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BARCODE IDENTIFICATION SYSTEM: THE SYSTEM FOR IDENTIFYING BARCODES INORDER TO MANAGE INVETORY CHALLENGES & SOLUTIONS

[1]HRISHIKESH ACHARYA

[1]Student, Vivekanand Education Society's Institute of Technology Chembur

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Abstract: A barcode is rectangular image that is composed of a sequence of parallel black and white lines that differ in length and breadth that can be read by a bar code scanner or mobile camera that has enabled barcode reader. Barcodes are printed on products that are useful to store information that can be later used in identifying product. They are used in retail stores and in warehouses to keep track of inventory, and on invoices to assist in keeping status and details track. Barcodes have smoothened the inventory management process. These barcodes can be used to map to the item code which will help in identifying product.

Keywords: Barcode, EAN Code,

Item Code, Mapping.

1. INTRODUCTION

Barcodes are graphical representation of the product that are used to store information regarding the product such as

MRP, type of the product, name of the product, name of the company, quantity etc. this information is then used by the retailers to manage and track inventory, update stock, apply discounts etc. There are various types of barcodes for example

UPC- A, UPC-E, Code 128, EAN-13, EAN-8, code 39 etc. Out of this UPC and EAN are most commonly used barcode scanners.

Example:

The benefits of using barcodes are as follows:

1. **Better accuracy** - Relying on a barcode to process data is way to convenient and accurate compared to data that are entered manually, which is prone to errors.

2. **Real Time Availability** – Due to high speed processing data is made available on real time basis.

3. **No Training Required** – Due to its simplicity using scanners requires very little or no training.

4. **Improved Inventory Control** – Companies can achieve higher level of accuracy in managing and controlling their inventories.

5. **Economically Feasible** – Generating barcode detection system is economically feasible as no cost is incurred and potential savings can be realized immediately.

The tools that can be used to scan the barcodes are barcode scanners and mobile phone cameras with enabled barcode readers. A barcode reader usually comprises of illumination system, the sensors and decoder, the sensor in the barcode scanner detects the reflected light from illumination system (the red light) and generates an analogue signal that is sent to decoder. The decoder interprets that signal, validates the barcode using check digit, and coverts it into text. This converted text is then delivered to connected computer software system. The system then uses this data to identify the product using self/machine learning algorithm. This will accelerate inventory management process.

2. Inventory Management Project:

Through the system purchase order is placed. Supplier then sends goods to the reseller. At the reseller store the associates count the goods physically and the manager enters the count against the product into the system. Manager creates a purchase receipt where he enters details such unit of measurement (UOM), quantity, manufacturing date etc. if all the parameters are matched as per the requirements then the manger accepts the delivery and purchase receipt is created, if the parameters are not matched then the manager rejects the delivery.

In current scenario as the associate manually counts the items it leads to lot of human errors for instance instead of entering count against head and shoulders

Smooth and silky the count is entered against head and shoulders hair fall damage rescue which leads to mismatch while creating purchase receipt which in turn leads to rejecting the product or partially accepting the supply. Moreover, stock is updated against incorrect product which leads to tremendous ambiguity in procurement to payment and order to cash cycle in distribution domain.

3. Probable Solutions:

3.1. Generate own barcodes for each product: To generate own bar codes you need manufacturer's license. One can then register with GS standards to geta unique set of barcodes. Further you need to select barcode size, barcode text, barcode colour etc. later you could print you own barcodes with respect to the product. The cost incurred in obtaining manufacturers license and printing equipment's makes this method less feasible from economic perspective.

The other drawback of obtaining this process is that it cannot be used in procurement to payment cycle and can only be used in order to cash cycle.

3.2. Outsourcing Government Database:

In this method we outsource governments database in which mapping of barcode with the product is received beforehand. This methodology is quite

Feasible from economic perspective as well as from time feasibility perspective, but in obtaining database from government incurs moderate amount of cost. This method is feasible and convenient for middle to large scale companies that lack or do not intend to invest in Information Technology department. However, for companies that have quite qualified Information Technology this method may or may not be convenient depending other scenario such as lack of funds or the company may refuse to invest since it has qualified IT department that can develop system required for such mappings.

3.3 Proposed solution by making use of self-learning algorithm:

In this approach we create our own item code for each item that we procure based on specification of the item and feed it into our system such as its M.R.P, weight, unit of measurement (UOM) etc. The barcodes are allocated to each product by any government body such as GS1 and the barcode for the product remains unchanged unless there are changes in specification of the product being manufactured. This way each manufactured product with unique specification will have unique item code mapped to it. This mapping will be done by associates and manager at the store by verifying the product in detail and then mapping can be used to uniquely identify the product. The similar approach is also followed by amazon, amazon has its own Amazon Standard Identification number or ASIN number that is used to identify all its products uniquely.

