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Just-In-Case or Just-In-Time Library Services: The Option and Usage Valuation of Libraries and Information Services

ABSTRACT
The efficiency of libraries and information services has been legitimately put to test. However, most evaluations of libraries and information services have measured usage value only and exclude option value. Measuring both values might clear existing doubts on the value and efficiency of libraries and information services. The paper argues that many previous evaluations of libraries and information services used ineffective methods and approaches, evaluates some of these methods, and suggests a model that might overcome previous approaches' shortcomings.

1.0 INTRODUCTION
Libraries are faced with budget cuts, limited resources, and decisions that are crucial in determining either their survival or demise. Such decisions include but are not limited to whether to cancel subscriptions to certain journals, or to buy extra computers, or to extend library hours, etc. As libraries grapple with such problems and decisions, the recent tendency has been to discontinue some of their services. The most prevalent tendency for libraries today is to cancel journal subscriptions, open fewer hours, outsource some services, and to cut staff. One major impact of such tendencies is that libraries have turned into "on demand" or "just in time" services providers. Under a just-in-time environment, libraries are offering only those services that are highly demanded (high usage services) and providing them as the demand arises.

Decisions on implementing changes such as the ones mentioned above require rigorous evaluation of both the benefits and the costs of the decisions and based on such an evaluation reach the most desirable decision. In order to undertake changes, libraries undergo a justification process that involves evaluation of decisions and actions on the basis of their benefits against their costs. Various economic methods such as cost-benefit analysis, consumer surplus[1], contingent valuation, and cost of time have been used in this justification process as well as in evaluating libraries and information services.

Library and information studies literature has abundant costs-benefit studies on information systems, services, as well as on users. These studies have adopted two main approaches; the systems-centered and the user-centered approach. The systems-centered studies, e.g. by White & Crawford (1998), Katz & Shapiro (1985) have been done from the "value added" perspectives of economic models. These value-added studies stress on the value that is added to information or information objects by libraries and information systems through processes such as identification, access, dissemination, etc. The value-added perspective however excludes value as experienced by the users of the library and information services. In order to include this form of value, user-centered studies focusing on user evaluations using dimensions such as utility, relevance, accuracy, timeliness, etc. have recently gained popularity.

Although user studies have previously been done, some such as Bawden (1990) adopt a systems approach in the sense that they evaluate information systems from a users' perspective. User studies focusing on the benefits of information to the users have mainly measured usage value[2]. Consequently, such studies have not given enough attention to the benefits of library services to non-users. Usage value underestimates the value of a service because it only measures the value to those who make use of a service but ignores option value. By being able to properly determine and justify the value of their services, libraries will be in a better position to justify their worth to funding agencies as well as solicit support from different sources. Such support is especially important at a time when libraries are operating with increasingly tighter budgets and limited resources.

Current libraries' operating conditions have prompted an urgent need for libraries to explicitly determine their value and that of their services. This urgent need has been accelerated by the changing roles and expectations of libraries at a time when information has taken center stage in the "information age". Changing the libraries' operating conditions and users have prompted a shift from the traditional "just-in-case" library services to "just-in-time" models of information provision. Networks and technological advancement have not made the situation any better but rather have accelerated the shift. Technology and networks have also enabled other "non-traditional information providers" to venture into the field of information consequently increasing the number of information providers. The implication of this entry by new players is that libraries are competing for users as well as for funding sources with these new entrants. This pressure to compete or close down is the reason why libraries are adopting business-like models such as the just-in-time model of service provision as a way to prove efficiency.

Although the efficiency of libraries and their services has been put to the test, this is a perception that, as I argue throughout this paper, has mainly been based on usage valuation. Accounting for all forms of value might prove libraries and their services to be efficient. If we can prove that users are willing to pay[3] to have library services maintained just in case they need the service, then we might be able to present a case that it is worth keeping the library doors open even though there might be just a few users inside the building. To be able to present such a case, our evaluation methods should not only be based on usage value but should also include option value[4]. The aim of this paper is to evaluate some of the economic models previously used to value libraries and information services and to identify any gaps in these previously used models. I will argue in this paper that many of the previously used economic models are not effective methods of measuring the value of information goods and services. This ineffectiveness is due to the nature of information, which exhibits characteristics that are different from those of private goods, whose value these models have been designed to measure. I will suggest adopting a model that in its evaluation acknowledges and considers the characteristics of information, the changing role of libraries, and the changing information access environment.

