Libraries as Co-working Spaces: Understanding User Motivations and Perceived Barriers to Social Learning

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Abstract

This paper aims to inform design strategies for smart space technology to enhance libraries as environments for co-working and informal social learning. The focus is on understanding user motivations, behaviour, and activities in the library when there is no programmed agenda. The study analyses gathered data over five months of ethnographic research at ‘The Edge’ – a ‘bookless’ library space at the State Library of Queensland in Brisbane, Australia, that is explicitly dedicated to co-working, social learning, peer collaboration, and creativity around digital culture and technology. The results present five personas that embody people’s main usage patterns as well as motivations, attitudes, and perceived barriers to social learning. It appears that most users work individually or within pre-organised groups, but usually do not make new connections with co-present, unacquainted users. Based on the personas, four hybrid design dimensions are suggested to improve the library as a social interface for shared learning encounters across physical and digital spaces. The findings in this paper offer actionable knowledge for managers, decision makers, and designers of technology-enhanced library spaces and similar collaboration and co-working spaces.

Keywords: Library as a Place, Technology Enhanced Learning, Library 2.0, Commons 2.0, Co-Working, Urban Informatics
Introduction

Literacy in the 21st century requires a different set of knowledge and skills compared to literacy in the previous century. In today’s knowledge economy, core skills include creativity, interdisciplinary thinking, problem solving, and the ability to collaborate with others – skills that cannot be learned easily from books, but rather through learning-by-doing and social interaction. Libraries, as facilitators of education and learning, have been challenged to reshape their approaches to meeting these changing needs. Scholars have outlined the significance of libraries as places that accommodate social activity (Gaus and Weech, 2008, Leckie and Hopkins, 2002, Pomerantz and Marchionini, 2007, Shill and Tonner, 2004, Sinclair, 2007, Weise, 2004), community gatherings and meetings (Aabo and Audunson, 2012, Aabo et al., 2010, Audunson, 2005, Audunson et al., 2011), and social learning and collaboration (Sinclair, 2007). In practice, we see more and more libraries removing bookshelves to make way for infrastructure and interior design elements that invite such activities (LaPointe, 2006, Martin and Kenney, 2004, McDonald, 2006, Shill and Tonner, 2003), such as lounge areas, couches, meeting rooms, whiteboards, projectors, video consoles, and cafés and food bars.

However, libraries mostly do not cater for a social or collaborative learning experience per se. Rather, their curation efforts focus on the aforementioned spatial and infrastructural elements that visitors might or might not end up utilising as part of a collaborative learning journey; e.g. student study groups in a library.

The focus of this paper is on the library as a place when there is no agenda or programmed activities (e.g. workshops, presentations, exhibition events). In particular, it aims to shed light on the following two sets of questions: (1) How do library users make use of collaborative library spaces? How do they experience social learning as a result of working in the library? What are the perceived challenges for social learning? (2) What are adequate design strategies for smart space technology innovation, such as ubiquitous computing and ambient media, to overcome the identified challenges and facilitate social learning among library users?

This paper presents results from a case study at The Edge, an innovative ‘Digital Culture Centre’ and prototype concept by the State Library of Queensland (SLQ). As a ‘bookless’ library space, the vision of The Edge is to provide a co-working space where social learning emerges as a result of people sharing the same workspace for their creative activities. It is conceived as a public community centre for peer collaboration and creativity around digital culture and technology, i.e. a place for people to meet, explore, experience, learn and teach, and share and discuss topics around creative practices in various areas related to digital technology.

The Edge provides technical infrastructure, multimedia equipment, and collaboration spaces. Most prominently, however, it envisions a community of users to help, learn, teach, and collaborate with
each other. The Edge’s management describes this as “…curation with a small ‘c’ rather than a capital ‘C.’ It is that mix of hard programming where we have four or five key areas where we want to program in, whether it is robotics, or music or whatever it might be, but that we also allow ourselves enough time and space not to be too prescriptive about the curation… and to actually let people come together and do that curation themselves as well.”

Launched in February 2010 as the Queensland Government’s flagship Digital Culture Centre, The Edge is the first library initiative of its kind in Australia. With its focus on social learning and collaboration, it serves as a cutting-edge case study to investigate the current status as well as explore future opportunities of social learning among visitors in libraries and other informal learning environments.

### Relevant Work

Social learning is a result of interaction and shared encounters with other people. This section discusses previous studies on shared encounters and meetings between library users outside of programmed library agendas and events.

