



Impact of Electronic Services on Users: A Study

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Introduction

Access to information is important for the process of development. Information by itself has no value, and its value doubles only with communication. The vital importance of information has made the whole world communication conscious of this fact.

The importance of providing wider access and thereby communication of scientific information to a wider audience can hardly be overemphasized. The progress of science depends to a great extent on the ability of the scientific community to access all relevant information, and progress further by using the platform provided with previous research. Science is cumulative in nature, wherein the results of the previous research become the foundation for further research. Thus, scientific information is regenerative and grows continuously. Growth of science, therefore depends on the availability of information; the lack of relevant information would hamper the progress of science. Therefore, the need is to ensure easy and fast access to all relevant information, so that it can be accessed and used by the scientists for their future research.

Recently, the number of professionals requiring information has



increased tremendously, and the nature of demand for information has changed consequently. Research now being conducted in more countries, the demand is for a wider geographical coverage, as well as a wider cross-discipline and cross-speciality coverage. The increase in demand and change in the nature of the demand itself, has called for an increase in supply of information. In the field of Library & Information Science, unlike others, the increased supply of information has not solved the problem, but has aggravated it.

For these reasons, Libraries and Information Centers play a major role within Information Transfer cycle. The need of the scientists has to be satisfied by those institutions. The role of Information Centers is no more limited to the stocking and issuing of books and journals, but relies on the capacity of ensuring that the information needs of users is met either by its own resources or through other resources accessed either on-line or on the net.

In this context, it was experienced that conventional and traditional methods are unable to handle the voluminous information and provide successful access. It was at this point that technology entered the libraries. The application of computer and allied technology to libraries has created wonders in the handling, organization and dissemination of information. These technologies have helped the Information Scientists in conquering space and time, and rendered it possible to retrieve information from any corner of the world, instantaneously, providing this chance to users efficiently and effectively. For the user, the electronic media assist in efficient, specific and exhaustive retrieval of information. Computer Mediated Communication has become integral part of the society. Keeping in pace with this, libraries today have been introducing range of electronic services:

any service introduced in a library is meant to serve the user of the library, since [...] the library is "bionic" in the

sense that it comprises not only facilities and formats, but also the essential human elements: users and staff. The success of any library system, after all, rests not on how well the design works on paper, in the abstract, but on how readily people will accept it and how effectively they can use it. And it is the biological components of the library that embrace or reject the new technologies, who will fulfill or frustrate the intentions of system designers (Kupersmith).

Thus, the success of any change in libraries has to be measured in terms of how much this change has benefited the user, how much the user is using these newly introduced services, and how much the user is satisfied by these changes.

Information seekers who come to the library will have certain expectations: these expectations would include the availability of the information they are looking for, easy access to the required information, exclusive information whenever they require, and results within a reasonable period of time, i.e. information availability at a fast rate. When there is a match between users expectations and the facilities provided by the library, the user derives satisfaction from the service. The acceptance or resistance towards any service depends on the degree of satisfaction the user derives from the newly introduced service. Users are satisfied with a service when they find a service fitting their expectations, meeting their requirements, and being suitable to their ability of using a technology based service. This satisfaction will have an ever lasting impact on the users.

Impact

Impact can be defined as the change the user experiences after using a service, also defined as the state of mind that takes place before the use of the service and after using it. With exposure to

any new services, a change takes place in the mind of the user. In the background of this change, the mind evaluates or assesses the service, with a resulting attitude to changes.

Attitude

Attitude is the evaluation of an object, stored in memory; in other words, it is a relatively enduring cognition about the value of an object (Ramachandran). Thus attitude is... "state of mind" or "readiness to respond" to a certain class of objects with a specified type of response, usually connoting liking or disliking for that class of objects (Ramachandran).

Attitudes are easy to form: for example, an attitude towards something is formed when people judge an object, considering its various features and its evaluation as a whole. The most direct experience with something, the strongest attitudes are usually formed. The exposure to an object can contribute to the formation of a particular attitude. Research has shown that repeated exposure to an object leads to liking that object. In other words, people tend to have a positive attitude toward familiar things (Ramachandran). Attitude has a pervasive influence on a person; once developed, attitude can be used as a guide for behavior, and it leads to preference.

Preference

Preference is "the choice of one among two or more alternatives or a sequence of choices, which establishes a preferential order among the available alternatives" (Walker). Preference is reached by assessing the merits and demerits of each of the alternatives, and selecting the best, based on such an assessment. Apart from merits

and demerits, aspects such as context of the choice, the composition of the set of choice alternatives, previous experience with one or more of the alternatives, and current ownership of one of the alternatives influence the assessment (Houston and Sherman). User's preference can be influenced by their familiarity with the changed environment (introduction of new technologies / services) in the library, or by a lack of familiarity with it. Since there can be a sort of resistance to a changed environment, the familiarity with that particular environment reduces resistance. Status quo bias, a contemporary psychological model of choice process, can be considered here; this model refers to the tendency to prefer the current state of things, rather than a new or changed situation. This bias, thus represents a form of conservatism in judgment and preference. As a model of choice, it predicts a tendency (often a non-normative one) to choose the option that one already has, rather than to trade it or give it up for another one, even if the alternative is a better option (Houston and Sherman).

