Measuring Indirect Access:
Indicators of the Impacts of Lay Information Mediary Behavior[1]

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Abstract

The U.S. Impact Study (2010) reported that 2/3rds of people in public libraries use computers on behalf of another person for informational and instrumental purposes, yielding broad societal impacts. This phenomenon of Lay Information Mediary Behavior (LIMB) is being researched on an unprecedented scale by the Global Impact Study in eight countries. This paper (1) introduces the LIMB theory of indirect access and reviews cognate literature; (2) shares methodological approaches from the U.S. and the Global Impact Studies conducted by the Technology & Social Change Group, and (3) proposes an agenda for studying LIMs that encompasses their network relationships with muses and the value of the information work carried out therein.

Introduction

From time immemorial, across cultures, across borders, people have turned to and relied on others for information and assistance with the myriad of situations that arise as part of everyday life. For researchers, this very basic behavior, known as Lay Information Mediary Behavior (LIMB)—the seeking and sharing of information and carrying out activities on behalf of others—has proven elusive for identifying impact. Considered in assessment research as part of "indirect access" because of its focus on the effects of how information activities are parlayed onto others, i.e., indirect users, muses, beneficiaries, hidden patients; LIMB's societal significance and need for study has become increasingly bold due to increased use of information and communication technologies (ICTs) in varied venues worldwide. The purpose of this paper is thus tri-fold: (1) to introduce the LIMB theory of indirect access and review cognate literature; (2) to share methodological approaches from the U.S. Impact Study and the Global Impact Study conducted by the University of Washington Information School's Technology & Social Change Group that were informed by LIMB and showed—from the U.S. Impact Study—that 2/3rds of users are LIMs; and (3) propose an agenda for the future study of LIMs that encompasses their network relationships with muses and the value of the information work carried out therein. Before turning to these objectives, however, key terms are reviewed, beginning with the very notion of "user."

Part I: Death of the User; Evaluation, Assessment, and Impact

At the 2005 Annual Conference of the American Society for Information Science & Technology, a panel was convened on the "death of the user" (Rosenbaum, Davenport, Lievrouw, & Day, 2003) that questioned the usefulness of the term "user" and led to a responding debate by Dervin, Fisher, Olsen, Ross, Savolainen, and Solomon (2005) from a deeper information behavior research perspective. Fisher (2005) argued the term "user" was inadequate because: (1) it can refer to a person who is not yet using the system, representing a potential user and thus use has not occurred, (2) the main beneficiary of the information is not necessarily the user interacting with the information system and thereby the "user is not always the direct user," and (3) that the uses made of information derived from information systems are multifold, manifested as direct and indirect outcomes that are of upmost significance to the people around the so-called user but indiscernible at the time of first system use. Fisher further critiqued the term "user" for being an elitist concept extracted from the systems-oriented paradigm of the 1970s-80s that limits current research because it focuses narrowly on individuals in isolation of others, on individuals and their use of individual systems, putting people in boxes. She summarized this treatment of the user as a weak concept inherent in nomothetic metatheories that conflicts with the ideographic metatheories and accompanying naturalistic methods prevalent in current information behavior research.

Where did these notions of the limitations of the term "user" come from? They can be traced through years of attempting to study users, especially through evaluating information systems in libraries. In their seminar article, "Public Library Use, Users, Uses" Zweizig and Dervin (1977) challenged the field with identifying the uses (and *possible* uses) that people make of public libraries, observing that the time for studying "how much use is made of libraries and by whom" is past, and what's needed is to focus

on "the library in the life of the user" not the "user in the life of the library." As explained by Fisher, Durrance and Hinton (2004), library response to public accountability has been in conflict with Zweizig and Dervin's directive: traditional approaches to evaluating public library "uses" (or outputs) are heavily quantitative and miss the contextual benefits often revealed through qualitative approaches, the diverse ways users benefit from library services that go beyond circulation and head counts.

