Blurring The Lines Between The Digital And Physical:
Designing a user-interface to create the 21st century town square

By

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ABSTRACT

Metaphors are instrumental to facilitate learning, and to the formation and maintenance of new ideas and concepts, especially in design thinking. This paper discusses the relationship of a specific metaphor in the design process, as well as in design outcomes of the collaborative project titled *SQWhere*. The thesis explores how a *town square* metaphor functioned as a creative thinking methodology and research tool throughout the design process. This metaphor provided novel ways of looking at the complex phenomena of digital social networks and human agency. Ultimately, this provides a detailed example of how a metaphorical approach to exploring a concept can guide a user-centered design process in Interaction Design.

SQWhere, a mobile storytelling application for the urban pedestrian will connect people in real time and real space in environments. The *SQWhere* application for mobile phones will enable social interactions and information exchange through location-based storytelling— utilizing video, audio, images, and text. *SQWhere* will make connections happen at the grassroots level creating an environment of peer-to-peer knowledge exchange— storytelling.

Keywords
Interaction design, metaphor, town square, social networking, mobile technologies, location-based storytelling

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The term "public sphere" is fundamentally metaphorical. In fact, the force of Habermas's thesis depends entirely on the idea that what's new about the public sphere is that it is a virtual space. A discursive realm of imagined collectivity where people "come together" in a sense far different from their traditional assembly in the agora, the public square, the meeting hall, or the like. The intimate connection between the public sphere and commodity exchange lies not in the fully fledged "middle-class" or "capitalist" identity of its participants but in the fact that both concepts hypostatize "places" where the circulation and exchange of virtual entities— information, polemic, commodities— establishes an imagined collectivity that is all the more compelling for not being limited by actuality... the virtualization of the public. (McKeon 2004)

THE CORE QUESTIONS

The core philosophical questions guiding the thinking in this paper:

1) Can working with the town square as a metaphor help to build an understanding of the

complexities of digital social networks?

2) What specific value might this offer for Interaction Design?

SCOPE

My ambition for this thesis is for it to be evaluated as an exploration into the theory and practice of interaction design. It was not my intention that this be evaluated for the potential successes, failures or marketability of the application itself. Furthermore, I wanted to avoid discussions that focused solely on aesthetical judgments regarding the interface design such as, iconography, color, composition, or typography. Instead, the focus should be on the potential user interactions and experiences resulting from the use of the town square as a metaphor.

In my readings, I found metaphor itself to be well discussed as a tool for interaction design. Thus, I wanted to explore and detail the effectiveness of the town square as a metaphor in developing a digital application (*SQWhere*) that offers insight into the complex phenomena of digital social networks and human agency.

INTRODUCTION

In the fall of 2007 the *SQWhere*[1] development team— a scientist, a producer, a programmer, a editor, and a graduate student (myself)— set out to address the following challenge: Social media and networks are creating new design opportunities. How do we inspire and enable people's ability to contribute, create, personalize, and share experiences?

I was working on a research internship that partnered Emily Carr Institute and an outside company called Elastic Entertainment. Through the span of this internship, the team used various design methodologies such as design research, ethnographic methods, ideation, conceptualization, storyboarding, role-playing, audience workshops, and prototyping, to build a better understanding of digital social networking. The research led to an understanding of the usefulness of metaphor as a creative thinking device.

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[1] The project title "*SQWhere*" plays on the words "town square" and "where" and becomes a metaphor for the user (and content) being specific to a geographical location. The reason for combining the words to create a single hybrid term (*SQWhere*) was, simply, the lack of availability and uniqueness when searching and securing a domain name for the Internet.

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We had imagined that the internship would lead to the development of a product— specifically, the design of a digital user interface. Although a number of interfaces were suggested through brainstorming sessions, the significant discovery was how the metaphor of the town square contributed to our design approach. The town square metaphor led to a shift in focus from the end product (digital user interface) to the overall user experience. This holistic design approach helped us to realize that months of research were needed to build understanding of some very complex issues, including concerns regarding trust, reputation, privacy, usability, identity, gossip, and boundaries. The most significant concerns (to *SQWhere*) were gossip and boundaries. These make up two sections in this paper. The remaining concerns, due to their commonality and connection to the larger constructs are threaded throughout this discussion. The paper concludes by summarizing some of the insights, challenges, and limitations of using the town square as a metaphor. More importantly, in the conclusion I summarize the advantages and benefits of working with the town square as metaphor in interaction design.

There are many possible metaphorical interpretations of the town square concept. The aspects of the town square concept we found valuable in structuring and interpreting and designing for digital social networks are presented in this thesis. As part of this introduction I have included a brief background summary of project *SQWhere* to contextualize the discussion that follows.

Project origins

The following is a situation many designers are familiar with: Walking into the studio on my first

day I was introduced to the existing development team Vida (the scientist), Jennifer (the

producer), Shawn (the programmer), and Jarrett (the editor). Along with this, I was given their

design focus.
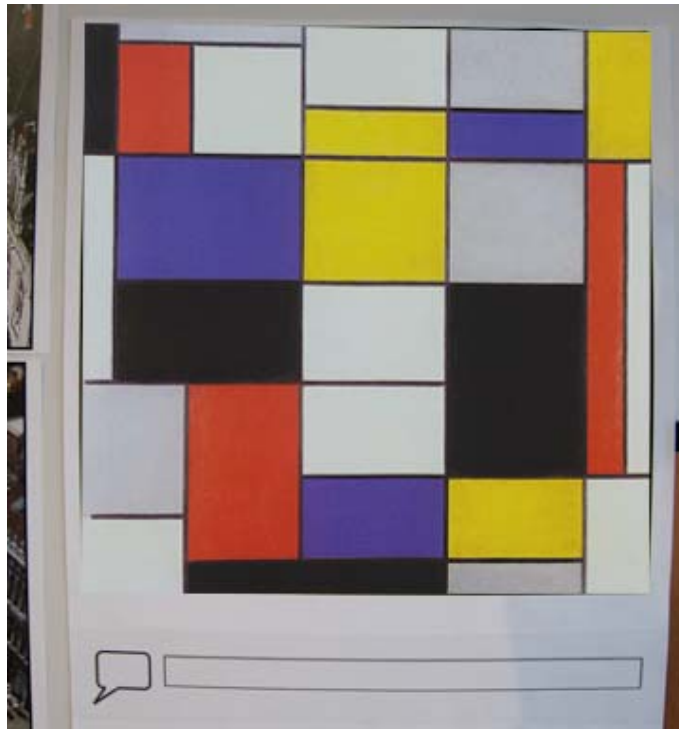
(fig. 1) The Mondrian Interface [2].

A single image of a painting by Piet Mondrian was central to their presentation. The painting is an

early example of Mondrian's pure geometric abstraction (fig. 1). Describing how the application

would work they used Mondrian's painting as a prop and made statements such as "this is our

interface" and "this grid will be housed within the browser and centered on the webpage" and

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[2] Piet Mondrian, Composition A, 1923. Oil on canvas (Galleria Nazionale d'Arte Moderna e Contemporanea, Rome).
Original image sourced from the following website- < http://www.cartage.org.lb/en/themes/Arts/painting/20th-century/art-
sake/artsake.htm>

"each panel in the grid will display specific hyper-localized content and if a user clicks a panel, more information becomes available". They summarized the presentation with an "elevator pitch":

> The application is a Vancouver based local platform that will be made accessible via an online website and through mobile phone browsers. The application provides web tools that use mapping, tagging, search and transaction systems, thus enabling social interactions and information exchange. Through this participatory process, information and knowledge will be delivered and relayed in creative and interactive storytelling[3] formats utilizing video, audio, images and text engaging viewers, consumers and participants. The platform makes connections happen at the grassroots level creating an environment of collaborative knowledge exchange. (Humphrey)

Over the next few months through in-depth exploration, using design thinking and design methodologies, we developed a deeper approach to the *SQWhere* interface. The team started to gain an understanding of how and why people connect socially, specifically in the digital space. The shift from thinking only about the application (interface) in browsers, to thinking more about connectivity and experiences enabled between people, places & things drew us to the metaphor of the town square, which quickly became a critical lens and provided the tools to distill information about the complex phenomenon of digital social networks.

Taking a fresh look at the physical and digital space a mobile or online (Internet) user occupies, we began to understand that the computer is no longer just a workstation but an entire lifestyle portal. We reviewed the current affordances in mobile computing and found that users are engaging, entertaining, and playing while in transition. Until recently, mobile devices have been

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[3] Storytelling involves a two-way interaction between a storyteller and one or more listeners. Storytelling, as it is used in this paper, emerges from the interaction and cooperative, coordinated efforts of teller and audience during communication.

limited to simply consuming or storing images, audio, and video. With the advent of inexpensive, haptic-enhanced touch-screens, new interface technologies, and the ability to upload directly to social networking services, media creation on a mobile device has become a more mainstream activity. With heightened levels of engagement, entertainment and play, mobile computing is blurring the boundaries between the digital and physical environments. Although Augusto Boal writes on the subject of acting, his metaxis paradigm was relevant to framing the potential experience or "state" of a *SQWhere* user (when engaged in location-based storytelling). Boal defines *Metaxis* as "the state of belonging completely and simultaneously to two different autonomous worlds" (43). He has used the term 'metaxis' as it is used in drama work, to capture the tension of the dual perception of the world that occurs for the actors, and can occur for the audience (the spectators, the observers): a state where one can be both oneself and someone other than oneself. This tension of dual perception holds true to bridging the physical and digital space a mobile user occupies, as a user belongs simultaneously to device and environment. As an Interaction Designer, this metaxis paradigm of computing raises many new design challenges, some of which I address in this paper.

This paper builds on the convention of interaction design[4]. It also builds on the knowledge surrounding metaphor (in verbal and visual communication) that has been elucidated by experts, such as George Lakoff, Marie-Laure Ryan, George Landow, Brenda Laurel, Alan Cooper, and Max Black. I will reflect and echo the research of these authors to create the critical framework and discussion throughout this thesis. This thesis will concentrate on the town square as a metaphorical device to bridge the digital and physical space (and mental space). Specifically, I address metaphor as a creative thinking methodology, as a research tool, and as inspiration throughout the design process of *SQWhere*.

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[4] When using the term *interaction design* throughout this paper, I refer to designing or facilitating or instigating interactions between humans, mediated by an experience, in this case through a product (the *SQWhere* application). By interactions, I mainly mean communication, human-to-computer (computer-to-human), one-on-one, one-to-many, or many-to-many.

Precedent technologies

The *SQWhere* team's objective was to create concepts of the 21st century town square, a digital solution that would socially connect the local community. This process involved multiple rounds of brainstorming, discussion, and refinement. Part of this process involved a technology audit to access how and where this application would be housed. The most obvious digital choice started with the World Wide Web, but it was important for *SQWhere* to exist in the physical space (an objective set by the development team). Thus, we explored interactive kiosks through partnerships with IBM that could be placed strategically throughout the downtown city core. Due to the added complexity, geography limitation and cost of producing a product to deliver an application (*SQWhere*) we decided to investigate other alternatives. Understanding the application was focused towards the urban pedestrian, we decided to investigate the current affordances of mobile devices (smart phones) that most Vancouverites possessed. Thus, the technological focus in this thesis addresses the *SQWhere* application as if it were to be designed, developed, and housed on a mobile phone.

Along with a technology audit the *SQWhere* team also performed several *competitive landscape*[5] audits as well. These audits resulted in many case study examinations of mobile and web applications, products, and services. Including but not limit to the following examples; eBay, Slashdot, Epinion, SmashFace, DodgeBall, loopt, Shiftspace, Smalltown, Walkscore, whrrl, YourStreet, beetag, BostonSquares, Ziplocal, UrbanSquares, Gumiyo, Toronto VirtualCity, British Columbia Travel and Tourism, Yahoo.Mobile, Original Signal, Twitter, Newser, and Facebook. Although some of these examples are mentioned in this paper, this thesis does not delve into the competitive landscape audit (case studies) body of research. Instead, the examples used in this paper support the larger thesis scope of metaphor in Interaction Design.

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[5] Competitive landscape was a termed the team used to describe research that surveyed existing concepts, products, applications, or services that were similar to SQWhere. The team used these case studies to evaluate potential successes and limitations with each case.