As mentioned earlier, user's preference could be influenced by their familiarity with the alternatives, which is confirmed by the psychological model - Comparison of Global Evaluations. According to the model, when facing a choice, the chooser might have had some previous experience with one or more of the choice alternatives. In such a case, it is possible that general attitudes toward those choice alternatives have already been formed and stored in memory. Accordingly, then a choice could be based on the person's global attitudes towards or on overall evaluations of the alternatives, rather than on attribute-by-attribute assessments of those alternatives (Houston and Sherman).

Viewed from the standpoint of the models discussed above, it is possible that some of the users have not been exposed to computers or the allied technologies introduced in the libraries, and

others would have had various degrees of exposures to them. This non-exposure or differential exposures could result in varied behavior towards the introduction of computers and new technologies. Further, few users are resistant to any change. Depending upon the degree of exposure and the kind of experiences they have had with computers (beneficial, difficulty in using etc.), users can be expected to show different types of attitudes towards computers and other new technologies.

From the above description it can be ascertained that Impact leads to the formation of attitude, which in turn leads to the development of preference. Preference results in the maximum use of the service.

Positive and Negative Impact

Impact can be positive or negative, depending on the level of satisfaction experienced by the user. These levels of satisfaction depend on varied level of exposure, resulting in different users behavior. When a user is satisfied with the service, it results in positive impact, while dissatisfaction with the service results in negative impact. Positive impact results in the formation of positive attitude and preference to the service, while negative impact results in the formation of negative attitude and rejection of the service. When a user prefers the service, that service is used; a non-preference for a service results in non-usage of that particular service. Thus, impact has a major role in the usage of a service. The reasons for this kind of impact can be various, starting from the initial problems that can be faced by users when they are exposed to computers for retrieval of information to the innumerable information available and the results is a difficulty in sorting and identifying the relevant information.

Problems Faced by the User

The influence of computer and electronic technology into libraries may have provided solutions to older problems, but they have brought in new ones. The issue does not relate to the adequacy of the new technologies, that are more than adequate to address most of users needs. The real problem is a marked reluctance to use the newer tools. As more and more technology entered the libraries, the reluctance in the form of aversion to computers became more and more marked. New terms coined in other fields now can be applied to the field of Library Science. These were:

- computer phobia;
- computer stress;
- computer anxiety;
- technophobia;
- technostress etc.

These terms defined the basic fear of the user about the new technology. The classic definition of technostress has been provided by Brod (*Technostress: The Human Cost of the Computer Revolution*) when he defines technostress as “a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner. It manifests itself in two distinct and related ways: in the struggle to accept computer technology and in the more specialized form of over identification with computer technology”. Technostress is expressed at three levels :

- anxious Technophobe: exhibits the classic signs of an anxiety reaction when using technology: Sweaty palms, Heart Palpitations, Headaches;

- cognitive Technophobe: on the surface is calm and relaxed, but internally seethes with negative messages: “Everybody but me knows how to do this” or “I’ll hit the wrong button and mess this machine up!”;
- uncomfortable User: May be slightly anxious or use some negative statements, but generally not in need of one-on-one counseling” (Rosen, Sears, and Weil).

Technostress is not merely a psychological problem. Rather, it has been physically measured. Research has shown that persons experience higher level of adrenaline and noradrenaline during work periods with computers (Ametz and Berg). Adrenaline and noradrenaline are catecholamines secreted by the adrenal gland. Increased secretion rates of adrenaline and noradrenaline are associated with both underload and overload (stress) stimulation and emotional arousal (Frankenhaeuser). Other effects of the increased catecholamines levels, as part of sympathetic nervous responses, are increased heart rate and blood pressure. Increased heart rate and blood pressure has been observed in persons performing a computer task. There is also a Skin Conductance Level (SCL) while performing a computer task (Muter et al.).

Added to this is the problem of information overload, expressing itself in increasing availability of information sources and the way to access these information. Frequent upgrade of hardware and software also triggers technostress.

Computer Avoidance

Problems discussed above results in avoidance of using computers and computer mediated services, such as Internet, e-mail, on-line access etc., and in managing without them as a consequence.