Example:

Base Product Code of **Head & Shoulders**= 123456

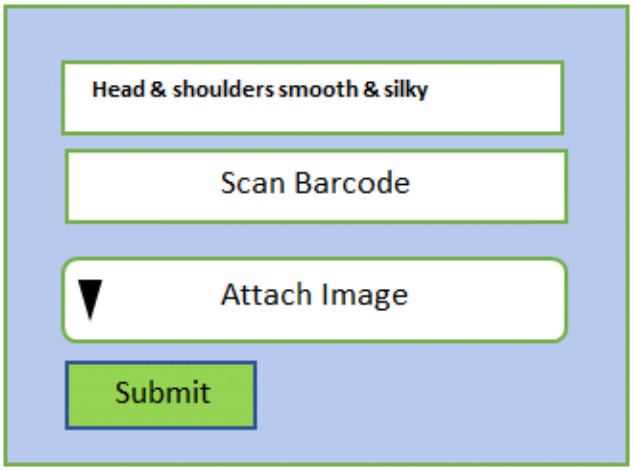
Item code of **Head & shoulders smooth and silky** = *12345651*

Item code of **Head & shoulders hair fall rescue** = 12345652

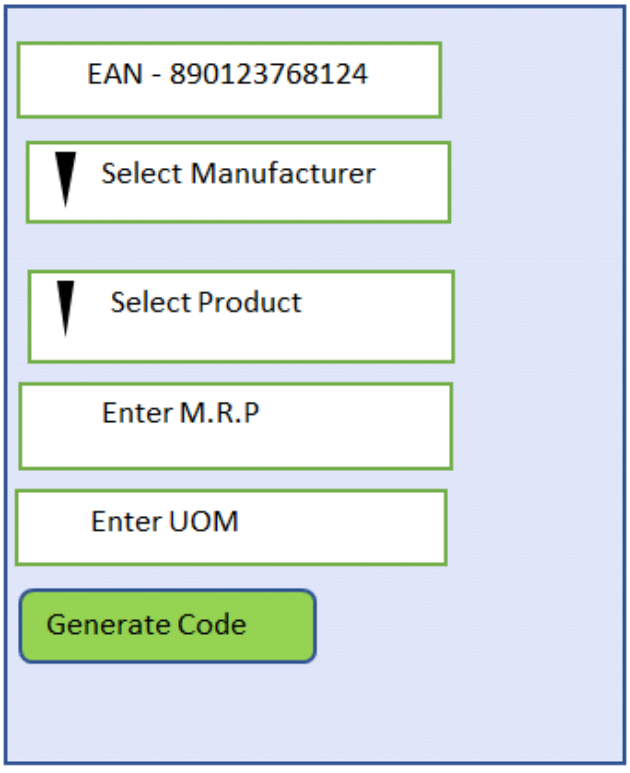
The code would be unique for each product i.e. item code would be primary key in the database that will be used to uniquely identify the product. The Reseller team would populate the database with item details and item code would get created for each unique item. The idea is we would make it mandatory for the resellers team to scan EAN code for each item. The EAN Codes will be then mapped on to the generated item code. This approach will reduce the problems that are faced during inventory management. The team will be asked to scan barcodes for specified number of items and attach image of barcode and product. The manager on the other end will receive the request, on receiving the request the person will be asked to enter the details by verifying the image that was sent in request. The details would include EAN code, Manufacturer name, Item name, M.R.P. etc. All the details that needs to be entered will be available in selectable form to avoid spelling mistakes. Once all these details are entered the algorithm would compare the details within the request and the entered details by manager; if there aren't any difference it the algorithm will search the database based on details within the request. In case the details are not matched then manager/team will have to rectify/verify the entered details and makes changes accordingly. In case the details are matched the algorithm will map the EAN code

with the item code in the system. The mapping would eventually grow and accommodate all the EAN associated with item code. This mapping can then be used to track inventory across reseller network.

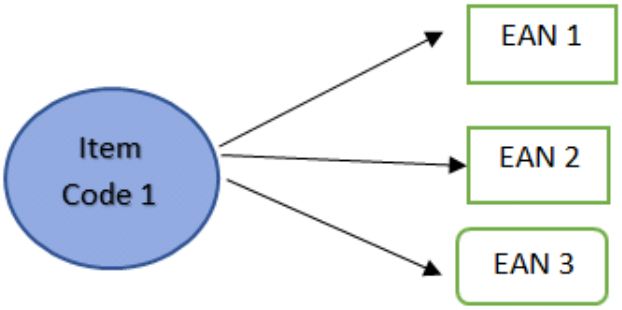
Request For mapping:



Generate Code



The system would consist of one to many mappings i.e. one item code – many EAN code.



This solution is economically feasible and scalable as the there is no overhead of investing in acquisition of EAN database and also it could map products that are manufactured in foreign countries. The system could also map barcodes of all standards example Universal Product Code (UPC) and Code 128. The only drawback with this approach is that it requires Tech support but organization with moderate to highly qualified tech department this approach is the best as the system can comply with volatile environment. This approach also saves lot of human errors that are caused during manual inventory management process that leads to mismatch in the stock entry which in turn leads to anomalies in entire workflow of the system.

4. Conclusion:

The following approach will help to build system that can recognize barcodes of different types and map them with respective item. This approach can scale and can map multiple EAN codes to single items. Since this process is self-reliant and doesn't require any acquisition of databases from various bodies it helps organizations to manage their inventories without any financial overhead in investing in acquisition of databases or acquiring manufacturing licenses to generate own barcodes and also machines required for it. Another advantage is that is doesn't require any high-end technologies such as machine learning or AI, companies with limited resources with respect to human resource and technical knowledge can also adopt this process.

5. References

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