The user or users play an obvious and important role developing a social networking service, shifting the design focus to a more user-centered approach. Using design research techniques (observations, interviews, personas, scenarios, and prototypes) the *SQWhere* development team investigated users and their environment in order to learn more about them and thus be better able to design for them. We built quick prototypes and tested them with the users to make sure the proposed solution was satisfactory and to guide further design investigations. Although these major steps in the design process were performed by the *SQWhere* team, they sit outside the scope of this thesis. It is important to note that the *SQWhere* project acts as a vehicle in this thesis, allowing and supporting a discussion of the use of a specific metaphor in design.

In summary, this thesis is an exploration of using metaphor as a device, tool, and aid in brainstorming and throughout the design process. This thesis is an example of theory applied in a professional context. Furthermore, this thesis examines the metaphor of a town square and it's usefulness as a methodology for learning, inspiration, and communicating.

CHALLENGES

The digital challenge

New media provides an important platform for exploring social relations and communicative practices. As Raymond Williams suggests, new communication technology both reflects and refracts the cultural climate in which it emerges (1975). Therefore, exploring early conceptions and use of new media can shed light on the social environment that produces and consumes such technology. Our exploration led us to believe that technology seems to be unintentionally mediating and modulating social interactions and spaces. The question for us became, how do we, as designers, deal with this complexity of culturally transformative technology? We might be able to improve the situation (complexity of technologies and social distractions) by designing interactions with technology to be more subtle, more integrated, more socially aware, even more ubiquitous when appropriate. It is a delicate task, half interaction design and half social engineering. Thus, the Interaction Designer's task is to also find ways to facilitate transformative interactions rather than mere moments that provide users with useful information. The need for design considerations like these will increase in demand and complexity as technologies continue

to evolve. Specifically, as hardware and software continue to "morph" it will continually present new challenges and opportunities for Interaction Design (Buxton 2008). Designed interactions have wide human behavioral implications. Understanding that design impacts social behavior is an axiological responsibility of the designer.

Fundamentally though, technology, in both its development and impact, is intrinsically social and contextual. The historical effect of computing (technology) on daily social activities and the space we occupy is summarized in the following quote;

> According to [James] Moor, the computer revolution is occurring in two stages. The first stage was that of "technological introduction" in which computer technology was developed and refined. This already occurred in America during the first forty years after the Second World War. The second stage — one that the industrialized world has only recently entered — is that of "technological permeation" in which technology gets integrated into everyday human activities and into social institutions, changing the very meaning of fundamental concepts, such as "money", "education", "work", and "fair elections". ("Computer Ethics")

Technological permeation dissolves the boundaries of digital, physical, and mental spaces. Evolving technologies— the Internet, mobile phones, geographical positioning systems (GPS), mobile cameras, instant messaging— are radically transforming how we connect and exchange information. Investigating this ecology of space (physical space, mental space, and digital space) led to SQWhere's social network "ecology", forming the construct of SQWhere's social network (fig. 2). This network ecology guided our thinking and framed how SQWhere users are connected to and could interact with other SQWhere users.

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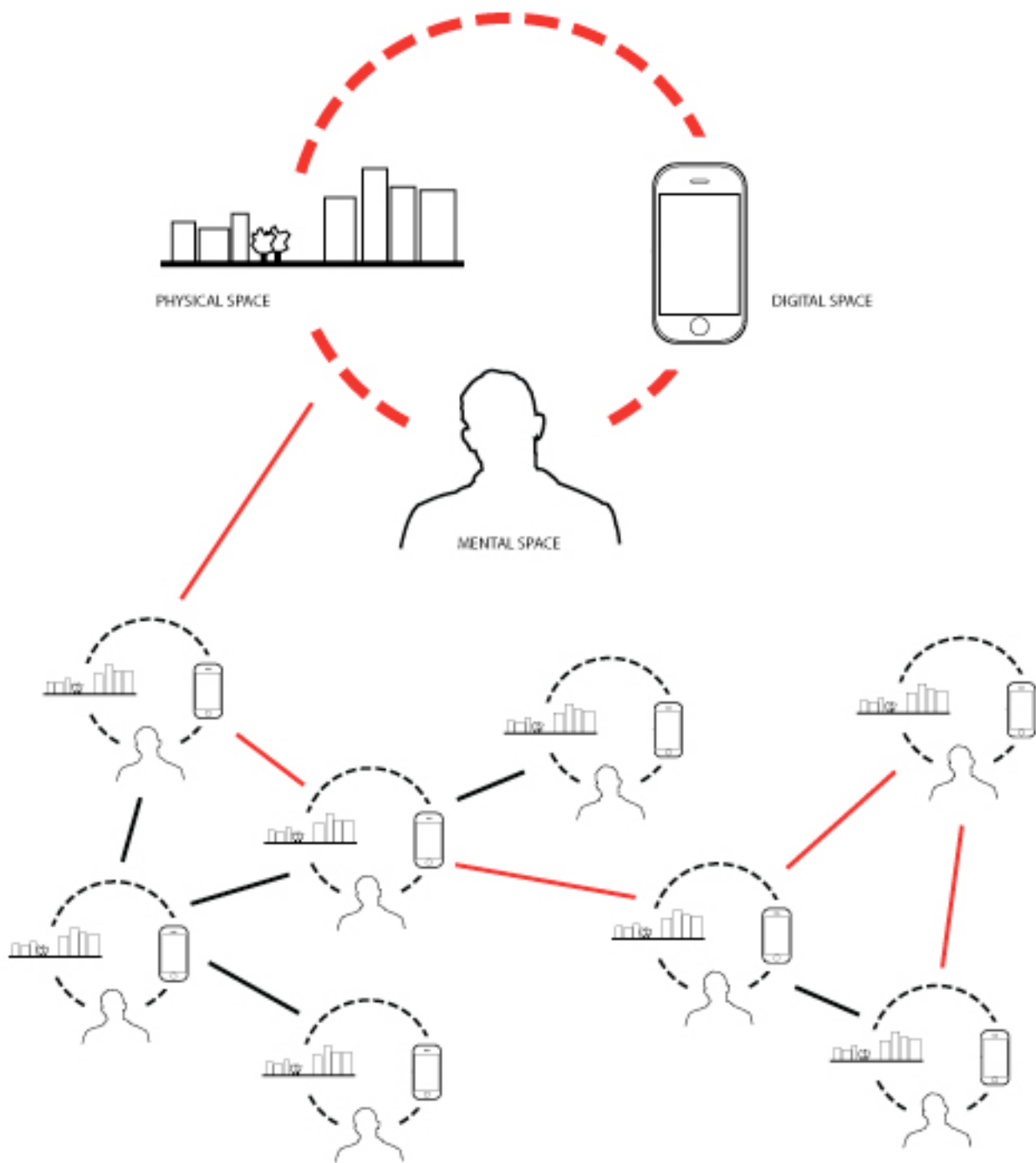
(fig. 2) A social network is a social structure made of nodes that are tied by one or more specific types of interdependency. Each of SQWhere's nodes are made of three components; the physical space, digital space, and mental space. The SQWhere application is a social network service that will create relationships between these nodes offering complex possibilities.

Virtual experiences now affect the physical realm, and vice versa. The digital device, not only affects the mental space, it can influence and shape the user's perspective of the physical space. For example, a user who has their mobile ring in the middle of a movie theater (or during someone's presentation) knows how the physical environment transforms after the mobile is finally silenced. Also, the way we use our digital device changes from environment to environment. Talking on the mobile in public, a person's voice sometimes changes tone and character, over a single conversation (i.e. when moving from a vacant bus shelter to sitting on a crowded bus). The digital device, especially the mobile phone, constantly places a user in a state of metaxis. Understanding Boal's metaxis paradigm (the state of belonging completely and simultaneously to two different autonomous worlds) influenced *SQWhere's* approach to how users could engage with content and location, through the digital device (mobile). Having the content specific to the location, the theory is that the user, immersed in a story tailored to the specifics of that environment, would experience a dual perception of both spaces (digital and physical) as illustrated in figure 3.
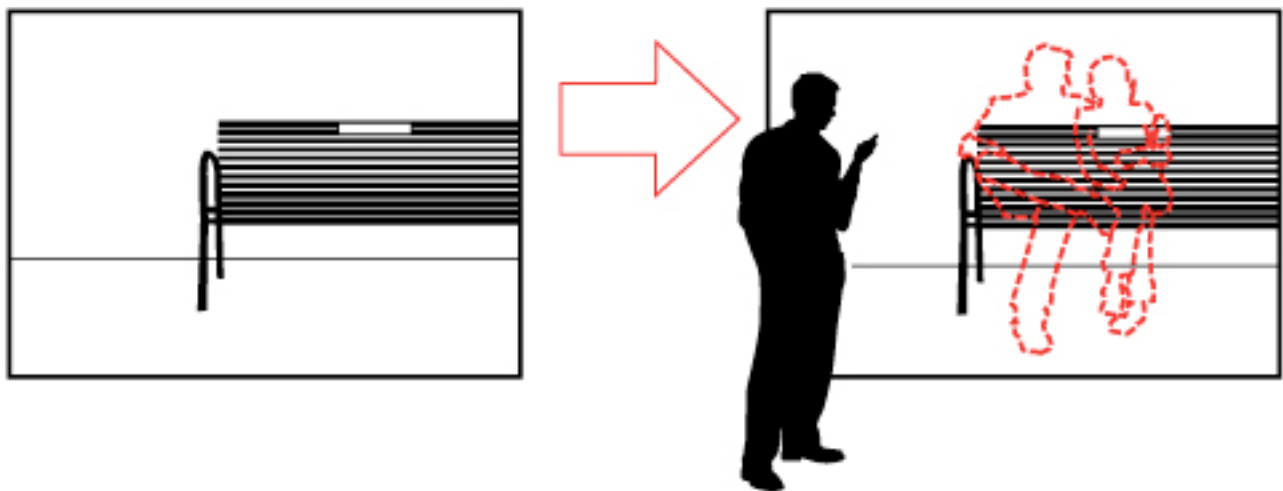
(fig. 3) A SQWhere user experineces a *Metaxis* state while watching a tagged media item (video). The video gives meaning and explanation to a park bench memorial plaque allowing the user to experience the story and the people that it marks, in real-time, real-space.

Designing in this context equals a multi-dimensional thinking approach between the digital, physical, and the temporal. Henri Lefebvre in his book, *The Production of Space*, seeks to collapse the silos created by philosophers, scientists, and social scientists. The *SQWhere* application has a similar ambition— to blur the boundaries between the digital, physical and mental spaces through location-based storytelling experiences. Lefebvre, in a project he calls *Spatiology* involves, among other things, a rapprochement between *physical* space (nature), *mental* space (formal abstractions about space), and *social* space (the space of human interaction). These different "fields" of space, Lefebvre says, have suffered at the hands of philosophers, scientists, and social scientists, because they have been apprehended as separate domains. Lefebvre considers fragmentation and conceptual dislocation as serving distinctly ideological ends (Merrifield 104).

Mental space, physical space, and especially the digital space were abstractions that constantly challenged the development team's understanding of digital technologies. We found the deeper we got into these abstractions, the more important using metaphor as a methodology became. To understand new things is to think of them in terms of things we already know. Thus, metaphors become natural models that allow us to take familiar, concrete objects and experiences and juxtapose them onto unknown or abstract concepts, giving them structure and meaning. This project shows how a metaphorical interpretation of a real-world concept, such as a town square, can be used throughout the design process to provide novel ways of looking at usage situations and to provide direction in interface and interaction design.

The physical challenge

One of the primary functions of a digital social network is connecting people with shared interests. Building on this understanding we (*SQWhere* development team) needed to investigate why, how, and where potentially liked-minded people gathered socially. We started by using ethnographic techniques to understand how people use public gathering spaces, in particular, the town square. The fieldwork consisted of photography, video recording, diary note taking, diagrams and sketches, and immersion in many of the local public spaces in the downtown and surrounding neighborhoods of Vancouver. What we found was that Vancouver does not have a "traditional" or centralized town square. A good example of a "traditional" or "historical" town square is *Piazza San Marco*, often known in English as St Mark's Square, is the principal square of Venice, Italy. (fig. 4).

(fig. 4) *Piazza San Marco*.

