Appendix 1: Theoretical frameworks

Figure 17 shows the relationship between these frameworks: the public value model (1) relates to the situated logic model (2&3), which corresponds to common indicators, including the Lay Information Mediary Behavior outcome indicator. Finally, the mixed methods research design (4) measures and tests the relationship between indicators using the three data collection techniques.
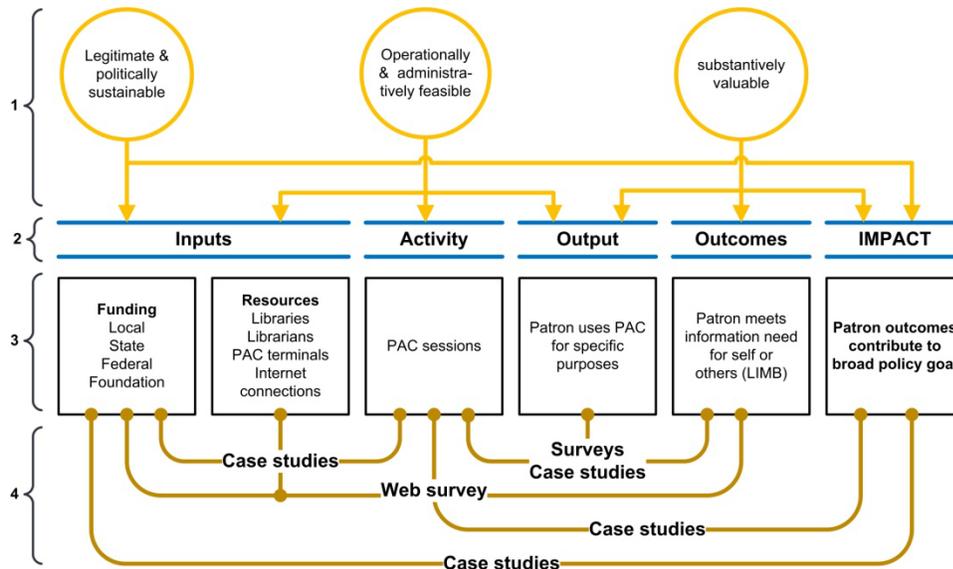

Figure 1: Relationship between theoretical frameworks

The strategic triangle

Moore's Strategic Triangle consists of three major components designed to place the evaluation of public services in a context that recognizes the differing needs of policy makers, the community, and the operations of a public organization (Figure 19). We have related each aspect of the strategic triangle to point along the public library computing logic model as follows:

- **Substantive value.** This is described by the organization's mission, with value being defined within a political context. The mission assists in identifying outputs and intermediate outcomes.

- **Legitimacy and political sustainability.** Sustainability focuses on the sources of support and legitimacy, and relates to inputs (particularly funding), outcomes, and the link to broader policy goals.

- **Operational and administrative feasibility.** Feasibility focuses on how libraries are organized to achieve their mission and how they measure performance. This relates to inputs, particularly the library's resources.
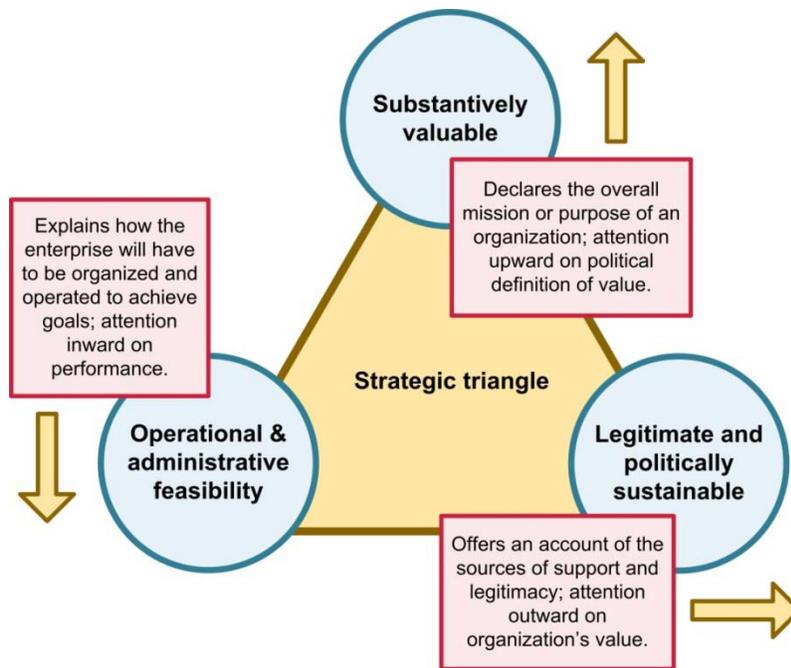
Figure 2: Moore's strategic triangle

The U.S. IMPACT Study took these three aspects of public service into account to focus the research design and instruments on measuring to what extent public libraries are providing substantive value through the production of socially desirable outcomes. This in turn is used to plan for operational feasibility and to communicate the activities to policy makers and funders to generate sustainable support for public library computing resources and services.

