ISSN: 2278-4632
Vol-12 Issue-08 No.02 August 2022

WEB WAREHOUSES INFORMATION SYSTEM DESIGN AND DEVELOPMENT

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ABSTRACT: The materials/goods handling industry is critical to facility efficiency for businesses. A competitive advantage necessitates systematization and efficiency across the board. This research focuses on creating a Kanban system for inventory distribution and storage. The program is designed to improve inventory stock inspections. Users can easily input finished goods from manufacturing, warehouses, clients, and vendors. Detailed master data is required to develop applications for a variety of process logistics warehouse topologies. The author used MySQL for the database and Java for the Java Web applications. Waterfall is how I create new systems. The waterfall process entails reviewing, designing, building, testing, and operating the show. The author obtains knowledge via watching, interviewing, and reviewing books.
Keywords: *warehouse management system, Sql,inventory, storage.*

1. INTRODUCTION

In order for businesses to remain competitive in the product and products handling industry of today, it is necessary for them to achieve and sustain depot efficiency. Maintaining a competitive advantage in the business world requires ensuring that operations are well-organized and efficient. This is a vital component of the business sector.As a result of inadequate utilization of their storage systems and racking layouts, a significant proportion of businesses have their warehouse racks crammed to capacity. Consequently, this leads to an increase in the cost of labor as well as a shortage of space for accommodating extra products. When things are not easily accessible and organized, it is more difficult to locate things that are required for transportation. This is especially true in instances where there is minimal structure. One of the potential outcomes of this is that there will be a scarcity of labor. Forklift operators are required to travel through various warehouse circuits in order to seek storage racks that are empty for newly delivered items. This is important in order to ensure safety and efficiency. As a result, they position the inventory pallet at any other spot that is accessible to them. If the kind and size of the pallets are not appropriately evaluated during the allocation process, a substantial quantity of merchandise may become jumbled and cannot be reassembled owing to the limited space available in the warehouse. This is because of the fact that the warehouse has a limited capacity.A smartphone or tablet that is connected to cloud technology allows for the data relevant to inventory to be entered, accessed, and depicted from any location and at any time. This is possible regardless of the time of day or the location. This is a method that makes effective use of the resources available. Make use of your smartphone, which is a bring-your-own-device gadget, in order to scan barcodes and perform inventory management. List-making chores like as inventory management, cycle counting, marketing event scanning, and many more can be accomplished with the help of Scan to Spreadsheet, which is an efficient solution for performing these operations.

2. METHODS

This program's design was informed by extensive research into current situations, user expectations, and well-known literary sources.

ISSN: 2278-4632
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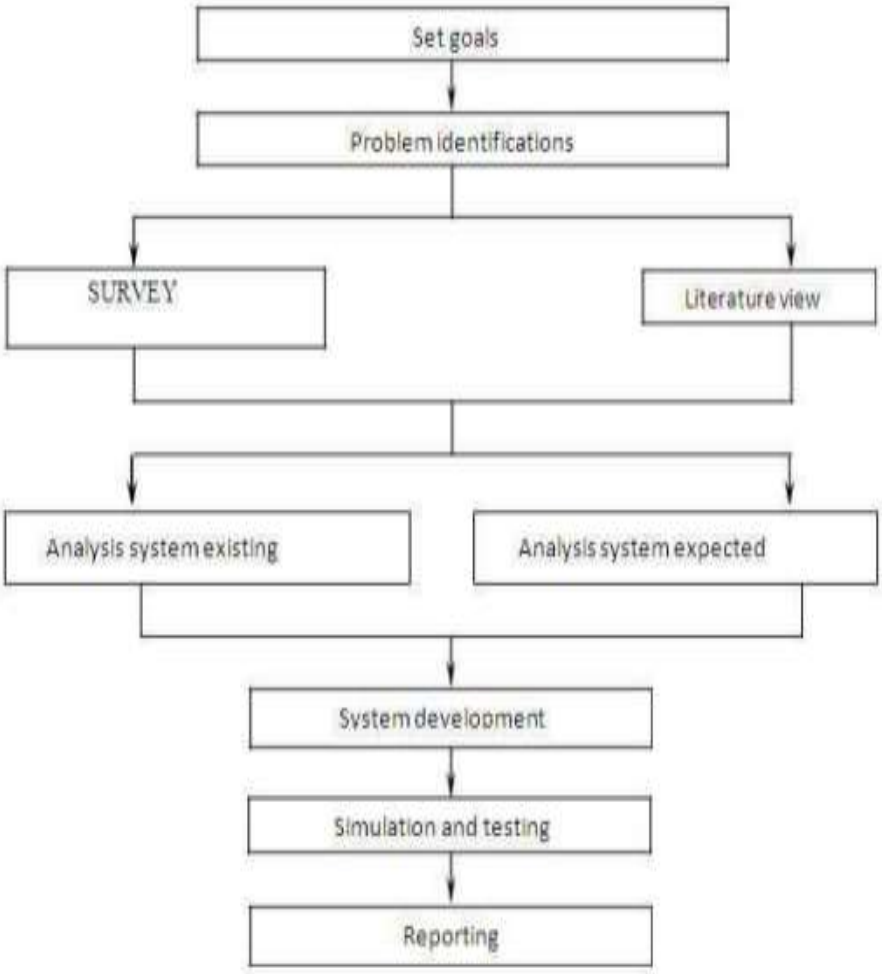

