Evaluating Digital Libraries with User Panels

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ABSTRACT
In this paper, we describe User Panels as a method for evaluating digital libraries. User Panels have a history of use in medical research and more recently with marketing research. The method is longitudinal in nature, allowing for study of behaviors and attitudes over time. This paper was developed for the JCDL 2009 workshop: User-Friendly Evaluation Knowledge for Digital Librarians.

Categories and Subject Descriptors
H.3.7 [**Digital Libraries**]: User Issues.

General Terms
Management, Measurement, Design, Human Factors

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Digital Library Evaluation, Evaluation Methodology, Longitudinal Research Methods, User Panels.

1. INTRODUCTION TO USER PANELS
In this paper we describe how the use of User Panels can be an effective means for evaluating digital libraries. This method shows particular promise as a means for examining user behavior in terms of how and why they use digital libraries as well as understanding opinions and attitudes about these libraries. The longitudinal nature of User Panels also suggests potential uses of the method in terms of examining the impact of use of digital libraries.

We will provide a brief over view of the method, briefly describing its history, when use of a User Panel is appropriate, its benefits and some of the challenges associated with using it. We will also briefly describe how we are using them in some of the evaluations we are conducting with two digital libraries that are a part of the NSF sponsored NSDL program. The discussion ends with a discussion of the future of the method as it might be used by others in the digital library world.

2. WHAT IS A USER PANEL
Longitudinal research allows a researcher to observe something at more than one point in time. Panels are a form of longitudinal research and as research tools have a long history in the field of medicine, where they are the gold standard for testing new medications or tracking the spread of a disease See for example, Chin and Lee's historical overview on medical trials [1]. However, panels are also used in other types of research. Panels have also have a strong lineage in the fields of marketing and

business. One of the best-known examples may be the Neilson ratings. The Neilson Company pioneered the idea of using families as panels and regularly checking in with these families about their media and consumer habits.

As an evaluation tool, a User Panel study then, is a type of longitudinal method where the same panel or group (of users or potential users) are measured at different points in time. Depending on the purpose of the study, researchers might implement a continuous panel, where members report specific attitudes or behavior patterns on a regular basis, or an interval panel, where members agree to complete a certain number of measurement instruments only when the information is needed.

3. WHY USE A USER PANEL
Longitudinal analysis and panel research in particular, are particularly useful in predicting long-term or cumulative effects that are normally hard to analyze in a one-shot case study (or cross-sectional study). Panels are also effective at chronicling an adoption process, particularly the process of adopting a new technology as in the case of many digital libraries. For example, in the early 90s there was a corporate fad that utilized computer aided group decision-making. Corporate assessments and non-longitudinal academic studies found that people liked using the decision software. However, individual case studies showed adoption rates to be low. Initially there was speculation that the lower adoption rates among many companies could be explained by a negative corporate culture, which had lead to poor implementation.

To test this assumption, a panel of new users was convened. The User Panel demonstrated that initially people liked the novelty of anonymous computerized chat. But over time, they found it far easier to talk to people in person because they did not like the hassle involved in using the software and they wanted more accountability (and recognition) in the decision making process [2]. This example illustrates the explanatory power of a panel by being able to track and illuminate an entire process.

In the case of evaluating a digital library there are a multitude of process questions for which a User Panel is well-suited to answer: What causes someone to be a high-user of a digital library? What does it take for a user to judge digital library as credible? If an initial impression of a digital library is poor, will a user come back? What factors do user's use to judge the quality of a digital library? And, in the case of educational digital libraries: How long does it take for a user of an educational digital library to use its resources for instructional purposes? How are digital library

resources used in a classroom or with students? Each of these questions addresses an aspect of the meta-question that is overarching across educational digital libraries: how are digital libraries impacting instruction and learning?

The types of questions raised above are not easily answered and we are not suggesting that excellent work in this area has not already been done. However, we believe that the use of User Panels as an evaluation strategy is a largely underutilized element in the pantheon of research on digital library use. It is one that we believe may be especially useful in overcoming some of the growing challenges that evaluators are experiencing. For example, it appears that increasingly, users of websites and online services are becoming less willing to respond to requests to respond to surveys. That, compounded by the difficulty in determining who exactly is visiting a digital library (especially for those libraries that do not have a sign in requirement) suggests that the effectiveness of these methods are or have been limited at best. User Panels offer one method for skirting these specific problems at the same time gathering useful data.

A particular strength of User Panels is that they allow the evaluator to examine how users change over time. Since the panelists have agreed to participate for a period of time, it is possible to, for example, examine how novice users might change to become expert users, or examine how regular users respond to changes in a system through a design cycle. And pertinent in the context of this workshop, is the question of the manage-ability of this method in this context. There are trade-offs, especially in regards to management of the method that we will discuss in the next section.