2.0 APPROACHES IN STUDYING VALUE OF INFORMATION

Economics view value as a process of creating wealth through land (natural resources), labor, and/or capital. In an information era, knowledge is a major component of wealth creation. The value of information has consequently increased and changed significantly and new challenges for libraries and information services have emerged with these changes. Defining the value of libraries and information services is just but one of those challenges.

Saracevic & Kantor (1997) identified three main approaches that can be used in studying the value of information as the normative value approach, the realistic value approach, and the perceived value approach. Using the normative value approach, information is valued on the basis of its outcome on decision-making. In his review research on asymmetric information, Stiglitz (2000) reiterates the fact that existence of asymmetric information between buyers and sellers affect their decisions and behavior in the market. Normative approach compares the outcome of situations characterized by information uncertainty in relation to decision-making. A realistic approach measures the effect of information on the outcomes of a decision and / or the performance of the decision makers. Feener & Grieves (1994) & Koenig (1990) applied the realistic value approach in their studies on economics and value of information.

This paper takes the perceived value approach, which is a subjective valuation by the users of the information. Although this approach is not as precise as the normative and the realistic value approaches, the fact that information is valued according to judgments of the users who are the recipients of the information is more sensible. Studies that have adopted a perceived value approach however focus on the ex post value and thus exclude the non-users' valuation. Unlike the previous studies that have taken a perceived value approach, this paper suggests an approach that includes both ex post and ex ante value.

In its approach to studying value, economics classify value into value-in-exchange and value-in-use. Value-in-exchange has been used in most of the economics studies because it is easy to measure by use of money or other exchange media. Most of these exchange media are unfortunately inapplicable to information mainly because information is valued subjectively and also because information has no market place where exchange transactions take place. Value-in-exchange is market oriented and is based on price and therefore inapplicable to non-market goods and services. As Repo (1989) suggests, value-in-exchange is the best approach to study information products i.e. the systems, services, and channels that carry information. However, in studying the value of information, i.e. the content (message) in the information products, a value-in-use approach is inevitable. Value-in-use addresses the inherent weaknesses associated with exchange and price when using value-in-exchange and also it extends the economics' view of value to include intrinsic value as expressed in demands, wants, usefulness, etc.

Each of the two forms of value is best suited for specific types and classes of goods and services. The free market model of economic theory is used to measure the value-in-exchange of private goods that are bought and sold in a market. After being bought in the market, such goods become the property of an identifiable buyer who then enjoys exclusive rights to the goods. Some goods and services however cannot be valued using a free market model and such goods and services have eluded the free market solutions. Such goods include "public goods", which according to Mitchell & Carson (1989) have collective property rights, exclusion of potential consumers is not possible, and are not traded in any organized market. "Quasi-private goods" combine the characteristics of both private and public goods. Like the private goods, quasi-private goods have individual property rights as well as exclusionary consumption but like the public goods, they are not freely traded in competitive markets. In table 1, Mitchell & Carson (1989) classify goods into 3 classes.

Class of good	Characteristics	Examples
Pure private	Individual property rights Ability to exclude potential consumer Traded freely in competitive markets	Agricultural products Automobiles Financial services
Quasi-private	Individual property rights Ability to exclude potential consumers Not freely traded in competitive markets	Public libraries Recreation in parks TV frequencies
Pure public	Collective property rights Cannot exclude potential consumers Not traded in any organized market	Air visibility Environmental risks National defense

Table 1: Classes and characteristics of goods according to Mitchell and Carson (1989).

Defining the borders among the three classes of goods is hard and assigning a specific good to a particular class proves to be even harder. Different authors, for example have classified public libraries and information services differently. Repo (1989), for example classified public libraries as public goods, while according to Mitchell & Carson (1989) public libraries are quasi-private goods. It may be argued that public libraries should not be classified as quasi-private because they do not exclude any users. It is however worth noting that a public library is capable of excluding potential users by ways such as charging for its services, charging for library membership cards, etc. Even decisions that may not be intended to exclude users e.g. requiring an address in order to issue membership cards, end up excluding people without a home (physical) address from using some of the public library services. The changing nature of information has drawn information's characterization further from being a pure public good making information partly a public good as its "markets" take a more private bend, therefore being characterized as a "quasi-private" a good.

