**LSCM MODULE 5 UNIT 5.3**

**MOBILE BARCODE SCANNER IN WAREHOUSING**

Modern barcode scanning system can greatly assist warehouse pickers by directing users to the correct bins or shelves to find the correct items right when they need them. Most small businesses tend to start with discrete picking, also known as picking orders one by one.

The warehouse worker scans the barcode when picking a product. The scanner then tells the worker if they have picked the right item. It also records the action in your inventory management system, helping keep an accurate track of stock levels.

Barcodes are used for a variety of tasks in a warehouse setting. They are used to track inventory, identify the location of items, and monitor the movement of products from receiving to shipping. This makes it easy to know where everything is at all times and ensure nothing gets lost in the shuffle. When it comes to warehouse scanning equipment, there are three main categories: barcode scanners, RFID readers, and the software that stores your inventory data. These equipment types allow accurate asset tracking for eCommerce businesses. Barcode scanners are the most common type of scanning equipment.

**Reasons to Leverage a Barcode Scanner in Your Warehouse:**

1. It’s Easier to Manage Your Inventory

When keeping track of inventory manually, many problems can arise: handwriting can get ruined, papers can get lost, data can be copied down wrongly leading to mistakes that can be missed, and more. When these things happen, it opens your business up to some serious repercussions. Tracking of certain data becomes easier than ever when going digital with a barcode scanner system. Barcoding systems are always used with inventory management software, which means all the necessary inventory information needed already exists in the easily-accessible cloud. Every stock operation conducted with the barcode scanner will be quickly stored in the cloud as most scanning solution sync data via Wi-Fi.

2. It Improves Picking Accuracy and Decreases Costs

Managing inventory for a business of any size usually means that the business must process hundreds or thousands of orders in a day, which means human error is a drawback which usually can’t avoid. With a barcode system, it can significantly improve the picking accuracy and decrease downstream costs when an order has been incorrectly packed and shipped.

3. It Improves Warehouse Efficiency

When there is a large warehouse with hundreds or thousands of items to keep track of, finding in-demand products in a timely manner can become a daunting task. Things can easily get lost or misplaced, which can slow down business flow and lead to poor customer satisfaction.  Modern barcode scanning system can greatly assist warehouse pickers by directing users to the correct bins or shelves to find the correct items right when they need them.

4. It Ups Security

 Inventory requires the utmost protection because, without it, there is really no business. If the products are lost or stolen, it means more than just wasted money and time: it also means that the businesses don’t have what your customers are looking for. Barcode technology actually helps lower the risk of mistakes by tightening security. It offers a totally traceable and auditable way of keeping track of the items no matter what happens to them or where they may end up. The barcode scanners log every scanning operation by a user with a timestamp providing the warehouse manager and business with complete visibility. With this extra security, it lowers the likelihood of theft, loss, and liability as well as ensures that should the worst happen that the problem will be solved quickly and efficiently.

5. It Provides Product Traceability

If the products have a unique identifier, barcode scanning is a must from the start. The inventory complexity compounds when trying to keep track of lot numbers or serial numbers. Modern inventory management solutions make it easy to keep track of per-stock-unit information from the start (receiving or manufacturing) to finish (shipping the products). This information is permanently recorded in the system, allowing the company the ability to easily access the unique identifiers.

**ORDER PROCESSING SYSTEM**

The order processing system is a method of capturing all necessary data regarding a customer and the order. Some processing systems may be manual, while most processes are increasingly technological.

An example of order processing is when a customer orders a pair of headphones from a particular brand. The order includes information such as the delivery location, order management options, and supply chain systems. This information allows both ends of the transaction to locate the order and order status at all times.

Traditional Processing System – A traditional, or manual system, is done primarily with the help of handwritten documents and manual file systems.

Technological Processing System – A system that makes use of technology would begin with orders being placed online. Different types of software are available that a business would use to capture and record the ordering information. The order would automatically be sent to the manufacturer who would be responsible for packing and sending the product to the customer. In some cases the product may be sent to the business, which would then ship it to the customer. Returns would also be handled through an online system that may include software specifically for this purpose. Order processing software is used to store and share data on customer orders, track order deliveries, and check stock availability. This increases the reliability and accuracy of the data while increasing customer satisfaction resulting in more sales.

