Process and Possibilities Associated with the Development of a Mobile App that Explores Culture, Place, and the Promise of Play

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Abstract and Keywords

Audiences are engaging with culture and the arts in digital and analog formats through a variety of modes and in a variety of roles in large numbers. By exploring the wide variety of user generated media works and collaborative digital projects and communities associated with today's participatory culture, it is arguable that participants are engaging with arts and culture more than ever, as artists, contributors, and curators, in a dual consumer-producer role. This research project aims to establish a pathway to participation in local culture for a broad audience through the design and development of a mobile application that can be used to collect digital artifacts that represent one's personal culture and, in turn, one of the many aspects of a community's larger, collective culture. *Cultureboard*, the mobile application I have developed for this research project, enables participants to digitally capture images, videos, and sound recordings of various cultural artifacts and phenomena that can be found in the community – particularly artifacts that represent the things that are meaningful to a participant's personal culture within the contexts of narrative, time, meaning, and place. The *Cultureboard* mobile application presents participants with opportunities to engage with participatory culture through storytelling, mapping, and discussion and collaboration via social networks. It also leverages *gamification,* or the process of incorporating multiplayer video game design mechanics and principles, to enhance the user experience while encouraging participation through friendly collaboration, competition, and play. This research project will include use cases that detail possibilities for ways to utilize the *Cultureboard* mobile application as a tool for collaborative learning, cultural mapping, augmented reality gaming, and anthropological, archeological, or ethnographic research. This project will also discuss ways that the *Cultureboard* mobile application could be used to promote participation at traditional arts and cultural organizations and events as they relate to each individual participant based on region and cultural interests.

Keywords

INTRODUCTION

Problem Statement and Significance

This research project aims to establish a pathway to participation in local culture for a broad audience through the design and development of a mobile app that can be used to collect digital artifacts that represent one's personal culture and, in turn, one of the many aspects of a community's larger, collective culture. The mobile application I have developed for this research project incorporates a variety of components associated with participatory culture - including storytelling, mapping, and discussion and collaboration via social networks - and leverages *gamification,* or the process of incorporating multiplayer video game design mechanics and principles, to enhance the user experience while encouraging participation through friendly collaboration and competition. Mapping is also an important component of this research project. The mobile application I have developed as part of this research project will be referred to as *Cultureboard* throughout the extent of this research paper.

Video games are growing more and more popular amongst participants who are between the ages of eighteen and forty-nine. Statistics compiled by the Entertainment Software Association (2010) revealed that in 2010, 67% of U.S. households played computer or video games, and that 49% of participants were between the ages of eighteen and forty-nine. The report also found that 25% of all participants were under the age of eighteen (ESA, 2010). It is conceivable that this this demographic could engage with culture and the arts by using a mobile application that leverages *gamification* to enhance the chore of collecting digital artifacts with aspects of play and competition.

The Cultureboard app aims to provide citizen curators and artists with a tool to collect and share digital artifacts that are pertinent to their local urban landscapes. Once captured and shared, artifacts can be accessed by other participants, observers, and the greater public who might not be aware of Cultureboard, but will find artifacts at various intersections along amplified trajectories that are driven by social networks and reimagined, or perhaps reinterpreted, in user generated media projects, remix works, narratives, and beyond. Mary Flanagan (2009), a game designer, artist and author writes that "computer games especially can be seen as critical frameworks that engage space and, when used in the context of artistic practice, become environments in which player-participants can make meaning that directly relates to urban spaces. There are additional deep ties to interventionist art practices in viewing the fluidity of performance, the city, and the simultaneous reading and authoring of social interaction in electronic game worlds" (Flanagan, 2009). Cultureboard aims to engage space through the artistic practice of seeing and identifying what is meaningful and aesthetically, contextually, or aurally important (subjectively), and capturing representations of artifacts to contribute to a collective understanding of culture, space, and time, and to intervene with preexisting assumptions and expectations pertinent to the surrounding urban landscape.

Urban spaces are significant to potential uses of Cultureboard as it is predictable the majority of activity will come from the walls, music halls, theaters, and various public places in the urban landscape. Eckardt and Bauhaus-Universitat Weimar (2008) establish that place consists of three forms. "Proper place" is defined as the material and social space that the public exists in, "place over place" is defined as the immaterial space of image, which overlay public spaces, and "temporary place" serves as the length of public

time, which is lived in space (Eckardt and Bauhaus-Universitat Weimar, 2008).

Cultureboard users will explore and collect digital representations of cultural objects as they are visible in place over place. The aggregated collection of artifacts within the Cultureboard system might lead to better understanding the temporary place of the urban landscape. And, finally, the exploration and act of capturing will commence within the context of proper place. With urban space comes the important process of mapping.

Cultureboard is designed to utilize a map as the primary means to visualizing and contextualizing the relationship between artifacts, narratives, and place. From a researcher's perspective, the Cultureboard map could provide a platform for analyzing place and its relationship to cultural participation.

The map component can also enable individual participants to foster a stronger sense of cultural identity so that they can become aware of various places, stories, and partnerships that relate to them. Aligning with the practice of cultural mapping, by which civic and community planners locate and map cultural assets – usually businesses, theaters, art galleries, and non-profit organizations based in the arts and culture sector – to best understand how culture and place work on a regional or community level, Cultureboard enables the mapping of personal culture or how things and places relate to participants on the personal, individual level. From the macro-perspective Cultureboard can also be used to augment larger, organized cultural mapping projects by merging known cultural assets with the multitude of artifacts that will be collected and shared by individual participants for an expanded view of a community's cultural sphere.

Participatory culture is another key area of significance to the Cultureboard Project as sharing and collaboration are important to fostering a greater understanding of

one's community and the arts and culture interests of other participants in the community. Given that this project is intended to reveal one's identity and artistic or cultural interests through the collection and aggregation of digital images, videos, and sound recordings that are relative to the participant's personal culture from various entry points via the social graph and direct submissions through the Cultureboard app, this project can be established as yet another tool for exploring and experiencing participatory culture. Ultimately, this research project aims to establish a game-based mobile application that can be used to encourage participation in arts and culture through the collection of digital artifacts and the conversation surrounding place while bringing a greater awareness to a community's collective culture.

Cultureboard's digital artifacts will speak to each other, establishing commonalities amongst tags, terms, and geo-coordinates, and through similarities within user-provided annotations. Digital artifacts will also leverage the social graph, wherever permissible, to further extend the potential for engagement and establishing likeness. Featherstone (2009) states that "digital new media not only provide the potential for ubiquitous connectivity and greater interactivity, enabling everyone to communicate with everyone else; they also open up a further stage, that of a physical environment of things talking to each other" (Featherstone, 2009). This project is based around the notion that ubiquitous connectivity between cultural artifacts, subjective interests, and place can lead to a larger conversation and stronger understanding about culture and where it exists in the physical environment.