While a term other than "user" is yet to be broadly accepted by the library and information science community, recognition of its weaknesses is pertinent to framing ongoing research. Also germane is recognition of the multifaceted nature of information use and its equation with (1) evaluation, (2) assessment and identification of (3) impact. Whilst many researchers use the terms evaluation and assessment interchangeably, particularly in the U.S. (Markless & Streatfield, 2006), they differ notably in that evaluation—outcome evaluation, more specifically—focuses on an identified program and measuring stakeholder changes due to particular interventions. According to the Institute of Museum and Library Services (2010):

> Outcomes [are] benefits to people: specifically, achievements or changes in skill, knowledge, attitude, behavior, condition, or life status for program participants […]. *Outcome-based evaluation*, "OBE," is the measurement of results. It identifies observations that can credibly demonstrate change or desirable conditions ("increased quality of work in the annual science fair," "interest in family history," "ability to use information effectively"). It systematically collects information about these indicators, and uses that information to show the extent to which a program achieved its goals.

For the purposes of this paper, assessment, while sharing characteristics of evaluation is more broadly seeks understanding of a social phenomenon, and is not necessarily aimed at identifying cause and effect or specific changes due to particular interventions. Assessment, therefore, seeks understanding of people's behavior, attitudes and states but not necessarily in context of predetermined objectives.

Impact—also as viewed in this paper—are the differences or cumulative meaning that people derive from experiencing a phenomenon and can be studied using methods of outcome evaluation or assessment, depending on the researcher's focus. Of important note is that impact has many ranges, from negative to positive—as just one example; and especially in terms of being categorized as the effects of either direct or indirect access where direct access refers to effects experienced by the person interacting closest with the phenomenon (i.e., information system), and indirect access are the experiences of people who connect with the phenomenon through those direct users, and hence mediaries. Downstream impacts are studied as longitudinal effects—those that occur or emerge over time on individuals, groups or society at-large, depending on the unit of analysis—and may also be considered along different ranges and have greatest potential for unintended effects and unanticipated experiences with indirect users facilitated via direct mediaries of the system.

Understanding and being able to measure the impacts of indirect access is vital for being able to communicate the full value of information services, regardless of venue. Such steps signal going beyond the "role of the information services in the life of the user" to

the role of the service in the life of families, networks, and communities. However, identifying indicators and capturing evidence of indirect access and its impacts represents unique challenges that require going beyond anecdotal evidence culled from second-hand reports of on-site or household users. Instead, techniques are needed that yield high reliability, validity and generalizability, and yet reveal the complex richness of indirect access. In the remainder of this paper we share the LIMB framework and the methodologies from two major studies that focused on the impacts of indirect access in different venues worldwide.

Lay Information Mediary Behavior (LIMB)

Lay Information Mediary Behavior was coined by Abrahamson and Fisher (2007) to describe the phenomena of everyday people who seek information in an informal capacity for others—known as muses—without necessarily being asked to do so or engaging in follow-up. Based on their research with users of a consumer health web site (Abrahamson, Fisher, et al., 2008) along with a meta-analysis of related studies, they proposed an original model to illustrate the complexity within such socially-bound concepts as information need, seeking and use that had not been accounted for in the majority of past information behavior models, despite the plethora of models addressing varied aspects of information behavior (c.f., Fisher, Erdelez & McKechnie, 2005). Several frameworks from the social sciences have parallels with LIMB, such as Roger's diffusion of innovations—proposed in 1962 and now in its 5th edition Roger's framework has been used extensively to model how ideas, tools, and practices spread virally across populations, segmented by groups and key players—such as opinion leaders—identified according to their role in the adoption process. Foundational to Rogers' work was the two-step flow model proposed by Lazarsfeld, Berleson and Gaudet (1944) and popularized by Katz and Lazarsfeld (1955), which explains the roles played by people in the flow of messages from mass communications, again heralding the importance of opinion leaders in influencing others and in sharing information.

