Mobilising Monopoly:
game design, place and social values

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ABSTRACT
Location based games have seen the translation of popular boardgames into mixed reality settings through the integration of mobile phone technologies. This paper explores modifying the game of Monopoly from a boardgame to a locative mobile phone based game utilising NFC and QR code technologies to engage players with real world places. In doing so, the mechanics, rules and motivations for playing the game shifted in the prototyping of the game concept. Here, we outline the initial game design process, problems and possibilities in modifying such a well-known game to the city streets. We also detail how the mechanics of the game were updated to provide some solutions to ideas surrounding property values, social media values and player location in the new game design.

Categories and Subject Descriptors
H.5.m [Information Interfaces and Presentation]: Miscellaneous

General Terms
Design

Keywords
Pervasive, Mobile, NFC, Location Based Game, Monopoly, Boardgame, Social Media, Social Capital.

1. INTRODUCTION
The concept of Monopoly has been traced back to 1903 and Elizabeth J. Magie Phillips creation, "The Landlord's Game". Phillips' original concept was constructed as an educational tool to explain the theories of tax and the negative aspects of private monopolies. Philips continued development with her game up until the 1930's where she added the ability to buy, sell and develop land. However, it was not until 1934 when the Parker Brothers conceived the original game of Monopoly. It is believed that this first version of the game heavily involved a participatory design element, whereby people contributed to the games design, which constructed to a 4 x 10 square board game, with cards associated with the properties and the ability. The ability to buy and sell properties was also extended to include the use of adding extra value through the purchasing of houses and hotels.

Since its inception Monopoly has been adopted for multiple cities, countries and even platforms. Alongside this mobile and tablet devices often having their own scaled down versions. In many of these versions, including the electronic boardgame version of Monopoly, the fixed board structure remains the same, but the players become replaced by artificially intelligent equivalents. Similarly, location-based versions of the game have also emerged, such as Quip Media's The Landlord Game for Android and iOS devices. Location-based gaming in itself has emerged over the last ten years with mobile phone technologies and widely available communication protocols playing a large part in their development and implementation [2, 3, 9]. Location as a way of discussing where we are is also frequently embedded into social media platforms such as Facebook and Twitter, as well as dedicated location applications such as Foursquare. As de Souza e Silva [4] notes, *"location has become an important piece of personal and spatial identity construction"*. Therefore, we can see that checking into places has become part of many people's routine in the connected world, through what can be termed as 'network locality' [8].

It is by examining the board of Monopoly as a series of places or locations, that it is possible to see how location-based mobile phone platforms would be ideal sites of porting the game. Therefore, what aspects of Monopoly can be used to create a new game space nearly 70 years on from the Parker Brothers version? And what real world social values can be extracted to create a new version of the game based on some of the original game mechanics? This paper explores these questions in relation to the development of a locative mobile-based game titled Local Property Trader (LPT). By taking common themes of Monopoly, such as land ownership, property development, and the accumulation of wealth, LPT seeks to update the boardgame by taking these rule sets to the streets of Manchester in the UK in order to educate both players and the owners of high-street businesses about 'social capital' and the importance of spending money locally. The traditional game of Monopoly is transformed into a location-based platform as LPT draws upon social media data as a way of reworking parts of the overall game mechanic. The use of social media starts to emphasise the importance of place within the spaces we frequent between home and work as we seek to move about areas within our social lives.

2. BACKGROUND
"Cities are dynamic places of change and transformation. Dense and heterogeneous, they offer a general framework for individuals to create personal patterns and act on them. Within the game of urban possibilities, the city is a constantly changing

stage, forever reinventing and redefining itself on the basis of its performer's creativity and interactions:" [6].

Locative mobile games are often linked to the integration of location technologies in mobile phones, with GPS seen as the key to the location experience. However, the use of GPS in cities where buildings are physically in close proximity to one another means that the sensitivity of such systems is not accurate enough to allow for precise check in possibilities, thus the need for Network and Wi-Fi based location methods. Loading up Foursquare provides the user with a list of possible check in sites, allowing for users to manipulate their check-ins based on proximity rather than exact location. In a game such as Monopoly, which relies on the exact location of buildings for players to claim particular places, GPS does not fulfil the requirements for this type of experience. Therefore, the design of LPT was instead focused around NFC (Near-Field Communication) and/or QR code tags located in the physical world. Burnett, Lochrie and Coulton recognise the intimate nature of using NFC as a means of collaborative play. Similarly the physicality of having to check in with NFC could be used to create a more personal relationship between player and place [1]. However, as NFC is not integrated into all mobile devices, an alternative has also been explored in terms of using QR codes. Developed in 1994 by DensoWave, the QR code is used as a means of transmitting information. It is a technology still used within communication media by companies in advertising their products or services as well as allowing for promotions, such as gift giveaways on drinks bottles. Using NFC and/or QR codes is an important component of the design of LPT. The need for the player to physically go to a location and interact with the game at a particular site is one part of the mechanic that links to how LPT has adapted the game of Monopoly to focus the game around real life issues.