The situated logic model

In a typical public library public access computing logic model, the inputs of computer terminals, Internet connections, librarians, and the library itself leads to activities and outputs like library-provided technology training, user sessions, searching for information, or emailing. These outputs in turn lead to outcomes like keeping in touch with loved ones or getting health information. The end outcomes of this sequence may be finding health information or maintaining social ties.

The U.S. IMPACT Study takes the typical public access computer and Internet logic model one step further in order to connect the outcomes of computing resources use to impacts identified in higher-level policy goals. This *situated logic model* helps clarify the contribution of library outcomes to policy goals for which many types of programs and services may be mobilized to address (Naumer, 2009). Figure 19 provides an example of the situated logic model in the policy arena of workforce development: access to computers and the Internet in public libraries allows people to search for and apply for jobs; these activities also serve the workforce development outcome sequence, and eventually make a contribution towards the desired outcome of employment, and the broad policy goals of an improved workforce and individual economic self-sufficiency.
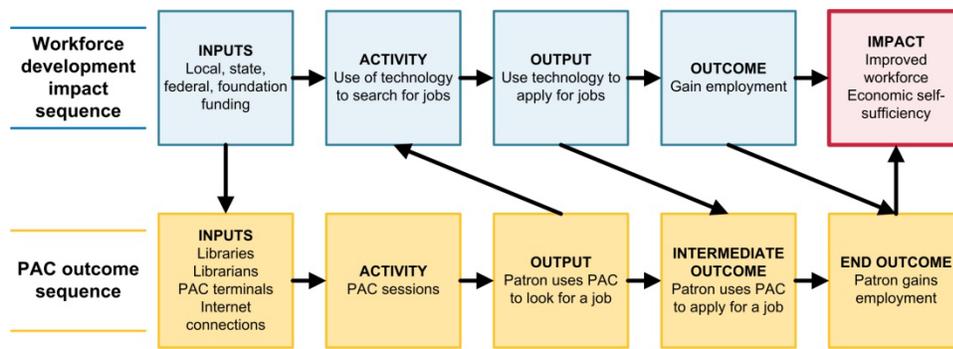
Figure 3: Public access computing situated logic model

The situated logic model helped to connect the research design to policy arenas where the use of public access computers and Internet access may contribute to the policy goals of other organizations, as well as leading to the inclusion of survey and interview questions about specific types of activities, outputs, and outcomes that are shared between the logic model sequences.

Common outcomes

A key tool in performance evaluation is the use of outcome indicators. Indicators are measures of progress or change and are commonly used to track the extent to which programs affect desired outcomes over time. *Building a Common Outcome Framework to Measure Nonprofit Performance* (Lampkin et al., 2006) served as a model for our approach to developing and validating indicators related to public access computing resources and services.

In order to build a collection of useful measures, we first consulted a number of impact studies to identify already existing outcome indicators that could be accomplished with public access computing use. We extended these candidate indicators to include others identified by the project expert committee and then translated them into survey and interview questions that can be used to gather reliable data on the phenomena of interest. Finally, the U.S. IMPACT Study surveys and field work tested whether the candidate indicators are valid and useful as outcome measures using the criteria set forth by Lampkin et al., i.e. that they are specific, observable, relevant, and reliable (2006, p. 6).

Lay Information Mediary Behavior (LIMB)

Lay Information Mediary Behavior (LIMB) was coined by Abrahamson and Fisher (2007) to describe the phenomena of people who seek information or perform instrumental tasks in a non-professional or informal capacity on behalf of others. The LIMB framework was used to structure our instruments to look for the use of public access computing resources and services to help others besides the individual users and to better understand how, why, and to what extent people use public access computing on behalf of others.