As shown in Table 1, in several fields, LIMB has been described using varied terms—including gatekeepers, proxies, encounterers, information-acquirers-and-sharers, information stars, and natural helpers—and has been a recurring finding in key studies for decades. Beyond people's basic instinct to seek and share information interpersonally (Harris & Dewdney, 1994; Case, 2007), recent catalysts for increased LIMB include rapid innovations in ICTs (Boase, *et al.* 2006), emphasis on collaborative teamwork in the workplace and school requiring information gathering by appointed team members (Fidel, *et al.* 2004; LePine, *et al.* 2002), increased demand for the role of familial caregivers regarding health situations (Fox, 2006; Family Caregiver Alliance, 2005), and climbing immigration rates where people who enter new cultures frequently use the help of LIMs to successfully adapt (Courtright, 2005; Fisher, Marcoux, Miller, Sanchez, & Cunningham, 2004). While research shows that LIMs may be of any age or gender, in some situations, such as health information seeking or parents seeking information on behalf of their children, research shows that certain age groups and women are more likely to act as LIMs (Abrahamson, Fisher, et al., 2008). Compared to muses, LIMs also are likely to have multilingual abilities as well as higher levels of education and income (Metoyer-Duran 1993; Agada 1999).

Table 1. Summary of LIMB-related literature

Author(s)	LIMB/Muse Intent/Serendipitous	Population	% LIMB
Technology & Social Change Group (2010a)	Either	Mixed venue users and nonusers, international	(in progress)
Becker, Crandall, Fisher, et al. (2010)	General LIMB (either)	Public library PAC users	63%
Nagler et al. (2010)	Health LIMB (either)	Breast, prostrate, & colorectal cancer patients	Up to 100% as muse (to various LIM types)
Bailey (2009)	Telecenter Muses (intent)	Jamaican seniors asked others for help	Not reported
Civan, et al. (2009)	Health LIMB (either)	Breast cancer patients	100% as muse
Fox & Jones (2009)	Health LIMB (either)	Internet health info seekers	68% as muse; 52% as LIM
Veinot (2009)	Health LIMB (either)	People living with HIV/AIDS & friends & family members	Varies: 25-60% as muse; 75-100% as LIM
Chigona & Licker (2008)	Library Muses (intent)	Girls exchanged computer time with boys	Not reported
Estabrook, et al. (2007)	General LIMB (intent)	Internet, library, & government agency help seekers	45%
Abrahamson, Fisher, et al. (2008)	Health LIMB (either)	Online health info seekers	20% last search; 80% overall
LaPorta et al. (2007)	Health LIMB (intent)	Cancer Info Service users	58%
Saxton, Naumer & Fisher (2007)	Proxy info seeking (either)	211 phone info service seekers	13-67%
Allen (1970); Metoyer-Duran (1991, 1993); Chu (1999); Agada (1999); Stavri (2001); Barzilai-Nahon (2006)	Gatekeeping (either)	R & D lab, ethnolinguistic, consumer health info seekers, Internet users	100% by research design; study subjects gatekeepers
Fisher et al. (2005)	Strong tie info seeking (either)	Community members	40%
Hogan & Palmer (2005)	Health LIMB (intent)	People living with HIV/AIDS	72% as muse; 56% as LIM
Moen & Brennan (2005)	Health LIMB (either)	Home health info managers	31-64% LIMB
Morey (2007)	Health LIMB (proxies) (intent)	Adult African-Americans	22%
Rioux (2004)	Info acquiring & sharing (IA&S) (either)	Undergrad & grad students	99%
Ulrich (2004)	Telecenter Muses (intent)	Parents asking child in China	89%
Warner & Procaccino (2004)	Health LIMB (intent)	Adult women	87-89%
Gross (1995), Gross & Saxton (2001)	Imposed query (proxies) (intent)	School & public library users	25-43%
Spink & Cole (2001)	Health LIMB (either)	African-American households	43% (as recipient)
Erdelez (1997; Erdelez & Rioux, 2000)	Encountering (either)	Undergrad & grad students	47%
Pescosolido (1992)	LIM preferred source (either)	Lay healthcare decision makers	74% (as recipient)