Research Question

The purpose of this study is to establish the process associated with designing and developing a mobile application that can be used as a tool for collecting and sharing cultural artifacts as a means for cultural participation. This study also explores methods for engaging participants through the use of multiplayer video game mechanics and social networking.   It is assumed that implementing some aspects associated with video game design mechanics and principles can provide valuable insight towards developing and implementing highly engaging products and activities, in this case a mobile application.

Primary Question

What is the process for developing a mobile app that is engaging, interactive, and that can be used to capture digital artifacts that represent arts and cultural phenomena within urban spaces?

Sub-Questions

1) What is gamification and why should it be used to enhance products and activities?

2) What type of functionality should be implemented with a cultural discovery-based mobile application?

3) How can traditional arts and cultural organizations engage with Cultureboard participants?

Definitions

API (Application Programming Interface):

An API is a set of routines, protocols, and tools for building a software application.

Cultural Mapping:

The process of gathering information pertinent to arts and culture organizations in a community and placing on a map for reference.

Digital Artifacts:

Images, sound recordings, and video recordings of arts and culture objects, phenomena, and activities that are captured via a digital device.

Game Mechanics:

Constructs of rules intended to produce a game or gameplay.

Gamification:

The concept that you can apply the basic elements that makes a game fun and engaging to things that typically aren't considered games.

Geolocation:

The identification of the real-world geographic location of an object, such as a mobile device.

Mobile App:

A mobile application is software written for mobile devices that performs a specific task, such as a game, calendar, or music player.

Mobile Development Framework:

A framework that is used to develop apps for a variety of mobile devices. Mobile development frameworks usually entail a hybrid development approach that can combine web app and native app functionalities.

Mobile Native App:

An app that is specifically designed to run on a device's operating system and machine firmware, and typically needs to be adapted for different devices. An app for a certain mobile device. They're installed directly onto the device.

Mobile Web App:

A Web app, or browser application, is one in which all or some parts of the software are downloaded from the Web each time it is run. It can usually be accessed from all Web-capable mobile devices.

Play:

To engage in activity for enjoyment and recreation rather than a serious or practical purpose.

Participatory Culture:

A culture in which private persons (the public) do not act as consumers only, but also as contributors or producers.

Smartphone:

A smartphone is a mobile phone built on a mobile operating system, with more advanced computing capability and connectivity than a feature phone.

Social Media:

The means of interaction among people in which they create, share, and exchange information and ideas in virtual communities and networks.

Social Graph:

A social graph depicts personal interests and relationships amongst users on a social network.

II. RESEARCH METHODOLOGY

Research Design

Document Analysis

While this master's project does not aim to discover or establish new knowledge, per se, its intention is to provide the public with a tool that could be used to discover knowledge and meaning pertaining to arts and culture and the surrounding urban landscape. O'Leary (2010) defines document analysis as the "collection, review, interrogation, and analysis of various forms of written text as a primary source of research data" (O'Leary, 2010). Before entering a production process for mobile applications development, it is important to take into considerations the themes that users will engage with and that best inform the design and development of the mobile application. Document analysis primarily entailed reviewing literature based on mobile applications development, game design and gamification, participatory culture, cultural mapping, geolocation, and various aspects of social media, including social networking, identity, and the social graph.

Mobile Applications: Use and Analysis

Prior to beginning the design and production process for the Cultureboard application, I felt that it would be important to use and review several popular mobile apps that could inform its design and functionality. It is important to note that there are

thousands of apps out on the market and that only four reviews were conducted. The apps that were reviewed were chosen because they appeared to be most relevant to this research project. It is also important to note that the reviews were specific to iPhone apps.

Gamification: Use and Analysis

To better understand uses and best practices associated with gamification, I conducted several reviews of websites and apps that implemented a gamification layer of interactivity within the user interface. Websites and apps that were reviewed were primarily based around the topics of learning and management – essentially non-game products that successfully implemented gamification to improve interest and engagement from the user interface perspective. It is important to note that there are a plethora of gamified products in virtual and real worlds and that this portion only consists of a small sample of available products.

Mobile Application Design and Development

The process for designing and developing mobile applications is comprised of many options and possibilities. App developers have a wide array of tools that can be used, some of which include software development kits (SDK), javascript libraries, and mobile applications development frameworks. This research paper summarizes several approaches that a developer might take – including key steps associated with the development a web app compiled as a native app - and includes a detailed outline of the tools and approach that I chose for developing the Cultureboard app. It is important to note that my approach is subjective to my personal programming style and skillset and

should not be considered a best practice, rather one of many pathways to effectively developing a mobile app. An app can be developed in many ways, with each approach having its own strengths and advantages as subjective to the developer.

Researcher Role

My role associated with this project entails serving as a researcher and a mobile application designer and developer. The research conducted was intended to best inform the various elements, concepts, and functionalities pertinent to the design, functionalities, and capabilities of the Cultureboard mobile app. My research role can be considered as *bricoleur*. O'Leary (2010) defines a bricoleur as being a "professional do-it-yourself person […] who sees methods as emergent and dependent upon both question and context" (O'Leary, 2010). Denzin and Lincoln (2007) express that "a bricoleur will employ a variety of methodological tools and even create new ones as needed to solve a puzzle or find a solution" (Denzin and Lincoln, 2007). As researcher, conceptualist, and professional developer, the bricoleur researcher role is a good match.

Research Type

As researcher-bricoleur, I am engaged with discovering and understanding key concepts and practices associated with gamification, cultural mapping, and participatory culture, all of which inform design and development considerations for the Cultureboard mobile application. I am also responsible for designing and developing the Cultureboard

mobile application. The final product associated with this project will be a tangible and functional mobile application that can be downloaded and installed to an Apple iOS device. The literature review associated with this project will be based upon the above concepts and practices. An additional segment of this research paper will be allocated for outlining the process and considerations for developing and designing the Cultureboard mobile application.

Methodological Paradigm

The methodological paradigm that I will align myself with is relativism.   I decided to choose relativism as it is aligns with my personal and professional viewpoint that there are no universals, and that things like truth, morals, and culture can only be understood in relation to their own socio-historic context (O'Leary, 2010). Subjectivity aside, the relativist perspective can influence my research with regard to the design and development of a mobile application that can be used to explore the various aspects associated with arts and culture in a community, and cultural participation. Conducting research through the relativist viewpoint can provide the opportunity to establish a variety of solutions beyond the confines of specific data and statistics, and can reinforce the notion that there aren't any universal absolutes, rather subjectivities that are based upon the needs and culture of particular societal demographics. With the limited amount of literature and data that is available for this particular research project, approaching the study with the relativist viewpoint appeared to be most promising.

