Understanding Smart Device Tabletop Games

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ABSTRACT
The aim of this short paper is to understand smart device tabletop games as a part of the larger phenomenon of hybrid tabletop games. The approach taken is to create a loose typology of smart device tabletop games via analyzing the features of such games currently on offer and mapping them in the historical context of hybrid tabletop games. The process of creating a typology also helps us move towards understanding the nature of a wider hybrid gaming experience, not restricted merely to the delivery medium of the game.

Categories and Subject Descriptors
K.8.0 **[Personal Computing]:** Games

General Terms
Design, Human Factors, Theory.

Keywords
Smart devices, tabletop games, hybrid games, hybrid experience, game design

INTRODUCTION
Recent years have seen the rise of physical-digital hybridity in many aspects of everyday life. Smart devices now help regularly in daily chores, whereas better and cheaper technology allows injecting physical everyday objects with information technology. In the field of play products, one emerging product category is hybrid tabletop games played with smart devices. Tabletop games that aim to combine a physical game experience with electronic or digital elements have existed since the 1970s, yet the app revolution of recent years has really turned the public eye on a multitude of new kinds of hybrid tabletop gaming experiences. To better understand the reasons for the success of smart devices in connection to tabletop gaming, the aim of this short article is to contextualize and understand the current scene of smart device tabletop games (SDTG).

The article briefly highlights the history of 'hybrid' tabletop games, goes over some of the recent studies focusing on hybrid tabletop games, and finally moves on to describe the types of smart device tabletop gaming experiences currently on offer. With this kind of loose categorization we also hope the article to inspire tabletop game design in further harnessing the design space offered by smart devices.

AcademicMindTrek '14, November 04 - 07 2014, Tampere, Finland
Copyright 2014 ACM 978-1-4503-3006-0/14/11…$15.00
http://dx.doi.org/10.1145/2676467.2676511

In this paper a tabletop game denotes any game that is designed to be played on a flat, table-like surface. 'Hybrid' tabletop game, on the other hand, denotes a tabletop game that in some meaningful way combines a computerized element into a traditional tabletop game experience (cf. [12]). The paper exclusively then focuses on the phenomenon of hybrid tabletop games played on smart devices, i.e. modern touch screen phones and tablet computers. The process of creating a loose typology of SDTGs connects to the discursive nature of the article: an underlying aim of the paper is to highlight how the phenomenon of tabletop gaming is in a stage of flux, and how, in the age of hybrid games, it has become harder and harder to define what a tabletop game actually is anymore.

HYBRID TABLETOP GAMES
First electrically enhanced board games that can be considered ancestors to modern hybrid tabletop games were released already in the 1910s[1]. In *Electra* (Sala Games, 1910) a lamp would notify a player for connecting the right answer to the corresponding question. Following electrification, the next significant advancement was the microchip mediated board games of the 1970s. In Parker Brothers' *Code Name: Sector* (1977) players would compete against each other in a battleship-style race game trying to sink a submarine controlled by a micro controller. *Dark Tower* (Milton Bradley, 1981), on the other hand, was among the first board games to utilize simple displays in a board game design.

During the 1980s, VCR technology offered the first steady platform for hybrid tabletop gaming and spawned even a few commercial hits, such as *Clue VCR Mystery Game* (Parker Brothers, 1985). Following the same design trajectory, the CD and DVD board games of the 1990s and the 2000s improved the genre by introducing some interactivity to it. *Eye of Judgment* (Sony, 2006), an augmented reality card game played on special play mat, attempted to bring hybrid tabletop gaming to the dedicated game consoles, but failed to generate much interest. Having faded momentarily into background, hybrid tabletop games started to gain newfound success after the app revolution of the late 2000s and the introduction of the tablet computer. Perhaps the most fitting medium for a hybrid game board yet, the tablet computer was a surprisingly comprehensive collection of suitable technologies for creating interesting board game experiences. Features like touch screen, support for capacitive technology, camera, speakers, microphone, tilt sensor, and online connectivity provided many new ways to tackle existing problems in the design of hybrid tabletop games, while at the same time presenting a rich platform for creating completely original gaming experiences. SDTGs have clearly contributed to the tabletop gaming boom of the recent years, as publishers have noted that entirely digital app

[1] http://boardgamegeek.com/boardgamecategory/1072/electronic

board-games often boost the sales of the physical version [6]. Be it a smart phone or a tablet computer, smart devices are also a platform most everyone seems to carry with them.