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Instead, Vancouver has isolated or alternative social spaces, such as Granville Island Market, the Vancouver Art Gallery's front stairs, and various garden parks and ocean beaches throughout the metro areas. Other social spaces promoted as "town squares" in downtown Vancouver are Robson Square and Library Square, but when explored closely they pale in the face of traditional town squares, due to their location, design, and usage. Investigating these social spaces lead to an understanding that the more diverse the people, places, and contexts are, the more diverse the interaction becomes. More specifically, the interaction affects what type and how information is exchanged. This social complexity can significantly impact how technologies are developed and used in social spaces. Thus, the challenge is how the potential development of the *SQWhere* application, using the town square metaphor, could benefit users by bridging digital and physical spaces. This paradigm of "technology and space" is also known as mediaspace.

The term mediaspace refers to the mutual connection, dependence, and constitution of communication technology and space. "Mediaspace, then, at once defines the artefactual existence of media forms within social space, the links that media objects forge between spaces, and the (no less real) cultural visions of a physical space transcended by technology and emergent virtual pathways of communication" (Couldry & McCarthy 2). Mediaspace theory argues that media use is inexorably tied to spatial practices, both social and physical.

In this paper, the *SQWhere* team explores how tying aspects of social networks to physical locations can strengthen, modify, and rearrange how urban public spaces and social connections are experienced. The sharing of social information through mobile computing could transform users' experiences of the public spaces they inhabit. Thus, the *SQWhere* project explores how the town square metaphor might be able to facilitate meaningful connections through location-based information within an urban landscape.

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METAPHOR

The basics

We encounter metaphors[6] every day of our lives. We use metaphors in language, in thought, and in our actions. Our conceptual system is fundamentally metaphorical in nature. Everyday routines and tasks— even mundane details— rely on metaphors for functioning. At the most basic level, metaphors describe the use of a body of knowledge about one concept to understand or comment on a second concept (Lakoff 3). Metaphors are especially powerful when used to help understand abstract and unfamiliar concepts, which is often the case in the design process.

Designers, especially Interaction Designers, deal with a number of abstract concepts, such as time, space, states, changes, causation, and actions— sometimes specifically and other times innately— but the commonality in all these concepts is that they are metaphorical in nature. For instance, we think of time as "moving forward". We see change and motion as, "He returned to what he was doing" or "He was crushed when they separated." These are ordinary examples of how people talk and, more importantly, how we, as humans, think. Metaphors are intrinsic to our conceptual system and are seen as valuable aids in problem solving tasks. Thus, metaphors are intrinsic to design thinking.

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[6] Metaphor is originally a Greek word that means "carrying across".

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Metaphor as an acquisition method

One of the challenges of being a designer is working in unfamiliar subject areas. The same challenge was true for the SQWhere development team, as we worked to develop a digital social networking application that linked the virtual and the physical. As the team navigated this unfamiliar subject area, we found the town square metaphor acted as a foundation and created starting points for specific investigations that furthered the project's research. Furthermore, the town square metaphor set the parameters that guided our researched.

In the early stages of the design process, metaphors aid reflection and provide a way to understand the crux of a situation. Reflecting metaphorically on a design situation can have a strong affect on the perception, analysis, and framing of a problem (Schön 1983). For example, using this method of metaphorical reflection in our own exploration allowed us to quickly establish initial frameworks and research direction, such as the analysis of Project for Public Spaces' *Ten Principles for Creating Successful Squares* (page 32). Using metaphor as an acquisition method not only created frameworks, but exposed certain complexities and led to some important design questions: *What are the limitations, constraints, or implications of using the town square concept as a social networking application? What are the affordances? What are the political rhetorical ramifications and assertions?* These questions presented specific challenges that motivated and fueled the need to further understand the potentials of *SQWhere.* Some of these questions are addressed in the *Implications* section of this paper.

Globally, in the design industry, these same complexities exist and present challenges in most design projects or problem solving situations. In his book *In the Bubble: Designing in a Complex World*, John Thackara states;

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Traditional design thinking focuses on form and structure. Problems are decomposed into smaller steps, and these are prioritized in lists. Actions and inputs are described in a blueprint or plan— and other people produce or implement it. This is a top-down, outside-in approach. It doesn't work well now because complex systems, especially human-centered ones, won't sit still while we redesign them. A sense-and-respond kind of design seems to work better: desired outcomes are described, but not the detailed means of getting to those outcomes. Sense and respond means being responsive to events in a context— such as a city or marketplace— and being able to respond quickly and appropriately when reality changes. This approach implies that we develop an understanding and sensitivity to the morphology of systems, their dynamics, their intelligence— how they work and what stimulates them, their ability to interpret, to see things differently, and to focus on principles of relationship, connection, communication, and interaction. (213)

Thackara's statements about how design is changing to address highly complex problems (or as he calls them, systems) have never been more relevant to designers. Designers will more and more often be thrust into domains in which they have little to no background knowledge. Traditionally, the way to overcome this deficiency was to utilize the help of a subject matter expert (SME) or in most cases, rely on the direction outlined in a design brief or worst, rely on secondary research conducted by the client. This can be problematic, as the expert might have too much knowledge and things that seem obvious to them are not as apparent to the designer. The same can be said for design briefs and research conducted by the client. The designer could misinterpret or fail to discovery potential user interactions and design outcomes. In short, the process of acquisition is equally important, or more important, than the resulting data.

The use of metaphor to aid acquisition of information is an invaluable method to acquire an understanding of complex subject matter. To summarize, designers can take a familiar domain and utilize its characteristics to find similarities (and differences) between it and the unfamiliar domain. Doing so enables designers to frame and reframe the design task that confronts them.

Metaphor as a conceptual tool

We use metaphors in a variety of conceptual ways. We use them to orient, to create "artificial" boundaries or containers, to examine or reason about a particular thing, to personify non-human entities (in terms of human emotions, motivations, characteristics, and activities). For example, it is not uncommon to say, "the computer will not let me open that document". Here we give the computer human attributes; we anthropomorphize it. The attributing of human characteristics and purposes to inanimate objects, such as digital devices, demonstrates how we speak, relate, understand and interact in terms of metaphor. One of the most widely used examples of metaphorical interaction, especially human-to-computer, is the computer desktop interface. Where users can interact by "dropping and dragging content into and out of folders", users "cut and paste" as editing actions, move around and place "items" on a "desktop", the experience is overwhelming metaphoric. Again, the way we understand and how we interact with new things is to think of them in relation to things we already know (to personify or anthropomorphize). This method of thinking (metaphorical) is fundamental to design thinking and the discipline as a whole, as it helps us to imagine and design for understandable functions (interactions).

Metaphor to aid explanation

In the design process when concepts, ideas, and project directions have been generated, the designer or design team will often have to "sell" or explain or present those ideas to key decision makers (project managers, third-party developers, or the client) who will ultimately implement the design. Specifically, with *SQWhere*, we used the metaphor (town square) as a communication

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tool, to convey concepts to the other members of the project team (key decision makers). This was helpful in motivating the decision makers and continuing forward momentum of the project.

The town square metaphor also helped to define boundaries of understanding, which enhanced communication between the design team members. This was critical throughout the many brainstorming and idea generation workshops that took place over several days and weeks. Having a shared metaphor helped maintain common goals and understanding as the project evolved. More importantly, this shared metaphor created the framework in which we could explore, evaluate, and communicate other related innovations and case studies.

Metaphor summary

Metaphor is typically ubiquitous in our daily existence, embedded in everyday language and interactions. As a tool, when metaphor is used as a technique in a deliberate manner, it becomes a powerful cognitive design methodology. Metaphorical reasoning is an iterative process through which designers gradually increase their knowledge of a design situation. Throughout all phases of a design project, from initial problem definition, to concept and ideation, to execution, to project presentation, to end product use, metaphor can be a solid asset in a interaction designer's tool-set.

Dan Saffer, a practicing designer and author on Interaction Design, nicely summarizes metaphor's importance in design; "If all invention comes from the juxtaposition of two unlike objects, then metaphor is at the heart of invention. And since invention (and reinvention) is at the heart of design as well, it stands to reason that metaphor itself is at the center of design (21)." The capacity of metaphor to promote a more efficient facilitation of understanding is tremendous. Using metaphor as a design device has practical applications for designers, design methodologies, and design outcomes. Metaphors are fundamental to interaction design.

TOWN SQUARE

The past mayor of Bogotá, Enrique Peñalosa, summarizes beautifully the diversity of social interaction in a town square: "Public space is for living, doing business, kissing, and playing. Its value can't be measured with economics or mathematics; it must be felt with the soul" ("Enrique Peñalosa"). Peñalosa led massive efforts related to transportation, land use and housing for the poor, pollution abatement, and the critical need for public spaces. This is one example of the depth and importance of the town square as a public gathering space. Stumbling across visions and perspectives, such as Peñalosa, were inspirational and constantly framed our ambitions of *SQWhere*. Furthermore, framing the project in this light reminded us of the responsibilities of designing software that have social and cultural impact.

Historical town squares

The Agora was the civic centre of a Greek city. "Agora" in Greek literally means "a place of gathering" and the Agora of Athens was the heart of Athenian life in ancient times. The Agora was the physical place where every Athenian citizen[7] gathered to conduct their business,

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[7] The class system in Athens was made up of two distinct classes- slaves and citizens. These classes were rarely open to any of the other classes; citizenship alone was given only to male Athenians. This excluded a majority of the population, namely slaves, children, women and resident foreigners (metics).

participate in their city's governance, decide judicial matters, express their opinion for all who cared to listen, and elect their city officials. For centuries the Agora served as a busy marketplace where merchants and artisans had congregated to offer their goods to all who gathered, and it also provided a platform for the Athenian political and intellectual life (Camp 4).

Town squares as conversation

Still today, town squares have historical roots in cultures all over the world and are being rediscovered as a powerful means of transforming communities. The historical town square is a place of social exchange and societal rituals (fig. 5). Squares and plazas, in their most traditional sense, share an ability to accommodate many different types of uses and people, thus allowing for many diverse social interactions. The challenge for *SQWhere* is to translate this diversity of social interactions into the digital space.

Town squares were places where supply met demand. Buyers and sellers looked each other in the eye, met, and connected. Town squares were not only places for exchange, where people came to buy what others had to sell, they were, above all, a social space dominated by talk. Many of the conversations were about the work or their craft: "Feel this leather bag. See how the stitching is so strong." "The cotton in this shirt, where did it come from?" "Taste this apple. We won't have them next week. If you like it you should take some today." Conversation was the market's currency. For thousands of years, we knew exactly what town squares were: conversations between a diversity of people who sought out others who shared the same interests— a platform for connecting.

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(fig. 5) Historical Town Squares.

Town squares as a research tool

Town squares are spaces where groups of strangers fuse into an instant community. They are

environments where people's individual identities are challenged and merge into something larger

than themselves. Town squares are spaces for mundane everyday ritual and spaces for

extraordinary one-time events. It is this power of "shared experiences" in town squares that has

motivated and created inspiration throughout the design research and conceptualization of

SQWhere. As a result of researching town squares, one of the key findings that guided and

established the foundational framework for critical analysis (between the physical and digital

space) came from an organization called Project for Public Spaces (PPS). PPS is a nonprofit

organization dedicated to helping people create and sustain public places that build communities.

They've established *Ten Principles for Creating Successful Squares* (page 32) based on the

hundreds of squares (the good and the bad) that they've analyzed and observed over the past

thirty years. The PPS website states "what stands out most is that design (urban

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planning/architecture) is only a small fraction of what goes into making a great square. To really

succeed, a square must take into account a host of factors that extend beyond its physical

dimensions" ("Ten Principles for Creating Successful Squares"). For the *SQWhere* team, these

ten principles were the springboard for much of the remaining research and exploration we

conducted. The ten principles also proved to be an excellent resource when distilling complex

ideas surrounding how people interact with both physical and digital social spaces. Furthermore,

the ten principles had a direct influence on the research direction and the potential design

outcomes of the *SQWhere* interface. Before I examine specific examples of influenced direction

and outcomes, its critical to understand the *Ten Principles for Creating Successful Squares*.