Computer avoidance is a normal outcome of techno-phobia or computer anxiety. Merely making technology available does not produce appropriate or adequate use of technology. Assuming that properly designed instruction or orientation programs for users will always change anxiety, attitudes and confidence are strong predictors of actually voluntary behaviors (such as whether to use new technological tools or not). If computer anxiety is combined with low confidence, low motivation, or negative attitudes, individuals will strive to avoid interactions with computers.

Assessment of impact has assumed greater importance, as impact plays a major role in shaping attitudes, and thereby promoting the use of the services. Consequently, Impact Assessment models have been developed. Mentioning a few: SCONUL/LIRG, VITAL, MINES.

- **SCONUL/LIRG:**¹ The LIRG/SCONUL Impact Initiative took place between July 2003 and December 2005. Twenty-two higher education institutions in the UK attempted to measure the impact of their services on learning, teaching, and research. Within the context of the program, each institution investigated the impact of an innovation. Although is not easy to do, measuring impact provides guidance for libraries on assessing impact drawing upon the experience of the Impact Initiative. Two phases of the *Impact Implementation Initiative* have taken place: the first phase involved ten higher education institutions and took place in 2003/2004. A further call for institutions to volunteer to participate led to a second phase involving twelve higher education institutions in 2004/2005;
- **VITAL:**² Value and Impact of IT Access in Public Libraries is a project funded by Resource: the Council for Museums,

¹http://www.sconul.ac.uk/groups/performance_improvement/impact2.html.

²<http://www.cerlim.ac.uk/projects/vital/report.pdf>.

Archives and Libraries, to address the Value and Impact of the provision of access to IT services on end users in Public Libraries. The Project focused on developing transferable methodologies that would provide data on assessment of the value of these services to the users, and positive or negative impacts on them;

- **MINES:**³ MINES adopted as a part of ASL's New Measures Program in May 2003, is an online survey form collecting data on users using specific resources, their location at the point of use and the purpose in making use of these services. *MINES for Libraries* adapts a long-established methodology to account for the use of information resources in the digital environment. The survey is based on methods developed to determine the indirect costs of conducting grant-funded R&D activities, and was adopted as part of ARL's New Measures program in May 2003. Sixteen libraries in Canada have implemented *MINES for Libraries* through a contract between ARL and the Ontario Council of University Libraries (OCUL). Additional institutions are involved in more extensive, campus-wide, cost analysis. *MINES for Libraries* has been developed by Brinley Franklin, University of Connecticut, and Terry Plum.

Methods to Convert Negative Impact to Positive Impact

Education and Training is an important means for reducing Technostress. Educating users to new technological developments is an ongoing process. Users will have to accept the fact that computer

³<http://www.arl.org/stats/initiatives/mines/index.shtml>.

technology will always be changing. Not resisting change is important, because resistance is more emotion-focused and less effective in reducing stressor. Users have to be convinced that resisting change will only add difficulties to their problems, as they would find more challenging to adjust to later technological change. Furthermore, when a new service is presented to users, a number of factors can influence their decision on how and when they will use it. The main ones are:

- **Perceived Usefulness (PU):** the degree to which a person believes that using a particular system would enhance his or her job performance.
- **Perceived Ease-Of-Use (PEOU):** the degree to which a person believes that using a particular system would be free from effort (Davis).

PU and PEOU will have a direct impact on the user, which in turn has a direct effect on the attitude towards computer use and intention to use. Attitude towards computer use has a direct effect on the behavioral intention, which in turn affects computer usage. Therefore, technology advantages should be presented to users in an acceptable manner. The user should be convinced of the usefulness of the technology, and that the technology can be easily used, when properly learnt. It is necessary that the user realizes that technology can provide access to information better than manual searching.

Conclusion

Above discussion makes it clear that the libraries adopt new technologies to render efficient services. Any new services introduced are meant for users, and should be used by users. Users

may have their own problems in using the technology, leading to dissatisfaction with the service and non-usage of it. Libraries, at this stage, must assess the impact of the new services on their users. Positive impact enhances the use of the Electronic Services, as impact assumes greater importance. Ease of use and availability of information would be the prime factors in creating a positive impact on the user and create preference for services.

Concluding, Sever Irene's ("Electronic Information retrieval as Culture Shock: an Anthropological Exploration") metaphor, when she portrays the experience of new users of electronic information systems as a form of culture shock can be cited here:

Today's library and even more that of tomorrow, has many characteristics of an exotic, alien environment: its language is unfamiliar and specialized and evokes incorrect associations. The form taken by the equipment creates difficulties which must be overcome: screen versus printed page. [...] The need to press combinations of keys of baffling complexity instead of running a finger and an eye down an index page, the difficulty of mastering the order of functions necessary to run a simple "User-friendly program. [...] An electronic library cannot be "learned" through instant coaching on which keys to press or even through the diligent perusal of a manual. What is necessary is to grow into an electronic library environment gradually through socialization as well as through education.

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