PREVIOUS RESEARCH

Academic studies on hybrid games have focused mostly on design aspects. Magerkurth [13] came up with a hybrid game model that highlights the different domains of the hybrid game and some of the design possibilities within these. Lundgren & Björk [12] discuss the possibilities, in terms of mechanics, hybridity offers for tabletop games. Wallace et al. [18], among others (e.g. [8]), have pointed out the possible helpfulness of digital aids in reducing the amount of meaningless tasks hindering the gameplay experience, noting however that too much automation can impair the gaming experience.

It is fair to say that for years, apart from a few commercial standouts, hybrid tabletop game have been a curiosity. One of the reasons for this might be that the field has not been able to settle on one defined form for how the hybridity should be implemented in the design of these games. Perhaps reflecting this predicament, hybrid tabletop games have been described in academia with an array of terms, such as 'augmented board game' [14] and 'digital-physical tabletop game' [20] (see also: [5]; [8]; [13]; [18]). Meanwhile, market talk has used such terms as 'combined game'[2] and 'zAPPed edition game'[3]. It is notable, that these terms often imply the tabletop game experience being unilaterally enhanced with the digital elements, perhaps unwittingly suggesting the traditional experience is somehow inferior to the computerized one. Carter et al. [4], for example, have argued that many studies on the hybrid games may have overlooked the unique nature of physical board game experience, i.e. being guilty of the digital fallacy [15]. However some studies (e.g. [20]) have noted the relevance of transparency of rules for a board gaming experience.

Instead of being a way to facilitate the physical play, hybridization can be seen as an approach to enhance the gameplay experience, be it physical or digital. Previous work by authors [17] has explored some of the design constrains in playful hybrid products. There, hybrid play experience is evaluated on the basis of how synchronous–asynchronous and how dependent–independent the two sides of the product – the physical and the digital – are. Lindtner et al. [11], on the other hand, argue that physical-digital hybridity should be understood as a multi-dimensional environment or "ecology". The player experience is not restricted only in the game, but the physical interaction between the players, for example in an Internet café, is a meaningful part of the experience as well. This way, different media can be seen acting as multiple interfaces to one gaming experience [11], suggesting that in some cases the hybrid board game experience might not be so easily confined into one delivery medium.

SMART DEVICE TABLETOP GAMES

Both board games and games in general have been classified in many ways (e.g. [2]; [7]). However, it seems explicit categorizations for hybrid tabletop games are nowhere to be found. Clearly this type of gaming – mixing traditional play with new technology – will only become more popular in the future, and as such, efforts to create clarifying models and typologies on the subject would be beneficial. A categorization of hybrid tabletop games doesn't only help us to define a more coherent vocabulary for hybrid tabletop gaming, but also works towards a scientific discourse needed to properly study them [9]. Our contribution is to create a loose typology of SDTGs currently on offer. Our analysis was based on a collection of approximately fifty contemporary and early hybrid tabletop games. The sample emphasized a variety of different ways to introduce hybridity in tabletop games and encompassed representative examples of hybrid tabletop games on market. Following the analysis phase the SDTGs were divided into a handful of categories based on the functionality the smart device has in the game (see figure 1).

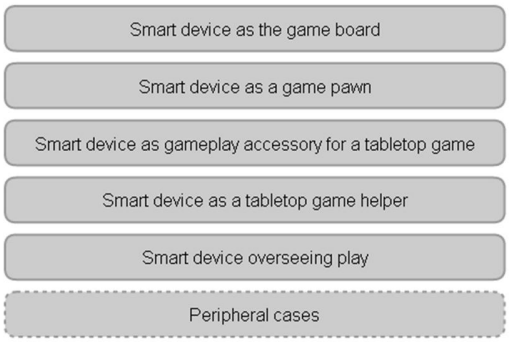

Figure 1: A loose smart device tabletop game typology

The division is created from the perspective of the player. It hopes to highlight how the design spectrum for these hybrid solutions is wider than what is currently in use, ideally offering a set of revealing lenses through which to gain new insight on the design of hybrid board games. The categories presented in the model are not exclusive.

In the following we describe different kinds of tabletop game experiences that utilize a smart device in one way or the other. The categories are not mutually exclusive, and one game could easily use several of them in their design. Rather than dogmatic, the model is meant to be pragmatic and inspirational. Thus, we not only include existing examples of the described game types, but also offer design suggestions where applicable examples are not available.