In a recent article in The Guardian newspaper, Ward (2013) notes *"Towns of the future need to offer something different and attract customers to 'the experience'"*. The aim of LPT is to utilise social media in order for players to engage with the local areas in a novel way. The game of Monopoly involves a player connection to place as individuals seek to claim parts of the board dependant on the amount of money they have acquired. This ability for the player to connect with places is a large part of the design of LPT through both NFC and QR codes but also the social media data used for players to acquire particular places. Social media platforms such as Twitter contain vast amounts of information beyond the tweets themselves, such as amount of followers and followees, favourites and retweets. These components can be gathered from the Twitter API and fed into other applications such as LPT. Therefore, instead of properties in LPT having fixed priced values (seen in Monopoly), the price of property fluctuates with the social trends and businesses engagement with their social media feeds. The link between social media data, and the physicality of checking into real world locations allows for the social nature of Monopoly to be recreated in a mixed-reality locative game space, allowing for multiple players and multiple motivations of play. As Ferrara [6] notes in his work on Playful Design, there are five planes of player experience including, *"aesthetics, usability, balance, meaningful choices, and motivation"*. It is these key factors that will now be explored further as the prototyping and play-testing of early versions of the game will be discussed as game mechanics had to be adjusted and altered in order to provide a potentially more fulfilling experience.

3.   THE GAME

The locative game LPT is based around ideas of social capital and exploration. As Gauntlett [7] notes, the term "social capital" has taken on various meanings throughout the years. However, according to the author, the social capital term "started life as a metaphorical mirror of financial capital: just as a supply of money can enable you to do things that you otherwise could not do, a stock of social relationships will also make it easier to do things that otherwise you could not." Therefore, taking data from social media networks like Twitter enables new game mechanics for generating an equivalent 'monetary value' in the game, as based around real world social media interactions. However, this approach posed the first problem within the game design. If well-known companies such as leading Football stadiums were integrated with smaller businesses such as newsagents then the converted values differ quite dramatically. To deal with this, the notion of bands was introduced into the game design to balance out the proportions of social worth evenly, especially in the higher end value properties.

3.1   Inspiration: Monopoly & Real World

As previously mentioned, LPT draws upon inspirations from classic boardgames (such as Monopoly) to modern day mobile Location Based Services (LBS). Similar to Monopoly, LPT players visit properties in and around the city, a similar mechanic to rolling dice and moving squares on the Monopoly board. However, players are encouraged to explore as much as they like the area by visiting new properties with the potential to buy any of them after successive checkins. Additionally LPT classifies properties into bands (this can be somewhat considered to the real world, with houses and businesses being categorised into varying tax bands). LPT bases the property into a 'Tax Band' like system, based on the property type (small business, public services or global brand) and the price of the property (explained in more depth in the next paragraph) where each property is classed in bands to help the player in gaining a better understanding of the business. At the start band A, is considered the same as the lowest priced properties in Monopoly. This is similar to Old Kent Road (the brown property featured in the UK version of the classic Monopoly boardgame). Like Monopoly, LPT also uses the six stages of property development from buying the property to putting a hotel on the land. In LPT players buy the blueprints (seen in Figure 1A), and continue on with the adding of the shell, bricks, roof, door and finally the chimney (Figure 1A – 1F).

Leveraging and modernising aspects of Monopoly in LPT was no straightforward task. There are strategic reasons why the boardgame consists of 28 properties situated around a 4 x 10 squared board, priced in varying increments and differing rent prices based on the type of property owned including the number of houses or hotels situated at the property. Other aspects include a 'passing go', jail, free parking etc. Some aspects were not carried over into the digital LBG of LPT for obvious reasons, such as the 'Jail'. In LPT no player can go to jail, as the main purpose of the game is to discover and explore a city, checking into places and interacting with businesses. On the other hand, passing go is represented daily through the opening of the mobile app and a simple poll of one of the main headlines for that city. For example, for the game in Manchester, the Manchester Evening News newspaper headlines are downloaded and selected at random and sent to the mobile client upon login. Players vote on their opinion of the headline.

