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Waiting Lines and Customer Satisfaction

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ABSTRACT:

The paper points out certain quantitative methods largely ignored by library service providers, highlights the importance of customer participation in service delivery process, examines the concepts service quality and customer satisfaction, emphasizes the need for appropriately handling waiting lines in service organizations, presents briefly the theory of waiting lines (queuing theory), psychology of customers in waiting lines with illustrations from library situations, discusses ways and means of reducing delays in waiting lines and increasing service quality and customer satisfaction and concludes by stressing the need for appropriate studies on these lines in Librarianship.

Keywords: Waiting lines; Queuing theory; Service quality; Customer satisfaction

1. INTRODUCTION

The quantitative approach and studies in librarianship have lopsidedly and excessively confined to bibliometric (including informetric and librametric) studies in general and citation related studies in particular. Both in research methodology and operations research there are many relevant and useful quantitative methods and approaches, librarianship needs to adopt for its own benefits. For example, content analysis in research methodology and linear programming, transportation problems, decision theory and queuing theory in operations research have excellent scope for application in library services.

Customer participation in service production and delivery process is a crucial element of service management and high customer contact systems have to very carefully look into theory and psychology of waiting lines to take advantage of customer participation and to avoid negative effects of delays and other psychological

factors on service quality and customer satisfaction (Sridhar, 1998).

One of the important determinants of service quality is ease of access, which includes not only location of service facility and its opening hours but also minimum waiting time to receive service. Generally, delays have a strong negative effect on service quality (i.e., customer perception of the service) and customer satisfaction. For example, it was found in a study that procurement delays lead to demotivation of customers in their participation in collection development of a special library. On the other hand, visible (in presence) waiting line delays have a much stronger and magnifying negative effects on service quality and customer satisfaction. Service operations need to have a clear understanding of the theory and psychology of waiting lines .. Waiting lines normally refer to customers personally waiting in queues before one or more service delivery counters for availing service. However, waiting lines can also be formed by customers 'inabsentia (i.e., proxy) in some cases. For instance, reservation queues for lent out books, written reference queries and requests for literature search, indents for acquisition of books, request for document delivery, etc., in libraries essentially go through inessential waiting lines. On the other hand, lending service, reprographic service, CD-ROM database search service and reference service could have waiting lines with physical presence of customers. There can also be waiting lines for goods like that of books in queue for classification and cataloging. The psychology of waiting lines are more relevant and applicable for waiting lines where customers have to be physically present in the queue.

2. SERVICE QUALITY

Before discussing theory and psychology of waiting lines we may note what service quality and customer satisfaction mean to us. "Quality is the totality of features and characteristics of a product or service that bear on its ability to meet stated or implied needs" (Ellis and Norton, 1993). Quality emphasizes a link between the customer and his purpose on one hand and the product or service being received on the other. Quality is considered to be one of the greatest levers for marketing of services. Service quality is intangible, relativistic, indivisible and has a tendency to deteriorate. Service quality is more a function of attitude than technology. It consists of technical quality (hard part) and functional quality (soft part). Some of the difficulties of determining service quality would strongly let customers to make high emotional judgment about the quality of services.

Generally, quality is also about passion and pride. In other words, service quality is a customer-oriented phenomenon. It is defined, judged and deduced by customer based on his experience, service process, physical evidence, environment, first impression, expertise, etc. In a sense the quality of service delivery personnel is inseparable from the quality of service provided. Normally five gaps between aspiration and performance in service delivery process are identified. They are: (i) Not knowing what are the expectations of customers; (ii) Gap between management's perception of customers expectations and service quality specifications; (iii) The service performance gap i.e., the gap between service quality specifications and the actual service delivery; (iv) Promises failing to match delivery i.e., situations where

promising more than what can be delivered; and (v) Gap between customer's expectations and their perception of quality of service. The first four gaps are in the arena of service provider where as the last is within the customer. All the above gaps significantly affect determination of service quality and hence the customer satisfaction.