The problem of classifying libraries and information services lies in separating the two, the library as an institution and the information services it provides. This separation is difficult because a discussion on economics of libraries naturally cannot exclude economics of information because libraries are information providing institutions. Many studies on economics of information have not made the distinction between information and the information product. Repo (1989) distinguishes information products as the services, systems, and channels that carry information while information itself is the content (the message) carried in these products. Taking the economics exchange theory, economists have studied the value of information from the perspective of exchange of information products and have missed the point that it is the content that gives value to the information product. The user of the information is the only one who can justify the value of this content, meaning that the value of the product (the system) can never reflect the subjective value that different users of the same product might place on its content.

3.0 THE NEOCLASSICAL ECONOMIC THEORY

Traditional microeconomic theory studies the production and distribution of tangible goods. According to this theory producers combine various inputs to produce a certain quantity of an item, which is then taken to the market for sale. The market brings together different outputs from different producers thus providing the consumer with a variety of goods to choose from. The economic theory assumes that each consumer will buy that

quantity of a good that maximizes his or her benefits given a set income. In market interactions, producers try to maximize their profits while buyers try to maximize their personal satisfaction (utility) from a good. By choosing a level that is best for each, this market interaction determines both the price of goods as well as how much of that good will be produced.

According to the market theory, a product's price depicts its value. On the one hand the consumers' willingness to pay is an indication of how much they are willing to buy (demand). The producers' willingness to accept on the other hand indicates how much they are willing to produce (supply). The willingness to accept and the willingness to pay are therefore ineligible factors that sellers and buyers use to determine how much to produce (supply) and consume (demand) respectively. Figure 1 below shows how supply and demand interact to determine the price of a good as well as how price also affects supply and demand. Supply (line S) is the willingness of the producer to sell while demand (line D) is the willingness of the consumer to buy. In a market the producer and consumer reach equilibrium level quantity of Q at a market price of P. An increase of demand from D to D_1 means that the producer has also to increase supply to S_1 otherwise a shortage will result (shortage illustrated by the shaded area Q_2-Q_1). A change in supply and demand results in a change in equilibrium price from P to P_1 as well as a change in the equilibrium quantity from Q to Q_1. At Q_2, which is less than market demand production of Q_1, the producer can charge a higher price of P_2 and therefore earning a surplus shown by the shaded area P_1-P_2.

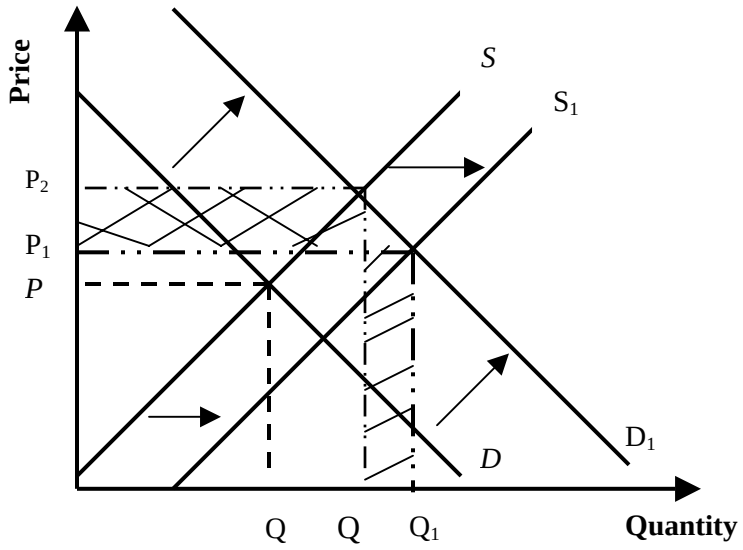

Figure 1: Supply and demand curves

From figure 1 above, when a buyer buys a good, he or she expresses a demand, which is the amount of that good that he or she is either willing or can afford to buy. The sum of the quantity demanded by all individual consumers is the market demand for that good or service. There are many factors that may influence a buyer's decision on how much of a good to buy. Such factors include the price of the good, the buyer's level of income, the price of similar (substitute) goods, and preferences for particular goods. However, as argued later in the paper, market and consumer theories do not take into account other factors such as social relations, socio-economic factors, power relations, wealth, etc. in their explanation of consumer behavior.