Conceptual Framework

There is a scarcity of research pertaining to the design and development of a mobile application as a tool for mapping cultural participation. Existing research linking mobile devices to the capture of digital media is widely available, as well as, research based upon the potential uses of game design principles within virtual and real world contexts. Preexisting research is available that discusses concepts and tools associated with cultural mapping and participatory culture. The key concept clusters associated with this research project include mobile applications, gamification, participatory culture, and cultural mapping.

Video game design principles, the framework associated with the design and development of video games, enable opportunities for arts participation and engagement through aesthetically pleasing and intuitive interfaces, compelling narratives and themes, and mechanics that are intended to entice players with rewards, challenges, social interactions, and progress, while promoting investment. Game design principles serve as a primary conceptual cluster for this research project as a firm understanding of multiplayer online video game mechanics will be essential to designing and developing an experimental model of an engaging mobile learning application that is developed using video game design principles.

Gamification is an emergent area of focus amongst many organizations and is often used internally as a means of team building and training. Gamification is the concept that you can apply the basic elements that make games fun and engaging to things that typically aren't considered a game (Gamification.org, 2011). Online learning

sites like *Codecademy* are a successful example of a site that implements game design principles to engage participants. However, there are many examples of projects that under-utilize gameplay mechanics, which often results in a lesser engaging experience. In *Gamification and Libraries*, Liz Danforth (2010) suggests "game mechanics are being tacked to practically everything these days, almost as an afterthought. The resulting experience, distastefully shallow and frankly venial, threatens to overshadow the deeper value of well-designed, substantive games that entertain through genuine engagement" (Danforth, 2010).

It will be important to address and implement the game design principles that promote genuine engagement beyond simple games that merely utilize leader boards and points systems. Peering into the design principles behind massively multiplayer online role-playing games like Blizzard Entertainment's *World of Warcraft* could provide valuable insight into the game design mechanics that can be both accessible and genuinely engaging.   In addition, the study of alternate reality games (ARG), a game format that often includes the use of mobile devices and applications, can provide some insight into aspects of social engagement and the use of commercial generated and user generated game narratives that engage audiences through the implementation of challenges that can be solved by large groups of participants, but that are typically too complex for a single person to solve (Ornebring, 2007).

Understanding the use and demographics associated with social networks and mobile applications, particularly within the arts and culture sector, is another concept area of strong importance. The use of mobile devices and applications is rapidly increasing. A recent Facebook report estimates that there are more than 350 million active users who

access Facebook through their mobile devices. The report also suggests that people who use Facebook on their mobile devices are twice as active on Facebook as non-mobile users (Facebook, 2011). Another area associated with mobile use involves general use and access, particularly with regard to the growing trend where consumers are moving away from laptops and desktop workstations, and replacing them with mobile devices. From an educational perspective, it will be important to provide examples as to how mobile technology is helping to fulfill students' desire and need to learn differently, and whether or not mobile devices can provide the platform and incentive for students to take personal ownership of the learning experience (McCaffrey, 2011).

Cultural mapping is also an area of strong interest as maps can provide a variety of insights that are pertinent to culture and its association with place, meaning, density and activity. While the mapping component of the Cultureboard app could be used in a variety of ways, the practice of cultural mapping aligns well with the capabilities and mission of the Cultureboard app. Cultural mapping is a complex exercise based around the spatial relationships of culture, as related to providers, users and consumers, across sectors, art forms, activity and geography (Evans and Foord, 2008).

The Cultureboard app can be utilized as a tool to assist with capturing digital artifacts that represent visual and aural objects, places and other tangible elements associated with a cultural mapping project. From the macro perspective, the mapping component of this research project holds intrinsic value as it will reveal a collection of artifacts and their relation to place, which can lead to further discussion related to cultural density, hotspots and activity throughout one's community. As of this writing, I have yet to find a mobile application that allows for autonomous capture and sharing of digital

artifacts with a larger cultural asset map.   However, I do expect there to be projects in

development with this capability and can't assume that Cultureboard is the first mobile

application to provide a pathway to the autonomous capture, documentation, and sharing

of digital artifacts that represent cultural phenomena within the urban landscape as

represented by a digital and interactive map.
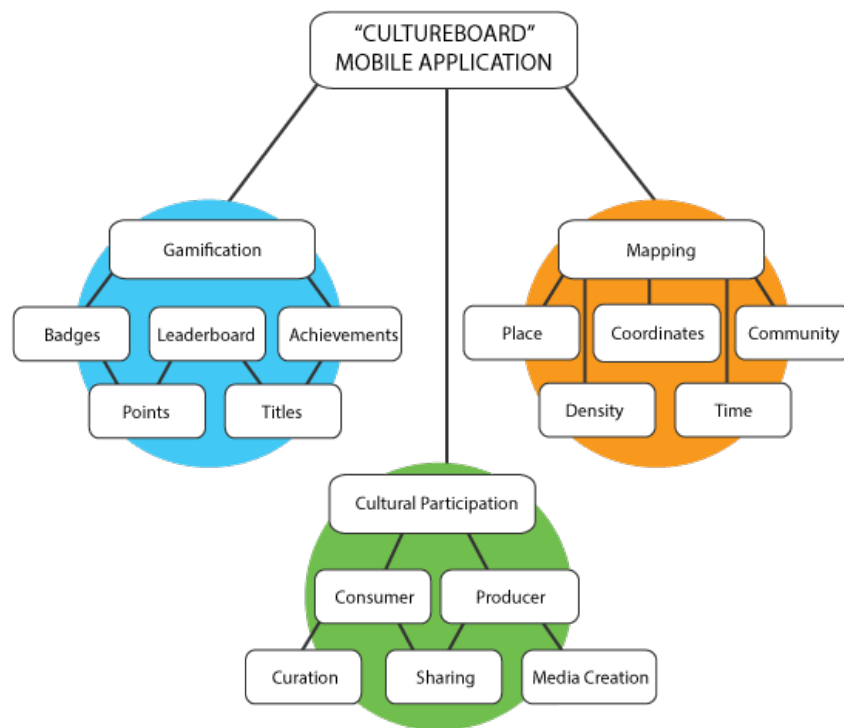
Conceptual Diagram of Cultureboard Mobile Application

III. LITERATURE REVIEW

Introduction

The intention of this literature review is to bring forth ideas and information pertinent to three key concept areas that informed the design and purpose of the Cultureboard mobile application. The key concept areas include gamification, participatory culture, and cultural mapping. In her book, *Critical Play: Radical Game Design*, Mary Flanagan (2009) writes, "if games themselves act as types of technologies, then technological games are twofold in their capacity for meaning making" (Flanagan, 2009). The primary purpose for considering these key concepts is to understand their roles and benefits to the Cultureboard app, and most importantly, to gain a stronger understanding for how these concepts can establish meaning while being engaging and fun.