The below "LIMB Model for Public Access Venues" updates Abrahamson and Fisher's (2007) original work as a result of using LIMB to help frame and explain the U.S. Impact and Global Impact Studies' investigations of the impacts of indirect access to ICTs in different venues worldwide. While the base model was intrinsic for helping explicate the need to ask users on whose behalf they were using public access computers, several factors dictated an expanded model. Firstly, most notable was that the presence of ICTs and the Web in different venues, ranging from libraries to cybercafés to telecenters, meant that direct users would be carrying out instrumental activities such as submitting job applications and paying bills on behalf of others as well as creating videos, etc—activities removed and distinguished from traditional information seeking. Secondly, made more explicit was how informational and/or instrumental needs are socially constructed between muses and direct users, often as part of serendipitous communication and interaction. Thirdly, the revised model features information grounds—social settings (e.g., public access venues) that facilitate the flow of everyday information and activities because of their people, place, information attributes (c.f., Counts & Fisher, 2010; Fisher, Landry & Naumer, 2007). Fourthly, the revised model shows more explicitly how indirect access emerges through the presence of muses, and that uses and impacts follow but by their very nature are less easily discernable.

Figure 1. LIMB Model for Public Access Venues
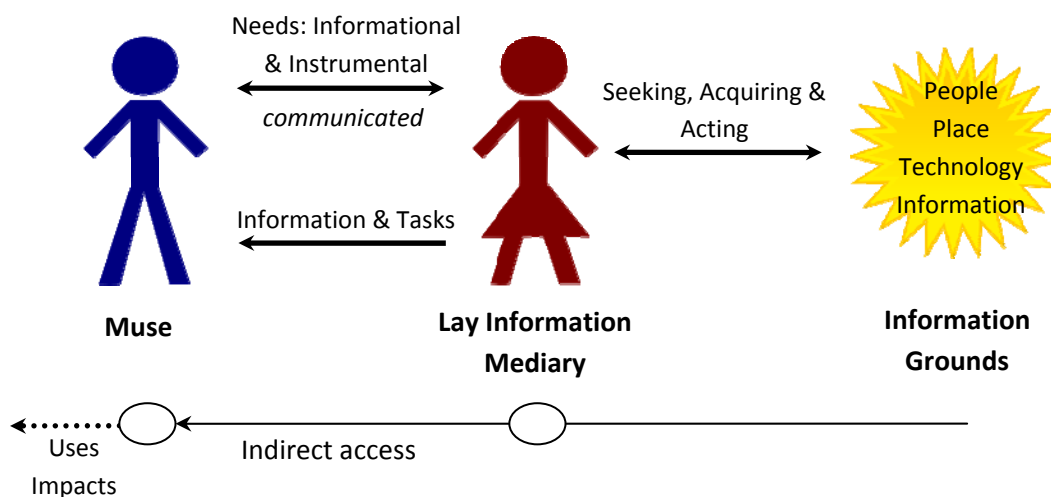
How the revised LIMB framework was used in tangent with the U.S. and Global Impact Studies of how people use and benefit from public access venues is explained in the following section.

Part II: Approaches to Studying Impact via Indirect Access

U.S. Impact Study

The purpose of the U.S. Impact Study was to identify the impacts of free access to computers, the Internet and related services at public libraries in the U.S. for improving advocacy and guiding policy and decision-making at the local, state and federal levels (Becker, Crandall, Fisher, et al., 2010). Since the 1990s, libraries have provided access to the Internet, computers, digital resources, databases, networked and virtual services, training, technical assistance, and technology-trained staff; however, little research has examined the relationship between free access to computers and the outcomes felt by individuals, families, and communities. "Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries" (Becker, Crandall, Fisher, et al., 2010) reports the U.S. Impact Study's findings regarding the characteristics of the people who use public access computers and Internet connections, the types of use they engage in across seven areas (civic engagement, eCommerce, education, eGovernment, health, employment, and social inclusion), and the impact that use has on their lives, their families and friends, and their communities.