Figure 1. Methods

3. SYSTEM ANALYSIS, DESIGN AND DEVELOPMENT

System analysis is the process of dismantling a complex information system into its constituent elements in order to detect and assess any potential impediments or faults with the existing system. This enables future tasks, such as establishing new systems and implementing countermeasures and advancements.

SYSTEM ANALYSIS

Current versus expected system

The authors assess the challenges and explain in detail what each party—internal and external users alike—expects from the situation.

Table 1. Current versus expected system

Item	Current/Existing	Next/Hope
Assambly and FG Handover	Data Kanban recording by manual/visual (handwriting)	Kanban be created by barcode system.
Storage/Rack/Area	There is no system to monitor the position of goods	FG Warehouse is divided into several locations. Goods are actually monitored.
Delivery Export	Control and checking is done manually, and has not been monitored actual arrival of goods	Conducted cross check with barcode scan for items in box, pallet, packling list and case mark

ISSN: 2278-4632
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Table 2 Current versus expected system (cont.

Item	Current/Existing	Next/Hope
Control Truck	Monitor truck has been done over the phone	Control with GPS, and reporting when goods arrive at customer by App Android based
Delivery preparation process	KANBAN, DIS and DO are visually processed	Checking using Barcode scanner
Input Data	manually data input and not integrated yet	
Monitoring Stock, goods location,	all items can't be monitored in an integrated system	Monitoring by dashboard infromation system