Interestingly, it is often said that shoddy service quality does not necessarily cost less than the superior service quality and the cost is long forgotten but the quality is remembered forever. In nutshell, service quality is illusive and elusive concept, nifty, difficult to measure and achieve. It is quite common that service managers fail to recognise quality problem. Lack of solid measures for service quality and the fact that large majority (as many as 96%) of dissatisfied customers do not complain keep service managers in dark.

3. CUSTOMER SATISFACTION

Customer satisfaction should be number one priority in library services. Though measuring is difficult, customer satisfaction can be defined in simple terms as perception minus expectation. Both expectation and perception of customer play crucial role in customer satisfaction. The expectations are often derived from personal experience. Perceived usefulness of service mainly measures the system's impact on individuals effectiveness, but it is not the only measure. It is often said in case of service organisations that the perceived quality of service is realised at the moment of truth i.e., when the service delivery personnel and customer come in contact for delivery and receipt of service and thus emphasising the importance of customer participation in service delivery process. In other words, customer-service provider interaction plays vital role in determining the level of customer satisfaction.

Satisfaction is primarily an emotional customer-centered personal response/ reaction. As a state experienced inside customer mind, it involves both intellectual and emotional responses. Customer satisfaction (including expectation and perception of customer) depend more on customer and his style (his overall post purchase evaluation) than technology or system. The customer and his style in turn depend on his perception, viewpoint, experience, expertise, prior personal knowledge, recent performance and first impression.

As far as library customers are concerned, image of a library helps to determine the expectations. Advertisements and casual conversations greatly affect the image of libraries.

Interestingly, regular users of libraries tend to have more realistic expectations than irregular users. Libraries can gauge the expectations of customers through: (i) suggestions; (ii) bench marking; (iii) focus groups or user panels and (iv) special studies like depth interviews .. Research methodology offers suitable instruments like scales and psychometric factors to measure satisfaction.

Customer perception and expectations are closely linked. Though impressions are not scientific- evaluations, they are formed during service delivery process. Normally customers tend to have multiple interactions (tasks) in a single visit to library. Single unfortunate incident can change customer perception in a multiple interactions

situation. Genuinely involving customers and developing a service-wide image of consistency and efficiency are two important ways to improve customer perception of service.

Customer satisfaction and demand are also closely linked. Good service generate greater use from limitless pool of latent demand. Satisfaction itself is adoptive in the sense a good service overstretched can cause drop in satisfaction. Poor service retain some customers who are: (i) persistent; (ii) rarely ·satisfied; and have (iii) low expectations. But the rating further goes down as service improves because of attracting more customers who are more critical and knowledgeable and want even higher level of service.

Customer satisfaction is sometimes wrongly equated with performance of the system Further, satisfying a person differs from satisfying a need. Customer satisfaction has a linear relation with loyalty and repeat use/purchase. We need to note the multiplying effects of happy and unhappy customers. Often, a satisfied customer is the best advertisement for service organizations.

4. MEASURING SERVICE QUALITY AND CUSTOMER SATISFACTION

Like measuring happiness, it is difficult to measure service quality. Inspecting and measuring it in advance of delivery is even more difficult. In other words, most services cannot be sampled or tried in advance. It is even difficult to determine and implement service specifications due to high customization, uniqueness and wide variability. The service product itself is fluid and most of the time the outcome is evaluated and not the service process. Service output, by and large, is a mix of physical facilities and mental or physical labor.

User information satisfaction (UIS) is considered as one of the six interdependent categories of measures of service quality in LIS. The others are: (i) system quality; (ii) information quality; (iii) use of IS; (iv) individual impact; and (v) organizational impact. UIS is inherently subjective measure whereas system quality is more objective measure. Further VIS and use of IS are reciprocally related. Perceived usefulness of an IS mainly measures system's impact and system's impact on job satisfaction is a complimentary measure.

As mentioned earlier, it is important to note that performance of a library system (or IS) or service cannot be used as a proxy measure for customer satisfaction. Secondly, customer judgments could differ from those of experts. Thirdly, since customer satisfaction is heavily influenced by expectations,' correcting' the 'incorrect' expectations of customers may be necessary. Emotional customer satisfaction is different from (and not entirely caused by) the satisfaction arising out of a discrete information request. Quality service can be achieved through broader conception of the customer satisfaction process.