Gamification

One of the key components of the Cultureboard mobile application is its gamification layer. By implementing a gamification layer, the Cultureboard mobile application transforms from a non-game to a mobile game with an intention to capture and share digital artifacts within an engaging and interactive video game based play space. Gamification is defined as applying game design thinking to non-game applications to solve problems and engage audiences (Forbes, 2012). Some of the most common elements include the leader board, points system, badges, avatars, real-time

messaging, and achievements.   Cultureboard features a points system. When an artifact is collected and shared with the Cultureboard system the user is awarded points. Each time the artifact is liked, collected or shared the original submitter collects additional points. The top twenty-five participants with the highest scores are listed on the Cultureboard. As points are accumulated, achievements and badges are unlocked.

Badges and achievements are also awarded to a player when a point threshold is met or in-game activity is performed. Badges and achievements can be awarded in tandem, although badges hold more significance in that they can become part of a user's collection, which can extend far beyond the scope of Cultureboard. Mozilla (2013) defines a digital badge as "an online representation of a skill you've earned" (Mozilla, 2013). Cultureboard will integrate with the Mozilla Foundation's Open Badges project and the Mozilla Backpack - where badges can be saved to and taken from anywhere. This presents users with the ability to share their achievements on Cultureboard and with colleagues, friends, potential employers, and other interested parties.

Cultural Mapping

The Cultureboard Map is an essential component in the Cultureboard Project. When a digital artifact is saved to the Cultureboard system, the artifact's geographical coordinates are recorded and tagged using the smartphone's internal GPS. This enables the artifact to be shared and pinned to a specific location on the Cultureboard map. Over the course of time, visible and navigable culture clusters will form, which can be useful in locating cultural hotspots throughout the urban landscape.

Because Cultureboard is based upon the capture and sharing of artifacts and geographic coordinates for display on a map, Cultureboard can be considered as a geographic information system for the cultural sector. "The application of Geographic Information Systems (GIS) to map and visualize complex and inter-related data provides a powerful if technical tool for planning, and more recently, for cultural planning" (Evans & Foord, 2008). Cultureboard map also provides an alternative way to navigate and explore the collection of digital artifacts that have been submitted to the system. Cultural mapping is defined as a systematic approach to identifying and recording a community's cultural assets and has two dimensions.

1. Resource Mapping – identifying and recording tangible cultural resources usually making use of Geographic Information Systems (GIS) tools and platforms; and,

2. Community Identity Mapping – exploring a community's 'intangible cultural resources' – the unique stories and traditions that define a community's identity and sense of place

Cultureboard's purpose is to serve as a tool for participants to use to collect and share cultural artifacts with Cultureboard's map, which is essentially a digital and interactive cultural asset map. Documentation pertaining to cultural asset mapping projects are often available online or in other digital formats. Some examples include the Rockwood Cultural Asset Mapping Project (Fenn & Moore, n.d.), CultureMap London (CultureMap London, 2013), and the Creative City Network of Canada: Municipal Cultural Mapping site (Creative City Network of Canada, 2013), which provides a wide array of cultural maps and scans, and mapping and planning tools. Canada also provides a Cultural Mapping Kit (Creative City Network of Canada, n.d.) for public consumption that

outlines the various requirements for collecting and documenting cultural assets on a cultural asset map.

Participatory Culture

Sharing and retrieving digital artifacts with mapping systems can be considered as a process associated with participatory culture. In the oft-quoted whitepaper titled *Confronting the Challenges of Participatory Culture*, Henry Jenkins (2009) establishes that participatory culture is:

- A culture with relatively low barriers to artistic expression and civic engagement

- One that offers strong support for creating and sharing one's creations

- One that involves some type of informal mentorship whereby what is known by the most experienced is passed along to novices

- One in which members believe their contributions matter and feel some degree of social connection with one another (Jenkins, 2009).

Collaboration and sharing artifacts and meaning is essential to the Cultureboard project. At the *2011 Gamification Summit*, Jane McGonigal stated, "People prefer cooperation games to competitive ones by 3 to 1. If you look at what's happening in gaming, most people don't want to compete. They want to work with their friends to achieve a common goal." Participants can support each other's findings and further harvest ideas and meanings from media and annotations that are collected and shared.

Sharing happens within the Cultureboard system and artifacts, badges and achievements can be pushed out to external social networks like Facebook, Tumblr, and Twitter as notifications and wall posts to extend the conversation around the collected

digital artifacts and *parochialize* the multimodal experience. "Mobile social networks can help to turn public realms into parochial realms through parochialization. Parochialization can be defined as the process of creating, sharing and exchanging information, social and locational, to contribute to a sense of commonality among a group of people in public space. Sharing information through mobile social networks can help to contribute to a sense of familiarity among users in urban public spaces" (Humphreys, 2010). Ultimately, the Cultureboard app aims to serve as a means for sharing and exploring digital artifacts within the contexts of place and time while establishing a collaborative culture based on participation.

Marketing and Engagement

When a user submits a captured digital artifact and associated data (categorization, tags, and annotation) to the Cultureboard system, the user's information is also attached to the submitted artifact. Users who choose to share their digital artifacts via social networks like Facebook, Twitter or Tumblr agree to allow Cultureboard access to certain types of information about them during the digital "handshake" between the Cultureboard system and the external social network's identity gateway. While my intention is not to exploit users' data for the sole purpose of marketing and advertising or generating profits, social media provides an opportunity for traditional arts and culture organization's and community-based organizations to promote events, courses, and offerings for Cultureboard users through in-app advertising and by sponsoring awards and incentives attached to badges and achievements that users can unlock as they engage with Cultureboard. Should participants opt to provide Cultureboard with some additional

information garnered from social networks, like musical tastes, movie interests, events, and other cultural-related topics, Cultureboard can determine how to deliver advertisements that are relevant to the user and other users who are linked to the user who share similar interests. As an example, if a user lives in Eugene, Oregon, in-app advertisements might be pertinent to upcoming events at the Hult Center or one of the many other performing arts venues in the region. Social graphs can also be useful to researchers who are exploring quantifiable intersections between users, groups, interests, and social trends for specific demographics, psychographics and regions.

IV. DEVELOPMENT PROCESS

Concept

My primary intent for designing and developing Cultureboard was three-fold: 1) to provide participants with an engaging mobile tool that can be used to discover and share the culture of one's community through the collection of digital representations of cultural artifacts that are set within the urban landscape; 2) to provide participants and researchers with an interactive map that can be used to view and understand a community's larger, collective culture based on the geographic locations, categorization, and annotations associated with the collected digital representations of cultural artifacts that are collected and submitted by participants; 3) to understand how culture flows within a community over the course of time.