Smart device as the game board

The most obvious category of SDTGs are games that use the tablet computer as a game board in some way. First, there are several straightforward conversions of traditional board games that recreate the game as faithfully as possible, typically replacing the physical game tokens with virtual ones (e.g. *Carcassonne*, The Coding Monkeys, 2010). The design could also utilize multiple, connected tablet screens to create an expanded game board or let each player use her own game board in an otherwise shared experience. Second, some games like *The Game Changer* (Identity Games, 2012) use the tablet as a *part* of the game board, creating a hybrid board with physical and digital sections. Third, many games are played with physical game pawns on the digital board. Special capacitive pads allow the screen to recognize specific game pieces (e.g. *Spellshot*, Hasbro, 2012), whereas capacitive ink can be used in the same vein on playing cards (e.g. *Monsterology*, Nukotoys, 2012), creating a wide spectrum of card game possibilities. The tablet screen might also shoot light in the spot where the game piece is in order to light up transparent parts of the figure (eyes, torch, etc.).

[2] http://combined-games.com/leaders/

[3] http://www.relentless.co.uk/games/battleship-zapped-edition

Smart device as a game pawn

Due to their smaller size, smart phones particularly can be used as game pawns themselves. French design studio Les Editions Volumiques[4] has created several games and prototypes where players place their smart phones on a large physical play mat on which the phones recognize their starting position and can track their movement via the phone's sensors. In *Yo-Ho* (2014) player's phone depicts a pirate ship, whereas the play mat is the sea. Phone displays the ship and the sea surrounding it, both adding an animation effect and acting as a clever version of the familiar "fog of war" mechanism (i.e. the player sees only what is near her).

Smart device as gameplay accessory for a tabletop game

Smart devices can also be used as different kinds of gameplay accessories for SDTGs. The variety comes from how integral the smart device is for the gameplay of the game. First, some games, utilize the smart device as a necessary part of the game design. In *Leaders: A Combined Game* (Rudy Games, 2013) players move pieces on a regular game board, while also taking turns using a tablet which relays hidden information such as allegiances between the players. *Golem Arcana* (Harebrainde Schemes, 2014) uses a special tag pen to interact with the physical game board, while the info is displayed on an associated tablet. Dice+ (Game Technologies, 2013) is a smart device based platform for custom designed games. It uses a special Bluetooth die to connect to a tablet which recognizes the rolls of the die and facilitates different games. SDTGs might also opt to use a smart device as an optional add-on. Instead of passing one tablet computer around, players can use *Scrabble Tile Rack* app to connect to *Scrabble for iPad* (Electronic Arts, 2013), allowing each player to use their smart phone as a personal rack for word tiles. Finally, smart devices could be utilized as an aesthetic element of the game; an RPG gamemaster could for example use a tablet computer as an animated part of the gamemaster's screen, creating atmosphere and giving cues.

Smart device as a tabletop game helper

Besides being a gameplay accessory, smart devices can be used outside the core gameplay to help streamline game sessions, for example during set-up. For example, there are several apps for *Dominion* (Donald X. Vaccarino, 2008), such as Dominion Kingdom Deck (Jerry Shu, 2010) that let players mark down which of the several add-ons they own for the game and then easily randomize which card decks to use in a single game. Other examples include the various virtual dice rollers available for smart devices. These typically allow users to shake their smart phone like a dice cup before rolling, adding to the tangible feel of the application.

Smart device overseeing play

Smart devices are now equipped with exceedingly good quality sensors of a wide variety. HD cameras can be used for object recognition, microphones can be used for giving voice commands or listening in on play situations, and so on. These features can be used to create a self-standing game master device to oversee play. While there are no tabletop game examples of this, *Osmo* (Tangible Play, 2014) is a smart device platform which uses object recognition to oversee pre-programmed games played in front of it. Standing in upright position, the application recognizes word tiles, play cubes, and shapes drawn with a marker, thus enabling different game forms. The same technology could be used for example to oversee figurine-based board game play, where the application could then act as the game master giving instructions based on the play situation.

Peripheral cases

Besides these smart device tabletop gaming examples, there are instances of gameplay that resemble game play on tabletop games and are associated with smart device, yet falling out of our definition of SDTG.