5. LEVELS OF SERVICE QUALITY AND CUSTOMER SATISFACTION

Certain levels or gradations of service quality are often mentioned by experts. Firstly, ‘exceptional' or 'surprise' quality in service is one that not only leads to customer

satisfaction but also to customer delight. In other words, the 'exceptional' or 'surprise' quality is found in the process of providing products and services which not only meet but exceed the customer's expectations. However, every service should have a bare minimum of 'basic' quality lack of which can cause "only dissatisfaction. So called 'miserable', 'careless' and 'unconcerned' levels of quality are said to be below the 'basic' level and are to be avoided at any cost. Above the 'basic' level are 'anticipated', 'performance' and 'competent' levels of quality. Hence, the expectations, perception and demand are also closely related and one affects the other two.

Another issue to be noted here is that when a service organization operates between its optimum capacity and maximum available capacity, there is a risk that customers being served at that time may receive inferior service and thus become dissatisfied. It is also difficult to play "catch-up ball" due to halo effect created by the early stages of any service encounter. Thus the experience of customer in early stages of service encounter plays a major role in customer satisfaction. For customers 'feelings are facts' and as mentioned earlier, there is a danger of multiplying effect of unhappy customers. This includes one's experiences of waiting in queue.

6. TIPS FOR IMPROVING SERVICE QUALITY AND CUSTOMER SATISFACTION

Finally, we may note some tips for improving service quality and in turn customer satisfaction particularly in library and information service context.

i. The service quality in LIS is judged on friendliness, courtesy, lack of queue and reputation.
ii. Small incremental changes for continuous improvements are very important in library services.
iii. Obsessive attention has to be paid to details in designing library services.
iv. A set of statistical measures like ratios and ratio analysis techniques (Sridhar, 1986) have to be kept in mind for checking the quality of services and the system.
v. Certain accepted norms and standards as well as agreed guidelines have to be evolved and adopted in rendering service.
vi. We need to internally market the quality goals, i.e., the 'quality' concept has to be first sold to our staff (service personnel). We have to strive hard to create 'customer focus and care' culture among staff. Creating a customer service language manual for service personnel of library is one of the important tasks in this direction.
vii. All efforts should be put into tangibles the intangible service and also to improve physical evidences in service delivery process.
viii. We also have to encourage 'word of mouth' communication about quality among staff as well as customers.
ix. We need to be careful in our promises and promise only what can be delivered.
x. Lastly, we need to openly invite complaints from customers.

7. THEORY OF WAITING LINES

Queuing systems or waiting lines exist throughout society and their adequacy has strong effect on quality of service and productivity. Queuing theory is concerned with mathematical study of queues or waiting lines, formulating mathematical models of queues and measuring performance using these models.

Waiting lines .are formed whenever the current demand for a service exceeds the current capacity to provide that service. Because of difficulty in accurately predicting arrival pattern of customers for service and/or how much time is required to provide service to each customer, accurate decision regarding the capacity to be provided is made quite difficult. Excess service capacity involves excessive costs due to under utilization and insufficient capacity to meet peak loads causes waiting lines to become excessively long and customers may even quit the waitinglines.

The ultimate goal is to achieve an economic balance between the cost of service (i.e., cost of idle facility and employee) and costs associated with waiting for the service (i.e., social cost and cost of lost customers). Queuing theory does not directly solve this problem, but tries to provide vital information required for taking decisions.

7.1 Basic Concepts of Queuing Models

Input source (or source of arrivals or calling population) refers to the population from which arrivals to, waiting line come from. Size of input source is the total number of distinct potential customers. It could be finite (or exhaustible) or infinite (or inexhaustible).

Queue is characterized by the maximum permissible number of customers that it can contain. This also could be finite or infinite. In most of the practical situations, it is finite. Queue discipline refers to the order in which members of the queue are selected for service. The order is usually first-cum-first-served. However, priority-discipline models give priority to rush jobs and important customers over others and follow random selection, priority selection or last in first out (LIFO).