The study employed a mixed-method design to improve generalizability and contextualization. The design incorporated a nationwide telephone survey (n=4537), using a dual frame probability sample of landlines and cell phones; a "mirror" nationwide Internet user survey administered via 400 public libraries selected using a stratified probability proportionate to size (PPS) sampling procedure (n=44,881); and case studies of four public libraries, purposively chosen to represent geographic and socio-demographic diversity. The user population included homeless and digitally-disconnected individuals, aged 14-plus; case study interviews also included library staff, trustees, and volunteers, and community stakeholders (n=280). Results were based on data gathered from over 50,000 people across all 50 states.

As the first national study to concertedly include indirect access in public venues, the U.S. Impact Study's telephone and web surveys asked respondents two main questions regarding their behavior in the past 12 months. Firstly, whether they had used the computers to help a family member, friend, coworker, stranger, or someone else. The second type of question was structured as high-level domain use where respondents were asked if their use of the computers in a particular domain was for themselves, someone else, or both. In the case study interviews, additional questions were asked of the participants to learn about the extent of their LIMB and gather rich stories from people of all demographics.

The survey findings showed that 63% or 2/3rds of survey respondents in the past 12 months used public access computers on behalf of someone else. A typical example included a 28-year old case study participant who said he was an active information seeker on other people's behalves, and that people sometimes call, asking him to seek information and do things for them at the library, including buying goods such as car parts online. Other examples included a teenager who uses the computers to look up the prices of rubber gloves and other medical supplies for his mother, a home health nurse. A teenage girl described looking up motorized chairs for her grandmother to get for her grandfather. A 52-year-old bus driver explained how she did historical research about a

friend's house. A 48-year-old woman described how she searches for college and employment opportunities for her family and friends.

Although most users reported engaging in LIMB activities, the U.S. Impact Study revealed that users reflecting particular socio-demographics were more likely to engage in LIMB, e.g., people who rely solely on the library for Internet access, are low income, of mixed race, speak languages other than English at home, female, and between ages of 14-24 and 45-54. Youth were also most likely to provide help to strangers in the library setting as were people without alternative access. Moreover, 79% of LIMs use library computers on a daily or near daily basis; while level of education was insignificant, LIMs make heavy use of library staff's expertise and avail themselves of training opportunities.

The LIMB framework proved invaluable in the U.S. Impact Study to uncovering the broad impacts of library computing. Using the LIMB framework to structure the instruments and guide analysis, findings revealed that instead of the traditional equating of one person per computer workstation (or usage), each user actually represents multiple users and hence, beneficiaries. Understanding how, why and to what effect people use library computers on behalf of others is a fundamental path to obtaining a complete view of its public value. For the U.S. Impact study, LIMB proved a highly important framework for several reasons. Foremost it provided a lens for framing the subtleties of computer use, particularly with operationalizing questions on the varied instruments about who are the direct and indirect users (muses) of library computers, and hence, direct and indirect beneficiaries. By establishing such parameters in questioning with both users and service providers (including library staff), the LIMB framework enabled a deeper dissection of the information needs and instrumental purposes which library computers play in people's everyday lives. By integrating the LIMB framework a substantially greater, more holistic view was gained of the reach of computers through familial and community networks. Moreover, at the variable level, LIMB enabled comparison across demographics and situations to aid understanding of the types of people who are more likely to assist others in information seeking and problem solving.

Overall, the U.S. Impact Study represents a tremendous first step at providing comprehensive, generalizable data on the extent to which indirect access occurs in public library venues and socio-demographics about LIMs. Its findings establish benchmarks for making comparisons with future studies, and identify several avenues for new research on LIMs—particularly how frequently they engage in LIMB activities, their motivations and the nature of their relationships with muses, as well as point to the need for extensive research on muses themselves.