Order processing systems can be a boon for businesses and enhance the customer experience. For example, order systems make it easier to keep track of orders in progress, from picking to shipping. This can help improve picking, sorting and packing accuracy. Order systems also make it easier to prevent lost or misplaced orders. In turn, this can provide a more reliable shopping experience for the customer, which can subsequently lead to recurring business and positive recommendations that help draw in new clients.

Though order systems are generally beneficial when implemented effectively, they’re not without some disadvantages. Highly technological or overly complex systems might require additional specialized personnel to ensure functionality, making implementation costly. On-premises order management software also brings significant upkeep costs that may include adding to your IT team. If an error does occur, it can be hard to track down given that order processing data is automatically captured by a software program, not manually entered by a warehouse worker who could retrace their steps.

**ORDER PROCESSING PROCESS / WORKFLOW**

Typically, order processing involves the following key steps: receiving the order, picking and packing the items, processing payments, and shipping the order. In some cases, additional steps may be involved, such as quality control or gift wrapping. Following are the steps:

1. Order Placement

Receiving the order can be done in several ways, depending on the company and its operating model. The most common method is for customers to place their orders online or over the phone with a customer service or sales representative. Once the order is placed, it is sent to the company’s fulfillment center where it can be fulfilled.

2. Picking

Picking the products refers to physically locating the items that were ordered and preparing them for shipment. In some cases, this may involve retrieving items from inventory that is stored on shelves or inventory that is stored in a warehouse. After the items have been located, they need to be inspected for quality control purposes and then packaged for shipment.

3. Sorting products

Often, a product is part of a larger order. Workers must then sort out which items belong to which orders and where to ship each order. This step is especially important for order accuracy, so it’s crucial to structure it so customers will receive the item(s) they purchased, guaranteed.

4. Packing

Packaging the products simply means putting them into boxes or bags so that they are ready to be shipped. Fragile items may need to be wrapped in bubble wrap or foam before they are placed in a box. When all of the items have been properly packaged, they are ready to be shipped.

4. Shipping

Shipping the products is getting them to the customer’s doorsteps. This can be done in various shipping methods, commonly by a delivery service such as UPS, FedEx, DHL, or Post. The shipping method will depend on factors like time sensitivity and cost. After the products have been shipped, the order is considered complete.

**SCM - PERFORMANCE MEASURES**

Supply chain performance measure can be defined as an approach to judge the performance of supply chain system. Supply chain performance measures can broadly be classified into two categories.

**Qualitative Measures** − For example, customer satisfaction and product quality.

**Quantitative Measures** − For example, order-to-delivery lead time, supply chain response time, flexibility, resource utilization, delivery performance.

Quantitative Measures: Mostly the measures taken for measuring the performance may be somewhat similar to each other, but the objective behind each segment is very different from the other. A quantitative measure is the assessments used to measure the performance, and compare or track the performance or products. It is further divided the quantitative measures of Supply Chain Performance into two types. They are:

Non-Financial Measures

Financial Measures

1. **Non - Financials Measures**

The metrics of non-financial measures comprise cycle time, customer service level, inventory levels, resource utilization ability to perform, flexibility, and quality.

1. **Cycle Time**

Cycle Time is often called the **Lead Time**. Cycle time is the total amount of time a team spends working on a project to produce products or services, from beginning to completion. It can be applied to measurable projects related to producing merchandise and designing products. It can be simply defined as the end-to-end delay in a business process. For supply chains, Cycle Time can be defined as the business processes of interest, supply chain process and the order-to-delivery process.

Here are some examples of how cycle time may be used in various industries:

* **Retail:** Stores can use cycle times to measure how long it takes for each item within an inventory to be made.
* **Software development:** Technology professionals use cycle time to track software development projects, since cycle time can tell them the average time it takes for project completion.
* **Restaurants:** Cycle times benefit restaurants because such calculations allow managers to track the time it takes for a customer to receive their meal.
* **Financial industry:** Cycle times help financial professionals track accounting periods, financial projects and investment profits.