The service mechanism consists of one or more *service facilities,* each of which contains one or more parallel service channels or stations called *Servers. Service Time* (or Holding Time) is the time elapsed from the commencement of service to its completion for a customer at a service facility. *Interval Time* is the time between consecutive arrivals of customers to waiting line. *State of system* is number of customers in queuing system and queue length refers to number of customers waiting for service. In other words, state of the system minus number of customers being served will give queue length.

The transient condition of the system refers to initial stage when the operation begins. The *steady state condition* is that condition when system becomes essentially independent of the initial state after lapse of some time. The *state dependent service rate and/or arrival rate* assumes that the (mean) service rate is always a constant. But it may not be true in practice. Servers tend to work faster than they do when the backlog is small or nonexistent. The increased service rate may be due to compromise in quality or external assistance for certain phases of service.

The physical structure of waiting lines consists of:

i. One or more input sources with arrival distribution

ii. None, one or more queue
iii. One or more servers operating in series or parallel
iv. Service discipline
v. Maximum number of customers allowed

The controllable aspects of queuing systems are:
i. Arrival rate
ii. Number of servers
iii. Service time
iv. Maximum length of waiting line
v. Queue discipline or priority rules.

7.2 Important Assumptions of a queuing model

i. Each source has a well defined arrival pattern over time, i.e., inter-arrival or interval times are constant or randomly spaced over time with a known inter-arrival time probability distribution (poison distribution)
ii. The service times at each channel (server) may be constant or random with a known service distribution (negative exponential distribution)
iii. The potential arrivals may balk if the length of waiting line becomes excessive and decide not to join or arrivals may join the waiting line and subsequently renege, i.e., become impatient and leave before being served. They are lost by the service system.
iv. In a steady state, the average rate of departure is equal to average rate of arrivals.

7.3 A Simple Queuing (Waiting Line) Model

The simplest waiting line model assumes that arrivals join a queue that is of unlimited size, waiting in line until their turn for service comes on a first-cum-first-serve basis and then enter a service facility consisting of a single channel.

If, W = Average time spent in queue (i.e., sum of the expected waiting time and expected service time)

λ = Average rate of units passing through the system per unit time L = Average number of units in the system

Then, $L = \lambda W$

If μ = Average service rate

$1/\lambda$ = Expected inter arrival time

$1/\mu$ = Expected service time

Further, the utilisation factor, ρ (i.e. the expected fraction of time the server is busy is given by

$\rho = \lambda / s\mu$

Where ($s \mu$) is the fraction of the system's service capacity that is being utilised on the average by arriving customers Cλ).

The crux of the queuing theory is to 'achieve a trade off between excessive waiting by customers (i.e., too much demand) and cost due to excessive idle time at the service facility (i.e., too little demand). Lending system in a library is an example of

single facility channel waiting line.

Other more complicated queuing models, which are outside the scope of this paper, incorporate additional parameters like multiple channels (servers), finite or infinite calling population, finite or infinite queue, servers in series, constant or variable service time. Constant or random arrival rates, etc., and various combination of these parameters.

7.4 Operating Capacity

One typical characteristic of service organisations is lack of inventory of service Le., non-inventoriability. However, in order to cope up with its capacity to service and the fluctuating demand for service two adhoc mechanisms are used. They are creating inventory of service through reservation system and through formalised queuing system. Either way will have its own side and ill effects on quality of service rendered. Infact, as said earlier, whenever a service organisation operates between maximum capacity and optimum capacity, it is bound to provide some inferior quality service to some or all of its customers.

8. PSYCHOLOGY OF WAITING LINES

As mentioned earlier waiting lines where customers need not have to be present and waiting lines of goods are less problematic, than waiting lines where customers are personally present. In other words, goods requiring servicing can be kept in a waiting line longer than people. There are a couple basic psychological aspects of customers in waiting lines have to be understood by the service organizations.

