

Simulation Model to Increase the Productivity of Distribution Process of Bottled Water Industry in Sri Lanka

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Abstract— The study is carried out based on data gathered from a survey carried out in a sample water bottle distribution organization and generalized to develop a simulation model to increase the efficiency of a such system. The researcher has discussed the introduction, eligibility of the study and the conclusions throughout the study.

I. INTRODUCTION

Bottled water consumption is growing exponentially over the past ten to fifteen years. This growth has taken place globally specially in the countries based on the equator; including Sri Lanka. Along with the recent climate changes in Sri Lanka, the demand for bottled water has almost become doubled according to the suppliers. Distributing the bottled water from the manufacturing plant to the customer has few steps but many constrains exist to consider in the process which makes significant delays due to the lack of integration, increase the cost and underutilization of the available resources. In the process of distributing bottled water, there is a daily demand for the water as well as the seasonal and rapid demands eventually. In the business process currently used in the distribution of the water, the supplier is using different transportation methods to deliver the water to the customer while the supplier has premier and non-premier customers who need to be treated separately. On the concern of serving all the customers while minimizing the distribution cost and time as well as utilizing the available resources (human, vehicles, products and standards) the researcher is conducting the study on developing a simulation model to increase the productivity of the distribution process of the bottled water supplying industry by using supply chain simulation software.

(Arena)

In the distribution system of water bottles the organization has an Operations Centre that handles customer requests and manage the distribution of orders. The researcher has identified that the system can be affected by some of the entities, resources and processes. The researcher has analyzed three main factors that can make a significant impact to the number of successful deliveries in the distribution channel.

i. Number of customer touch points –

In this research area, the number of customer touch points are depending on the call center, schedule of call center assistants and the number of telephone lines.

ii. Delivery time –

In the research, the delivery time can be defined as the waiting time in the system.

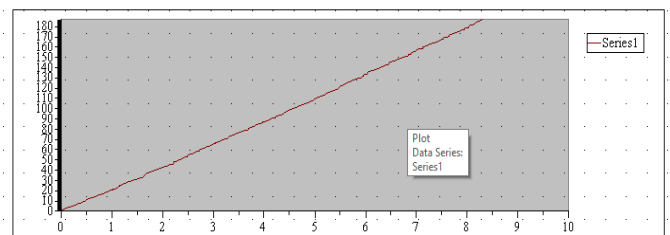
iii. Destinations availability –

In the research area, the delivery of the order depends on the customer's availability at the destination

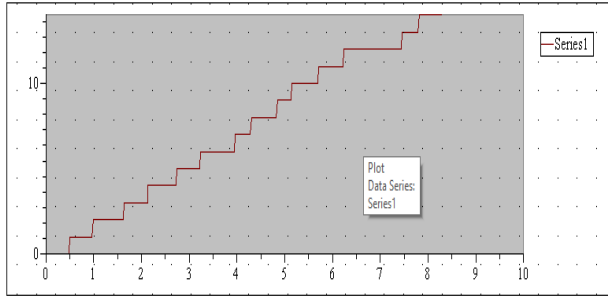
II. FIGURES

i. Number of call center assistants impact to the number of success orders

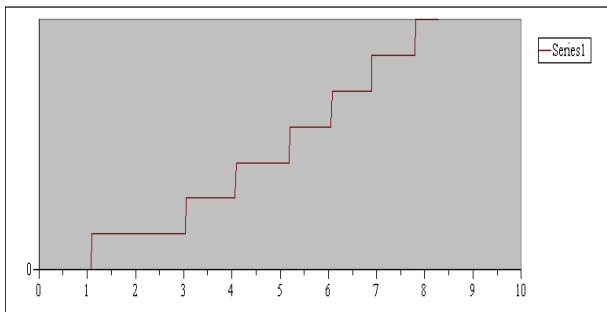
X- Number of call center assistance
 Y- Number of Success orders



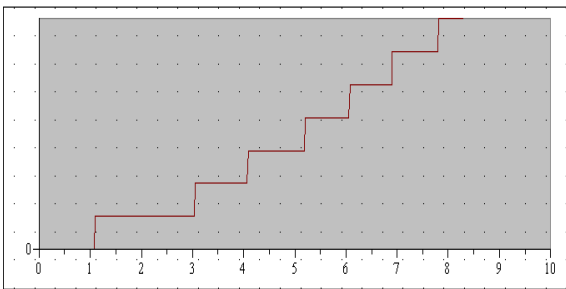
- ii. Impact of the number of telephone lines available to the number of success orders.
 X- Number of Telephone lines
 Y- Number of success orders



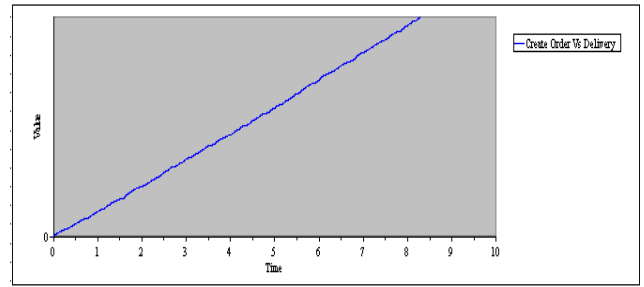
- iii. Impact of waiting time to the number of returned orders
 X- Waiting time
 Y- Number of returned orders



- iv. Analysis of Number of successful order creations vs. Number of successful deliveries.
 X- Number of successful order creations
 Y – Number of successful deliveries



- v. Number of out orders vs number of returned orders
 X- Number of out orders
 Y – Number of returned orders



III. CITING PREVIOUS WORK

[1] A salient example is the buyer-seller relationships established in the past few years. This has benefits for both retailer and manufacturer. For the retailers involved, warehouse and back-room inventories can be reduced substantially. [2] incorporating the customer behavior is important in modeling the strategic use of inventory. Further, it is explained the inventory is mainly depending on the customer decisions. [3] It is explained that there is a negative relationship between the waiting time and the customer perception and waiting time is a major concern on customer decision making.

IV. CONCLUSION

The researcher has concluded according to the findings of the study, the customer touchpoints have a positive impact on increasing the number of orders as well as increasing the customer availability at the destination. The unavailability of the customer at the destination causes to return the order while the waiting time has an impact on the number of orders returned. When the waiting time in the queue increases the number of returned orders also increases.

ACKNOWLEDGMENT

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[3]G. ANTONIDES, P. VERHOEF AND M. VAN AALST, "CONSUMER PERCEPTION AND EVALUATION OF WAITING TIME: A FIELD EXPERIMENT", *JOURNAL OF CONSUMER PSYCHOLOGY*, VOL. 12, NO. 3, PP. 193-202, 2002.