

Impact of Queuing Theory in Whole Process in Business from Manufacture to Consumer

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Abstract - Queuing theory is the study of waiting in line. It is a management science that's all about finding the best ways to use limited resources. It has been applied to a wide variety of business situation. It is also called waiting line theory. Waiting line theory is also widely used by manufacturing units. It has been popularly used in the area of tool cribs. There is a general complaint from the foreman that their workmen wait too long in line for tools and parts. Queueing theory can help your business reduce costs, drive up efficiency, and provide better service for your customers. The common problem arise in almost is that they lose their place due to a long wait in line. This shows a need of queuing model for business management to understand the situation better.

Index Terms - Queuing theory, Manufacture, Wholesaler, Retailer, Stability, Product, Demand.

INTRODUCTION

Queue management is a smart, efficient way to balance costs, minimize loss, and avoid overinvesting in equipment, products, or labour hours you do not actually need—all while maintaining a high level of customer satisfaction:



It is important to use the queuing theory to constantly reevaluate your business. Continuous improvement will help your business grow in the long term. In every phase of business, there are steps that have to happen in order to produce, stock, and sell an item. As soon as

an item moves through one step in that process, it joins a queue of other items waiting to move to the next phase. The psychology of queuing is related to queuing theory. This is the component of queuing that deals with the natural irritation felt by many people who are forced to queue for service, whether they're waiting to check out at the supermarket or waiting for a website to load.

CREATION OF QUEUING THEORY

Agner Krarup Erlang, a Danish mathematician, statistician, and engineer, is credited with creating not only queuing theory but the entire field of telephone traffic engineering.

In the early 20th century, Erlang was head of a technical laboratory at the Copenhagen Telephone Co. His extensive studies of wait time in automated telephone services and his proposals for more efficient networks were widely adopted by telephone companies.

OBJECTIVE

take the guesswork out of the decision-making process in multiple areas of your business.

A lot can change in your business within a short time. to design balanced systems that serve customers quickly and efficiently but do not cost too much to be sustainable.

MANUFACTURING

Manufacture is defined as to make something from raw materials by hand or using machines. An example of to manufacture is to make clothing from cotton, automobiles in factories. It is the production of goods through the use of labour, machinery, tools and biological or chemical processing or formulation. In manufacturing, queuing is a necessary element of

flexible systems in which factors of production may be continually adjusted to handle periodic increases in demand for manufacturing capacity.



It has close connections to the engineering and industrial process design sectors.

There are three main type of manufacture: -

1. Make-To-Stock (MTS)

In this system a factory produces goods that are held in stock at stores and showrooms. This means that a market for the goods needs to be predicted so that the items can be produced in advance ready for the consumer. However, producing too much can mean that surplus stock needs to be sold at a loss while producing too little may mean the market is missed and costs aren't covered by sales.

2. Make-To-Order (MTO)

The make to order method allows the manufacturer to wait until orders are received before production begins. This makes it much easier to manage inventories and react to market demand. However, customers will need to wait for their products to be produced and the manufacturer will need a steady stream of orders to keep the factory in production and profitable.

3. Make-To-Assemble (MTA)

This method is similar to make to stock, except the factory will produce component parts in a chance of orders for assembly. This means that the manufacturer is ready to fulfil customer orders as they arrive but can leave the manufacturer with a stock of unwanted parts if there is no demand.

Quality control is also an important aspect of any manufacturing process in order to protect the image of your brand and products. A successful manufacturing business requires a good mix of sales management, stock management, quality control and production costing.

WHOLESALE

A wholesale business is a type of business that earns money by buying large quantities of goods from suppliers then selling in bulk to other small merchants. A wholesaler can supply only a single product or a variety of goods. The main purpose of this kind of business is to distribute goods.



There are 3 main types of wholesalers:

Merchant wholesalers – These are the ones that work directly with suppliers, buy in large quantities, store the inventory, price competitively, and sell directly to online.

Agents or brokers – These wholesalers work on behalf of manufacturers that are not able to sell products on their own. In other words, they are like middle-man salespeople for suppliers and will be paid a percentage of the sale.

Manufacturing distributors – Several producers are large enough to have sales teams that can sell directly to the customers online. If the sales and production areas of the company are totally separate in locations and management, the sales department could be considered as a wholesaler.

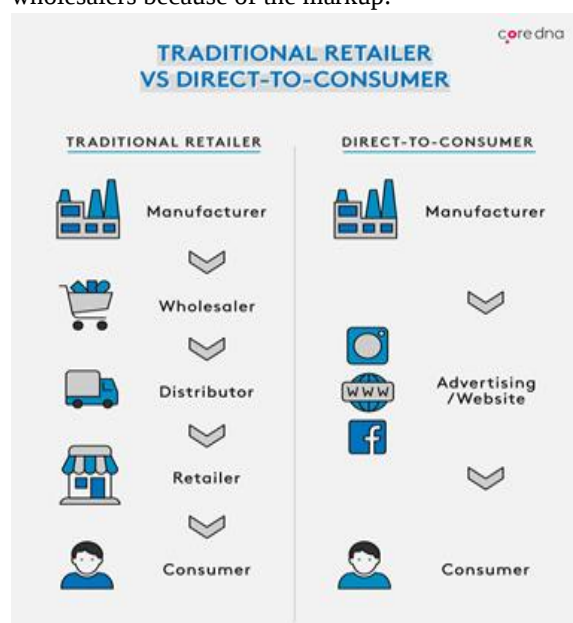
Importance of Wholesalers

1. Breaks down the bulk: Wholesalers buy in bulk from the manufacturers, breaks it down into comparatively small quantities and sell them to different retailers.
2. Provide storage facility: Wholesalers move the burden of storing away from the manufacturers as they also provide storage facilities to store the products.
3. Risk Bearing: Wholesalers bears the risk of loss due to fluctuating demand and goods during storage. They also take the responsibility of attracting retailers to buy the product.

4. Maintain the demand-supply stability: Wholesalers always have some stock of the product with them. They make use of it to maintain the demand-supply stability with retailers and end consumers.

RETAIL

A retailer is a person or company that sends products directly to its customers for profit. A retailer may be a manufacturer of the product, or a distributor may obtain relevant products from a wholesaler. The products they sell will be priced higher than the wholesalers because of the markup.



Your retail location sees increased traffic in the late afternoon. You decide to use a queueing model to forecast traffic, then make sure you have sufficient inventory levels on hand to meet demand.

You also use your queueing model to estimate customer wait times and compare that to the cost of the extra equipment and payroll costs associated with opening more registers. You wind up with a solution that does not reduce customer wait time to nothing, but it ensures your buyers are still satisfied and you do not overspend on staff or equipment.

CONSUMER

Consumer purchases goods from the retailer in small quantities to satisfy demand. Consumers can be either an individual or group of people who purchase or use

goods and services solely for personal use, and not for manufacturing or resale. They are the end-users in the sales distribution chain. The consumer is an individual who pays some amount of money for the thing required to consume goods and services. It is a person who buys goods or services for their own use. Example: - The new telephone rates will affect all consumers.

DISTRIBUTION CHANNELS

Companies must decide how they will distribute their products. Will they sell directly to customers or will they sell through an intermediary—a wholesaler or retailer who helps move products from their original source to the end user.



SUGGESTION

Once you know the limits of your current system or process, you can effectively plan around those limits—or find areas where you can improve.

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