The following chart (fig. 6) outlines PPS's *Ten Principles for Creating Successful Squares* for

creating a social gathering space (town square) in the physical environment. The right hand

column juxtaposes this to our research cross-referencing the digital environment. This research is

a direct outcome of our workshop sessions during the internship phase and has not been altered

or revised during the writing of this paper:

Project for Public Spaces (PPS)	Project *SQWhere*
1. Image and Identity	
Historically, squares were the center of communities, and they traditionally helped shape the identity of entire cities. Sometimes a fountain was used to give the square a strong image: Think of the majestic Trevi Fountain in Rome. The image of many squares was closely tied to the great civic buildings located nearby, such as cathedrals, city halls, or libraries.	Research focused on content and interface designs concerning content from or connecting to civic institutions. What's our responsibility for "representing" Vancouver? What's SQWhere's fountain? An art piece or editorial feature?
2. Attractions and Destinations	
Any great square has a variety of smaller "places" within it to appeal to various people. These can include outdoor cafés, fountains, sculpture, or a bandshell for performances. These attractions don't need to be big to make the square a success. We often use the idea of "The Power of Ten" to set goals for destinations within a square. Creating ten good places, each with ten things to do, offers a full program for a successful square.	We explored "The Power of Ten" as a way of filtering and managing content. It led to preliminary design systems dealing with the information architecture of the application. Led to a "Top Ten" content approach (ranking).
3. Amenities	
A square should feature amenities that make it comfortable for people to use. A bench or waste receptacle in just the right location can make a big difference in how people choose to use a place. Lighting can strengthen a square's identity while highlighting specific activities, entrances, or pathways. Public art can be a great magnet for children of all ages to come together. Whether temporary or permanent, a good amenity will help establish a convivial setting for social interaction.	Researched; entertainment, information, interaction (interface) as "things that enable use". What are our tools and services? Investigated interface elements, such as sliders, search fields, and maps.
4. Flexible Design	
The use of a square changes during the course of the day, week, and year. To respond to these natural fluctuations, flexibility needs to be built in. Instead of a permanent stage, for example, a retractable or temporary stage could be used. Likewise, it is important to have on-site storage for movable chairs, tables, umbrellas, and games so they can be used at a moment's notice.	We explored Interface design, user customization concepts. (i.e. control panels to change the visual appearance to the user's preference). How do we build the site flexible? Skins, themes, and customized content?
5. Seasonal Strategy	
A successful square can't flourish with just one design or management strategy. Great squares such as Bryant Park, the plazas of Rockefeller Center, and Detroit's new Campus Martius change with the seasons. Skating rinks, outdoor cafés, markets, horticulture displays, art and sculpture help adapt our use of the space from one season to the next.	Content and interface structure investigations. Should the content be timely, refreshed, changing? (i.e. daily, weekly, monthly). Should certain interface elements expand and collapse to user's needs (i.e maps)?

Project for Public Spaces (PPS)	Project *SQWhere*
6. Access	
To be successful, a square needs to be easy to get to. The best squares are always easily accessible by foot: Surrounding streets are narrow; crosswalks are well marked; lights are timed for pedestrians, not vehicles; traffic moves slowly; and transit stops are located nearby. A square surrounded by lanes of fast-moving traffic will be cut off from pedestrians and deprived of its most essential element: people.	Access concerns, such as "online and offline" visibility and page ranking. Other research involved "open platform and integrated technologies" as development options. Exposed design issues surrounding user registration (amount of information and steps needed (privacy issues) or "free radical" users).
7. The Inner Square & the Outer Square	
The streets and sidewalks around a square greatly affect its accessibility and use, as do the buildings that surround it. A public library doors should open right onto the square; people sit outside and read on the steps; maybe the children's reading room has an outdoor space right on the square, or even a bookstore and cafe. An active, welcoming outer square is essential to the well-being of the inner square.	Explored branding and identity concerns relating to partnerships and events to encourage participation (i.e. businesses act as the "outer wall" and the public content act as the "inner wall"). Issues of private and public sphere surfaced. Also led to usability explorations.
8. Reaching Out Like an Octopus	
Just as important as the edge of a square is the way that streets, sidewalks and ground floors of adjacent buildings lead into it. Vehicles slow down, walking becomes more enjoyable, and pedestrian traffic increases. Elements within the square are visible from a distance, and the ground floor activity of buildings entices pedestrians to move toward the square.	Explored how the application could "reach out" to diverse communities and build networks (of business, people, and content). Researched feedback loops and focused on the question: "can we legitimize 'real-world' connections?"
9. The Central Role of Management	
Good management understands existing and potential users and gears events to both types of people. Good managers become so familiar with the patterns of how people use the park that waste receptacles get emptied at just the right time and refreshment stands are open when people most want them. Good managers create a feeling of comfort and safety in a square, fixing and maintaining it so that people feel assured that someone is in charge.	Explored concerns such as control, regulation, freedom, safety, trust, comfort, and entertainment. What is our "stickiness" factor? Why would users return to *SQWhere*? Investigated "editorial influence"- should there be any, if so how much?
10. Diverse Funding Sources	
A well-managed square is generally beyond the scope of the average city parks or public works department, which is why partnerships have been established to operate most of the best squares in the United States. These partnerships seek to supplement what the city can provide with funding from diverse sources, including--but not limited to--rent from cafés, markets or other small commercial uses on the site; taxes on adjacent properties; film shoots; and benefit fundraisers.	Explored options such as "renting" the *SQWhere* space and how this would influence the interface design, such as flexibility and templating concerns. Investigated "square-footage - square pixel" model, space as a commodity. (potential revenue models)

(fig. 6) PPS's *Ten Principles for Creating Successful Squares*.

Sometimes, the hardest part to any design project is getting started. Once we understood and used these ten principles as a critical lens to explore and define what the potentials of the digital town square could be, the project quickly started to gather momentum. Each principle created, what we called a "research silo[8]". For example, principal #4 addresses the issues of "flexibility" regarding both the amenities and the usage of the town square (physical space). We treated each of the ten principles as one "research silo" and investigated further how and what behavioral changes it created and how it influenced people in a social space. As a result, principal #4 exposed serious interface and interaction design questions surrounding information architecture and menu navigation. Building on typical or universal interaction design concerns (i.e. content flexibility, menu and information hierarchies, user preferences, and customization) were specific questions such as: 1) *How will users delve for information in mapping and geography-based interface environments?*, 2) *What functionality affordances (i.e. buttons) in these environments, specifically the town square interface metaphor, would users intuitively understand and engage?*, and 3) *How could geography-based content translate from the device into the physical space to mentally bridge the digital space, mental space, and physical space and provide a metaxis experience?.* These types of questions required new ways of looking at traditional problems in interaction design.

Each principle led to its own research silo, that led to several specific design issues and questions. Using the PPS's established research (*Ten Principles for Creating Successful Squares)* and then layering our own research proved to be a valuable tool and method to frame multiple design potentials and to resolve the questions and issues that surfaced.

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[8] The term *research silo* is used to describe a localization or framework of content within a particular segment of data that allowed the *SQWhere* team to explore possibilities and constraints of inherited situations by applying critical thinking through qualitative and quantitative research methods.

Town square qualities

After researching the history, design, usages, and purpose of town squares, another significant finding or framework started to take shape. We distilled four "qualities" of town squares that consistently surfaced as being the essence of or essential to the town square experience (social interaction). The four qualities that were established are *knowledge, connection, transaction*, and *entertainment*. Although these are words that often rely on metaphor to convey a meaning, we used these qualities to frame (and reframe) the *SQWhere* project as it evolved through the various design phases and concepts. What was more interesting, when we cross-referenced these qualities to the digital space, specifically social networking websites (i.e. Facebook, Twitter, MySpace, Flickr, Linkedin, YouTube) we found they remained equally relevant as principles, standards, or attributes of social networking interaction. For example, social networking sites are commonly used as a vehicle or a means of knowledge exchange (typically through gossiping). And with this information exchange comes a sense of connectedness, not only from being informed, but being included as a member of a specific network. Thus, recognizing *knowledge* and *connection* as consistent qualities across these media was important when shaping the design and use of *SQWhere*. Equally important was *transaction* and *entertainment*: *transaction* through the exchange of knowledge, emotion, and in some cases monetary value and *entertainment*, most often through the experience of interacting with social networking software's features, such as photo and video sharing, posting to message walls, and through various informative widgets (i.e. weather updates). The four qualities helped to build understanding of social networks and from a design perspective, allowed a filter for editing potential content, aesthetical treatments, information layouts, use case scenarios and further research silos.

THE APPLICATION

SQWhere will be a mobile storytelling application for the urban pedestrian. *SQWhere* will connect people through location-based stories, in real time and real space, in urban environments. Through this participatory and collaborative approach, information and knowledge will be delivered and relayed in creative and interactive storytelling formats utilizing video, audio, images and text (media items). The platform will make connections happen at the grassroots level creating an environment of peer-to-peer knowledge exchange— storytelling.

Who will use SQWhere?

To help realize user requirements, designers often use tools such as personas[9] (personae) or user profiles that are reflective of their targeted user group. The SQWhere team conducted a "bullseye" audience workshop to help define potential user demographics. The exercise started with concentric circles (or rings) on a large sheet of paper mounted on a wall. After a brief discussion of the *SQWhere* application and potential use cases, the group was instructed to write the names of potential users (groups or individuals) on self-adhesive notes. These notes were placed into circles in order of importance (the center bullseye is the most important expanding outward to the last ring being least important) (fig. 7a). The "importance" and "audience naming" were subjective and varied with each participant. The results led to interesting overlaps and fuelled several audience discussions afterwards.

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[9] Personas are fictitious characters used to better understand how a person could use and experience a potential product or service. This was a useful method assisting the *SQWhere* team in exposing potential user benefits and limitations of the application.

(fig. 7a) Audience workshop.

The outcome of this workshop resulted in five personae named *Tyler, Michelle, Jonathan, Victoria, and Marianne* (fig. 7b). The *SQWhere* personae were developed from quantitative and qualitative data from our audience workshop and further research and investigations. These five characters gave the project a "human element" seemly bringing the *SQWhere* project to life.
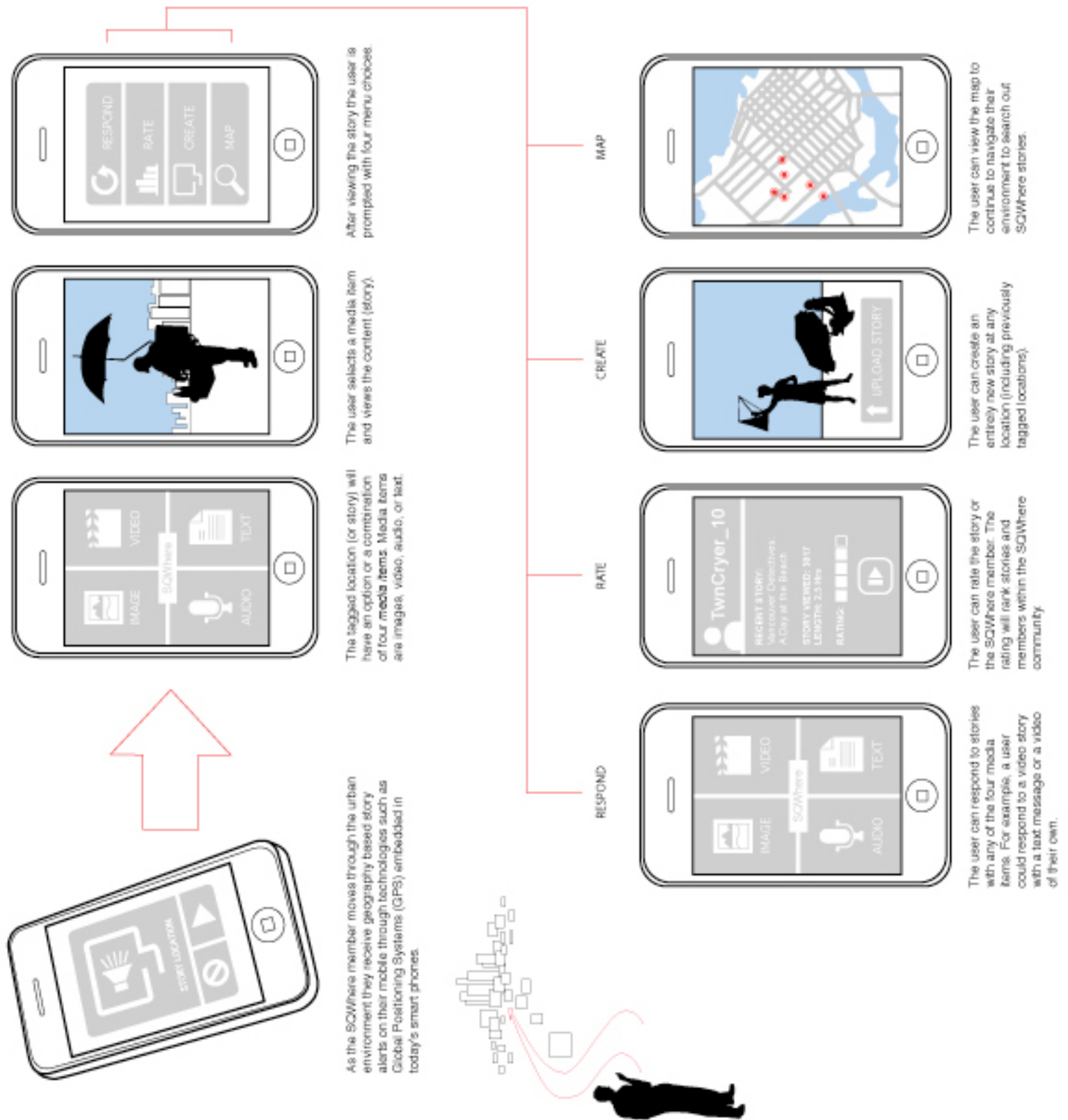

(fig. 7b) *SQWhere* personae.