#### Libraries as Meeting Places

Aabo et al. (2010) identify local libraries as places that host six different types of meetings and social encounters between people, three of which include joint activities with friends and family, serendipitous encounters with neighbours and other acquaintances, or encounters with local community information. Aabo and Audunson (2012) find that such meetings vary significantly in their degree of interaction and instrumentality. Thereby, the meetings they list as examples of a high degree of interaction are among users who already knew each other before they came to the library, e.g. a group of friends chatting over a cup of coffee or students collaborating on an assignment (p.148). On the other hand, interactions between strangers and “users with different cultural backgrounds were in most cases indirect and nonverbal” (2012, p.146). Based on these observations, Aabo and Audunson suggest that meetings and interactions in the public library primarily contribute to bonding social capital (strengthening the links between already integrated groups), rather than bridging social capital (creating new links between unacquainted others) (cf. Putnam, 2001). Bridging social capital was rarely observed, and if so, only during library-initiated and organised events.

They further claim that the library stands out as a typical public place in the public realm where the majority of other users are regarded as strangers, and where people mostly work within their “individual bubbles” (2012, p.143), many even weaving “an individual net around themselves that does not invite communication with others” (2012, p.143). In accordance, McKechnie et al. (2004) find users marking their work space with coats, bags, notebooks, and other possessions (p. 44). It
appears that library users perform their individual activities next to each other, rather than with each other, which Aabo and Audunson (2012) compare to the social setting typically found in fitness studios. On the other hand, McKechnie et al. (2004) report observations of social interactions between strangers. The examples listed indicate that these conversations were triggered by obvious common interests between people (e.g., a particular book, or mothers with children), when users requested help from other users (e.g., how to use a computer) or random informal conversations (e.g., when queuing for a coffee) (McKechnie et al., 2004).

**Low-intensive and high-intensive meetings**

Aabo et al. (Aabo and Audunson, 2012, Aabo et al., 2010) point out a subtle yet crucial quality of the library as perceived by its users: even though people mainly engage in individual work or isolated meetings with acquainted others, the library as a place exposes them to a diversity of people, activities, and information that they would not encounter if they worked at home or from a regular office space. This quality of the library comes to the fore, for example, when users take a break and stroll around serendipitously browsing through brochures, community information, and other materials, or see other individuals and groups working on projects that are different from their own. The library provides rich opportunities for people to explore and randomly stumble upon new information across physical (book, magazine, newspaper), digital (website, online archive), or social (librarian) interfaces (Björneborn, 2008, Björneborn, 2010). From this point of view, the goals of this paper are specifically concerned with social interfaces.

Audunson (2005) has coined the term *low-intensive meeting place*, to describe and promote the library as a physical place where highly heterogeneous individuals and groups of people are exposed to each other. Low-intensive meetings describe social situations where a person is exposed to diversity and otherness, e.g., social and cultural beliefs, values, or interests that are different from their own. In contrast, Audunson defines *high-intensive meeting places* as places where people live out and interact around their primary interests, e.g., in the context of a particular subculture, interest, or hobby.

Whether a meeting is low-intensive or high-intensive is subjective and depends on each participant’s background and core interest in life. For a professional photographer participating in a photography club to discuss photography techniques and processes, that meeting is a high-intensive meeting, as photography is part of their core interests in life. For a friend of that photographer who joins serendipitously out of curiosity to learn what photography is all about, that same meeting is a low-intensive meeting, as they are exposed to a topic and subculture that may be quite different from their other core interests in life.

Aabo et al. (2012, p.146) find that libraries function as “arenas” for high-intensive as well as low-intensive meetings. For example, one of their interviewees would choose to work from the public
library rather than the university library due to the rewarding experience of being exposed to a wider age range of people (children, youths, adults, pensioners) and their activities (playing game consoles, reading newspapers, surfing the net, etc.). He appreciates the public library’s quality as a place for low-intensive meetings, i.e. where he is exposed to diversity and ‘otherness.’

In the context of the knowledge economy in the 21st century, the library’s function as a place for discourse, peer collaboration, social learning, and particularly inspiration through and learning from people that are different to ourselves, is more important than ever before. Despite libraries investing a lot of resources in widely open physical architecture and interior design that lowers the barriers for making new connections and being inspired by others, previous research indicates that there is still untapped potential for such low-intensive meetings (Aabo and Audunson, 2012, Aabo et al., 2010). The case study, as described in the following sections, aims to shed light on people’s attitudes, motivations, and perceived challenges of low-intensive meetings, and how smart space technology innovations can address those.