In the Cycle Time, there are two types of Lead Times. They are:

Supply Chain Lead Time

Order-to-Delivery Lead Time

The Order-to-Delivery Lead Time can be defined as the time of delay in the middle of the placement of order by a customer and the delivery of products to the customer. In case the item is in stock, it would be similar to the distribution lead time and order management time. If the ordered item needs to be produced, it would be the summation of supplier lead time, manufacturing lead time, distribution lead time and order management time.

The supply chain process lead time can be defined as the time taken by the supply chain to transform the raw materials into final products along with the time required to reach the products to the customer’s destination address.

Hence it comprises supplier lead time, manufacturing lead time, distribution lead time and the logistics lead time for transport of raw materials from suppliers to plants and for shipment of semi-finished/finished products in and out of intermediate storage points.

Lead time in supply chains is governed by the halts in the interface because of the interfaces between suppliers and manufacturing plants, between plants and warehouses, between distributors and retailers and many more.

1. **Customer Service Level**

The customer service level in a supply chain is marked as an operation of multiple unique performance indices. Here we have three measures to gauge performance. They are as follows:−

1. **Order fill rate** − The order fill rate is the portion of customer demands that can be easily satisfied from the stock available. For this portion of customer demands, there is no need to consider the supplier lead time and the manufacturing lead time. The order fill rate could be with respect to a central warehouse or a field warehouse or stock at any level in the system.
2. **Stockout rate** − It is the reverse of order fill rate and marks the portion of orders lost because of a stockout.
3. **Backorder level** − This is yet another measure, which is the gauge of total number of orders waiting to be filled.
4. **Probability of on-time delivery** − It is the portion of customer orders that are completed on-time, i.e., within the agreed-upon due date.

In order to maximize the customer service level, it is important to maximize order fill rate, minimize stockout rate, and minimize backorder levels.

1. **Inventory Levels**

As the inventory-carrying costs increase the total costs significantly, it is essential to carry sufficient inventory to meet the customer demands. In a supply chain system, inventories can be further divided into four categories.

Raw materials

Work-in-process, i.e., unfinished and semi-finished sections

Finished goods inventory

Spare parts

Every inventory is held for a different reason. It’s a must to maintain optimal levels of each type of inventory. Hence gauging the actual inventory levels will supply a better scenario of system efficiency.

1. **Resource Utilization**

In a Supply Chain Network, huge variety of resources is used. These different types of resources are:

1. **Manufacturing resources** − Include the machines, material handlers, tools, etc.
2. **Storage resources** − Comprise warehouses, automated storage and retrieval systems.
3. **Logistics resources** − Engage trucks, rail transport, air-cargo carriers, etc.
4. **Human resources** − Consist of labor, scientific and technical personnel.
5. **Financial resources** − Include working capital, stocks, etc.

In the resource utilization paradigm, the main motto is to utilize all the assets or resources efficiently in order to maximize customer service levels, reduce lead times and optimize inventory levels.

1. **Finanacial Measures**

The measures taken for gauging different fixed and operational costs related to a supply chain are considered the financial measures. Finally, the key objective to be achieved is to maximize the revenue by maintaining low supply chain costs. There is a hike in prices because of the inventories, transportation, facilities, operations, technology, materials, and labor. Generally, the financial performance of a supply chain is assessed by considering the following items:

1. Cost of raw materials.
2. Revenue from goods sold.
3. Activity-based costs like the material handling, manufacturing, assembling rates etc.
4. Inventory holding costs.
5. Transportation costs.
6. Cost of expired perishable goods.
7. Penalties for incorrectly filled or late orders delivered to customers.
8. Credits for incorrectly filled or late deliveries from suppliers.
9. Cost of goods returned by customers.
10. Credits for goods returned to suppliers.

In short, it can be said that the financial performance indices can be merged as one by using key modules such as activity based costing, inventory costing, transportation costing, and inter-company financial transactions.