

Warehouse Location and Layout

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Abstract

Warehouses have to be situated in such a way to directly cover the market and to be able to ship their products most quickly and in the best way. So, an organization has to locate its warehouse in such a way as to get close to the target customers. Historically, a warehouse could be thought of as a large container where extra inventory would be stored for years. But, today, warehouse facilities are considered as distribution activity centers that also minimize stock but also offer added value through such procedures as processing. Nowadays, the main focus is on productivity and operational efficiency. Once the basic planning processes are completed, it will be much easier and most importantly at a low-cost to put up an architectural design, construction and operational know-how. The conceptual warehouse design should include an individual analysis of the relationship between customer service and costs.

Keywords: Layout, Warehouse Capacity, Operational Know-How, Architectural Design, Cross Docking

Warehouse Location Selection

When products are stored in locations that are convenient, it is easy to manage the customer requests. The several factors that need to be considered while choosing the warehouse location are as follows:

Layout and Flow of Building

The warehouse's outline or layout can be done much like the activities taking place there. The kind of equipment to be stored in the warehouse determines the ceiling height along with the column spacing that bear the responsibility to determine whether the equipment or layout can be fitted into the given space.

Availability of Skilled Workforce

Putting a warehouse in a remote area will save money, but it will be very difficult to locate and hire skilled labor. Because of this, it is important to select a warehouse situated in a location where there is enough labor. The duration of labour holds an important place too.

Intensity of Use

Another factor influencing the choice of a warehouse location is the intensity or tempo of events within the warehouse. In instances of light assembly, less intense usage is better. Yet, the emission, noise level and outdoor storage facility must be the ones which should be given priority.

Proximity to major linkage

It means transportation that can be used, like road transport, rail, water or air transport. It is important that the warehouse is located in a place that is easy to reach. A broad range of transportation options should be available to any organization. Another critical consideration of the warehouse location is the proximity to the customers.

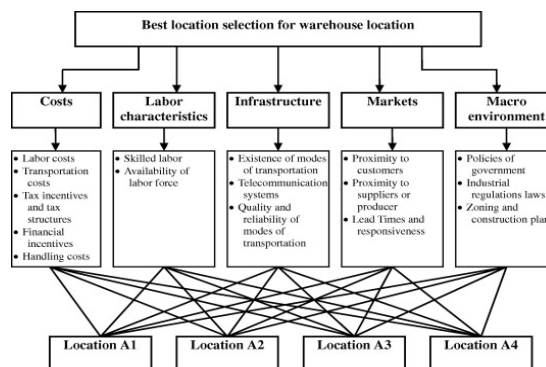


Figure 1

Material-Handling Capacity

It refers to the handling equipment and the availability of storage and staging facilities. It includes packing, moving, and storing of stocks or it is the case when the materials are the ones that are transferred in the warehouse.

Dimensions

Merchandise accommodation should be in place and fit it into the warehouse variable to the organization. The startup should leave some extra space around the warehouse in order to ensure the future growth of the business. In addition, a warehouse building has to be able to cover merchandise and be proportional to the company's size. Moreover, in the case of new companies and startups, it is important to ensure that there is enough space around the facility for development.

Rules

Before acquiring a warehouse, one has to respect all the local laws and regulations. The restriction is important since the government sanctions particular storing policies which are not allowed in certain areas, e.g. residential zone where LPG stations are banned.

Rates of Rent and Taxes

The cost will remain the main factor when it comes to deciding the location of a warehouse but not the only thing to mention is the price. For instance, positive rental savings could go up in smoke due to invisible costs; thus, we need to consider them in our estimation. In India, rents for a warehouse are generally stated as per square feet (SF) per annum or monthly depending on the lessor.

Highways, Roads, and Traffic Movement

Besides the existence of the rail lines, a good road network and a low transport density, other factors play a key role in the choice of a location. One of those factors is the presence of roads and highways as well as the local traffic congestion. These are the factors which, either alone or together, change the logistics costs, though the latter can influence company's competition capacity or the assiduity/disconsolation of clients in constructing a warehouse.

The access: roads, exit ramps; highways interconnectivity; public traffic penetration; average traffic volume and speed; traffic peak hours; road safety and conditions; road signs and signals design are the parameters to be checked.

Close to the Airport, Train Stations, and Ports

In this scenario, the first priority should be the principal method of delivery or the typical way the products are being brought to the warehouse. For example, you should set up your office or factory as near as feasible to the air terminal if the bulk of the goods is transported in the air. If that is not possible for you, make sure that there are firms that are strategically situated along the lanes and roads that have a direct connection to the airport. In order to cut down on drayage, you should keep the volume at the top level and locate your plant or warehouse in the warehousing facility which has the greatest mode of transportation.

Markets and Elements of the Local Environment

Local weather conditions and the proximity to the resource integrity as well as the proximity to suppliers are also important. The biggest suppliers, manufacturers, and/or users should be as close as they can most likely to the new warehouse. That will improve the speed of response, decrease the lead time, and cut the transportation costs of the items. Additionally, you have to figure out who the primary supply chain partners are and through what means you can boost the supply chain effectiveness by tailoring the warehouse site to be more strategic.

Warehouse Locations Flow



Figure 2

Items are being dealt with differently at different times (as it) as well as during the shift between the different areas of physical storage. The following table is an illustration of the places and the actions taken during the item flow at the different stages as illustrated.