The SQWhere interface

SQWhere will be used on most next generation mobile units, such as the HP iPAQ, RIM

BlackBerry and the Apple iPhone[10]. These have Global Positioning Systems (GPS) built directly in

the units, which is fundamental to the *SQWhere* application. GPS enabled devices allow users to

connect to satellites to get the coordinates of their position. The GPS receiver continuously sends

the updated location coordinates to the mobile phone (the *SQWhere* application). Most of the

existing navigation assistance systems are meant for cars and give directions following a specific

point A to point B approach. *SQWhere* is meant for people who are walking and wandering in a

city and provides ambient information based on a user's location.

The application will enable users to tag media (media items) at specific locations and make that

tagged media and location visible to other users. *Media items* is a term we used throughout the

SQWhere project to describe text messages, photos (taken from the phone's camera or stored on

the device), audio (recorded from or stored on the device), and video (recorded from or stored on

the device). *SQWhere* users will receive a visual, haptic, or audio message on their device (via

the *SQWhere* application) notifying the proximity[11] of a story. A guided step-by-step "screen flow"

is illustrated in the following diagram (fig. 8):

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[10] Apple will be opening up the iPhone's operating system to third-party developers during the time of this writing. GPS applications for the iPhone/iPod Touch are expected to be one of the first third-party apps developed. In the unlikely event that this does not happen, an existing application called LocateMe, a mash-up for Google Maps that uses cell tower traingulation to locate users, will be used. LocateMe and cell tower triangulation have been successfully researched and trialed in mobile/location-based research and development.

[11] The proximity radius or measurement is still undetermined. Although, during the prototyping we approximated a 15-foot diameter to simulate a certain range of a "tagged" location.

(fig. 8) *SQWhere* interface screen flow.

As the SQWhere member moves through the urban environment they receive geography-based story alerts on their mobile through technologies such as Global Positioning Systems (GPS) embedded in today's smart phones.

The tagged location (or story) will have an option or a combination of four media items. Media items are images, video, audio, or text.

The user selects a media item and views the content (story).

After viewing the story the user is prompted with four menu choices.

RESPOND

The user can respond to stories with any of the four media items. For example, a user could respond to a video story with a text message or a video of their own.

RATE

The user can rate the story or the SQWhere member. The rating will rank stories and members within the SQWhere community.

CREATE

The user can create an entirely new story at any location (including previously tagged locations).

MAP

The user can view the map to continue to navigate their environment to search out SQWhere stories.

How will SQWhere be used?

There will be two methods through which a user can engage with media items: 1) through *random encounters*, a *SQWhere* user moving through the urban environment can "stumble" upon a story; vice versa, a user can also create and upload a story (media items) from their location; and 2) through authored *StorySkins*[12] that have been downloaded to their device, which instruct a user to follow a specific location-to-location journey. *SQWhere* members will self-author and self-publish *StorySkins*. Other members will be able to choose one of these *StorySkins* and experience a premeditated, multi-location story. To gather insight of how users would engage these methods we used scenarios to imagine future use cases that users could experience using *SQWhere*. Using the personae techniques, and the patterns of behaviour observed in our research, the development team created scenarios (or user stories). The following five scenarios *StorySkins, Urban Classroom, Hollywood North, Time Travel, and Gossip* (fig. 9a, 9b, 9c, 9d, 9e) were chosen from twenty-seven scenarios (from brainstorming and workshop sessions) and best represent a diversity of both potential users and application uses:

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[12] *StorySkins* will be downloaded from the destination website (or through the Internet browser of the mobile device). A *StorySkin* is similar to a guided tour in a museum, where a person wears headphones with prerecorded information specific to numbered locations (i.e. museum displays or paintings) and as the user moves through the space, entering the numbers of the locations, they receive information specific to what they are viewing. Examples of a *StorySkin* for *SQWhere* could range from a scavenger hunt scenario to murder mystery scenario that have location specific clues throughout the urban downtown for a user to find, investigate and solve.
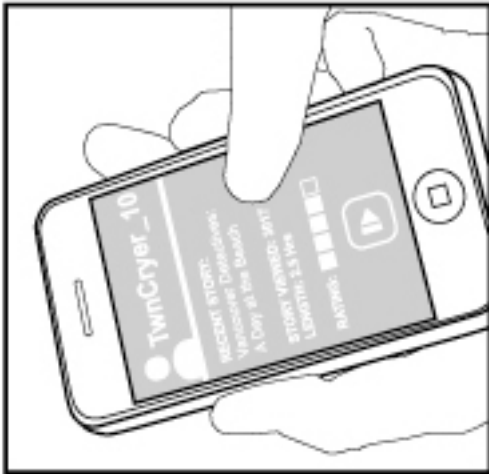
Jack at home on his mobile is looking for an entertaining reason to get outdoors to walk his dog. He sees that new stories have been uploaded to SCWhere. He notices SCWhere member, TwnCryer_10, has a 4 out of 5 squares rating and her story has been walked 3017 times. Jack chooses her new story "Vancouver Detectives: A Day at the Beach".

Using SCWhere's map Jack and his dog Roxy navigate their way through back alleys to the seawall that wraps English Bay to the first location of their investigation.
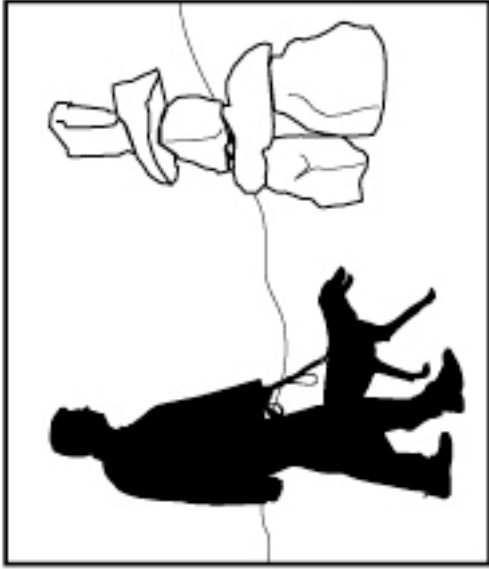
Walking towards the Inukshuk Jack receives an alert on his mobile from SCWhere... Jack knows these incredible pieces of art are not just piles of stones but figures holding spirit, sacred meaning and direction. He plays the video from headquarters... "An open leg on an inukshuk found near water or a coastline may point to an open channel for navigation. If an inukshuk is in open land, a leg or arm might suggest a direction. Inuksuit placed near a lake might show that fish can be found in the lake at the same distance the figure is placed from the shoreline. Some inuksuit were built out of respect for a beloved person and are seen as memorials. Jack what is the symbolism of this Inukshuk?"

Jack responds by text messaging. Moments later his Captain sends instruction to move to the next location on the previous Expo 86 grounds to gather more cryptic clues and evidence.
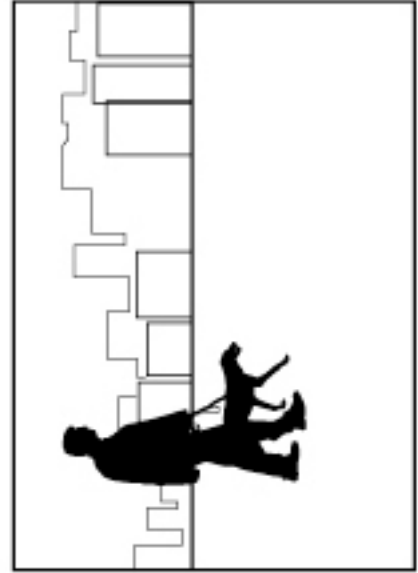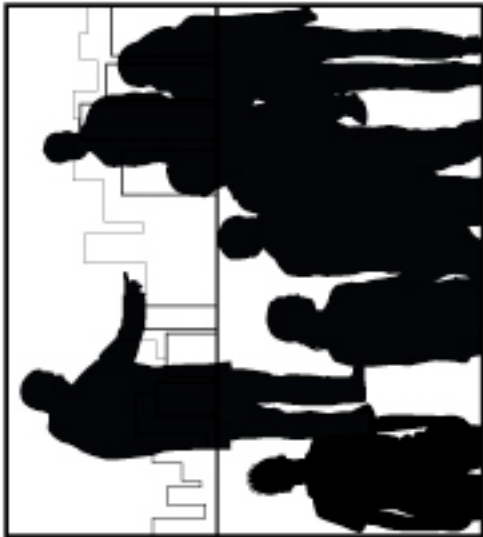
Two hours later Jack and Roxy arrive home feeling like accomplished "detectives" and a little tired from their extended walk!

Later that night Jack decides to start crafting his own narrative walk "A West End Ghost Named Dan Woirs" to share with the SCWhere community.

(fig. 9a) StorySkins.

The program provides students with the opportunity to experience and witness life on the Downtown Eastside (DTES) by accompanying DEYAS staff on walk-alongs. Through SQWhere they may see firsthand the effects of drug use on the community and individuals...

John uses SQWhere to navigate the area and to show his group stories from previous street-entrenched youth in specific locations of the Downtown Eastside.

John is a volunteer at the Downtown Eastside Youth Activities Society (DEYAS). He runs a program called Community Education to help keep the city and its citizens informed on a variety of topics and issues including disposal of used syringes, communicable disease education, addiction education, first aid and many other subjects that can affect people's lives. The service is based and operated on the streets, mainly in the Downtown Eastside with the objective being to engage the youth and assisting them in accessing resources and services.

Moments later as the group moves to another part of the area SQWhere alerts John about an interview between Vancouver Mayor Sam Sullivan and news anchor Dan Rather from a documentary titled "A Safe Place to Shoot Up"... The group watched clips and read transcripts of the documentary that previously aired on cable-TV.

John lets each person in the group watch a portion of a video he tagged with SQWhere. The video is an interview of a well-known street person named Stevie... "You will find a lot of DTESers addicted to crack cocaine. If you walk down Hastings Street near Carral, Columbia, or Main you will see people doing drugs on the street, smoking crack or injecting themselves with heroin... The police can't really do anything about it because there are too many addicts! If they were all arrested there would be no place to put everyone..."

(fig. 9b) Urban Classrooms.

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Matt is walking in Gastown looking for a good patio to have a drink. When he rounds the corner of Cambie and Pender he receives a SOWhere alert. Matt remembers he has his town square set to "Hollywood North".

Matt is curious to see what film and scene has been shot here. He accepts and plays the video. The 'media item' has been tagged by the original film crew of "Who is Harry Crumb" from 1989. The film crew has been reunited to make the sequel as a tribute to John Candy and has uploaded several media items throughout Vancouver to promote the new movie.
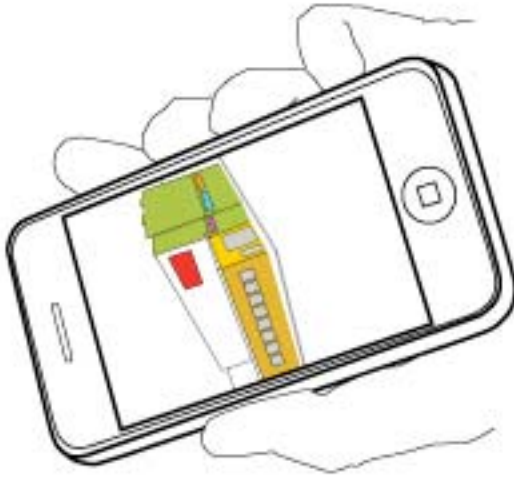
Matt watching the scene remembers moments that made him laugh... But this time Matt takes a moment to look around and notices how different the buildings, signage, and other details look. Matt is impressed by the transformation made for the movie and has fun looking for details he can recognize.