**Case Study at The Edge: A Space Designed with Social Learning and Collaboration in Mind**

The space at The Edge has been architecturally constructed in an open and accessible manner. As the executive manager explained, “the physical architecture of the space is designed with collaboration and open sharing in mind.” While it has several distinct spaces, there is little separation between them (Figure 1). The entrance, foyer, and 11 collaborative lounge spaces (‘window bays’) are essentially one big open environment. The lounges can, if needed, only be divided by semi-transparent curtains, and the computer, audio recording, and physical computing lab (labs 1-3) are separated by transparent glass walls rather than concrete or bricks. The intention of this setup is to facilitate serendipitous discoveries and inspiration among people who work side-by-side.
In addition to its open architecture (Figure 2), the idea of The Edge being a place for collaboration is actively promoted on The Edge website, its brochures, and a welcome sign at the entrance: “We encourage The Edge’s facilities to be used in ways that are constructive towards the development of creative projects, digital education and peer collaboration.”
The Edge's programming provides a range of workshops, presentations, exhibitions, and other events on specific topics, but most of the time it functions as an unscheduled space for co-working with no imposed agenda.

**Methodology**

In an attempt to gather a holistic understanding of the social space at The Edge, we used Lefebvre’s triad of social space (1991) as a conceptual framework to drive the investigations. Lefebvre provides a trialectic lens (Soja, 1996) for spatial thinking, i.e. from a (1) conceived, (2) perceived, and (3) lived point of view. In the context of this study, we regard the conceived space of The Edge as the vision and long-term goals set by the Queensland Government and SLQ as the funders and initiators of The Edge. The perceived space represents the infrastructure, services, and facilities that The Edge as an institution provides to fulfill its purpose and mission, and how those are perceived by its visitors. The lived space represents how individual visitors live, practice, and use The Edge as a social space on an everyday basis, as well as the underlying motivations for their visits.

Following Lefebvre’s trialectic view, we studied different stakeholders of The Edge. To gain an understanding of The Edge’s conceived vision and mission, we interviewed the director and three executive managers of The Edge’s organisational parent department at SLQ, The Edge’s executive manager, as well as three high-level management staff members. We also interviewed seven of the ten Visitor Service Operators (VSO), i.e. operating staff members who are in close daily contact with Edge users. VSOs are also in charge of operating a small coffee and snack kiosk in the foyer of The Edge and, at the same time, function as the main point of contact for users who need to ask for technical assistance, book a computer or work space, or have general questions. Furthermore, we engaged in five months of ethnographic visitor observations with more than 70 informal conversations and 30 in-depth interviews with selected visitors during their informal everyday visits and activities at The Edge. The observations were made at different times and days of the week. Visitors were selected for interviews according to their spatial distribution, activities, distinct behavioural patterns, and personal objects of use such as books, work material, headphones, smartphones, or laptop computers.

All interviewees were offered a free coffee voucher as compensation for their time. The interviews were based on a semi-structured interview guide and audio-recorded for later transcription purposes. Field notes were taken during the visitor observations. For the analysis of the data collection, we borrowed a grounded theory approach (Strauss and Corbin, 1997). We looked for emerging patterns, particularly in regards to people’s motivation for coming to The Edge, what activities they engaged in, and their attitudes towards other co-present users at The Edge.
Findings: Some User Archetypes of Library Spaces

By way of solidifying our findings towards informing future action and design interventions, we have developed five design personas – archetypal users as they emerged from the ethnographic observations and interviews during our fieldwork. Design personas are a common tool in interaction design to “identify significant and meaningful patterns in user behaviour and turning these into archetypes that represent a broad cross-section of users” (Cooper et al., 2007, p. 76). Rather than focusing on different demographics or market segments, personas aim to reflect the various motivations, attitudes, needs, activities, and behavioural patterns of visitors when they use The Edge. The personas do not illustrate real individuals, but rather a “composite user archetype” (cf. Cooper, et al., 2007, p. 82); i.e. a group or subset of visitors with distinct (sometimes extreme) motivational and behavioural patterns. As such, the five personas represent the core distinct motivations, attitudes, behavioural patterns, and perceived challenges in relation to social learning in the case study (Figure 3).

Based on these personas, we later suggest design strategies for smart space technology innovations to overcome the perceived challenges of each persona and enhance social learning and collaboration in public library spaces in general. The personas are also intended as an invitation and tool for other designers to help brainstorming, conceptualising, and designing for smart space technologies in library settings.

Figure 3: Based on ethnographic observations and user interviews, we have developed five Personas that represent the core motivations, attitudes, and behavioural patterns of visitors at The Edge.
Doesn’t-care Claire

Claire uses the Edge as a free access point to computers, the Internet, multimedia equipment, hardware, and software that would otherwise be too expensive to buy (e.g., music studio, computer lab, Adobe Photoshop, etc.). She is not particularly interested in The Edge as a collaboration space (e.g., for meeting, chatting or getting inspired by other users), but rather, comes to The Edge with tunnel vision to use or access a particular resource. Such users we talked to included high-school and university students, unemployed people, pensioners, backpackers, and homeless people.

“Over 70% of that [computer] lab is used by people like guys over 27, definitely over 27. Surfing the net, like YouTube and Facebook. 70% of that lab, and that’s every single day.”