Towards the beginning of this research project, I posed a series of questions based around the purpose of the Cultureboard mobile application. In what ways should this

mobile app intersect with arts and culture? What is the best approach for making Cultureboard engaging and rewarding? How important is sharing and to what degree should participants be allowed to interact? I determined that Cultureboard should serve as a discovery tool for participants to use to explore their personal landscapes through the collection of digital images, sound recordings, and video of artifacts that represent their subjective artistic and cultural interests. To maximize the engagement value of Cultureboard, I decided to implement a gamification layer that would enhance the user interface with features that are common to multiplayer video games. The features include a leaderboard, point accrual system, digital badges, achievements, and mini-games. Partnering the gamified interface with the participatory nature of the Cultureboard app, it was evident that functionality must be available for sharing content and messaging amongst social networks, websites, and other digital channels to promote and amplify engagement amongst online users and communities.

Mobile Applications Review

Prior to beginning the design phase, I explored the iTunes App Store for mobile applications that were related to arts, culture and sharing. After scanning through several dozen applications, I found four mobile applications with some of the features and functionalities that could be useful as part of the Cultureboard mobile application. I found the following four mobile apps to be most relative: *HistoryPin*, *Instagram*, *Project Noah*, and *PublicArtPDX*. It is important to note that there are thousands of mobile applications available on the App Store and that this collection is merely a small sample.

Historypin

Historypin is a mobile application that enables participants to share historic

photos in an effort to explore the picture of human history. Photos, stories, audio and

video are pinned to a map based on the approximate place and time of capture. From the

Home Screen, each user can access the Historypin Map, where collections of images can

be explored on an interactive map and through a search field. The Map screen also

includes a sliding timeline that ranges from 1840 through 2012. The timeline feature

provides a way for users to filter results to a particular point in history. The Tours screen

enables users to put together historic tours using new and existing content for a particular

region. The Collections screen allows users to put together collections of images and

other media for a particular region. The Channels screen allows users to create a channel

that combines selected content on the Map, Channels and Tours. Participants can also

capture and upload media via the Post a Photo screen. The My Channel screen enables

users to modify their profile settings and to view media that has been posted or collected.

Altogether, the Historypin app is a powerful tool for exploring the history of places

through images, audio, and video artifacts.

Instagram

Instagram is arguably one of the most popular apps on the market. Its primary

focus is on the sharing of digital photographs on the Instagram social network and with

other social networks like Facebook, Tumblr, and Pinterest.   Instragram has a familiar

interface and features five buttons: Home, Explore, Capture, Activity, and Profile. The

Home button returns the user back to the Home screen, which is essentially a feed that displays the latest posts made by users that you are following. The Explore button allows you to search for new users to follow. It also allows for a hash tag search, which can be used to look up recent images based on hash tag terms. As an example, entering the #uoregon hashtag in the search field will query images that are relevant to the University of Oregon in some way or another. The Activity button allows you to see the actions that the people you are following have initiated with the most recent being at the top of the list. There is also a News feed which displays actions pertaining to you and the images you share. Finally, the Profile button allows you to manage your profile and displays the images that you've shared with the Instagram network. Instagram is a powerful photo sharing tool.

Project Noah

Project Noah is a mobile application that can be used as a tool for digitally capturing and tracking digital representations of natural organisms. Per the Project Noah website, "Project Noah is a tool to explore and document wildlife and a platform to harness the power of citizen scientists everywhere" (Project Noah, 2013). Project Noah requires participants to create accounts. After logging-in, participants can share up to five photos that represent the subject you are seeking more information about. Subjects are broken into ten categories: plants, mammals, birds, arthropods, fungi, reptiles, amphibians, fish, pets, and others (uncategorized). When a photo is submitted as a "New Spotting", it is tagged with geographical coordinates and can include a common name, scientific name, description, habitat, notes, and tags. If a spotting is undefined, other

citizen scientists can help out by identifying the species and completing any incomplete

information about the subject. Project Noah also includes a Field Guide that can be

filtered by content, location, or category.

PublicArtPDX

The Portland Public Art mobile application is essentially a digital cultural asset

map. From the map view, public art works are visible as colored pins attached to a map.

Each colored pin represents a different type of art. The types of art denoted in the Map

Legend include sculpture, painting, photography, ceramics, fiber, architectural integration,

mural, fountain, and multiple works/other. Tapping on a pin will reveal the title of the art

work and its general location. Clicking again will reveal a detailed view of the art work,

including a photo, street address, specifics, and a summary. While users can't

autonomously share art works and locations with the app, users can email a submission

email account to place a request to add art to the collection. Users can also search the

collection of cultural assets by title or artists via a search field. While this app is

somewhat limited in relation to some of the other participatory-enhanced apps, this app is

a good example of a mobile cultural asset map.

Gamified Projects Review

Prior to beginning the design phase of the Cultural mobile application, I decided

that it would be important to review some popular sites that harness the power of

gamification to enhance participant engagement. The primary features that I was looking

for included the use of badges and achievements, and a points system or a system that

tracked advancement. While there is a plethora of sites and mobile applications that

utilize elements associated with gamification, I decided to select three products that I felt

best reflected the core features of gamification. These products include the Codecademy

website and the Project Noah mobile application and website.

Codecademy

Codecademy (2013) is an online education site that teaches users how to code

interactively, and for free, within a variety of topic areas, including: Web Fundamentals,

jQuery, JavaScript, Projects, Python, Ruby, PHP, and APIs (Codecademy, 2013).

Codecademy breaks its learning tracks into objectives that are usually based around a

specific feature or function. Each track is comprised of a series of exercises. As tracks

and exercises are successfully completed, the user is awarded with points, which can

unlock badges. Once unlocked badges and achievements are attached to a users profile.

From the user profile screen, a user can track total points, the streak of days lessons have

been worked on, progress, and the collection of unlocked badges.

Project Noah (Mobile Application available on iTunes App Store)

Project Noah is available as a mobile application and website. Project Noah's

gamification layer is subtle, but pervasive throughout the system.   Participants can create

missions based around hunting and tracking natural organisms. These missions are

essentially mini-games designed to engage and provide purpose to participants.

Participants can also earn "patches" as they engage with mobile application. Patches are

awarded for "spottings", missions, special achievements, and for experienced participants

who qualify as specialists. Patches are essentially digital badges that can be tracked by

students on the user profile screen. Project Noah is an excellent example of using

gamification as part of a collaborative and educational approach.