Firstly, unoccupied time of the customer in the waiting line is always felt· longer than the occupied time. If a customer in service waiting line is engaged with some activity either by himself or by service personnel he will not feel waiting as longer. One of the funny but practical suggestions is to provide for a big mirror where people have to wait in standing for longer. This is nothing but the subjective element of the customer as they are not occupied by any activity in the line. Secondly, preprocess waits of the customer is always felt as longer by customer than in-process waits. Obviously the customer do not take cognizance of longer time involved in the service delivery process as long as he is actively participating the process. Thirdly, any anxiety on the part of the customer make him to feel waiting time as subjectively longer. Fourthly, it is very crucial from the angle of a customer in the waiting line that he should be given to understand how long he has to wait to get his turn and receive the service. In other words, uncertain waits appear longer to customers than known and finite waits. If only libraries can declare that no member need to wait for more than (say) 10 minutes in tending counters for getting a book issued as a standard for service quality the anxiety of members standing in queue in counters is substantially reduced. Further (fifthly), any open explanation about why one has to wait so long always relieves commotion in the mind of customer. Hence, unexplained waits appear longer than the explained waits. Sixthly, customers obviously expect either equitable treatment or a special favorable treatment from service personnel. Hence, any unfair waits appear longer to them than equitable waits. Any by-passing of a customer in the

waiting line causes dissatisfaction. It has been established through research that the perceived equality of customers in a service centre has an important positive effect on customer satisfaction of the service. Seventhly, the more valuable the service, the longer the customer is willing to wait. This can be seen within the services of the library as well' as among various services in the society. Customers in waiting lines for fundamental and esoteric requirements and those for scarce resources (like money, art, health, food, etc.) are more tolerable to delays in waiting lines than those in library circulation counter. Lastly, customers having solo waits feel it longer than those waiting in groups. It is always better to allow customers in groups for waiting.

All the above psychological aspects of waiting lines have some lessons for service managers who have to design service counters and operate them with customers in waiting lines.

9. REDUCING DELAYS IN WAITING LINES

How to reduce delays, particularly subjective delays, in waiting lines and hence enhance service quality and customer satisfaction is the crucial question. Some possibilities based on theory and psychology of waiting lines discussed earlier are presented here

i. The first step in this direction is to determine the maximum amount of time that customers will have to wait for service.

ii. The second step is to apply theory of waiting lines to reduce the delays wherever possible by introducing additional service counter, enhancing the service production capacity, introduction of reservation system, market segmentation by. customer type and kind of service required and manipulating the demand itself.

The reservation system is a mechanism to pre-sell the service. It helps in avoiding queue, balancing capacity utilisation and guarantees service availability at a specified time. Of course, the reservation system should make provision for handling emergency jobs at a premium price.

The market segmentation strategy may help to identify higher priorities and shorter jobs in waiting line to provide 'express lanes' or faster service on priority or on a premium price.

iii. Lastly, finding ways and means by which customers who are inevitably in waiting lines are allowed to pass time quickly and pleasantly. This strategy calls for developing agreeable surroundings (like comfortable temperature, seating, restful music, light hearted video programs, a large mirror, etc.), collecting preliminary information from customers in waiting lines, disseminating advance information on the service, promoting other products offered by the service firm and offering supplementary 'services like entertainment (TV, Video), reading material, water, etc.

10. CONCLUSION

Having seen a birds-eye-view of service quality, customer satisfaction and ways of handling waiting lines of customers in service organisations in general and libraries in particular, it appears obvious to have more emphasis on creating theoretical frame works and practical guidelines for service quality and customer satisfaction in libraries. Theory of waiting lines as a quantitative approach has to be given a try by the profession. There is also a dire need for studies covering customer attitudes toward queuing under varying conditions and customer opinions on whether the quality of service delivered varies with different levels of capacity utilisation and waiting line environments.

Some possible ways of circumventing problems of waiting lines based on theory and psychology of waiting lines are:

i. Provision for reservations,
ii. Making waiting a comfortable and less painful activity,
iii. Reducing perception of actual waiting and increasing expectation of waiting, i.e., do not under estimate the likely period of wait rather overstate and make real wait to be less than expected so that a way of protective thinking is to be brought in the customer,
iv. Arranging some absorbing/ interesting activity during waiting,
v. A voiding visibility of long queues,
vi. Some of the preliminaries of service delivery process be done during the waiting,
vii. Providing attention, concern and necessary information for reducing uncertainty and anxiety.

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