“They don’t work on creative projects… they’re travellers or they are just like people who have passed by. Maybe they are writing or something as well… but talking to people, the majority are here to use the WiFi, just to get connected… not really for anything else.”

(Visitor Service Officers at The Edge)

One of our interviewees, a pensioner in his late 70s, effectively illustrated the ignorance towards the social and collaborative vision of the space. He visits The Edge on a daily basis to read news and e-books in the computer lab, and would regularly complain to staff about students being too loud, who were in fact collaborating on a project for university. To him The Edge is a library, and in his view of a library everyone is supposed to be quiet.

We often met backpackers and homeless people sitting on the concrete ground outside the actual building, utilising the free Wifi and working on their laptops. We sat next to some of these people while working on our own laptops and attempted to engage them in informal chats. Mostly they were just after WiFi access, and had no interest in coming into the building or even using the more comfortable couch and lounge areas. We sensed that many did not know that The Edge is actually part of the library, but perceived it as some sort of Internet café where they are expected to buy a coffee or snack in compensation for using their space and internet access.

What-can-I-do-here Sophia

Sophia is unfamiliar with what The Edge is or what it has to offer. She has heard or read about the Edge, or stumbled in as a serendipitous passer-by. Seeing the space for the first time, she is a bit confused. “What is this place, and what can I do here?” are usually the first questions she asks after entering the building. In contrast to the other institutions at the Cultural Precinct such as the Queensland Museum, the State Library, the Queensland Art Gallery or the Gallery of Modern Art, The Edge has few elements that catch a first-time visitor’s attention. Sophia usually looks around
for a bit, sees people working on laptops and computers, struggles to find any engaging activities, and eventually leaves again. Two VSOs describe their experience with 'Sophia' visitors as the following:

"What is this place, what can I do here? That's definitely one of the most frequent questions we get from visitors… and it’s kinda hard to explain in one-sentence really what we do here at the Edge."

"When they walk in [for the first time], everyone is really always confused. They’re just looking around, but they don’t really know what the space actually does."

"…just like two girls just before, they go oh we’re just sneaking around. And I go, no don’t sneak around, I will tell you about the place. So there is this sneaky element here. I reckon 50% of the time that’s how people find out about the place, sort of wander in and then they explore […] and then they walk out again unless you stop them."

(Visitor Service Officers at The Edge)

In terms of social learning, the barrier for Sophia is that she does not recognise the purpose and function of the space. As a ‘bookless’ library, the space lacks means and perceived opportunities for engagement.

Therefore, what can libraries do to increase awareness and opportunities for social learning?

**Learning-Freak Fred**

Fred likes the idea of The Edge as a centre for creative individuals to hang out, meet, and collaborate on projects related to digital culture and technology. As someone who is keen to be inspired and learn new things constantly, he knows that interaction and collaboration with like-minded others is crucial to his creativity. A singer and sound artist, for example, who is a weekly visitor at The Edge, stated that as an artist “it's about meeting other people, and supporting them and they support you […] I mean you have to work on it by yourself. You can try to do it in a vacuum, but it's much easier doing it with other people around.” However, people like Fred find it extremely difficult to identify peers that have complementary skills or interests to his. As a VSO reports, “I remember when we first opened, this guy came in… he is like… oh I am here for the networking. And we were all like... ahb okay yeeehah [laughing], well just hang around mate, and talk to the next person that walks through the front door.”

There are two main issues as perceived by users like Fred. The first issue is that there is no sense or transparency about other people’s backgrounds, interests, or potential topics to learn about or collaborate on. There is a lack of opportunity to identify and access skills and social capital within the user community.

“I think that’s probably one of the criticisms that I have of [The Edge], although there are these interesting people who are there, you don’t necessarily know that they are there because you don’t know what resources are available to you.”
“For me it’s about communicating with other people in the industry or other industries. I mean that was one of the things I really wanted to get out of the Edge. In the fact that I could say, I wanna talk to an electrical engineer to proof this. And I didn’t see that that was available to me through the Edge. Even if it possibly was, I didn’t find those facilities through it.”

The second issue is that other users in the space appear as strangers, rather than potential collaboration partners. When asked about their actual relationships and interactions with other users, people generally state that they perceive a social barrier to approaching other users. Social interaction with unacquainted others does not come naturally.

“I think it’s human nature. People are strangers, you don’t really interact with them.”

“I don’t want to disturb others, they are already doing stuff…”

“I don’t talk to anyone, no one talks to me […] I don’t know, I am shy (laughing). …usually people are not by themselves. For example, they are in group or they are with their friends, but I am alone, so…”

“… you can’t drill anyone’s privacy, they actually do stuff”

Fred sees the potential of places such as The Edge, but does not see much benefit in visiting unless he is likely to meet someone interesting and learn something new. Learning and expanding his skills and knowledge is crucial to his visiting experience. As a result, he only visits the space for programmed workshops, presentations, and other events.