Global Impact Study

The phenomenon of indirect access is highly significant in the developing world, especially among communities with fewer economic resources, lower literacy and educational levels, and less locally relevant digital content in local languages. Most of the literature addresses the role of formal mediaries (Heeks, 1999; Cecchini & Raina, 2004; Rajalekshmi (2007). Professional staff or other designated users help "bridge

both the overt and the social resource endowment gaps between what the poor have and what they would need in order to use ICT" (Heeks, 1999). Fewer studies show how ICT users act as LIMs themselves, sharing the information and skills gained from using computers in public access venues with their families, friends, and larger communities. Ulrich (2004) found a high degree of LIMB among households where at least one member visited a telecenter, particularly in Yuyang, the poorest county included in a study across five counties in China. Ulrich provides the example of a semi-literate parent asking a child to visit a telecenter to find online information. Muse behavior also occurs inside public access venues. Bailey (2009) found that semi-literate and elderly people using telecenters in Jamaica often asked staff, family, friends or other users to complete tasks for them. Chigona and Licker (2008) observed that library visitors asked people with more computer skills to do tasks for them; in this case, girls exchanged their time on computers with boys, who completed the girls' tasks for extra time to play video games. Rather than benefiting the girls, these exchanges showed how technological diffusion can reinforce inequitable development.

It is against this backdrop that we investigate the phenomenon of indirect access and effects in a five-year, multi-country study—the *Global Impact Study of Public Access to Information and Communication Technologies* (Technology & Social Change Group, 2010a). The Global Impact Study examines the impact of ICTs in libraries, telecenters and cybercafés in such areas as communication and leisure, culture and language, education, employment and income, governance, and health. Using longitudinal and comparative research approaches, the project seeks answers regarding the magnitude of these impacts and how to measure them, as well as the relationship between the costs of providing public access to ICT and its benefits. The study is being implemented in eight countries: Bangladesh, Botswana, Brazil, Chile, Ghana, Lithuania, the Philippines, and South Africa. The research design comprises three sets of activities. First, national inventories capture the number, location and basic characteristics of currently operating public access venues in each country. Quantifying and classifying venues provides a baseline against which we can infer the reach and distribution of public access venues, assess the magnitude of the larger public access phenomenon, and begin to formulate statements about impact. Second, surveys are being administered to representative samples of public access venues (operators) and populations (users and non-users). Analyzing survey and inventory data together will produce a greater understanding of the magnitude, characteristics, distribution, costs, and impacts of ICTs within the impact areas. And third, a number of in-depth studies examine specific venue characteristics and mechanisms leading to impact—e.g., the roles of formal and lay mediaries, patterns of shared use, and rules prescribing what users can and cannot do— as well as alternatives and complements to public access venues, such as mobile phones. In-depth studies employ a range of methods—ethnographies, focus groups, experiments, etc.—and when analyzed with data from the inventories and surveys will complete the project's understanding of impact. The study will be completed in 2012.

In stark contrast to richer countries, where findings of the U.S. Impact Study and other research validate the impact of public access computing and the value of libraries is for the most part accepted, in developing countries the impact of public access venues remains questionable. A comprehensive literature review of 145 research articles and reports undertaken as part of the Global Impact Study concludes:

[T]here is limited conclusive evidence on downstream impacts of public access to ICTs. The evidence that does exist suggests that the public access ICT model is not living up to the expectations placed on it. This is not necessarily because public access has had no impacts, but because its impact is particularly difficult to identify and measure. As a model, public access to ICTs has experienced success and failure, leading to both reinforcement of the belief that the model should be expanded and strengthened, as well as to claims that public access ICTs are ultimately ineffective or even counter-productive from a development perspective (Sey & Fellows, 2009).

