agricola.com “regular players” and the top three places in the contest were taken by those regulars. Similar claims have been made about the quality of BSW’s *Puerto Rico* players (see Maloney 2010). Meanwhile, tools like the *Puerto Rico Evolver* allow players to run alternative scenarios and experiment with the cost of buildings, and may have inspired the designer’s own comment that “he would indeed decrease the cost of the university by 1 doubloon and increase the cost of the factory by 1 doubloon.” (Rosenberg 2009, para. 95). It is notable that none of the official implementations that we have reviewed enables this overt tinkering. Game developers have suggested that they see this type of information as useful to developers and designers in balancing a game but potentially game-breaking in the hands of consumers or players (Sztajer et al. 2014). For many players, however, as well as their opponents, digitisation, with its support for informing and theorycrafting, has fundamentally changed their engagement with and experience of the game.

CONCLUSION

The examples of *Agricola*, *Puerto Rico* and *Ascension* demonstrate that the choice and design of a digital platform can influence the ways in which digitisation affects a boardgame. The tension between the specific metaphor of the boardgame and the affordances of the digital medium remains largely unexplored. Whilst there is widespread acceptance of some simplification on the periphery of the game, modifications to gameplay remain controversial and hint at a divide between the boardgame industry and the digital game industry, where developers seek to extend the game and add magic as they translate it to the digital medium rather than simply copying the game literally from one medium to the other. Digitisation can support the player community by supporting sophisticated players and/or by making the game accessible to new audiences, but there is a need for game developers to recognise the effects of automating key articulation activities, which may assist players to understand the rules and strategies of a game. Importantly, hiding the “work” of the game may obscure rather than simplify the player’s understanding of the game’s structures and systems; articulation tasks are more than just “crap” to be endured, they contribute to players’ understanding of the game’s rules as well as its patterns of play.

A digitised boardgame can be a valuable learning tool, but can also create new information about the game through informing game statistics, and can engender new tactics through theorycrafting, which may be equally effective in face to face play as in a digital implementation. Publishing informed data and statistics makes theorycrafting an overt activity which increases some players’ enjoyment of the game through their perceived improvement in performance while interfering with the enjoyment of others, who feel that the gameplay has been reduced to an exercise in “groupthink”.

Although this paper focuses on digital boardgames, its implications extend more broadly within the digital game environment. The metaphor of “game” frequently leverages tropes of analogue games which are tested within the boardgame environment but extend beyond it into digital and even pervasive gaming. Further work in understanding these design choices, in particular the way that boardgame designers and publishers, players and digital game developers perceive the relevance of the metaphor of the physical

boardgame, as well as exploration of types of chores found in digitised boardgames and the way in which they are represented to the users, will inform development of digital boardgames and provide broader insight into the experience of play across analogue and digital environments. Informating or theorycrafting is known to occur in natively digital games as well as in digitised boardgames; understanding its effects may allow for it to be directly leveraged within gameplay. Lastly, developing an understanding of articulation of play and how this contributes to learning, strategy and a sense of wonder or magic will not only contribute to successful digitisation of boardgames but will also suggest opportunities to hide or reveal elements of the structure of natively digital games to enhance and innovate their play.

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ENDNOTES

¹ See for example <http://boardgamegeek.com/thread/1060609/new-edition-being-released> and <http://boardgamegeek.com/image/1815278/puerto-rico-limited-anniversary-edition> - the Alea Big Box series is seen as a collector's set, with the games to be "shelved" in order, and many felt that they did not want to see the same game twice in the series. Similar concerns were expressed when its eighth game, Mammoth Hunters (Moon and Weissblum 2003), was published in English without the series number "8" on the box.

² Whilst Lookout Games has never officially commented on the legality or otherwise of the site, tacit approval was provided by Lookout's Hanno Girke, who provided public feedback after using the interface for a solo game (Girke 2008, October 9)

³ *Agricola* can also be played online (in English, French and German) at boiteajeu.net, albeit with a restricted set of cards (diplojak 2011). Card drafting is available; players can also choose the "Draw 10, keep 7" option. The site offers online turn-based (asynchronous) play of 49 different boardgames and ranks users using an Elo style rating system common to other gaming sites including the Playdek app, but does not offer the detailed statistics and analysis that are routinely found on [play-Agricola.com](http://play-agricola.com).

⁴ A word on terminology. The game itself is generally known as *Ascension*; each boxed edition has historically had its own title (*Chronicle of the Godslayer*, *Rise of Vigil*, etc). With the third release of the game, the core set (*Chronicle*) was rebranded as *Ascension: Deckbuilding Game*.

⁵ The *Puerto Rico Evolver* is unusual here in that it breaks the boardgame metaphor. Comments from its programmer suggest that this was expediency rather than a design choice – "I an [*sic*], indeed, not a professional programmer and the only programming-like tool I have available at both work and home is Excel." (Mitton 2010a). The *Evolver* is an unusual case, however, and is not representative of mainstream design choices.

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