Flow process

The current process can be seen in the flow diagram below

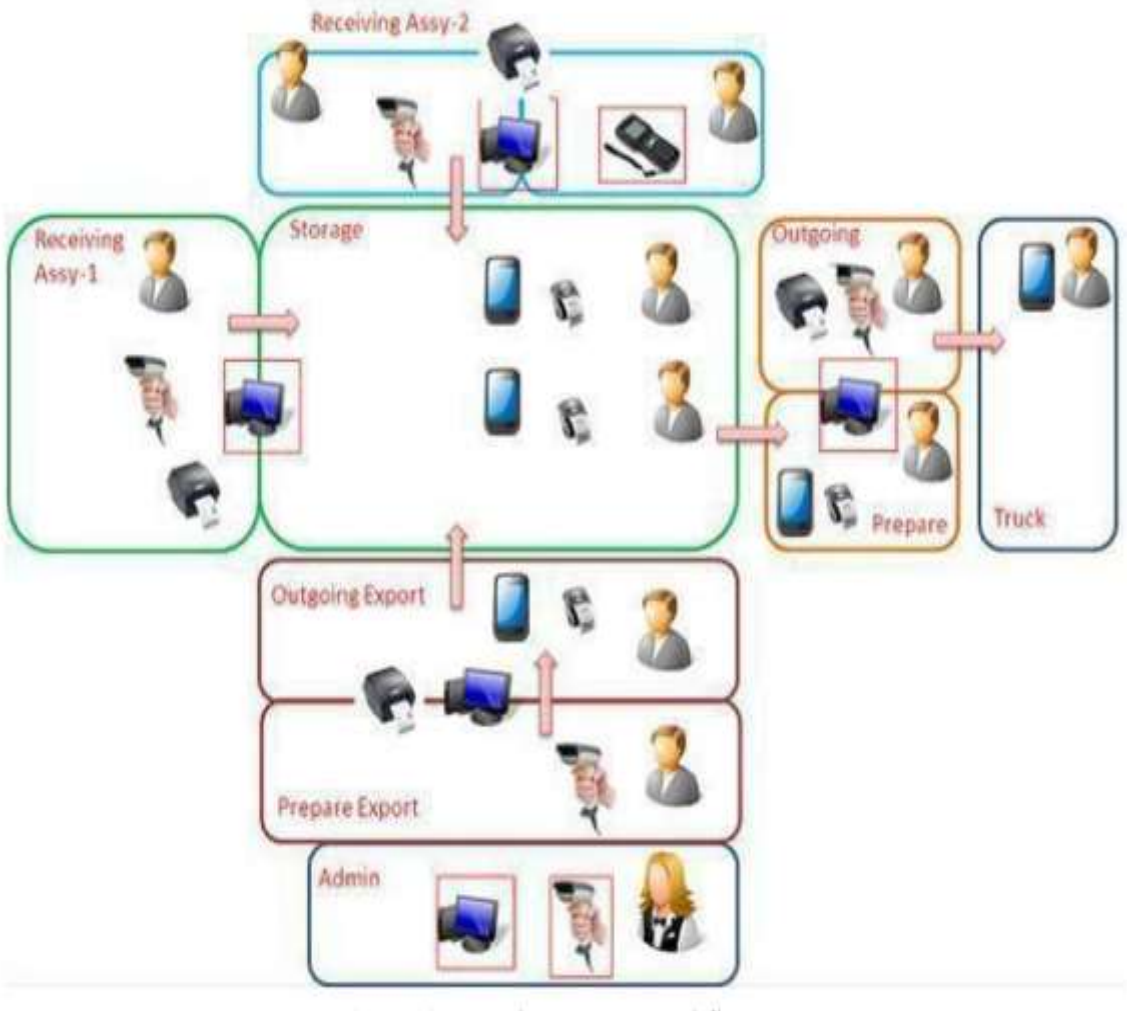

Figure 2. Warehouse expected flow

SYSTEM DESIGN

Key features

- Real-time inventory synchronization for creation, distribution, management, and tracking, along with barcode scanning using Android mobile devices, are some of this application's primary features.
- Interfaces that are easy to use facilitate navigation.

ISSN: 2278-4632
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- applicable to all warehouse manufacturing businesses (a case study analysis is conducted on three corporations).

Technology

The Google Map API is a component of the technological stack used to construct this application. The accompanying illustration has information.

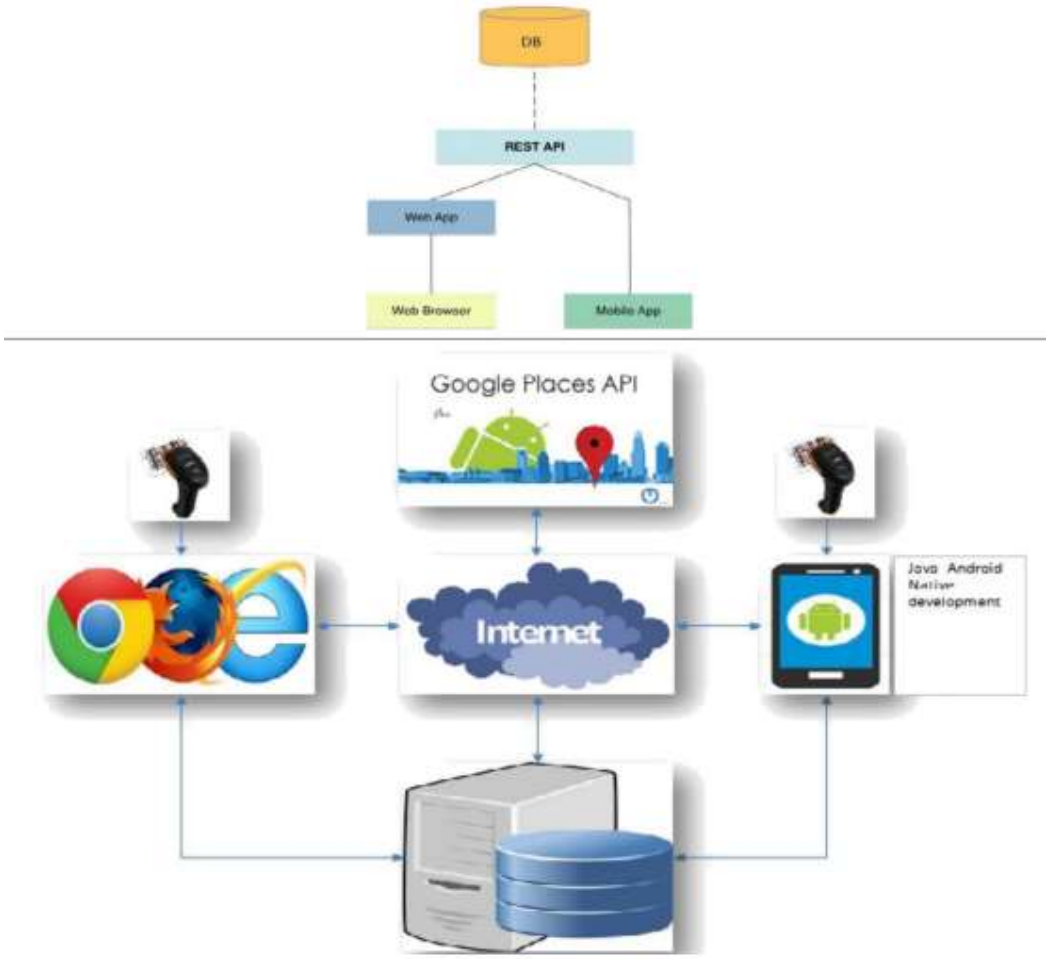

Figure 3. Technology and concept system

Modules

There are several sections to the application. The layout of each module is determined by the users' specific needs and functionalities. The application's modules are listed below.