In the LIMB variation of the classic information seeking model (Figure 20), the participants include: (1) the primary information seeker who conveys an information need to (2) the lay information mediary, who, in turn seeks answers from (3) information systems and professional intermediaries.
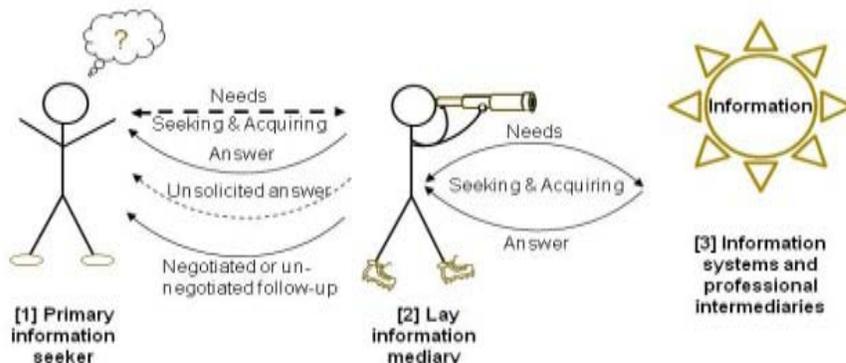

Figure 4: Lay Information Mediary Behavior (LIMB) conceptual model

Past approaches to library (and library computing resources) evaluation have typically focused on the easily observable and countable direct users; by integrating the LIMB framework, the U.S. IMPACT Study were able to better understand the extent of indirect public access computing beneficiaries through familial and community networks. Moreover, the LIMB framework enabled comparisons of patron characteristics to aid in understanding who is more likely to assist others by using public access computing resources and services.

Mixed methods research framework

Mixed methods research designs (i.e., involving both quantitative and qualitative methods that are mixed at the analysis and/or interpretation phase) are particularly well suited to outcomes research and the development of indicators, as they allow for both the generalization of findings as well as the exploration of conditionalities and context. This practical and nuanced utility has attracted growing interest in medicine, education, and social work (Creswell & Plano Clark, 2007). However, mixed methods research has not been extensively used in library and information science research (Fidel, 2008).

As shown in Figure 21, the U.S. IMPACT Study used case studies and survey research to create links between segments of the public access computing logic model: the case studies provide contextual information about library inputs and their relationship to activities and outcomes and links the outcome-sequence to broad policy goals; the surveys link user activities to outcomes and provide the means to understand the penetration of public access computing use across specific segments of the population; and the web survey allows for deeper analysis of the relationship between computing resources and outcomes as well as use among groups commonly missed by telephone research methods.
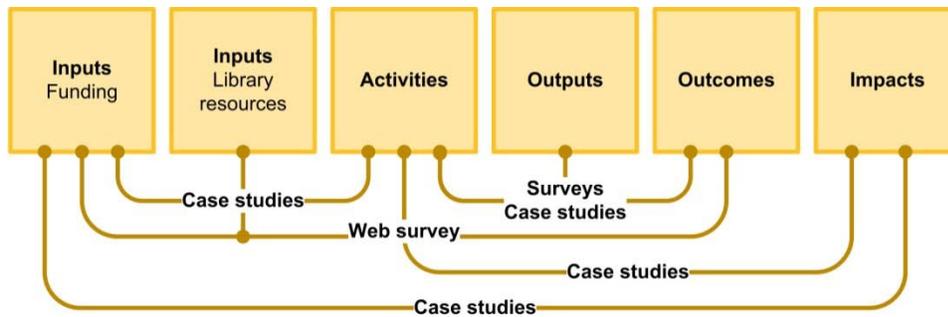
Figure 5: Relationship between research methods and public access computing logic model

A concurrent triangulated design was selected for the U.S. IMPACT Study in order to take advantage of the extensive data collection effort, and also because time constraints precluded the possibility of a sequential design. The triangulated approach offers the advantage of offsetting the methodological weaknesses of relying solely on either qualitative or quantitative methods and stimulates policy insight by drawing attention to areas of convergence, or the extent to which open-ended qualitative themes support quantitative results from survey data (Creswell & Plano Clark 2007). This in turn allows for a holistic interpretation of statistical relationships and the confirmation of results. The confirmatory utility of triangulation is especially important in the U.S. IMPACT Study, as the populations of interest are relatively small and sometimes difficult to reach. Triangulation also helped uncover important dimensions of public access computing use that were not anticipated or diverge from the outcomes-sequence and stimulate directions for further research (Jick, 1979).

Operationalized, mixed methods research analysis consists of comparing results of analysis performed on data independently and/or blending data and carrying out analysis concurrently. The U.S. IMPACT Study employ both methods, as will be described in each of the following sections.