Figure 1. Iconography used within the game to represent the stages of property development.

From left to right (A–G).

3.2 Taking the Boardgame to the Streets

Unlike the popular boardgame, LPT utilises dynamic properties prices based on the social capital of each property. The social capital known as SC, changes daily similar to the stock market where each property's SC is based on their previous days activity on Twitter (Figure 2B). Only the influential aspects of Twitter's social network are considered for the purposes of determining a property's SC, such as new followers, increased tweet count, number of favourite tweets performed, be added to lists and follow other users (these are all considered as positive impacts to the social capital) whereas losing a follower, not tweeting, being removed from lists and unfollow some users are negative aspects of Twitter. As the SC changes daily, so does the categorisation of the property, which implies that if a property is in Band A and it is more active on Twitter, it will eventually be promoted into Band B. This means the value of the property has increased, which increases the rent, checkin points as well as the reputation difficulty (as each property is promoted into a new band, their SC is calculated differently, e.g. if you loose a follower in Band B the scoring is greatly effected and it will be higher than a similar action in Band A). This means that when a player owns a property, they should do their best to interact with the business on Twitter to boost its value within the game. Such mechanics create communication channels between the player and the physical business, which might have not existed before, as well as loyalty and bond between the two parties.

In contrast to the original Monopoly game, players in LPT are not required to acquire all properties within a neighbourhood for the player to be able to start developing houses and hotels. As each property is treated as an individual within the game world. In order for a player to achieve the highest development for the property (final property icon, Figure 1F) they must have visited the property and physically checked in. However this simply can not be achieved by tagging the mobile device 6 times, since players are only permitted to visit the same property once a day. This means for the player to reach this stage a minimum of 6 checkins over a 6-day period must be performed. At the same time the player must pay for the developments in the property. During this time other players that are checking into the property have the ability to 'steal' the ownership from the owner (operation known as 'Squatting' within the game). Squatters' rights are in place to encourage players to maintain their interactions within both worlds (in game and physical). As the owner increases the stages of development for the property, the difficulty of squatting increases, which creates the need for owners to continually checkin to maintain their property but also opens up the possibility of refreshing the property ownership, should a player become inactive within the game.

Also, at the start of Monopoly each player is given the same start up cash, as the properties prices in LPT are dynamic. If the same approach was adopted, it would make the game unbalanced, therefore whenever a new player joins the game, their initial start up points are calculated based on the average SC of all properties in the game.

As active participation is key within LPT, players who cannot continually check into their owned properties can purchase in game extras such as insurance policies to protect their properties from being stolen. Insurances can only be bought upon checkin, and the owner can decide how much insurance their properties require (2, 5, 10, 15, 20 days). There is a directly proportional relationship between the number of days the insurance runs for and the amount of capital required to acquire the insurance. If a property is insured, all players within the game can see the property is insured, however, only the owner knows the duration of the insurance (Figure 1G). This was decided upon to still encourage players to checkin and earn points in the attempt to steal off the property from the owner. The highest level of insurance is 20 days, which allows other players to check into the property, however no squatting can take place during this time. The number of days was adopted based around UK's insurance law, as no insurers will protect the property if it is not inhabited for longer than 30 days. The 20 days of insurance combined with the 7 days to actually own the property, means a player can potentially secure their property for a total of 27 days.

3.3 Creating in Game Balance

Alongside the reflective nature of start up funds, daily SC evaluations, the aforementioned property prices in Monopoly and LPT differ significantly, thus the highest priced properties could reach an outstanding number, which effectively unbalances the game. When players own such properties, mechanics are in place to avoid any unfair situations arising between players. These mechanics range from only allowing the purchase of high priced properties to those players considered as 'Good Citizens'. A Good Citizen consists of an active player building a strong portfolio of properties while at the same time contributing to the local public services. Public services within the game include properties such as the police, fire, hospital and town hall but also transportation systems like rail, bus, tram and underground are all properties within the game which cannot be owned by the players, these properties are owned by the game. Players can visit these places, earn checkin points, donate points towards the maintenance of the city, as well as using them as community chances. Players who checkin into these properties earn kudos points, which contribute towards their property portfolio in the attempt to take ownership of the highest valued properties within the game.