In addition to determining demand, price is also useful in quantifying the value or benefits of consuming a particular good or service. This benefit, also referred to as consumer welfare, can be quantified by looking at the consumer's total benefits, marginal benefits, net benefits, and consumer surplus (the maximum gain that one can obtain from a product at a given market price). The amount that a consumer is willing to pay for a product is a measure of the consumer's benefit from the good. Therefore, the price (P in figure 1 above) of a product indicates the marginal benefit[5] (MB) for a consumer as well as the marginal cost[6] (MC) for the producer and can be expressed as MB = P = MC.

4.0 ECONOMIC VALUATION MODELS

Economic theory has for long been used to allocate value to products that are exchanged in a market. This theory has also been applied in allocating value to information but due to the non-market characteristics of information, the theory's application to information seems to be deficient in various aspects. In an economic theory;

> Production implies that valuable input is allocated to the bringing forth of valuable output. The input is valued in terms of foregone opportunities, that is, by the magnitude of the sacrifice of alternative outputs that could be produced in lieu of the output actually obtained. The output is valued in terms of someone's willingness to pay for it (Machlup, 1980,193).

The input-output concept expressed by the author above is the basis for cost-benefit analysis, which economists have applied to value information and information services. This kind of analysis requires a market where buyers and sellers express their willingness to pay and accept respectively. In their application of such an analysis to information, economists have used a market model to study information. Some of the economic models that have been applied to information include contingent valuation method, the hedonic pricing method[7], and the value of time[8] method. The contingent valuation model is discussed and evaluated later in the paper in the context of information goods and services in order to determine whether it is a proper basis for valuing libraries and information services.

4.1 Market valuation: usage value

Market valuation is based on consumers' preferences as expressed in their market interactions with producers. It is a measure of exchange value and is therefore a valuation that is completely market-based and measures costs against the benefits of producing and consuming a good. Market valuation is a method that measures value after all uncertainty in consumption has been resolved and is therefore a usage value. The most common economic method used for market valuation is cost-benefits analysis.

4.1.1 Cost benefit analysis (CBA)

4.1.1.1 Theoretical foundations for CBA

CBA is a framework used by public project analysts to identify the benefits and costs of a proposed public project from the society's perspective. CBA is also used to justify government's intervention in the economy. A government might get involved in a private economy for various reasons (mainly in instances of market failure) and in various ways in order to ensure that the market's allocation and distribution of resources is socially efficient. The government may intervene as a provider of a public good or service i.e. the government raises money through taxes and provides the good or service. The government may also intervene as a regulator in which case it sets standards, clarifies the

property rights, imposes regulations, etc. In such instances of market failure the price mechanism does not operate and therefore public policy makers have to uncover the society's preferences and the costs of the provision of a good or service. CBA is a framework that draws on the principles of welfare economics[9] and is a method that public policy makers use most in ensuring that resources are allocated in ways that best suit the society's efficiency and equity objectives.

4.1.1.2 Applications of CBA

CBA is an empirical method that economists have long believed can answer questions related to making choices and is based on the above rationale that balancing costs against the benefits accruing from a good or a service helps in arriving at more informed decisions and choices. In order to apply a CBA approach to measure value, economists use models based on goods that are routinely exchanged in a market. CBA calculates the present value of cost (PVC) and the present value of benefits (PVB) in monetary terms. The costs of producing a good as well as the benefits of consuming it are measured and if PVC is greater than PVB, then it is inefficient to pursue the project or to provide a service. The shortcoming of using a market approach is that it is hard to allocate a monetary value to goods and services that are not necessarily exchanged in a market.

CBA has been used to evaluate public policy issues. Using the CBA methodology all the potential gains and losses of a proposed decision are identified, converted into monetary units, and then a decision is reached based on whether or not the proposed changes are beneficial to society. The library literature has studies such as Berton, McClure, & Ryan (2001), Van House, et al. (1987, 1990) and others that have applied CBA to measure performance of libraries and information services. Other CBA studies such as Kingma (1998) and White & Crawford (1998) focus on library operations and services. Earlier literature was inundated with cost studies but recently there has been a shift towards studying the benefits of library services to library users. Most of these user-centered studies have however used CBA to measure usage value, which as mentioned earlier excludes option value. Such previous studies' omission of option value is due to the fact that CBA's market approach has no way of capturing and measuring option value. In order to value a good or service using CBA, that good has to be exchanged in a market so as to be able to calculate its costs and benefits. It is therefore hard to use CBA to measure the benefits of the future possibility (the option) of using a good and to place a value based on the possibility of future consumption.