In order to satisfy their social learning needs, users like Fred visit other places. One user reports that he regularly attends eleven different meet-up groups to learn new things relevant to his interests in different personal and professional domains (including game design, user experience design, anthropology, psychology, life drawing, and web development). For example, the “Brisbane Game Development group showcases a lot of what the local game artists are doing. So you get to learn the new emerging technologies in the local group. […] I have seen a lot of technology that I would not know about if I didn’t go to that group.” He finds it difficult or nearly impossible to find one particular place, institution, or social group that satisfies his desire to improve his skills and knowledge in all these areas, so he attends various special interest meet-up groups, each of which focus on a particular interest domain of his. In some of these groups he feels like an “alien,” but this exposure to diversity and people who think differently is what he appreciates and feels that he learns from. “I can’t say that I always feel totally comfortable when I’m with artists. It is hard to go to that group and sometimes because I feel a little bit like an alien. Because I don’t think exactly the same as they do. And sometimes being around programmers, I feel a bit like an alien as well. Because they are programmers, and they think differently. […] but at the same time I do get a lot from them, like I learn a lot. I learn a different way of thinking, and I guess I like to maintain that. […] I think I would say that I have learned what I don’t know and have been able to go about reading about things that I could improve on.” This is an example of incidental learning through low-incentive meetings – learning that happens as a by-product of socialising and interacting with people from other
backgrounds who have different core interests in life, and being exposed to their subcultures (in this case, game development).

Another Edge user reports his positive experiences from being a member at the local Hackerspace: "Sometimes you read something and it doesn’t ‘make click’. But when someone manages to phrase it in a way that works for you, it suddenly makes sense. And that’s one of the things that Google can’t do. You need to get someone you know... a good communicator who knows what you’re trying to learn you know and where you’re struggling. And who also knows the topic really well, so they can then phrase it in such a way that it makes sense for you... like aaaaah that part is missing... and I find that quite to be the case at the Hackerspace.”

Hackerspace’s function as a high-intensive meeting place stands out in this example. The user values having the opportunity to ask like-minded, more knowledgeable people specific questions to fill personal knowledge gaps.

When asked about places where they have rich social learning experiences through low-intensive or high-intensive meetings, users like Fred usually name environments outside the library (Hackerspace, meet-up groups, community/sports clubs, etc.).

Therefore, what can libraries do to become similar forums for social learning activities?

I-wanna-share-it Garrett

Garrett is what some people would call a 'geek'. He is exceptionally knowledgeable in particular domains and is driven by enthusiasm, curiosity, and ideals rather than money or materialistic value. He engages in topics for the sake of knowing, understanding, creating, or finding out. In a continuous attempt to grow and expand interest in his subcultural domain, he likes to ‘infect’ other people with his knowledge, ideas, and enthusiasm. He is intrinsically motivated to share and pass on his skills, experiences, and know-how.

Most of the users that fit into Garrett’s profile were found during a dozen workshops and events that we attended as part of The Edge’s events program such as “Robowars,” “Making Things Sense with Arduino,” “Video Editing,” or “Library Hack.” Robowars, for example, was organised as a two day Australian national robotics competition at The Edge, where robotics amateurs come together with their self-assembled and programmed combat robots to let them fight each other. As part of the Robowars weekend, two members of the Queensland Robotics Sports Club (QRSC) volunteered to run a workshop for kids and lay users on building a combat robot using a miniature starter kit (Figure 4). “The workshop has given me an opportunity to express myself and participate in the broader community… and at the same time follow my own interests in electronics and being a parent and seeing people enjoy things. So that’s what motivates me […] It’s all about getting young kids interested… the toolkit robots are not anything complex, they are very, very simple. But it’s sort of sparkling that interest which leads them on to something bigger and gets them in there… That was a very positive experience, that’s rewarding and satisfying. It has been a lot of fun. Yeah, people just jump in there and have a great time. That’s good, isn’t it?”
Such workshops are highly successful, but at the same time almost exclusively observed examples of social learning. People like Garrett do not tend to use the space on an informal basis outside of such events, but rather gather in their private or community-owned places that provide the special tools and infrastructure they need for their hobbies: “There is no real reason for me to be in there. It’s a nice space, but there is no real advantage of facilities there that I need […] If they had equipment sort of like a 3D printer or laser-cutter, that would fit in really well with what we did […] When you build little robots, you don’t get the tools and parts off the shelf, so you need to design your own in CAD and print it out in a 3D printer. Those are the sort of tools which most people can’t just go out there and buy. […] Without this, I guess there is no real reason for us to ever go there and try to do these things, because we have our own space and there is sort of more of a hassle to go try and do anything there.”