S. No	Stage	Action	Physical Location
1	Item receipt	The item arrives at the warehouse.	Inbound dock
2	Item identification and registration	Lines are entered and posted in the item arrival journal.	Inbound dock
3	Line entry and posting of the item arrival journal	Items are physically transferred and transport jobs are completed.	From inbound dock to bulk or picking location.
4	Item or order selection for shipping	Output order is collected and shipping is activated.	Bulk or picking location.
5	Shipment staging and loading	Items are staged and prepared for shipment. Then items are loaded into the truck or other shipping method.	Staging location.
6	Item shipping	Shipping documents are printed and shipping is completed.	Outbound dock and out of warehouse

Warehouse Layout



Figure 3

The very first step to build a warehouse is to make a sketch of it. A warehouse layout, despite seeming simple, is a really hard problem to solve in real life. The primary elements that must be taken into account during the design process are dispelled here. The example of a different way of laying the warehouse with AS/RS systems into six different regions is also shown.

Usually, designers have to work with a bounded space where the available surface area is confined by set variables. For this reason, a well-designed plan for the layout is essential. The establishment of new warehouses, the enlargement of existing facilities, and the reconstruction of the ones already operating are the three alternatives that may lead to a different space allocation when it comes to the interior and exterior of a warehouse (and thus the last one will not bring about the decisions that are detrimental to the business growth over the medium- to long-term). Yet, even if the situation is different, a facility's design must include all the requirements below:

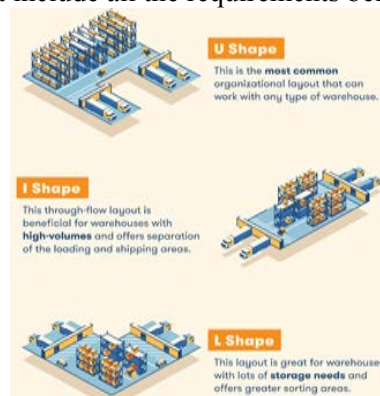


Figure 4

The first step to achieve these goals is to make a warehouse layout, which is a plan that shows the warehouse's design. This plan should foremostly be founded on the good storage principles explained above, be situated at unsaturated regions, be more easily maintained, and obtain the resources required to get as efficient patterns as possible and minimize production time.

A Glimpse at the Budget

It is valid to check all of your business needs, analyze your budget, and then envision the layout that the warehouse would have before laying out any design. The suggestion is that you weigh the benefits and costs of each option for your warehouse to find the most suitable and economical one, although you might have to process more detailed layouts, which may also be costlier than others in this process.

Available Space

Improving the proper usage of warehouse space can help in enhancing overall operating efficiency, cutting down on travel time, and increasing inventory visibility. It is very important to maximize the warehouse area for the stock processing and storage as well as to take out the space for the office section, charging stations, and other utilities.

Flow

Ordinarily, the continuous flow of people and equipment is how your warehouse will get things done seamlessly but the configuration of the warehousing plan is extremely important. A warehouse can be arranged in many ways, but it is crucial to ensure that a warehouse design reflects the tasks to be completed as effectively as possible. Allow goods, people, and machines to move effortlessly through the warehouse as if following a production line sequence and consequently preventing the use of inefficient paths and the resulting disruptions.

Accessibility

The warehouse layout must be built in such a way that every facility and each item can be easily accessed. One of the main objectives of a warehouse layout is to make the system personnel's job easier. Basically, the facility should have a system to allow easy access to products. Employees can locate materials simply without disturbing other items in the facility by ensuring the layout is judiciously thought through. As a reaction, your orders will be processed faster and your production will be higher.

Tools

The way in which a warehouse layout design appears/develops will have a huge impact on the machinery you choose to use like, pallet racks, conveyors, and lifts and packaging tools. Before the design stage, the first thing you need to do is to identify the equipment required for the smooth operation of the warehouse. After that, one can work on the design based on your needs in terms of layout and also increase the efficiency of facility.



Figure 5

Rate of Throughput

Throughput is the amount of goods processed and transported through different warehouse operations, including receiving, putting away, storing, picking, packing, and shipping. But there is a lack of technological progress, and inefficient and error-prone processes riddle the systems. It was not until recently that warehouse systems started to be automatic to reduce the amount of human error.



Figure 6

Together with your staff, you are to plan the best way to arrange the warehouse, the warehouse layout that way all your shoppers will not be lost as to how many workers are needed, their current skill levels are, what are the shift times and other important factors. On top of that, the warehouse layout has to be so designed that the incoming future requirements can be adequately met and then the new hires can be accommodated.

Guidelines for Authority

Obedience to the part the city administration plays in the warehouse layout planning is critical. This means sticking to the rules of the town will save not only the workers but also the machines, software as well as the company as a whole, from getting in trouble with the law, apart from making sure industrial activities continue to go on by a legal manner.

Conclusion

First and foremost, the effectiveness of a warehouse is largely determined by the layout and design. For a start, a complete warehouse floor plan will give you the go-ahead to the major activities like manufactured products making, assembly orders, order filing, and shipment within the premises of the plant with minimum cost and high output. To ensure that your warehouse project is as goal-oriented, use the design and layout planning to pre-think about the needs of your company in terms of space or place, storage, and equipment utilization, the layout of aisles, production area workflows, etc. In addition to keeping the inventory along with the products up-to-date, make sure that the layout void/inventory management system is designed in a way that the warehouse layout will be made directly with the sales of the products. When capacities are kept constant in the location and layout of a warehouse, supply chains show all stages and work with success. A warehouse should be sited in an area conducive to the owners' and should be constructed in a manner, a standard, that will benefit the customers by making sure they get the supplies on time and in order.

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