A metric offered in several studies as evidence of limited impact is usage statistics. Many centers log only a handful of computer users per day, drawing researchers to conclude that centers must have little value to the communities in which they operate. This, however, may be an erroneous conclusion because it ignores indirect access. Thus, focused attention on capturing indirect access occupies a significant role in the Global Impact Study.

Types of Indirect Access
How extensive is indirect access or LIMB in the developing world? We commenced the Global Impact Study with exploratory field work in Bangladesh, Chile, and Lithuania to, among other aims, understand how people—directly and indirectly—benefit from public access.

While no research exists to quantify LIMB to the degree that was accomplished in the U.S. Impact Study, we hypothesize that it is equally if not more prevalent in places where fewer members of society are information literate. The infoliterati in these environments can be expected to serve the needs of their family, friends, co-workers and broader community more so than those in places where a high proportion of the population is information literate and with access to computers and the Internet.

One interesting dimension is the role of LIMs inside the venue or information ground, in LIMB terms. This is the subject of a focused investigation within the Global Study: the co-present space sharing of knowledge and experience among physically proximate users, as well as co-present technology sharing among multiple users on a single computer terminal where computing resources are scarce (Best, 2010).

Another important dimension is indirect access via formal mediaries. This occurs in two ways. In Bangladesh our research partner estimates that only 20% of visitors to telecenters use the public access computers directly (Raihan, 2010). This occurs when low- or semi-literate people come to a telecenter and ask the operator to, for instance, send an email on their behalf to a remote family member, find health information, or perform some other informational or instrumental task. The "user" never comes into direct contact with the computer. The other way indirect access via a formal mediary occurs is when a venue staff goes into the community, walking house to house to inquire about people's information needs. In some cases the staff member is equipped with a cell phone or laptop and attempts to answer their questions during the visit; or, the staff member may capture people's needs on paper, return to the venue to seek the requested information and perform the tasks (e.g. email, transactions), and return to the homes at a later time. The Global Impact Study examines both of these forms of indirect

access via a formal mediary, but for the purposes of this paper we focus only on LIMB indirect access.

Global Impact Study and LIMB

The Global Impact Study delves deeper into the nature and effects of indirect access than was possible within the scope of the U.S. Impact Study. Whereas the latter captured a broad snapshot of the extent of LIMB, demographics, and other findings as described above, the Global Study is collecting richer data from LIMs (motivations, frequencies, information seeking by impact domain, perceptions of impact on muses, etc.) and from muses (motivations, frequencies, perceived impact by domain, etc.) themselves. In this aim, we are conducting user and non-user surveys, as well as two focused investigations that employ qualitative and experimental methods.

The <u>User Survey</u> is a 45-minute, enumerator-administered questionnaire to 1,000 users of public access venues in each country. Survey implementation is scheduled for July-August 2010. In constructing the indirect access questions, we drew upon the U.S. Impact Study along with other instruments developed by the Technology & Social Change Group (Garrido, Rissola, Rastrelli, Diaz, & Ruiz, 2010; Garrido, Rothschild & Oumar, 2009) and elsewhere.

The first set of questions are directed at LIMs inside a venue, where we investigate incidence, frequency and perceived impacts on Muses. These questions include:

LIM Incidence: Similar to the U.S. Impact Study we ask whether someone used a public access computer in the past 12 months on behalf of someone else. The question is repeated for each of six impact domains. Data will be compared to the U.S. Impact Study's findings.

LIM Frequency: Capturing the frequency with which people engage in this behavior is essential to generating an accurate picture of, for instance, the proportion of library computer users at any given time who are engaging in LIMB. Thus, we ask how often a person spends at least some of his/her time using the computers for a person not at the venue.

LIM Impact on Muse by Domain: We ask users to what extent they believe their use of computers has had impact on their muses, people they intend to help, across the impact areas (e.g., access to the resources and skills necessary to find work, time savings, pursuing interests and hobbies).