Therefore, what can libraries do to attract people like Garrett, hence increasing the amount of expertise, skills, and social capital in the user community?

**Co-working Chris**

Chris uses The Edge as a third place (Oldenburg, 2001); a public place that is away from the distractions and procrastination traps at home as well as the pressures at work. Chris brings his
own laptop and work material, and is busy with the agenda dictated by his work. Actually, The Edge is not an optimal work place for him: he usually starts work early in the morning before The Edge opens; the bandwidth of the library’s Internet connection is far below the standards he needs for work; the desks are too low for laptop work, and the social background noise sometimes gets distracting when he has a client on the phone. However, he enjoys the environmentally pleasing setup at The Edge and the social ‘buzz,’ e.g., the serendipitous conversations with other people while queuing for a coffee and snack at the kiosk. As one user reports: “I work from home and do consultant type of work. But working from home you don’t get the social experience. You don’t get that office experience, sitting at the water cooler and chatting about the cricket game last weekend […] we are social animals so… that’s why even tech people are social and need that social interaction.”

However, such social encounters (between users that have actually not known each other before) are limited to (a few) particular occasions. Our interviewees reported five different ways they met or became involved in social encounters with other (unacquainted) users at The Edge:

(1) Encounters between regular users: “with regular users, if there is somebody you see often eventually you get to start to talk I guess […] depends how many times I have seen them”
   “…with regulars, I see them all the time. We have conversations, but superficial…”

(2) Encounters between participants in an organised workshop: the mutual understanding of why everyone attends a workshop or event provides a motivation as well as ice-breaker for conversations. “…during lectures you know, it’s a great way to meet people who are into your interests. So you have common bond with them. And it’s easier to converse about that bond. It’s easy to come across a conversation about something that you’re into, because they’re into it as well, because you’re in the same course.”

(3) Encounters in shared ‘zones’ – spaces that provide people a reason to remain in each others’ immediate physical proximity even if they are strangers. Our interviewees reported random conversations with strangers, for example, while waiting for the library to open in the mornings, waiting in a line to buy a coffee, or smoking outside at the library entrance. Users who happen to share the same window bay sometimes engage in serendipitous conversations. Such zones, similar to a bus stop, encourage conversations that mostly do not occur. On the other hand, music studio users at The Edge quite often engage in transition with other users who have booked the studio in a timeslot immediately before or after theirs. The mutual interest and use of the music studio sparks conversations about their work and projects. Similarly, in the computer lab (which has a dozen computer workstations placed right next to each other), people sometimes initiate conversations with others who work on similar projects (video editing, photo editing, graphic design, etc.) or use the same program. “Someone’s gotta be sitting very close to me to engage in a conversation with them. You know, I’ve gotta sort of take a peak at their screen (laughing) see what they’re doing. That’s how
I came across Guan, and it was like oh you’re doing ‘Logic’ – so am I! […] Guan, he is a sound producer. I was sitting next to him in the Mac Lab […] I am still friends with him, I even got his contact number.”

(4) Encounters for the sake of helping someone: short conversations would occur between strangers when someone obviously needs help. Users, for example, were observed helping one another to find the paper cups at the water cooler or connect their laptop the WiFi network in the case of technical issues.

(5) Encounters for the sake of personal benefit: active approaches to strangers were made when a particular personal benefit was perceived. One interviewee reported, “when I first came here, I would often talk to the German tourists and trying to keep up my German.” Similarly, a travelling backpacker from Italy and first time user at The Edge reported that he tries to make an active effort to talk to native English speakers. He would, for example, “go inside a shop and ask an assistant for the price of something, even though I don’t want to buy anything.”

These examples show that social interaction between unacquainted people does not occur naturally, but can be facilitated through particular social and spatial circumstances. What can libraries do to provide conversation ice-breakers for users like Co-working Chris?

**Discussion**

The personas show that the people in our case study of The Edge mainly use the space in three different ways: (1) to access computers, the Internet, multimedia equipment, hardware and software for free that would otherwise be too expensive to buy (Doesn’t-care Claire); (2) as a third place for co-working among individuals and groups (Co-working Chris), and (3) as an informal learning environment, i.e. to attend workshops, presentations, exhibitions, and similar events (Learning-freak Fred, I-wanna-share-it Garrett).

Similar to previous observations in libraries (Aabo and Audunson, 2012, McKechnie et al., 2004), The Edge functions primarily as a high-intensive meeting place but is limited in terms of providing low-intensive meeting experiences for users. Users mostly work individually or collaborate within pre-organised groups (Doesn’t-care Claire, Co-working Chris) but usually do not make new connections, interact with, or get inspired by other co-present users. The open and accessible architecture does facilitate occasional serendipitous encounters between people, in particular at shared ‘zones’ such as the computer lab or coffee kiosk, or during officially organised workshops. Libraries could facilitate social learning by setting up or announcing more specific and explicit zones, e.g. a particular room at a particular timeslot for people to meet around a particular interest or profession.