Design and Development

At the beginning of the development phase of the Cultureboard app, I made the

decision to limit the Cultureboard mobile application to Apple devices so that I can focus

on designing the app to have a similar visual design and familiar controls to native iOS

mobile applications. After determining that the Cultureboard mobile application would

be specific to iOS, at least as far as its initial release was concerned, I moved to the next

hurdle. While I could plan to launch the Cultureboard app as a web app, I decided that

the Cultureboard app should be released as native mobile application so that it could be

available for download via the iTunes App Store. To do this, I would need to either learn

how to code in Objective-C or create the app using a mobile web development

framework that allow me to create an app using HTML5, JavaScript, and CSS3 –

programming languages that are common to web development. For some background,

Objective-C is Apple's proprietary programming language and is used for development

programs that run on Apple devices; HTML5 is the standard programming language for

developing web pages and apps; JavaScript is a scripting language that augments HTML5

by enabling enhanced interactivity and dynamic functionality; and cascading style sheets

(CSS) govern the visual presentation of the interface of a website or web app. With the

understanding that learning Objective-C would be a major undertaking, I decided to go develop a web app and place it within a native iOS wrapper to allow the app access to various features and components that aren't available to non-native web applications. These features included the internal gyroscope, camera, microphone, and GPS – all of which are essential to the Cultureboard mobile application.

At the start of the project, I chose Nimblekit as the mobile application development framework that I would build the Cultureboard app with. While Nimblekit was a good choice for building a rapid prototype, it became evident that I needed to develop the app using a framework that had a larger community of developers attached to it. Nimblekit was an excellent framework, but has since been acquired by Sencha Inc., another company that specializes in mobile app frameworks, and licensing has stopped. Moving away from Nimblekit, I chose Phonegap as the mobile app framework for Cultureboard. Phonegap seemed to be well supported and had the capability to deploy the Cultureboard app to a variety of smartphones – not limited to solely the Apple iPhone. As development commenced, Adobe acquired Phonegap and released it to the open source community under the Apache License, Version 2.0 as Apache Cordova. The release of Phonegap to the open source community was important as Cultureboard was intended to be a free tool for all to use, and an open source license ensured that the mobile app development framework used to develop the Cultureboard app would also remain free to use. Adobe maintained the Phonegap brand name and continues to maintain Adobe Phonegap and the Adobe Phonegap Builder, which allows developers to deploy a mobile application to a variety of devices and operating systems. Per the Cordova website, "Apache Cordova is a set of device APIs that allow a mobile app

developer to access native device function such as the camera or accelerometer from

JavaScript. Combined with a UI framework such as JQuery Mobile, Dojo Mobile, or

Sencha Touch, this allows a smartphone app to be developed with just HTML, CSS, and

JavaScript" (Apache Cordova, 2013). Before moving forward with coding the

Cultureboard mobile application, I had to establish a list of APIs that would be essential

to the Cultureboard mobile application and the functionality that I desired. I determined

the following APIs to be essential.

Compass

The Compass API can obtain the direction that the mobile device is pointing towards.

Geolocation

The Geolocation API makes the app location aware and allows for the collection of

geographic coordinates.

Media

The Media API allows for the recording and playback of audio files.

Storage

The Storage API hooks into the device's native storage capacity and options.

Camera

The Camera API enables the capture of a photo using the mobile device's camera.

Connection

The Connection API allows you to check the status of your device's network connectivity and cellular network information.

Events

The Events API enables a Phonegap app to hook into native events using JavaScript.

Globalization

The Globalization API allows an app to present information specific to the user's locale. Information can include timezone, currency, language preference, and other region-based data.

Notification

The Notification API enables a mobile app to launch a visual or audible device notification.

Capture

The Capture API enables a mobile app to capture media files using a mobile device's media capture applications.

File

The File API enables a mobile app to hook into a mobile device's native file system using JavaScript.

InAppBrowser

The InAppBrowser API allows a mobile application to launch websites in a separate in-app instance.

Splashscreen

The Splashscreen API enables the developer to show and hide a mobile app's splash screen. The splash screen is the starting screen that is usually present when a mobile app is loading.

Given that I decided to develop the Cultureboard primarily for Apple iOS devices, I had to download install Apple Xcode. Xcode is a development environment that includes the Xcode IDE, Interface Builder design tool, iOS Simulator, and Apple LLVM compiler. Per the Apple Developer website, "The Xcode developer tools package provides everything you need to create great applications for Mac, iPhone, and iPad. Xcode is tightly integrated with Cocoa and Cocoa Touch frameworks, creating a productive and easy-to-use development environment that is powerful enough to be the same tools used by Apple to produce OS X and iOS. The Xcode toolset includes the amazing Xcode IDE, with the Interface Builder design tool and Apple LLVM compiler fully integrated. The instruments analysis tool is also included, along with dozens of

other supporting developer tools" (Apple Developer, 2013). These components are essential to developing mobile applications for Apple devices. Adobe Phonegap projects can be created using Xcode and distributed to the Adobe Phonegap Build distribution pipeline for distribution on iOS and non-iOS platforms.

Deployment and Distribution

In order to test iOS mobile applications on physical Apple devices, a developer will need to be enrolled in the iOS Developer Program. Once enrolled, a developer will be able to test and deploy iOS apps on Apple mobile devices, in addition to submitting mobile apps to the iTunes App Store for distribution. All iOS builds need to be signed by an Apple developer certificate and a provisioning profile that is tied to the developer's Apple Developer Account and the developer's mobile device used for testing. The process for setting an Apple developer certificate and provisioning profile can be somewhat complex and will not be detailed in this research paper. Information pertaining to using a developer certificate and provisioning profile to test and distribute Apple iOS apps can be found at https://developer.apple.com/programs/ios/.

V. USE CASES

The Cultureboard mobile app can be used in a variety of ways. The following use cases describe some possibilities for the Cultureboard app. While there are a variety of ways an app can be implemented into a project or study, I decided to choose four cases that best align with my research interests: collaborative learning, play, field research, and marketing.

Collaborative Arts Learning

　　Cultureboard could be a useful tool for collaborative arts learning projects, specifically those that encourage students to explore the surrounding community for public works of art (authorized or unauthorized) or cultural happenings that represent their personal interests and collective identity.   Blandy & Hoffman (1993) determined that "an art education of place is possible by infusing community-based art education with a bioregional perspective that emphasizes natural, cultural and social environments towards a shared identity" (Blandy & Hoffman, 1993). As students explore and capture digital representations of their natural and cultural surroundings, they can gain a stronger understanding of their community and the importance of arts, culture, identity and place. Students can also create their own artworks within the public, urban space and share them on Cultureboard, further augmenting participation and digital curation with creation and sharing. A project like this could be realized within the Cultureboard mobile application as a mini-game. Arts educators, parents, or volunteers can serve as facilitators and create the rules, goals, and objectives for the mini-game. Following the creation of the mini-

game, students could play through the rules in a collaborative fashion to find and share

cultural objects and meet the goals and objectives set-forth in the rules for the mini-game.