4.2 Non-market valuation: non-usage value

Non-usage value of goods and services includes two forms of value, the existence and option values. In the case of existence values as applied in environmental projects, society reveals its preferences for the existence of the resources under question, even when these resources may not be of any identifiable future use. Individuals benefit from these resources not from using them but rather from knowing that the resources exist. In such cases individuals will reveal their willingness to pay in order to ensure continued existence of the resources. In the case of option values, there is a possibility of future use and individuals reveal their preferences by stating their WTP so as to be able to use the resources in the future. The option value of the good or service is then calculated as the difference between the option price and the consumer surplus expected.

Cost-benefit studies provide several methods for valuing non-market goods and services. The most common methods are the contingent valuation method, consumer surplus, and the value of time method. Two methods that have previously been applied to information

goods and services are the value of time method[10] and the contingent valuation method[11]. The value of time method assumes that by choosing to engage in a certain activity e.g. using the library, the user foregoes the equivalent of the wages that would have been earned in that time. Again, this method is market-based because market hourly wage is used to value the users' time. A major drawback in using value of time method is that time is not homogeneous and therefore its valuation is very subjective.

4.2.1 Contingent Valuation Method (CVM)

For many years economists have struggled to develop a method suitable for valuing public goods that either do not fit into the market model or for goods whose preferences are not directly observable from users. Contingent valuation is one of the many methods that economists have previously used to value public goods. This method is as accurate as other methods and as Mitchell & Carson (1989) remark, although CVM has several limitations (discussed later in the paper) and requires the researcher to make few assumptions, it is a method that is capable of measuring types of benefits that other methods have difficulty measuring.

CVM is a survey method that uses two approaches, the willingness-to-pay (WTP) approach and the willingness-to-accept (WTA) approach. CVM is used to gain insights into people's preferences for a public good or service and their willingness to pay for the continuation or improvement of that service. Some cases may involve the loss of a service, e.g. the cancellation of a subscription, the closure of a branch library, etc. in which case using CVM, the various stakeholders will be surveyed on what they are willing to accept as compensation for the loss of the service. Both WTP and the WTA are expressed in monetary values. In order to elicit the stakeholders' WTP and WTA, CV can be performed by telephone, mail surveys, face-to-face interviews, self-administered interviews, etc.

CVM presents the consumers with a detailed description of a hypothetical market, which may be modeled after a market for private goods or a political market. In their study on patron benefits of reference desk services, Harless & Allen (1999) explain some requirements of the CVM's hypothetical market. Such requirements include a description of the good, variations in levels of provision, the quantity, and the changes under consideration in the hypothetical market. The authors state the objective of the contingent valuation as to simulate a situation in which individuals make bids such as they would make in an actual market. In order for users to make proper and accurate bids, a detailed description of the hypothetical market and of the change in the level of provision of a good is therefore crucial.

Unlike a general CBA, which only measures the usage value, CVM includes in its measurement the option value, a value that arises;

> When an individual is uncertain about whether he or she will make use of an environmental amenity … When uncertainty exists, the appropriate measure of the total value of the amenity is the ex ante value the individual's maximum willingness to pay for access to the amenity before the uncertainty about use is resolved (Harless & Allen, 1999, 58).

The two main advantages of CVM over other methodologies is that first it is user-centered and second it includes both usage and non-usage value. Unlike CBA, the usage value in CVM can be designed to include both value-in-exchange and value-in-use. By including these two forms of value, CVM deviates from approaches that have not distinguished information (measured as value-in-use) from information products

(measured as value-in-exchange). However, as mentioned earlier, by creating a hypothetical market modeled after a private goods market, CVM also risks falling into the same trap of market valuation.

CVM has several limitations but it is a methodology that has potential for use in eliciting information on non-usage values. It might however be legitimately argued that modeling the hypothetical market after a private goods market makes CVM vulnerable to the same shortcomings of CBA and other methods that use a market valuation approach. In addition to falling prey to market valuation shortcomings, a major problem that may occur with CVM is the respondents' honesty in disclosing their preferences. It can be argued that respondents may either understate their true preferences when asked their willingness to pay or overstate their preferences when asked their willingness to accept. Harless & Allen (1999) foresaw a problem of respondents overstating their true preferences if they wish to get more of the good or service in question. The authors also reckon that such strategic thinking might also result in understatement of preferences when respondents fear that taxes will be based on the preference statements. CVM is also prone to the "embedding effect", which occurs when roughly similar WTP amounts are obtained for varying quantities of a public good. Because CVM is a survey method, it is prone to problems associated with surveys e.g. getting a representative sample for the survey, getting willing respondents, administering the survey instruments, etc. CVM's capacity to provide accurate estimates of a benefit is dependent on the method's ability to meet the requisites of surveys.