In order to provide rich low-intensive meeting opportunities, the library needs to attract a variety of people engaging in different high-intensive activities. The more people use a library for their
high-intensive meetings, the more pluralism, diversity, and exposure to otherness the library provides as a space.

Users like Garret with their expert skills, knowledge, and particular interests could be a source of inspiration for other users such as Co-working Chris or Learning-freak Fred. Similarly, interviewees reported information on meet-up groups and hackerspaces as locales for social learning. Libraries can make an effort to attract such users or user groups from the local community, and advertise their presence in the space accordingly. Further ethnographic research in such groups might also reveal valuable insights into what makes them such successful environments for social learning, and what libraries can learn about providing similar experiences for their users.

The main perceived barriers to approaching other users in the space are a lack of awareness of their skills and interests, as well as perceived anxiety to approach ‘strangers.’ Users such as Co-working Chris and Learning-freak Fred who are generally open to, or even actively seek to engage in conversations with creative and interesting others, lack the ability to find such peers.

Whilst traditionally, libraries provided catalogues and indices for their collections and archives, there are no catalogues that refer users to fellow users with particular knowledge or skills.

Improving such social interfaces within libraries will help to overcome the identification problem, and might also lower the social barriers for approaching other users.

The findings show that the library in the case study is frequented by a diversity of users who, in general, remain unaware of and uninspired by each other’s subcultural domains of interest and expertise. This provides an opportunity space for digital technologies. How can digital technologies capture and highlight opportunities for social learning among users? Business process management and other enterprise systems connect and facilitate transactions between manufacturers, suppliers, vendors, and other businesses along the value chain of a product, from raw materials to finished products. Following this analogy, what does a value chain for the creation of knowledge look like, and how can the library as a facilitator of access to knowledge, skills, and education connect different individual users, community groups, and institutions along that knowledge value chain? Future digital technologies in libraries need to support the nurturing of a knowledge community among library users who would mutually benefit from their awareness of each other’s interests, projects, and activities as a result of being collocated.

Elsewhere, we provide an overview of previous work (Bilandzic and Foth, 2012) illustrating how locative media, mobile applications, and ubiquitous computing not only support people to connect to networks over distance, but also to coordinate and initiate social interactions in their physical proximity. Such technologies bridge spatial and temporal barriers in the physical world. Location-based social networks, for example, provide information on collocated people that would remain invisible otherwise, and hence have the ability to make the library building more ‘socially
translucent’ (Erickson and Kellogg, 2000). Users would not only see other users working on their laptops, but get a glimpse of what they are working on. Such technologies can enrich the library space as a place for inspiration, social learning, and collaboration by keeping track of high-intensive user activities and topics, and rendering them visible as objects for low-intensive encounters to other library users. Encounters such as these are not limited to the situated resources and users available inside the library building in the “here-and-now,” but can expand to previous and future library users as well as other creative places and environments where relevant knowledge is produced.

**Implications for Design and Future Work**

Based on the personas from this case study, we suggest four strategic dimensions for designing and directing further research on digital technologies towards improving the library as a place that affords serendipitous inspiration, social learning, and collaboration by exposing the user to a diversity of other users and their subcultural topics. Figure 5 illustrates these four dimensions, each of which aims to facilitate low-intensive meetings that would not occur otherwise, between (1) library users or groups of library users that share the library space at the same time for different high-intensive activities; (2) current in-situ library users and users who engage in relevant high-intensive meetings at another place outside the library; (3) current in-situ library users and activities of previous users in the library, and; (4) library users in different high-intensive meeting places.
Each dimension reveals opportunities for further design research on systems that facilitate the respective encounters in the context of a library.

(1) Studies on location-based, mobile social networking illustrate how displaying background information about other co-present people can facilitate face-to-face connections (Humphreys, 2010, Konomi et al., 2010). Further research needs to investigate and evaluate how such technologies can be applied to the library setting. What sort of information is suitable to facilitate low-intensive meetings between co-present visitors that would remain invisible otherwise (relevant to Fred, Chris and Garrett above)? Previous research about context-aware systems (Dey and Abowd, 2000a, Dey and Abowd, 2000b, Dourish, 2004), virtual co-presence (Schroeder, 2006), responsive architecture (Frenchman and Rojas, 2006, Seitinger et al., 2010), planned serendipity (Eagle, 2004), shared encounters (Willis, 2010), and ambient displays (Gellersen et al., 1999, Jafarinaimi et al., 2005, Pousman and Stasko, 2006, Wisneski et al., 1998) may provide valuable insights into how relevant but invisible information can be rendered visible, and potentially even leading to face-to-face interactions. Further insight might be gained from knowledge management solutions of large scale organisations (e.g. Ziaie et al., 2009). How do organisations track what their individual employees know, and how do they make that knowledge (in particular tacit knowledge)
accessible to other employees? How can such solutions be appropriated to suit library settings, where the stakeholders are not employees but visitors from the general public?