4. LIMITATIONS TO USER PANELS

For all of the process benefits cited above as reasons to use a panel, cost, panel management and efficiency are significant reasons why panel research may be an under-used evaluation technique. Panels can be expensive. Typically, participants have needed to be compensated for their participation. You are asking people to "commit" to your research for an amount of time, and this commitment in and of itself can introduce bias into your sample pool of participants. People who agree to participate may already believe in your research, or may participate because they are motivated by the incentive. For panels, the later motivation is preferred to the former [3]. The misdirected motivation that a good incentive brings to a panel can yield the most natural or true results, but this can also require a significant outlay of funds for a panel assessment.

Once a panel is created, it is essential that it be effectively managed. Management tasks include making sure that you have regular communication with participants. Surveys (or interviews) need to be conducted regularly to ensure that the topic remains at the forefront for panelists' attention. Record keeping is also important in order to keep track of participation, and to communicate about rewards. Even with a relatively small User Panel (20 – 25 participants) this management work can become significant.

Ironically, there is also evidence to suggest that while increased online access has made the assembling and research related to panels easier, there is an increased expectation among panelists that they will receive communication and status updates from researchers [4]. This kind of expectation has actually led to a burgeoning cottage industry that has a sole focus of recruiting

panelists, tracking and administering incentives and communicating with panelists between research tasks to keep panelists engaged. Such services of course, are typically quite expensive.

Perhaps most significantly, panel research suffers from issues of participant attrition. In the interval between each measurement, a percentage of panelists will decide to stop participating in the study. Effective panel management can help mitigate this attrition, but even the best panel management will not eliminate it. Attrition has the affect of forcing a researcher to make some decisions that lower the overall efficiency of a panel design.

Given that historically there might be significant attrition across each stage for a panel, a researcher might opt to gather a large number of panelists at the outset as one means to mitigate the impact of the attrition. The tradeoff here is that while you will be left with a smaller sample of people who completes all phases of a study, if the initial sample is large enough, the end result may be that you are left with a sample large enough to be meaningful. The tradeoff however is cost. An initial large sample is simply more expensive.

Another option might be to limit the number of stages of the research to mitigate losses between stages. However, this compromises the very utility of a panel in being able to accurately pinpoint critical aspects of a process or how it develops. In short, there is no completely effective answer to attrition for the do-it-yourself panel architect. Some helpful suggestions are to: keep any one measurement stage fast and easy, over compensate panelists, and focus your measurement with clear goals with the hope of being able to shorten the overall duration of a study for panelists.

5. IMPLEMENTING PANELS - EXAMPLES

The MathDL is a Pathways project of the NSF funded NSDL program. Closely associated with the Mathematics Association of America (MAA) it has been funded by the NSF digital library program for around 10 years. Recently, it has undergone a significant redesign to align several services more closely with the MAA. With this redesign, new questions regarding the project arose, most particularly around the relationship between the MAA and MathDL, the value of the library to MAA members and how the new services were being perceived. The close ties to the MAA made the implementation relatively easy to implement because they were willing to share the membership data necessary to identify and recruit a panel. NSDL funding supports the remuneration for the panel. The panel has been selected and the evaluation process has been initiated.

AMSER is also a pathways project of the NSF funded NSDL program. AMSER took a very different approach to the use of their panel. Their primary question was how do non-users become active users of the site? And, do various services that AMSER offers on its site resonate with potential users? The efficiency of AMSER's panel development was greatly aided by the fact that by virtue of AMSER's mission, they have a very targeted user group (community, technical and vocational college STEM instructors). Individuals fitting this demographic were recruited and given specific site tasks over time to see if these naïve users would become advocates for the AMSER site. Results from these data collections are ongoing and will be presented in detail at a later date.

6. THE FUTURE OF EVALUATION, DIGITAL LIBARIES AND USER PANELS

It is important to note that panel research is certainly not a panacea for all the answers to evaluation questions facing digital libraries. Rather, we believe that this method is more of a missing ingredient in an otherwise hearty stew of digital library evaluation research as a whole. While the NSDL differs widely for other digital libraries, for example campus-based digital libraries, or libraries that are not focused specifically on educational materials, we wonder how, as a loose collective, we might extrapolate and learn from the experience of a collaborative effort to use User Panels? Given the close-knit nature of NSDL digital library projects, we wonder what other library projects might benefit from collaboration? Looking at the AMSER and MathDL efforts as pilot studies of the method, we believe there may be ways to collaborate to maximally utilize and cost share a panel of users. Collaborations might lead to:

• User Panels that might be shared with other digital library projects who have similar constituents.

• Centralization of User Panels for digital library federations and collaborations. Centralization might make a vendor-managed solution viable.

• Different models for compensation of panelists (e.g. free or reduced rate conference registrations, special training opportunities); it is unclear what types of compensation work best with the intended audiences for digital libraries.

• Role and impact of 'community membership' or 'ownership' of panel members.

The exploration and testing of User Panels in evaluating digital libraries has only just begun. There are many things to learn about this method before making or suggesting best practices associated with its use. It is however, a method that we believe is highly adaptable to the evaluation of digital libraries. While cost of evaluation is always a consideration, this is a method where a sense of community may be one aspect that has been over looked when implementing them and could ultimately lower cost. Panels research may help to significantly refine knowledge we currently hold about digital libraries, and make that stew that we researchers eat daily that much tastier.

7. REFERENCES

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