5.0 TOWARDS A POLITICAL ECONOMY VALUATION APPROACH

According to Mosco (1996) economics begins with the individual, naturalized across time and space but a political economy approach starts with the socially constituted individual, engaged in a socially constituted production. Social construction has not been taken into account in the economics' explanation of individuals' behavior. Exclusion of the social structure and power relation from economics leaves the economics' explanation with major weaknesses such as ones discussed below.

The "invisible hand" that Adam Smith in 1862 supposed to be the driving force behind the economy is no longer invisible. It is very clear that there are several forces that interact to drive the economy. However, economists have for a long time rendered a blind eye to these forces. A major omission of economics is that it does not take into account the power and social relations that influence economic decisions. Economics assumes that humans will behave rationally in making economic decisions and therefore they will choose those levels of either consumption or production that match their needs and maximize their benefits. This assumption is however not always true and even though humans might in some instances behave rationally, there are always many other factors influencing their behavior and choice. Many of such socio-economic factors and determinants of production and consumption are rarely considered in economic thought.

The market in which humans are supposed to make rational decisions is not as free as the "free market" concept in economics would like us to believe. Economics completely ignores the relationship between power and wealth and how through power the markets are vulnerable to manipulation so as to behave in the favor of the powerful. Big and powerful corporations, for example, manipulate the market by creating artificial scarcity, practicing price discrimination, wage differentiation, etc. Although economists suggest that government intervention in such situations keeps such activities in check, it ignores

the fact that some of the manipulators may either be in the government or are powerful enough to hijack the intervention and make it work in their favor.

It is evident that although economics studies human behavior, it does so outside the social structure and inside an imagined free market structure. Such is a market that does not acknowledge socio-economic factors, social relations, power relations, and wealth and how these affect "rational human behavior". Such is the market that previous studies using a market valuation approach have adopted together with all market approach's shortcomings. In order to acknowledge the social, power, and wealth relations that the market valuation model ignores, there is a need for an alternative model; a political market model.

5.1 Contingent valuation method: a simulated political market approach

In a CVM study, respondents are presented with hypothetical markets, which most previous studies have modeled after markets for private goods. In an attempt to overcome some of the shortcomings associated with using private goods market model, I am suggesting a CVM approach that presents respondents with a political hypothetical market. This suggested political market model would use a referendum approach to derive the value of benefits from libraries and information services. In its survey to elicit these values, a political market model would include social and power relations as well as socio-economic factors that may affect respondents' preferences and consequently their willingness to pay.

The advantage of using a political market model over a private goods market model is that "instead of assuming that people express preexisting well-realized preferences, this [political market] model assumes that people make choices which are influenced by multiple motives, by contextual factors, and by less than perfect information" (Carson, Hanemann, & Mitchell, 1986, 3-2). In studying voting behavior, the authors used a referendum, in which they provided respondents with a one-time choice of a predetermined policy package to which they were required to provide a yes or no answer. In information studies such a political market model would be appropriate as it includes various factors that determine consumer behavior in addition to factors that market theorists have previously put forward and used to study information.

An evaluation of libraries and information services using a political market approach would elicit users' willingness to pay given all possible social, economic, and power relation factors. Because CVM is a survey method, designing the survey in such a way to ensure that questions reflecting social, power, and socio-economic relations are included is as important as describing the hypothetical political market. A political market approach in evaluation of libraries and information services would also take into consideration factors such as the tasks and roles that trigger information use. For example, users of information services for work related tasks, for school related tasks, etc. are more likely to have higher willingness to pay than users of the same services but for leisure and personal reading. Class and wealth of the different users are also factors that determine the users' WTP. A user with a higher income is more likely to have a greater WTP than a low-income user[12]. WTP should therefore be elicited within the context of the various constructs of society. A well-designed political market model will not only measure the users' willingness to pay but it will also explain why there are variations in user preferences. The design of such a model is however beyond the scope of this paper.