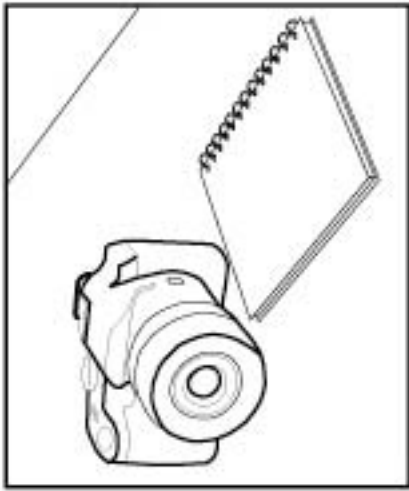Matt views the SOWhere map to see all of the movie locations and finds three he must see!
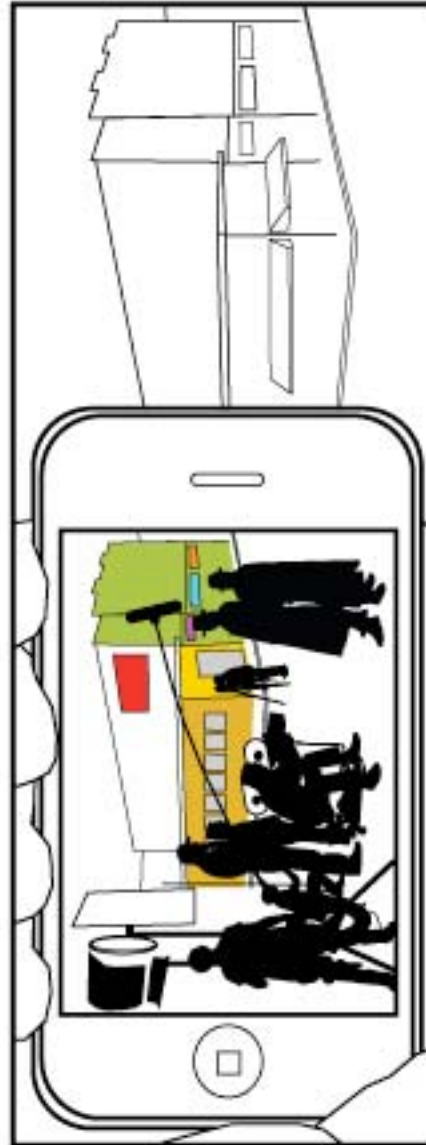
Matt then watches the "Behind-the-Scenes" videos. He also walks to the adjacent corner to check out another camera angle...

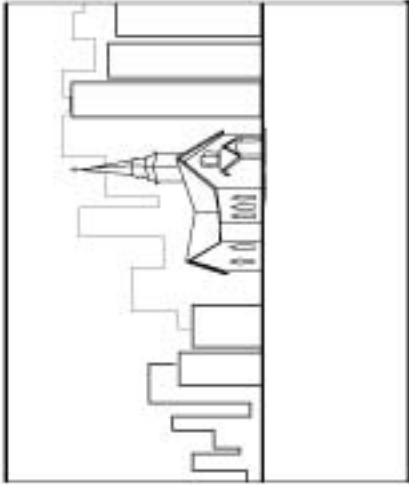(fig. 9c) Hollywood North.

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As she approaches the church her mobile vibrates, and sounds a personalized message alert. Stella is alerted by the Vancouver Heritage Society of a nearby SQWhere story they tagged in the area where she is standing.

Stella interest is piqued and decides to search the locations of where these smaller churches use to stand. She walks a bit further down the street to see that there are several more stories about them.

Stella is walking in the West End of downtown Vancouver searching for historic churches in the area which she decided will be her photo targets for the day. She thinks she spots one!

UPLOAD STORY

Stella realizes that this church is over 120 years old and was previously surrounded by several little churches. Stella also notices how much the city skyline has changed. After writing the information in her journal, she takes several photos and chooses the most beautiful image. She engages a conversation with Vancouver Heritage Society and uploads a current skyline shot with her journal comments to SQWhere.
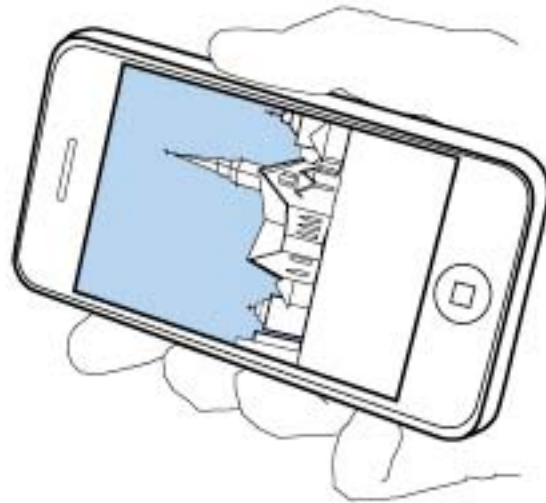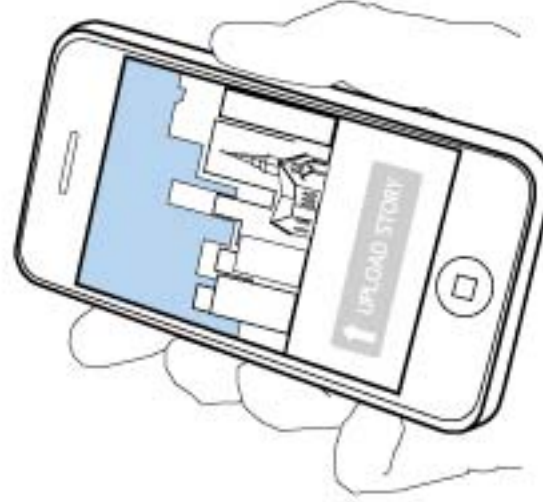

Stella is a 27-year-old part-time photography student at the University of British Columbia. She frequently walks the downtown city core to take pictures of urban landscapes. Stella likes to create meaning by having her images contextualized with stories. As part of that process she keeps a detailed journal and uses SQWhere.

She accepts and views many old images and reads the text message as well "when the congregation outgrew the little building on Main Street, a new church, seating about 600, was built at Hamilton and Dunsmuir Streets, and was dedicated on Sunday, September 15, 1887. It was decided to seek a location farther west, and in 1904 a property was purchased for $4,000. at Burrard and Nelson Streets.

(fig. 9d) Time Travel.

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Jill chats in txt message to John to find that there is a live lecture taking place at the VAG starting in 10 minutes... Jill asks John to "save her a seat".

As the event ends... Jill sees that most of her friends made the lecture! She sends out a quick message to check if anyone wants to grab a coffee at the cafe across the street to talk about the "Truth/Beauty: Pictorialism and the Photograph as Art" exhibition.

Jill sees several of their mutual friends are close. She chooses her friend John by tapping the screen to enlarge his town square and starts a conversation...

Jill is walking around downtown Vancouver and has some free time before going home. She checks SQWhere to see if anything interesting is happening nearby. On her mobile she opens the SQWhere community map and notices four people in her network are also downtown.

John's message hits his whole network informing the group of the live event. His friends get the SQWhere alert and decide to join the group at the VAG.

(fig. 9e) Gossip.

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GOSSIP

Dating back to the 17th century gossip forms one of the oldest means of spreading and sharing information. Some people commonly understand gossip as meaning the spreading of rumor and misinformation, for example through excited discussion of scandals ("Gossip"). Gossip as it is used in this paper does not focus on the information itself (whether the information has a negative or positive connotation). Instead, the focus is on the mechanics of the gossip paradigm. For example gossip can function or serve to normalize and reinforce moral boundaries (social accountability) and foster a sense of community through shared interests. Thus, the term gossip in this thesis is understood as a peer-to-peer mechanism for disseminating information in social communities.

The gossip paradigm is also important to the *SQWhere* application to form a type of collaborative filter, which attempts to determine social rank in the *SQWhere* community. Investigating "collaborative filters" led to the term reputation system[13], which through a collection of opinions (gossip) those community members hold each other accountable and determine other member's

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[13] Reputation systems are often useful in large online communities in which users may frequently have the opportunity to interact with users with whom they have no prior experience or in communities where user generated content is posted like YouTube or Flickr. In such a situation, it is often helpful to base the decision whether or not to interact with that user on the prior experiences of other users.

social rank. Today's online reputation systems are computer-based technologies that make it possible to manipulate in new and powerful ways an old and essential human trait. The *SQWhere* team understood gossip as the aggregated opinions of users that would provide the measure of trust necessary for social interactions to flourish within the *SQWhere* application.

The role of gossip

Town squares are generally filled with conversation. Some of it relates to goods and products, but people meet to share news, opinion, and gossip. Gossip is a type of hidden or privileged knowledge and its fundamental purpose is to be shared through storytelling. When we look at just how and why (and amongst whom) gossip is shared, we find that there's more going on than most social software, for instance, captures. Gossiping is a learned behavior. For example, people learn what sort of gossip might be shared with other people (or should be kept from them), what kind of gossip cements friendships (or destroys them), and how gossip has strategic and tactical uses. Gossip lives within a complex of social relations and meanings. Gossip acts as a social barometer. Through sharing knowledge, we constantly assess where others and ourselves fit within social circles. Today, the buzzword used to describe this gossip feedback loop or knowledge exchange is "collective intelligence". Henry Jenkins, one of the leading academics in this area states "What holds a collective intelligence together is not the possession of knowledge— which is relatively static, but the social process of acquiring knowledge— which is dynamic and participatory, continually testing and reaffirming the group's social ties" (54).

Gossip as a metaphorical device

During the research phase of *SQWhere* we used this gossip paradigm (the method of knowledge exchange) as a metaphorical device. Using the metaphor of gossip we created the framework (and exposed motivating factors) for how and why users would share stories (media items). The obvious parallel between gossip and storytelling is the exchange of knowledge. One case study we examined that best demonstrated gossip as "knowledge exchange" was the digital social software called Facebook. Facebook users can update their public profile information and change their status from "single" to "married" and vice versa to inform their "friends". Users can also exchange knowledge by "posting" messages to member's "message walls", such as activity updates or event invitations. Gossip is fundamental to Facebook's software and its infrastructure.

Facebook and other similar case studies (social softwares) exposed a universal aspect of gossip, namely "ranking and reputation". Ranking and reputation models led to significant impacts in the design concepts of *SQWhere*. For example, after a user engaged a *SQWhere* story (media items) they would have the option to "rate it" (based on a set of criteria). This would create a global rank and position, for both the original storyteller (author) and for the story itself. Other members in the *SQWhere* community would regulate content and members, in a democratic fashion, allowing the most popular stories and storytellers to rise to the top. This community-based filtering system would dictate which stories (by rank) get exposure, and which members (by reputation) get featured. In his book, *Smart Mobs*, Howard Rheingold states "ranking and reputation systems have been fundamental to social life for a long time. In circles of close friends, everyone knows everyone, and everyone's biography is an open book both in the on and offline world. Gossip keeps us "in the loop" and up to date on who to trust, who other people trust, who is important, and who decides who is important" (129).

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Systems of ranking and reputation are not new and have been well established, specifically as a tool and resource in interaction design. Many digital social networking environments or peer-to-peer networks use ranking and reputation systems, popularized by such companies as Ebay, Amazon, Google, Flickr, Epinions, and most online community-based games (i.e. SecondLife and World of Warcraft). What is important to note as it relates to the *SQWhere* application, is how organically rooted gossip (ranking and reputation) is within the framework of storytelling and how the metaphor of gossip inspired design exploration which led to potential system designs, such as content filtering. Furthermore, gossip was the gateway to explorations that influenced other design systems and concepts including user features, interactions, and the visual design of *SQWhere*.

When we talk about gossip, we are talking about boundaries between people and between social groups. But we are also talking about other sorts of boundaries— those that denote norms, conventions, expectations, and limits to inquiry and openness. What is important about boundaries is that we know they are there.

BOUNDARIES

The role of boundaries

One of the physical attributes of a town square is its boundary. Boundaries are borders that

enclose a space and define geographic boundaries, which can often be seen by differences in

land use on either side. Boundaries can also define ephemeral or symbolic boundaries such as

political perspectives, legal jurisdictions (governments), and social class and norms— this is

particularly true of agoras (page 28). For the *SQWhere* team, using boundaries as a metaphor

and building off of the ethnographic research and findings led to several discoveries. The primary

discovery is that boundaries affect how a person interacts in a social space by the limitation and

expectations of that space.