Culture-caching

Cultural-caching entails using GPS-enabled devices to track down artifacts and

places that are significant to one's culture. Culture-caching is essentially the same as

geocaching, but with a focus on culture-specific places or items. Geocaching is an

activity that entails the use of a GPS-enabled device to track down a hidden cache based

on geographic coordinates that are published at various geocaching member sites by

coordinators. By tradition, caches generally contain a logbook for participants to sign

when they find the hidden cache at the designated coordinates (Suarez & Dudley, 2012).

Cultureboard users can create mini-games based around culture-caching by establishing a

list of coordinates for artifacts and places that exist within the Cultureboard system. The

mini-game can be administered physically with by placing a cache within proximity of a

cultural place or artifact, or virtually by navigating via the Cultureboard map and signing

a digital logbook associated with the mini-game. When a comment is placed in the

logbook, the user's coordinates are posted with the comment, which validates the users

finding of the culture-cache. Culture-caching and geocaching are fun treasure hunting

activities for participants of all ages.

Field Research

Using the Cultureboard mobile application, cultural researchers can collect digital representations of artifacts, events, and places associated with research in the field. Cultureboard allows participants to form public or private teams that can partake in mini-games or research projects. After creating a team, assigning team members, and starting a project, researchers will be able to capture digital representations of cultural artifacts as images, sound recordings, and video. Geographical coordinates and a timestamp will be attached to each artifact that is saved to the Cultureboard system. Submissions can also be categorized, tagged, and annotated, as needed. In addition, participants will be able to export collections of digital artifacts to databases and spreadsheets, or by using the Cultureboard Field Guide Generator, which dynamically generates field guides in PDF format. Researchers can also publish their field guides to the Cultureboard system for other users to access.

Promotions and Marketing

Cultureboard will have built-in capabilities for hosting in-app advertising for non-profit arts and culture organizations. One of the goals of the Cultureboard project is to promote traditional arts and culture events and organizations as relevant to a user's interests and region. Maintaining a user's privacy and control of displayed advertising is important so user's will have the ability to opt-out of all advertising, if desired. If in-app advertising is disabled, arts and culture organizations can still reach participants by sponsoring awards and incentives that are attached to badges and achievements associated with the gamification elements of the Cultureboard app. As an example, if a

participant receives a digital badge for submitting ten digital artifacts within the "music"

category, the participant might receive a free ticket to an upcoming event at a local music

venue or perhaps a discount on a music class at a local community-arts organization.

Promotions and marketing on Cultureboard will be limited to non-profit and community-

based organizations, commercial organizations will not be able to market their brands or

products on the Cultureboard mobile application.

References

About Apache Cordova. (2013). In *Apache Cordova*. Retreived from
　　　http://cordova.apache.org/

Banks, J., & Potts, J. (January 01, 2010). Co-creating games: a co-evolutionary analysis.
　　　New Media & Society, 12, 2, 253-270.

Blandy, D. (January 01, 2011). Sustainability, Participatory Culture, and the
　　　Performance of Democracy: Ascendant Sites of Theory and Practice in Art
　　　Education. *Studies in Art Education: a Journal of Issues and Research in Art
　　　Education, 52,* 3, 243-255.

Cohen, A. M. (September 01, 2011). The Gamification of Education. *Futurist, 45,* 5.)

Creative City Network of Canada. (n.d.). *Cultural mapping toolkit: A partnership
　　　between 2010 legacies now and creative city network of Canada.* Vancouver,
　　　B.C., Canada: Author.

Danforth, L. (February 15, 2011). Gamification and Libraries. Library Journal New
　　　York-, 136, 3, 84-84.

Entertainment Software Association. (2010). Sales, Demographic and Usage Data, 2-4

Facebook Statistics. (2011). Retrieved October 19, 2011
　　　from: http://www.facebook.com/press/info.php?statistics

Featherstone, M. (March 01, 2009). Ubiquitous Media. Theory, Culture and Society, 26,
　　　1-22.

Fenn, John B., III, & Moore, Stephanie. (n.d.). *Rockwood Cultural Asset Mapping : Building Community and Engaging Residents.* (Rockwood Cultural Asset Mapping : Building Community and Engaging Residents.) University of Oregon.

Flanagan, M. (2009). *Critical play.* Cambridge, MA: MIT Press.

Evans, G., & Foord, J. (2008). Cultural mapping and sustainable communities: planning for the arts revisited. *Cultural Trends*, *17*(2), 65-96. doi:10.1080/09548960802090634

Humphreys, L. (January 01, 2010). Mobile social networks and urban public space. New Media & Society, 12, 5, 763-778.

Jenkins, H. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century.* Cambridge, MA: The MIT Press.

Launch the Maps. (2013). In *CultureMap London.* Retrieved from http://www.culturemaplondon.org/maps_cm.htm

Learn to code interactively, for free. (2013). In *Codecademy.* Retrieved from http://www.codecademy.com

McCaffrey, M. (February 01, 2011). Why Mobile Is a Must. T.h.e. Journal, 38, 2, 21-22.

Municipal Cultural Mapping. (2013). In *Creative City Network of Canada.* Retrieved from http://www.creativecity.ca/research-hub/municipal-cultural-mapping.php

National Endowment of the Arts. (2008). Survey of Public Participation in the Arts, 2

Ornebring, H. (January 01, 2007). Alternate reality gaming and convergence culture. International Journal of Cultural Studies, 10, 4, 445-462.

Rabkin, N., Hedberg, E. C., & National Endowment for the Arts. (2011). Arts education in America: What the declines mean for arts participation. Washington, DC: National Endowment for the Arts.

Suarez, P., & Dudley, J. (January 01, 2012). Finding Their Way How Geocaching Is an Adventure for All, Including Teens. *Young Adult Library Services, 10,* 2.)