Meetup.com (http://meetup.com) is a global online platform that enables local people to form and organise meet-ups easily around special interests ranging from Japanese Language and Culture, Spiritual-Energy Healing, to Book Clubs, Hiking Groups, Internet Business Meetups or Photography. As of October 2011, there are 409 groups registered with regular meetings within a two-mile radius of the Brisbane CBD; most of them in cafés, local community clubs, libraries and other (semi-) public places. The largest group has over 1,000 members, the top 60 groups have 200 members or more, the top 200 groups have 50 members or more, and most of the rest between 5 and 25 members. Meetup.com certainly does not cover all special interest groups in Brisbane, but the number and variety of these groups illustrate the immense creativity, skills, and knowledge within a local community, as well as people’s needs and willingness to meet and engage with others in real-world settings around specific topics of interest. Those settings are locales of collaboration and the co-creation of local knowledge, and need to be nurtured by local libraries (see Garrett above). Local libraries can connect to such groups in their local community, take part in their discourse, and promote the existence and availability of their respective subculture to other locals. Further research that addresses the nature, interactions, and needs of these groups may reveal ways to embrace them as part of the resources that the library can provide or link to. What can the library do to attract meet-up groups and other high-intensive meetings to hold their meetings in the library? Or, how can modalities of mediated presence be used to connect library users with users from special interest groups from other locations? Such modalities include virtual co-presence across a continuum of real and digital environments (Schroeder, 2006), as well as connected presence (Licoppe, 2004) between distant people. Popular contemporary examples are video-conferencing systems or massive multiplayer online games. How can virtual co-presence and connected presence be applied as design concepts to break down the library's physical boundaries to provide potential low-intensive meetings with users at other places?

Locative media, such as location-based mobile phone applications, enable people to leave and annotate digital traces of their interactions in space, hence providing inspiration as well as local knowledge and intelligence for later navigators of the same space (Gordon and de Souza e Silva, 2011). Digital libraries and e-catalogues mostly provide access to books, collections, archives, and other resources. However, they provide little information about other library users and their skills, interests, projects, and areas of expertise. Libraries can encourage and support their users to document their meet-ups, projects, discussions, and results using photo, video, and audio sharing platforms as well as blogs, microblogs, and other social media. Library information systems that aggregate this data and further broadcast through the library website, email-newsletters, or ambient media such as public screens inside the library can afford further low-intensity meetings. These
features could help users like Fred and Chris to identify in-situ knowledge embodied in users such as Garrett, as well as help first time visitors such as Sophia gain an understanding of the social learning purpose of the place.

Such technologies, applied in the context of a public library, do come with constraints. In contrast to organisational settings, the library as a public place needs to adhere to stronger privacy expectations, settings, and regulations. Furthermore, provided services must be socially inclusive, i.e. accessible to non-tech-savvy users and users who do not own personal high-end technology (e.g. laptops or smartphones).

**Conclusion**

There is little previous research and development in programs that recognise the library user as an asset and resource for other library users. This paper presented a case study of a public library space that was built with collaboration, sharing, and social learning in mind. User observations and interviews show that social learning between strangers in such a public library place does not come naturally. There is a perceived lack of affordances to directly or indirectly learn from other unacquainted creative users in the space. Users find it difficult to identify or approach other likeminded users. They, in general, remain unaware of and uninspired by each other’s subcultural domains of interest and expertise. We argue that this provides an opportunity for smart space technologies and suggest four strategic design dimensions that facilitate library users to get more out of simply working “next to each other,” gaining inspiration and a learning experience as a result of co-working and socialising in the library.

We present five personas that encapsulate core user motivations, attitudes, and challenges for social learning. As the personas are based on insights gathered from the case study environment at The Edge only, limitations exist due to the population and potential socio-cultural idiosyncrasies of the case study. Further user research in other libraries and specific social learning environments is needed to amend or extend the presented persona framework. Meet-up groups and hackerspaces (as encountered through user interviews in this study) might be good locales for further research to gather more insights into socio-spatial and technological aspects that facilitate social learning.

**Acknowledgements**

We would like to thank The Edge and the State Library of Queensland for their support of this study. Thanks to Kelsey Bricknell for her creative input on the persona descriptions. We are grateful to Ronald Schroeter, Daniel Johnson, and the anonymous reviewers for their insightful comments and critical feedback on earlier drafts of this paper.
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