Limitations and expectations play a specific and important role in Interaction Design, specifically

when designing interfaces. The perception theorist J. J. Gibson brought about radical changes in

the way we think about limitations and expectations with his theories of affordances and direct

perception. Gibson called the perceivable possibilities for action affordances (Gibson 1979). In

short, Gibson claims that we perceive possibilities for action (i.e. surfaces for walking, handles for

pulling, space for navigation, tools for manipulating, etc). Gibson's theories have been understood

and used as methodologies in both academic and design communities for over 50 years. Today

when designing digital interfaces it is becoming more important to understand, that "affordances

and perceptions" are enhanced by the use of metaphor. We found through our research that the town square offers unique social and physical affordances, such as boundaries. For example, the *SQWhere* application would convey specific expectations relating to a town square, such as socializing, conversing, playing a game, orientation, etc. Within *SQWhere* a user would not expect to drive a Formula 1 racing car in a digital simulation game or answer email or make reservations for a flight. The metaphor of a town square will inform the user of certain affordances— what the application will do, and more importantly, what it will not do. These specific town square affordances create a "boundary of expectations", a framework of understanding. Because boundaries connote the container in which things are done differently or the limits to where things are done in one way, they are social constructs. This directly relates to Lefebvre's work to define "the production of space" – that is, the ways that specific constructions of social space play constitutive roles in the production and reproduction of social relations, rather than merely serving as neutral settings within which more properly historical processes of struggle, transformation, and reaction play out.

Boundaries also are constructed and maintained by people's mental maps, which divide home from work, or the familiar from the unfamiliar. According to Joel Migdal, mental maps incorporate elements of the meaning people attach to spatial configurations and their cognitive ideas about how the world is constructed (7). The town square metaphor is a reflective and cognitive construction of the relationship to the "physical object" (town square). People do not directly experience the town square as town square; it's a complex construct of multiple interpretations from a person's individual experiences and mental maps. That is, the world is organized and interpreted according to the meanings and interpretations of objects. Migdal continues "people draw their mental maps by configuring the world as familiar and unfamiliar spaces. They are thus constantly navigating, searching for those "manners of acting" that can delineate configurations of spaces where they feel that they are, or should be, relatively safe, places that somehow feel familiar and different from the chaotic sense of the totally unfamiliar (9).

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All space needs limiting dimensions to make it manageable, understandable, familiar,

comfortable, and believable; this is arguably one of the greatest challenges of any digital space,

specifically the Internet. This was *SQWhere's* greatest challenge as well: to create a "sense" of

dimensions or boundaries in the digital space. These concerns became prevalent and more

challenging when our investigation delved into mapping, wayfinding, and orientation.

Boundaries as orientation

Parallel to offline life, the spatial dimensions in online communities are important for the

individual's navigation, relation, and communication. Stine Gotved comments on spatial

dimensions in online communities; "the interface serves as a visible and ontological space on the

screen, a shared common spot in the vast cyberspace. The social space is mainly

epistemological, based on the individual's interpretations of social interactions. The metaphorical

space is purely epistemological, based on reconstructed reality and geography, and evokes the

sense of a place" (2002). Removing the real-world limitations or boundaries that are placed on

social or collaborative behavior by factors such as language, geography, background, and

financial status, could be one of the strongest benefits of the digital town square, and social

softwares in general.

Having the knowledge that location[14] and boundaries would be fundamental to the *SQWhere*

application resulted in investigating how people navigate, orientate and engage wayfinding

methods. The investigation led to explorations into various visual mapping techniques and maps,

as potential interface designs. Maps provide information on the existence, the location of, and the

distance between ground features, such as places and routes of travel. The *SQWhere*

development team has found in the digital space, "map interfaces" are providing hybrid uses and

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[14] The user's proximity (GPS location) to *media items* and the ability to tag (upload and download) location-specific media; vice versa.

more interactive ways to delve for information. Through our prototyping experiments[15] we found the user was not only using the map interface to locate media items, but using the map itself as a wayfinding device to navigate the environment (fig. 10). This hybrid use led to several aesthetical and information-based design questions. Our main concern was to survey how much information and map detail would be needed to allow users to navigate their environment effectively (as a secondary function) and yet, still have the media items and their location as the primary focus.

(fig. 10) Paper prototyping.

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[15] We developed a prototype using paper map prints taped on the back of a Blackberry mobile phone. Printed on three individual sheets of paper were simulated location-based stories and images. The user navigated the environment using the map and when near the "tagged location" a *SQWhere* team member called the Blackberry with another mobile. The Blackberry's ringer was set to vibrate which simulated the haptic action of a *SQWhere* story alert. The user then matched the colored story to the colored location mark on the map and experienced the *SQWhere* story.

Researching mapping and geography-based navigation surfaced a term introduced by Kevin Lynch called *imageability*[16]. Imageability is the quality of a physical object, which gives an observer a strong, vivid image (Lynch 1960). Lynch concluded that a highly "imageable" city would be well formed, would contain very distinct parts, and would be instantly recognizable to the common inhabitant." (1960). We have used this theory as framework and support in *SQWhere's* map interface design iterations. For example, it led to evaluating certain design aesthetics, such as whether the interface should be detailed enough to represent street numbers or could it have a minimalist approach that only displays the shape of buildings. Lynch's theory supports the later, the minimalist approach. Testing this minimalist interface in the real environment through paper prototyping solidified the use and methodology of this theoretical framework.

> A theoretical framework can be conceived of as a form of boundary. However, it is only a temporary boundary. The conceptual mechanics of a theoretical framework are as such: to incorporate certain theoretical concerns in one's reading of a situation (design or otherwise) far from limiting the potentialities, the situation has in fact introduced new views to the situation. As such, a theoretical framework becomes a device in which impasses may be trespassed. (Chan)

Boundaries lead to new orientations. Using Kevin Lynch's five components of imageability actually allowed the *SQWhere* development team new venues of exploration for what and how a 21st century town square may be constituted. Using the metaphor of "physical boundaries" as a visual marker or design element in the interface design uses the "physical measure" of a town square. This technique introduces a way of delimiting the amount of physical space (boundary)

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[16] Kevin Lynch was a significant contributor to city planning and city design in the twentieth century. Lynch also explains that a well-formed city is highly reliant upon the most predominant city element, paths. Similarly, edges, districts, nodes, and landmarks are favorable contributors to imageability if they are meaningful, distinct, and not confusing. These elements, when placed in good form, increase human ability to see and remember patterns, and it is these patterns that make it easier to learn.

that the user could otherwise perceive in the actual environment, therefore reducing cognitive load of orientation, mapping memory, or as Lynch describes imageability.

Technology is "blurring" the boundaries of the digital and physical space and creating new hybrid spaces that are establishing cultural nomenclatures, such as mediaspaces, thirdspace, secondlife, etc. These hybrid spaces are presenting new and exciting challenges for interaction design. Investigating these hybrid spaces led to discovering several discussion questions that guided some of the *SQWhere* team's thinking and have strong relevance to this thesis: 1) *"to what extent have we moved beyond the metaphor of space as container, to cultural logics in which there are no absolute boundaries?* ("Spaces of Identity"), and 2) *"to what extent are reconfigurations of social space accompanied by redefinitions of the space of subjectivity, of the "inner world" of the individual defined by its opposition to the public and the social?* ("Spaces of Identity"). As a research and development team with a goal of producing social software, our responsibility must be in attempting to answer these questions and to discover other potential implications.

IMPLICATIONS

Research and exploration

As a result of our exploration with town squares, we found a recurring subject matter— the public sphere vs. the private sphere. Acknowledging that it sat outside the scope of this thesis, I did not directly address it in this paper. Concerns stemming from this subject matter that could potentially be explored include; identity, open vs. closed friend or member networks, security, avatars, content rights and ownership, and privacy. Also, during the writing of this thesis I was introduced to readings and academic scholars focusing on the public and private sphere that has led to the inclusion of a quote at the opening of this paper. The quote summarizes the thoughts of social theorist and philosopher Jürgen Habermas. Habermas is best known for his work on the concept of the public sphere, which he has based in his theory of communicative action. Habermas also examined the political public sphere and how the self-referential character of the practice of communication in civil society helps reproduce and stabilize its communication structures. It is *SQWhere's* ambition to model aspects of Habermas' theory to create a "transformative experience" for users in local urban spaces. The *SQWhere* development team is currently researching and developing these and other concepts on an on-going basis.

Metaphor and culture

Our research of town squares spanned the globe from Europe to South America to our local neighborhoods in Vancouver. Having a global understanding and awareness of town square has raised certain cultural issues. We realized that different cultures have different conceptual frameworks of town squares. The town square concept may have different meaning and expectations for one culture than another. This could lead to culturally specific limitations and constraints or, in some cases, could render the *SQWhere* concept inapplicable. Reiterating the example of the desktop interface metaphor— if a culture has never used a desk, then the desktop metaphor would be meaningless (Saffer 23).

CONCLUSION

The core philosophical questions in this thesis generated a critical exploration of the digital space, mental space, and physical space using the metaphor of a town square. This metaphorical approach led to a deeper and more meaningful use of creative thinking, ideation, design research and methodologies throughout the design process of *SQWhere*. The town square metaphor also led to alternative ways of engaging the user on a physical, digital and mental level, that provided multiple perspectives and understandings of sociality. The town square metaphor offered insight into interactions that have evolved in public spaces over centuries, the boundaries that contain them, the networks that maintain them, and the space itself that shapes them. These insights directly informed how the *SQWhere* design envisions new technologies functioning in physical space to support meaningful social interactions. Features such as the red square overlays (interface buttons representing the user's social network and proximity to other members) and scenarios such as gossip (location-based peer-to-peer knowledge exchange), build directly out of an understanding of physical boundaries.

Design methods such as metaphor remain an important part of how we process information, on screen or off. Using the metaphorical interpretation of a town square guided the team's imagination beyond the constraints of function-driven design, and focused on a higher level of interaction design purpose. SQWhere's higher-level design focus meant designing with an emphasis on user goals and experience, and evaluating potential design outcomes in terms of usability and affective influence. This design purpose led to a richer and more holistic understanding of SQWhere's potential social impact and application. More importantly, we understood that metaphors are instrumental to facilitate learning, and to the formation and maintenance of new ideas and concepts.

Digital social software is a tremendously exciting area for interaction design that has the potential to overcome many of the limitations and failings of traditional online communication and community systems. Understanding of human-to-computer interaction and how to design for it is constantly evolving. The importance of social interactions in interaction design is increasingly clear and this requires the designer to have a more engaging, holistic, integrated design approach to the entire development process.

It is clear that the design concepts presented in this paper are preliminary and in a conceptual stage. In their current state, they mainly express the insights gained through using the town square metaphor. *SQWhere* as a product is not ready for market. *SQWhere's* value is in the fact that it allowed for this exploration of metaphor to aid and inspire creative thinking in the design. Furthermore, it provided a novel way of looking at the complex phenomena of digital social networks and human agency.

Ultimately, this project is an example of how a metaphorical approach to exploring a concept can guide a user-centered design process. It has shown this approach to be rich and meaningful and to have the potential to provide fresh interaction design concepts.

REFERENCES

Boal, Augusto. The Rainbow of Desire: The Boal method of Theatre and Therapy. NY: Routledge. 1995.

"Boundary." Encyclopedia Britannica. 2008. Encyclopedia Britannica Online. 08 May 2008.
<http://www.britannica.com/EBchecked/topic/75619/boundary>.

Chan, Patrick. Personal Interview. 22 February 2008.

Couldry, Nick. & McCarthy, Anna. MediaSpace: Place, Scale, and Culture in a Media Age. NY: Routledge, 2004.

Buxton, Bill. "It's 1927 All Over Again." Webinar Lecture. IDSA/Microsoft Designer Spotlight: Bill Buxton. Microsoft Office Live Meeting. February 20, 2008. March 1, 2008.

Camp, John McK., II. The Athenian Agora: A Short Guide to the Excavations. Picture Book No. 16. American School of Classical Studies at Athens, in collaboration with the Parkard Humanities Institute. Athens. 2003

"Computer Ethics." Bynum, Terrell. Winter 2001. The Stanford Encyclopedia of Philosophy. Ed. Edward N. Zalta. Stanford University. Nov 27, 2001. November 26, 2007.
<http://plato.stanford.edu/archives/win2001/entries/ethics−computer/>

"Enrique Peñalosa." Webpage. Project for Public Spaces (PPS). November 26, 2007.
<http://pps.org/info/placemakingtools/placemakers/epenalosa>

Gibson, James, J.. The Ecological Approach to Visual Perception, Hillsdale, NJ: Lawrence Eribaum Associates. 1986. (Original work published 1979).