Another set of questions is directed at muses in public access venues. The muse questions in the User Survey are an acknowledgment that computer users can simultaneously be muses. Here, we measure frequency, motivations, and impact domains. We will compare the findings from these respondents with those covered in the non-user survey.

Muse (inside venue) Frequency: This question asks how often a person seeks assistance from other users.

Muse (inside venue) Motivations: We address motivations through two question types. Firstly, we ask why people go to a public access venue, with "get help from other users" and "get help from venue staff" among the options. This offers a rich opportunity to compare the extent to which people rely on other users for assistance versus trained staff. Secondly, we ask why muses seek the assistance of other users, with options ranging from technical (hardware and software) to informational (searching, performing tasks), to personal (patience, caring, share socio-cultural characteristics).

Muse (inside venue) Impact Domains: We investigate the categories of information and instrumental tasks in which muses receive assistance, including: education, health, emailing and using social networking, and producing online content.

The <u>Non-User Survey</u> is currently being designed. Largely mirroring the User Survey, it will replicate the "Muse inside venue" questions, thus enabling a rich examination into the LIMB phenomenon in addition to achieving other study goals. In particular, it will allow us to measure the extent to which Muses exist in a community (incidence and frequency), media consumption patterns, topics where they have received assistance (impact domains), utilization of alternative information grounds (e.g. health clinics, community centers), demographics, and other characteristics.

Part 3 Research Agenda

This paper describes the efforts of two synergistic studies to understand the impacts of indirect access to public access computing at varied venues worldwide by explicating the theory of lay information mediary behavior (LIMB). While the U.S. Impact Study shows that a widespread 2/3rds of library computer users engaged in LIMB in the past year and captured their demographics, the Global Impact Study is embarking on an unprecedented examination of LIMs and muses that will build upon the U.S. findings and add new insights regarding the frequencies, motivations, and effects of indirect access.

Beyond these two studies, a research agenda that engages the broad library and international development communities is needed to understand the phenomena of indirect access, building systematic, in-depth understanding of its nuances, forms of impacts, and implications for public policy and the design of opportunistic systems and services. Examples of agenda-setting questions include:

- Who are LIMs and who are muses?
- Do particular personality types lend themselves towards being LIMs or muses?
- What is the nature of the social relationship between LIMs and their muses?
- How do muses choose LIMs? How do LIMs choose muses?
- Do muses actively have more than one LIM? Vice-versa?
- What are LIMs' and muses' information literacy proficiencies/aptitudes?
- What prompts muses to ask LIMs to seek information or carry out tasks?
- How do muses communicate and LIMs identify needs?
- What forms of information work do LIMs and muses carry out?
- How are LIM's & muse's information and instrumental needs related?
- How do themes of power, domination, and altruism affect LIMB?

- How do muses evaluate LIMs' information and help?
- What prompts a muse to use a LIM's information and resources?

Beyond contributions to understanding the nature of indirect access and its implications for impact, the LIMB findings reported in this paper and delineation of a progressive research agenda hold greater significance for information services in the 21st century. They imply a direct call to re-think the traditional notion of information literacy and update it to reflect LIMB—a concept we call Social Information Literacy (Technology & Social Change Group, 2010b). In addition to comprising the core elements of traditional information literacy—"to be able to identify, locate, evaluate, and effectively use information" (National Forum on Information Literacy, 2010)— Social Information Literacy premises that individuals be attuned to the information situations of others, that they have the skills to surface people's information needs, and know how to optimally provide information (i.e., the right information, in the best format, in the right way at the right time), while utilizing personal information management systems. Social Information Literacy thus promotes 21st century skills by extending traditional information literacy to reflect people's broader range of everyday life information behavior. The Technology & Social Change Group (2010b) has initiated a new research program to advance this inquiry and develop curriculum, applications and other resources that will assist libraries and other public access venues better meet the needs—directly and indirectly—in their communities.

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