Upon owning a high valued property, the owner must subsidise the maintenance of the public services that helped the player achieve their current level of ownership. As they receive rent for the property from other players checking in, a city tax is applied to this rent profit, which is automatically subtracted from the player's balance. The aforementioned city tax is then applied to one of the public services, to which the player can choose where

this tax is spent. This is where the community chance aspect of Monopoly is applied within LPT. Upon placing the tax in one of the public service properties, the next player to check into that property will receive the bonus from the tax. If more than one player contributes to the same public service property via the city tax, the total bonus is rolled over, creating a greater suspense as to where the bonus is held. This creates a full circle effect of community participation and helps players understand society better.
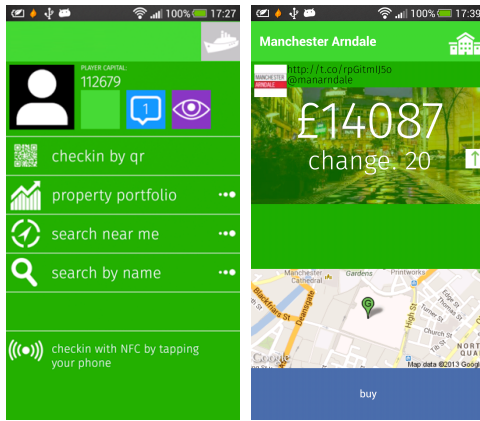
Figure 2. Initial screenshot of LPT game interface.

From left (A) to right (B).

4. CONCLUSIONS AND FURTHER WORK

By taking the game of Monopoly and modifying it for 21st Century needs, the underlying narrative of the game changed. Although some of the more common rules, such as gaining places, and accumulating wealth remained, the shift in emphasis to lower priced properties in terms of social capital started to become more prominent. Here, the small business became more recognised in the game design concept, as a way for the player to engage with them and want to build up a portfolio of smaller businesses, rather than going for the supposed quick gain of a larger company. These initial discussions about social capital in terms of the smaller company also allowed us to rethink the services of the train stations, water and gas companies as found on the traditional Monopoly board, and once again reshape them for use within the locative version. Changing game rules and mechanics for players to invest in the local area became a large part of the game design, and hopefully a motivation for players to keep being engaged with the game.

Although the initial prototype allowed for changing some of the first features imagined for the game, there is still further work to be done on seeing how the game is presented in other situations. The use of NFC and QR codes means that the game is location dependant. Not only does it rely on companies wanting to have these tags within their vicinities, it also relies on players learning a new set of signs for the local place in order to know what and where the game is, part of this is solved with the inclusion of a web-based map that can be explored by players and non-players alike. Providing a secondary system for viewing game action allows players to view the position of places within the game, and also see how properties are holding up in their social capital values. Another issue related to place is the notion of scalability in terms of the game's design. Running the game in a different city with its own set of business and related social media values, means there is a possibility that the game may have to be

rebalanced for different areas. Cities with differing properties allow for a spread of values, yet played in a smaller town, the game mechanics might need shifting slightly to deal with potentially fewer players and potentially fewer sites to check into.

The physical properties in and around the city form the focal point of the game. LPT gives these businesses a way of representing themselves in a different manner. Unlike Google's 'Places for Business', which lists companies on Google, TripAdvisor, Twitter, Facebook and Foursquare, LPT represents this data in a different way. The properties engagement with Twitter as represented in LPT has the ability to influence the game by increasing their value within the game. As previously mentioned this is achieved by increasing the social score, in essence this is improving, maintaining and interacting with their own Twitter account, by tweeting, getting new followers and generally interacting with their audiences. Furthermore, this gives the business an opportunity to engage with the players of the game, encouraging them to check-in by applying a discount within the business or by simply understanding the customer demographics. In doing so, the aim is to create a closer relationship between the company and the customer, through the playing of the game, which might start to construct a more unified town, city or high street through these interactions.

The place specific nature of the NFC and QR codes (Figure 2A) provides an intimacy to the player-place relationship, yet it also means that translating the game to other areas is not as straightforward as using a game using GPS as location detection. Although the initial results of playing the game have been promising, these are clearly extra areas that will need to be investigated in developing the game further and will be of benefit to other people exploring location-based game design.

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