EMPIRICAL APPLICATIONS OF QUEUING THEORY IN TECHNICAL ASPECTS

[1]DR.D.VIJAYA KUMAR   **[2]G.NAGESHWAR RAO**

[1] Principal KITS KODAD   *[2] Asst.Prof*

ABSTRACT

Queuing theory as an operation mgt techniques is commonly used to determining and streamline staffing needs scheduling and inventory in order to improve overall customer service the service mechanism is the way that customer receive service once they selected from the front of queuing (many valuable applications of of the quenching theory are) queuing and simulation deal with the study of waiting lines mathematical model used to stimulate the queuing this paper proposes data drives queuing models and solutions to advice arrival times delays originating from air lift arrival processing but to develop mathematical models to predict arrival delays resulting from increased future aircraft traffic .

KEY-WORDS: Queuing theory, simulation, mathematical models, time delays, predict arrival delays.

INTRODUCTION

When there is an excess of planes, the absence of a queen would have real safety implications as planes all tried to land at the same time. Queuing theory is important because it helps describe future of the queen like average wait time and provides the tools for optimizing queues many voluble applications of the queuing theory are traffic

flow (vehicles,aircraft,people communications) scheduler (patients in hospitals job on machines, programs on computer) and facilities design (banks, post office, super market) as a branch of operation research queuing theory can helps inform business decision on how to build more efficient and cost efficient work flow systems

In their model, upon researching the departure runways, air craft live up in the run ways queue, where they get served by the run way server

According to a probability service process they estimated the travel time for each flight, and modeled the probability serves processes queue based modeling approaches suggest that all potentials solution is to expand the realization of time based operation,officiently shifting from traffic flow control and time based arrival management at most of the airport , there single "S" shaped queue when the next person has moved to the top, he can chose which ever server that available therefore to ensure there only one user in front of each server but all servers are operating in a similar phase

The flow of movement around your airport plays a crucial role in effective queue management. To avoid un necessary bottle necks in high traffic areas where you really don't want queue forming, keep walk waves clear and allow for bags and trolleys schedule arrival time , lines can reduces reported delays simply by un floating the schedule time of the flight and, indeed avoidance shows that a lines have done exactly that. If you have most received a request with in six minutes, you will be automatically added in to the airport queue, you can either chose to stay in the queue and wait for request (d) read back to the only while accommodating ----of passengers in a year, the airport business is touching the heights in recent times the spectrum of around control and queuing products under its umbrella includes belts post ,rope post ,chain post, stand alone units , café barriers, etc..solutions to reduce impact of a travel on the environment (1) setting up of resolutions (2) use of technology (3) carbon off settings programs (4) using alternative planes (5) use of computer program to reduce noise pollution (6) optimization of flight routes (7) invention of alternative energy sources that time a specific flight is are to arrive , the airport arrivals board displays the flight arrival times for all flights are in that day.

Airlines use a system called hub banking which clusters flight around similar times the idea is that passengers spent less time waiting around for connections an average day has 10 (or) 80 banked times , in which several flights all leave within minutes of each other .

The queuing theory a disciplines within the mathematical theory of probability , an M/M/1 Queue represents the queue length in a system having a single server, where arrivals as determined by a Poisson process and off service times have an exponential distribution.

M/M/1 SYSTEM

In the rotation, the M stands for mark on an, M/M/1 means that the system has a poison arrival process ,an exponential service time distribution and are server. Analytical queuing models have frequently been found un practical for many types of real world problems. Among chiefly to the inability of queuing system to change their parearetation in response to fluctuations in traffic intensity are type of practical problem that fits the simple classical queuing models quiet well however, is the passenger security queuing operation founded modern airports this service facilities (security check posts)must always be available the service (screening procedure)must be unvarying, and the airlines passenger have no practical alternative to accepting this service .