What is Gamification? (2013). In *Gamification Wiki.* Retrieved from: http://gamification.org/wiki/Gamification

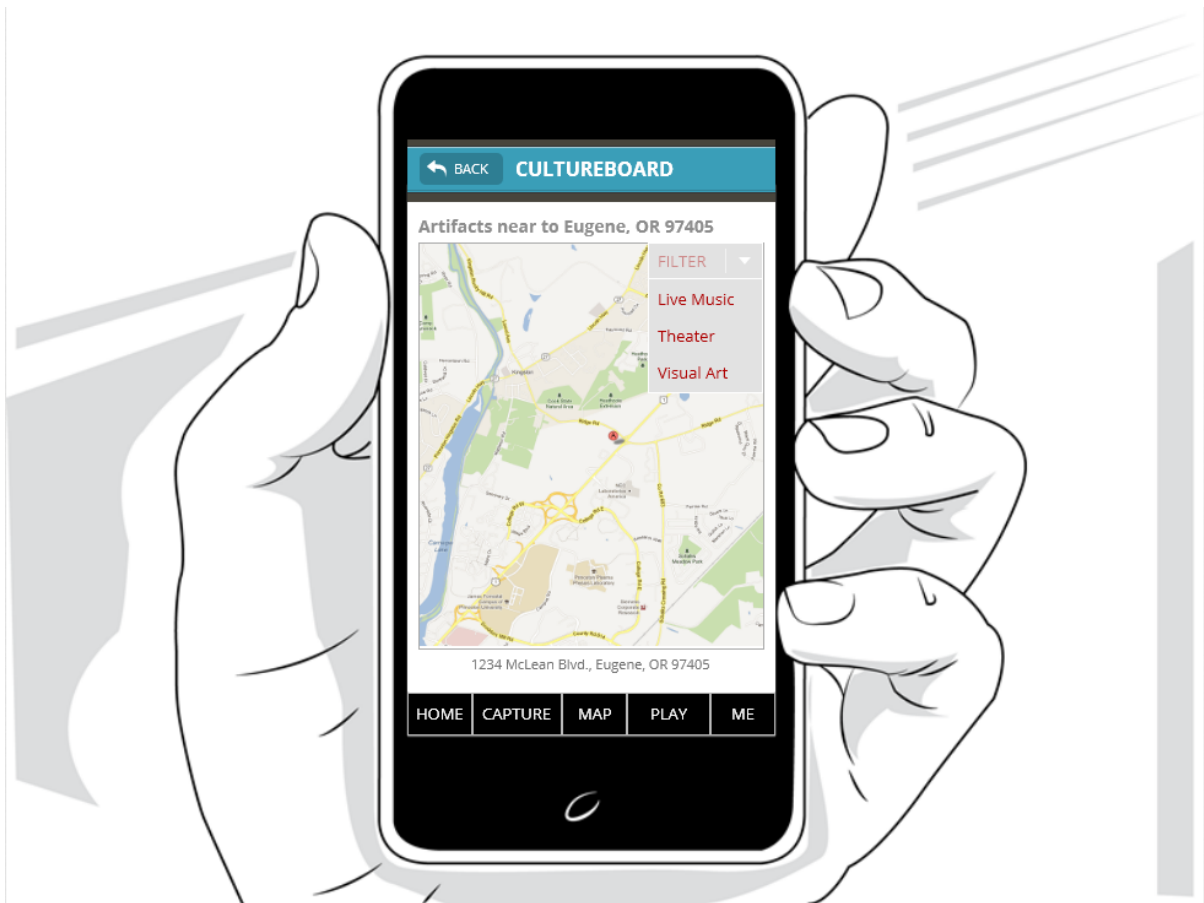Appendix: Cultureboard Wireframes

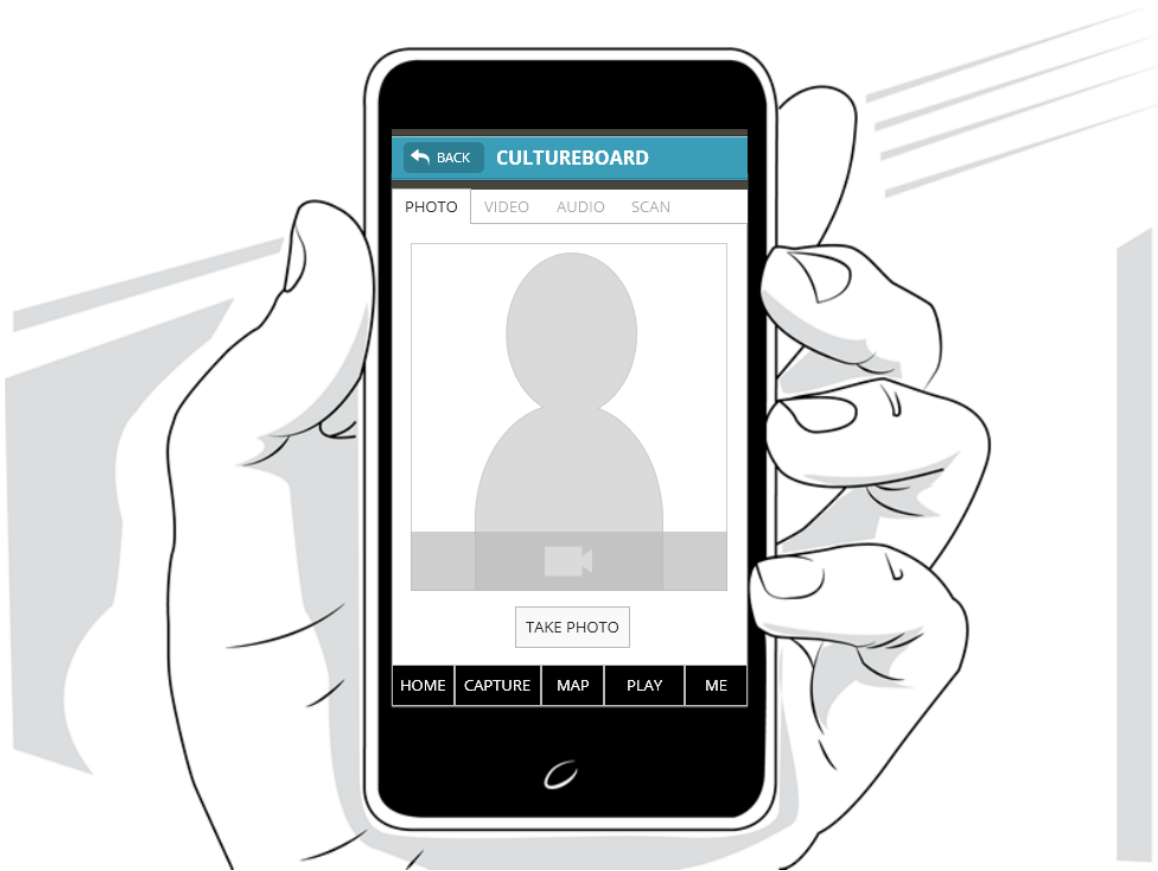*Figure 1. Cultureboard – Wireframe - Map View*

Figure 2. Cultureboard – Wireframe – Capture Screen

Figure 3. Cultureboard – Wireframe – Play View