"Gossip." Merriam-Webster Online Dictionary. 2008. Merriam-Webster Online. 9 May 2008
<http://www.merriam-webster.com/dictionary/gossip>

Gotved, Stine. Spatial Dimensions in Online Communities. University of Copenhagen, Denmark. Space and Culture, Vol. 5, No. 4, 405-414. Sage Publications 2002. February 27, 2008.

Humphrey, David. Journal Notes. MITACS Internship. Project SQWhere. 06 September, 2007.

Jenkins, Henry. Convergence Culture: Where Old and New Media Collide. New York and London: New York University Press, 2006.

Lakoff, George and Mark Johnson. Metaphors We Live By. Chicago: University of Chicago Press, 1980.

Lynch, Kevin. The Image of the City. Cambridge, MA: The MIT Press, 1960.

MCKeon, Michael. Parsing Habermas's "Bourgeois Public Sphere". Criticism - Volume 46, Number 2, Spring 2004.

Merrifield, Andy. Henri Lefebvre: A Critical Introduction. New York, NY: Routledge, Taylor & Francis Group, 2006.

Migdal, Joel S. Boundaries and Belonging: States and Societies in the Struggle to Shape Identities and Local Practices. University of Washington. Cambridge University Press, 2008.

Rheingold, Howard. Smart Mobs: The Next Social Revolution. Cambridge, MA: Persus Books Group, 2002.

Saffer, Dan. The Role of Metaphor in Interaction Design. The School of Design Carnegie Mellon University, A thesis submitted for candidacy for the degree of Master of Design in Interaction Design. Committee: prof. Shelley Evenson, Department of Design. Pittsburg, Pennsylvania. May 2005.

Schön, Donald. The Reflective Practitioner. How professionals think in action . London: Temple Smith, 1983.

"Spaces of Identity." Webpage. Eighth Annual Cultural Studies Conference. March 29, 2003. <http://www.indiana.edu/~cstudies/main/conference5.html>

"Ten Principles for Creating Successful Squares." Webpage. Project for Public Spaces (PPS). December 16, 2007. <http://www.pps.org/squares/info/squares_articles/squares_principles>

Thackara, John. In the Bubble: Designing in a Complex World. London, England: The MIT Press, 2006.

Williams, Raymond. (1975). Television: Technology and Cultural Form. New York: Routledge, 2003.

BIBLIOGRAPHY

Abrams, Janet and Hall, Peter (et al.). Else/Where: Mapping. MN: University of Minnesota Design Institute, 2006.

Bennett, Audrey. Design Studies: Theory and Research in Graphic Design. NY: Princeton Architectural Press, 2006.

Bennett, Audrey (et al.). Design Studies" Theory and Research in Graphic Design. NY: Princeton Architectural Press, 2006.

Bogost, Ian. Unit Operations: An Approach to Videogame Criticism. MA: The MIT Press, 2006.

Buchanan, Richard and Margolin, Victor. Discovering Design: Explorations in Design Studies. London: The University of Chicago Press, 1995.

Burnett, Ron. How Images Think. England: The MIT Press, 2004.

Buxton, Bill. Sketching User Experiences. CA: Morgan Kaufmann, 2007.

Cooper, Alan. The Inmates Are Running The Asylum. Sams Publishing, 2004.

Cooper, Alan (et al.). About Face: The Essentials of Interaction Design 3.

Couldry, Nick and McCarthy, Anna. Mediaspace: Place, Scale and Culture in Media Age. NY: Routledge, 2004.

Coupland, Douglas. City of Glass. Canada: Friesens, 2000.

Cross, Nigel. Designerly Ways of Knowing. Berlin: Springer-Verlag AG, 2007.

Diamond, Jared. Collapse. England: Penguin Books, 2005.

Fiske, John. Introduction to Communication Studies. NY: Routledge, 1990.

Gladwell, Malcolm. Blink: the power of thinking without thinking. NY: Hachette Book Group, 2005.

Hawken, Paul. Blessed Unrest: How the Largest Movement in the World Came into Being and Why No One Saw It Coming. The Viking Penguin, a member of the Penguin Group, 2007.

Hayles, N. Katherine. How We Became Posthuman. London: The University of Chicago Press, 1999.

Hester, Randolph. Design for Ecological Democracy. England: MIT Press, 2006.

Jamieson, Kathleen and Campbell, Karlyn. The Interplay of Influence; News, Advertising, Politics, and the Mass Media. Wadsworth Publishing Company, 1997.

Jenkins, Henry. Convergence Culture: Where Old and New media Collide. NY: New York University Press, 2006.

Jenkins, Henry. Fans, Bloggers, and Gamers: Exploring Participatory Culture. NY: New York University Press, 2006.

Kantor, Paul and Savitch, H.V. Cities in the International Marketplace. UK: Princeton University Press, 2002.

Kuniavsky, Mike. Observing The User Experience: A Practitioner's Guide To User Research. CA: Morgan Kaufmann Publishers, 2003.

Laurel, Brenda. Design Research: Methods and Perspectives. England: MIT Press, 2003.

Lawson, Bryan. How Designers Think: The design process demystified. MA: Architectural Press, 2006.

Lawson, Bryan. What Designers Know. MA: Architectural Press, 2004.

Lefebvre, Henri. The Production of Space. English Translation by Donald Nicholson-Smith. UK: Blackwell Publishing, 1991.

Lidwell, William (et al). Universal Principles of Design. Rockport Publishers Inc, 2003.

Maeda, John. The Laws of Simplicity: Design, Technology, Business, Life. England: MIT Press, 2006.

Mau, Bruce. Lifestyles. Phaidon, 2005.

Mau, Bruce and Rockwell, David. Spectacle. Phaidon, 2006.

McCloud, Scott. Understanding Comics: The Invisible Art. NY: Harper Collins, 1993.

Michel, Ralf (et al.). Design Research Now: Essays and Selected Projects. Berlin: Birkhauser Verlag AG, 2007.

Morris, Desmond. The Human Zoo: A Zoologist's Classic Study of the Urban Animal. NY: Random House, 1996.

Morley, David. Home Territories: Media, Mobility, and Identity. NY: Routledge, 2000.

Norman, Donald. The Design of Everyday Things. NY: Basic Books, 1988.

Norman, Donald. The Design of Future Things. NY: Basic Books, 2007.

Pink, Daniel H. A Whole New Mind: Why Right-Brainers Will Rule The Future. NY: The Berkley Publishing Group, 2006.

Sharp, Helen. Interaction Design: Beyond Human-computer Interaction. England: John Wiley & Sons, 2007.

Simon, Herbert A. The Sciences of the Artificial. MIT Press, 1996.

Sullivan, Luke. Hey Whipple, Squeeze This. NY: John Wiley & Sons, Hoboken, 2003.

Tapscott, Don and Williams, Anthony. Wikinomics: How Mass Collaboration Changes Everything. England: Penguin Books, 2006.

Tuan, Yi-Fu. Space and Place: The Perspective of Experience. MN: University of Minnesota Press, 1977.

Visocky O'Grady, Jenn and Ken. A Designer's Research Manual: Succeed In Design By Knowing Your Clients And What They Really Need. Rockport Publishers, 2006.

Weisberg, Robert. Creativity" Genius and other myths. NY: W.H. Freeman and Company, 1985.

Wilson, Edward. Consilience: The Unity of knowledge. NY: First Vantage Books Edition, 1998.

Wilson, Stephen. Information Arts: Intersections of Art, Science, and Technology. MA: The MIT Press, 2002.

Papers

Aagaard, Sune and VanPatter, GK. <u>AskNextD, Design 1.0, 2.0, 3.0: Making Sense of Design Now.</u> NextDesign Leadership Institution, 2005.

Branting, Karl L. <u>A Generative Model of Narrative Cases.</u> Department of Computer Science, University of Wyoming.

Christensen, Tamara. <u>Assessing the Effect of Ethnographic Observation on Creativity For the Birds.</u> www.innovationjournal.org

Clayton, Richard. <u>The Message is the Medium.</u> Creative Review, February, 2002.

Crawford, Chris. <u>Artist and Engineers as Cats and Dogs: Implications for Interactive Storytelling.</u> Computer & Graphics 26, pg 13-20, 2002.

Daniels, Dieter. <u>Strategies of Interactivity.</u> 2007.

Design Research Society. <u>Design Research Quarterly. V.2:1 January 2007.</u> ISSN 1752-8445. www.designresearchsociety.org

<u>Design Observer: writings about design & culture.</u> 2007

Don, Abbe. <u>Narrative and the Interface.</u> The Art of Human-Computer Interface Design, Apple Computer, 1990.

Donovan, Brendan (et al.). <u>Nature Trailer: Physically Navigate Stories in the Wild.</u> Everyday Learning, Story Networks Group, Media Lab, Dublin Ireland.

Espen, Aarseth. <u>Playing Research: Methodological approaches to game analysis.</u> University of Bergen, MelbourneDAC, 2003.

Gabora, Liane. <u>Cognitive Mechanisms Underlying the Creative Process.</u> Center Leo Apostel for Interdisciplinary Studies, Free University of Brussels.

Klastrup, Lisbeth. <u>Towards a Poetics of Virtual Worlds- Multi-User Textuality and the Emergence of Story</u>. IT University of Copenhagen, April 2003.

Klastrup, Lisbeth. <u>A Virtual World Aesthetics: Theorising Multi-user Textuality</u>. Department of Digital Aesthetics & Communication, IT University of Copenhagen, 2002.

Lorinc, John. <u>Driven to Distraction: How our multi-channel, multi-tasking society is making it harder for us to think.</u> April 2007.

Nakakoji, Kumiyo (et al.) <u>Interaction Design as a Collective Creative Process.</u> PRESTO, JST, KID Laboratory, RCAST, University of Tokyo.

Newman, Ken. <u>The Case for the Narrative Brain.</u> Proceedings of the Second Australasian Conference on Interactive Entertainment, Sydney, Australia. Department of Creative Technologies, University of Portsmouth.

Oviatt, Sharon. <u>Ten Myths of Multimodal Interaction.</u> Communications of the ACM, Vol 42, No 11, November 1999.

Poliakov, Andrew V. (et al.). <u>Integration and Visualization of Multimodality Brain Data for Language Mapping.</u> Structural Informatics Group, Department of Biological Structure, University of Washington, Seattle, Washington USA.

Rashid, Karim. <u>The Beauty of Business – The Business of Beauty.</u> 2007.

Richards, Russell. <u>Users, Interactivity and Generation.</u> New Media & Society. Sage Publications, Vol 8(4), 2006.

Ryan, Marie-Laure. <u>Beyond Myth and Metaphor- The Case of Narrative in Digital Media.</u> Presented as a paper at the 2001 Computer Games & Digital Textualities conference in Copenhagen.

Ryan, Marie-Laure. <u>Peeling the Onion: Layers of Interactivity in Digital Narrative Texts.</u> Based on a talk presented at the Conference - Interactivity of Digital Texts, Münster, Germany, May 2005.

Seago, Alex and Dunne, Anthony. <u>New Methodologies in Art and Design Research: The Object as Discourse.</u> Design Issues, Summer99, Vol. 15 Issue 2.

Smith, Jonas Heide. <u>Framing the Ludic Commons: Cooperation and Conflict in Multiplayer Games.</u> The IT University of Copenhagen, Department of Digital Aesthetics and Communication, Study Plan, Version 9, March 2004.

Strasser, Susan. <u>Making Consumption Conspicuous: Transgressive Topics Go Mainstream.</u> 2002.

Stubblefield, William A. <u>Narrative Structure in Virtual Collaborative Environments.</u> Sandia National Laboratories, SIGGROUP Bulletin, Vol 21, No 1, April 2000.

Thrift, Nigel. <u>Re-inventing invention: new tendencies in capitalist commodification.</u> Economy and Society, Volume 35, Number 2, May 2006: 279-306.

Von Stamm, Dr. Bettina and VanPatter, GK. <u>Organizational Innovation: Exploring Avenues of Approach.</u> NextD Journal: ReReThinking Design, Issue 6, Conversation 6.3. NextDesign Leadership Institution, 2005.