Queue management is used to control queues .queues of people form in various situations and locations in a queue area .the process of queue formation and propagation, a set of tool and sub systems assisting the controlling customers flow FIFO(first in ,first out)is the most common type of queuing and it is generally behaved to be the parries way to manage queues

TRAFFIC MANAGEMENT

Queuing is the study of traffic behavior near a certain section where demand exceeds available capacity in transportation engineering ,queuing can occur at red lights, stop signs, bottlenecks,(or)any design based(or)traffic based flow construction.

Queuing theory can be used to analysis the flow of traffic on the approach to and through an intersection control by a traffic signal. This is accomplished by analyzing the cumulative passage of besides of time.

METHODOLOGY OF QUEUING MANAGEMENT

Queuing is a abs tock data structure somewhat similar to stacks unlike stacks a queuing theory open at both its ends are and is always used to insert data (un queue)

And the other is used to remove data (de queue) queue fallows first to first at methodology queuing methods are systems put in place to serve customers in an orderly manner queuing methods prevent chaos in customer serves by ensuring the company can serve are at a time an equitable basis they are 1. premature priority and 2. Non premature priority the system many have either a limited as an unlimited capacity of holding customers often used

as an operation management tool, queuing theory can address stuffing scheduling and customer serves shortfalls some queuing is acceptable in business if there never a queue its sign of over capacity queuing theory aims to achieve a balance that is efficient and affordable a study of a line using queuing theory world break it down into six element 1. The arrival processes 2. The service and departure processes the number of services available the queuing discipline (such as first in, first out) the queue capacity and the member being served.

The component of a queuing system: A queuing system is characterized by three components

- ➢ Arrival processes
- ➢ Service mechanism
- ➢ Queue discipline

NEED OF STUDY

Queuing theory is important because it helps describe feature of the queue like average wait time and provide the tools for optimizing queues queuing models is to find out the premium service rate and the number of servers so that the average cost of the being in queuing system and the lost of service are minimized.

Most of ------- contains queues as part of the model queuing theory refers to the ---- material used to suitability these queues as a branch of operation research queuing theory can help inform business decision house to build more efficient and they cast effective work flow system queuing theory is the study of the moment of people, objects --- information through a line the objective of a queuing model is to find out the optimum serves rate and the number of serves so that the average cost of being in queuing system and the cost of serves are minimized a queuing model is a suitable model to represent a service oriented problem where customer arrive randomly to received same service the service time begin also a random variable

Queuing delay calculation:

Assume a constant transmit ion rate of R =17000000 bps

A constant packet-length L =3600 bits

And a is the average rate of packets second traffic intensity 1=La/R

The queuing delay is calculated as 1(L/R)

$$(1-l)$$

For l<1

Are of the most challenging area of queuing involves waiting time making the wait time shorter i.e. a slow line a less productive line and this impact both the satisfaction of your customer and profitability of your business queuing system reduce @ optimized the total waiting cost a transport company such as fed EX@SUPS can use queuing theory to determine the most operationally efficient manner of transferring packages from are transport vehicle to another queuing theory is used in business settings permeably in operations management and research problems such as production scheduling log the distribution and computer network management queuing theory refers to the mathematical models used to simulated these queues and will reduce wait time to the reasonable level by balancing wait time with the number of servers queuing model are used the analyze trade of conserving the number of servers verges the waiting time of the ----

CONCLUSION

In general speaking queuing system waiting time are widely used in each area in the world nowadays in our paper we mention about the fast for the queuing system the queuing using presently and how the queuing system will change develop in the future queuing theory is a major system in our society every person has had to stand in line at are point in their lines understanding queuing theory helps business compensate for these waiting periods people culting in and dis organized lies can pass many problems there many reports showing that reduction of queuing in business efficiency and profit significantly queuing happens everywhere queuing affect our productivity thus study about queuing is very important and very practical

The advantages of queues are that the multiple data can be handle and they are past and flexibility customer population and arrival processes characteristic apply to queuing system queuing theory is the mathematical study of the congestion and delays of waiting in line queuing theory is a powerful tool to analyze the daily phenomenon waiting in line discover how to define queuing theory how is started why it's important and how it can be apply to real life situations.

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