6.0 CONCLUSION

The application of contingent valuation method to valuing information services is relatively unexplored. However, findings from the few past empirical studies that have used CVM have stressed that option value is of fundamental importance in the valuation of information services. These studies have found that non-users place a positive option value to information services and are willing to pay to maintain the services just in case a need to use those services arises in future. As long as valuations of such services exclude this positive option value, the calculated net value is an under-valuation. This under-valuation might be the explanation to the doubts raised on the efficiency and cost effectiveness of many information services. Such under-valuations might also be the reason why it is becoming increasingly hard for libraries to present very convincing cases to funding agencies and other supporters resulting in pressure for libraries to operate under tighter budgets. Further empirical studies however need to be carried out in order to compare models as well as to develop a contingent valuation model applicable to valuing information and information services.

ACKNOWLEDGEMENT

Thanks to Professor Sam Trosow of the Faculty of Information and Media Studies, University of Western Ontario for the invaluable comments.

ENDNOTES

[1] Consumer surplus is "the difference between the maximum amount that an individual would be willing to pay for a good and the actual amount paid" (Nas, 1996, 67). In simpler terms, it is a measure of the maximum gain that an individual can obtain from a product at a given market price.

[2] Usage value according to Harless & Allen (1999) is an ex post measure of value of an individual's willingness to pay after uncertainty has been resolved. Option value (the benefit to potential users of knowing they have the option of using the services) is an ex ante measure of willingness to pay in the presence of uncertainty about use. Usage value is the difference between the ex post and ex ante.

[3] Willingness to pay (WTP) is a measure of a user's preferences for an improved provision of a specified good or service. Although these preferences are expressed in dollar amounts, it does not necessarily imply that users will charged for the provision of the good or service. In case of a loss in the provision of a good or service, users will be asked what level of compensation they will be willing to accept (WTA) for the loss.

[4] By including option value, Harless & Allen (1999) reported a higher total willingness to pay (WTP) for students who had never used the reference desk. The 11 students who visited the desk more than 10 times had a WTP mean of 8.8 and a median of 5.5 while the 36 students who indicated they never used the reference desk services had a WTP mean of 13.3 and a median of 9.5. Such an observation can only be explained by the fact that non-users or infrequent users "know the reference desk exists, plan to use it when the need arises, and are willing to pay to ensure that the service will be available to them when the need arises" (Harless & Allen, 1999, 67). Another possible explanation for this high WTP by non-users is that non-users and infrequent users are likely to be

inexperienced and unsophisticated and therefore their need for help will be greater and consequently will be willing to pay more.

[5] The marginal benefit (MB) of a consumer is the benefit received from consuming one extra unit of a product. MB is expressed by the consumer's willingness to pay for that extra unit. The sum of the marginal benefits from each unit purchased is the consumer's total benefit.

[6] Marginal cost (MC) of a producer is the benefit received from producing one extra unit of a product. MC is expressed by the producer's willingness to accept for that extra unit.

[7] Hedonic pricing method is extensively used in environmental economics and is a method that relates the price of a marketed good to its characteristics by establishing the consumers' willingness to pay for each characteristic. A hedonic price is therefore a shadow price of the characteristic of a good.

[8] The value of time spent on a specific activity is used as the value or cost of opportunities that are forgone during that time. For example, the value that library users place on library services must at least be equal to or greater than their sacrifice in accessing and using them. In this method an individual's hourly wage is used to measure that individual's value of time, e.g. if one is paid $10.00 per hour and decides to take 2 hours off from work to go to the library, the individual will have forgone $20.00 in potential earnings.

[9] Economics is divided into normative and positive economics. Normative economics often referred to as welfare or social economics according to Lutz (1999) explores "the principles on which production of goods and services can be undertaken such that human welfare in its broadest sense is maximized." This branch of economics examines how the world could work while positive economics, according to Mitchell & Carson (1989) examines how the world works.

[10] The St Louis Public Library in its study on estimating benefits to patrons used consumer surplus, contingent valuation, and cost of time. However, only the first two methods were judged appropriate for the study.

[11] D. W. Harless & F. R. Allen (1999) applied the CV method to measure the value that patrons (students and faculty members) place on reference desk services offered at the Virginia Commonwealth University.

[12] Harless & Allen (1999) acknowledged factors, mainly economic, that might affect the users' WTP and consequently used different surveys for students and faculty. Among students, the researchers differentiated students whose tuition was either being paid by parents or relatives or held scholarships and grants from those who paid their fees through loans or out of pocket. The various fees were then adjusted accordingly depending on the percentage of fees paid by the student.

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