All-digital tablet games with board game aesthetics

Some games, like *Hitman Go!* (Square Enix Ltd, 2014), specifically aim to mimic the visual and/or mechanical aspects of traditional board games. Through connotations these kinds of features stir-up, and the tablet computer platform they are played on, the gameplay experience can be considered bordering with hybrid tabletop gaming.

Smart device tabletop toys

Many games aimed mostly at children, such as *Dora the Explorer Let's Play Backpack* (Discovery Bay Games, 2012), often move towards the status of toys mirroring older battery-powered children's games like *Hungry Hungry Hippos* (Hasbro, 1978). Cases like these challenge the vague boundary between games and toys, as well as the one separating digital and tabletop games. As such, defining these kinds of games is a case-by-case affair.

DISCUSSION & CONCLUSIONS

By opening up the prevailing situation in the field, we hope to have increased theoretic understanding on the possibilities of hybrid entertainment media in general. Highlighted categories also work towards opening up historical trajectories leading from the early manifestations of hybrid tabletop games into the modern SDTGs. Overseeing of play, for example, was in a way introduced already in VCR board games.

With older technology, the players might have been tied to a given location with the device needed for play (e.g. in the living room with the VCR-player). Actual tabletop games might have been also easily breakable or arduous to carry around. In turn the smart devices are a natural part of a modern life, to the extent they can be considered extensions of ourselves [1]. Good usability and easy accessibility might be partial reasons why SDTGs seem to be the current pinnacle of hybrid tabletop game development.

Our initial aim of creating an adequate classification of hybrid tabletop games soon proved to be a too demanding task. Focusing on SDTG types proved to be more fruitful than trying to cover all the peripheries of hybrid tabletop gaming. Still, coming up with the presented model was a daunting task, clearly leaving room for further studies to come up with more polished research. We repeatedly found ourselves asking whether SDTGs, or hybrid tabletop games in general, could be organized in some other way that would better reflect the kinship between these games (cf. [19]).

Making definitive distinctions between the games was difficult for many reasons. First, it could be argued that in the end, due to the fact that the platform, player, gaming environment, etc. are always physical, *all games* can be considered physical (cf. [16]). Second, the aim to define the hybrid gameplay experience essentially means trying to pinpoint or "insulate" something "hybrid" in a gameplay experience that initially seems to involve entirely digital or physical play products – something that the authors found increasingly difficult to frame in a sufficiently satisfying way. For example it would certainly seem that a board game played on a

[4] http://volumique.com

tablet, rather than on a computer screen, could be considered both a more faithful remediation [3] of the traditional board game but also a mimetic interface that resembles traditional board gaming more in the same fashion as *Wii Tennis* (Nintendo, 2006) resembled tennis more than, say, *Mario Tennis* (Nintendo, 2000) (cf. [10]).

It might be tempting to complement all games played on the digital tablet board for being somehow more board game like than games that are not played on them. However, there are now more and more games, such as the children's game *Cityville Skies* (Hasbro, 2012), that, while played on a tablet, clearly are not "tabletop games". And yet it is hard to deny that even in these cases the gameplay situation resembles tabletop gaming.

Hybridity – the combination of digital and material affordances – can be seen most of all as a facilitator, giving rise to a new, third set of design choices to accompany those reserved for the traditionally separate domains of material board games and entirely digital games. As such, the article hopes to highlight the hybrid tabletop game experience as something that resides between the physical and digital elements, yet drawing experiential elements from both. For example, entirely digital online game boards like *Vassal - The Open-source Boardgame Engine*[5] provide players with a savable, network connected play environment, while still offering room to negotiate house rules.

Following these musings, it is becoming clearer that in this new environment of ubiquitous technology the boundaries that define a "tabletop game" are fast becoming blurred. Earlier, the designer often tried to create a game within the medium which she worked in. As technology is becoming cheaper and ever-present, we might be moving towards a time where we do not talk about 'hybrids'; it has become a norm rather than an exception, as expected by the proponents of the Internet of Things. In such environment the game designer would probably choose the medium or the platform freely according to the intention of the gameplay experience.

In this short paper, we have presented a preliminary, loose typology on smart device tabletop games. By analyzing existing examples in the market we divided the games in categories based on the role the device serves in the game. The typology clarifies the relations of multitude smart device tabletop games out there, while taking a step toward creating a more distinct vocabulary for future studies. Categorization also brought forth the challenging nature of hybrid experience, something that is hard to define explicitly.

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