Table 2. List of modules 1

Area	Process	Detail
Receiving	Input production result from assy line	Check model. Lot Number, and Quantity, give barcode each box, and seal plastic cover
		Print barcode for 1 pallet
		Make receiving Document (BSTB)

ISSN: 2278-4632
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Area	Process	Detail
Storage	Place Pallet into warehouse storage Area	Warehouse have small section (A1, A2, Etc..)
		PIC Storage input Storage location on system by scan on area barcode
		PIC Storage able to check stock quantity, location, and FIFO
		Non pallet (partial) part handling
Pre Delivery	PIC pick up from storage area, repacking into delivery trolley	PIC pre delivery check stock location, Lot Number
		Scan delivery instruction sheet (DIS), prepare by admin, to check delivery schedule.
		Repacking from pallet into delivery trolley, and scan each box and print trolley barcode, based on DIS

Table 2. List of modules 2

Area	Process	Detail
Delivery Local Customer	Loading to Truck base on Delivery Note (DN) and monitoring truck movement	PIC prepare trolley base on DN, scan DN Barcode, and Trolley Barcode for confirmation
		Input data for trucking, vendor, plate number, driver, destination
		Hand over GPS device to driver
		Tracking Truck position
		Hand over part from Trucking driver to customer, report, take a picture
Delivery Export	PIC pick up from storage area, repacking into delivery box	PIC pre delivery check stock location, Lot Number
		Scan delivery instruction sheet (DIS), prepare by admin, to check delivery schedule.
		Repacking from pallet into carton box, and scan each box and print export pallet barcode, based on DIS
		Scan export pallet barcode and packing list barcode to re confirm
Stock Control	Admin and Storage PIC able to control and monitoring stock in warehouse	Warehouse member able to see stock level in LED Monitor, real time, data shown on graphic
		Data shown stock level quantity, each model, Lot Number
		Warehouse member can see stock position, rack position
		Warehouse member can see how long will extent for remaining stock, comparing with delivery plan. Production plan
Import Part	Input production result from Assy line	Check model. Lot Number, and Quantity, give barcode each pallet/boxes
		Record for Invoice, Packing List document from origin country
		Make receiving Document (BSTB)

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Area	Process	Detail
In transit	Part production on KID Plant-1 delivery to KID Plant for storage, and vice versa	Part production from Plant-1, but delivery to Plant-2 for storage, and delivery to customer, part stock in Plant-2, and vice versa
Other Account	Combine Part	Part more than 1 part number, but delivery to customer only 1 part number
	Import/Export data to other system from Customer or internal (PRONES)	To prevent additional job, can use data from other system/platform
	Disposal	Part dispose/scrap if not use/NG
	Picture/Data Storage	Warehouse member can storage data (PDF,JPG format) for traceability and paper less
	Temporary Warehouse	If part pending, rework, repair, stock will be separate from OK part, until judgment OK/NG from quality. Classification
	Initial Delivery/First Delivery	Information for initial delivery, due to new model, design change
	Part Borrow	Data if part borrow by other department
	Return /Claim Part	Data if part returned from customer/claimed

Table 2. List of modules 3

Area	Process	Detail
	Transfer Stock	Change stock from part number A to part number B
	BOM	Bill of Material, Part Database
Other	Daily Sales	Report detail all PO monthly
Planning and Monitoring	Monitoring Daily	Daily report for stock level, delivery schedule, etc.
	Delivery Plan	Input delivery plan, weekly, monthly, 3 month
	Traceability	Print out data base on Model, Lot Number, delivery date, etc.
	Production plan	Input production plan weekly, monthly
Packing control	BOM Packing	List of packaging, model, size
	In-Out Packing	Input data from incoming supplier/customer and Out data base on actual delivery quantity
	Delivery Tag	Print delivery tag from system, based on part number
	Packaging Stock Report	Report for packaging stock

SYSTEM DEVELOPMENT

The author created the application using the Java programming language, which is commonly used in the development of Java Web applications, as well as the MySQL database. I design systems utilizing the Waterfall method. The waterfall technique's phases are analysis, system design, implementation, integration, operation, and maintenance.

User intervace (UI)

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The flexible design of a website's interface allows it to look excellent across a variety of screen sizes. The screenshots below showcase the app's user experience.

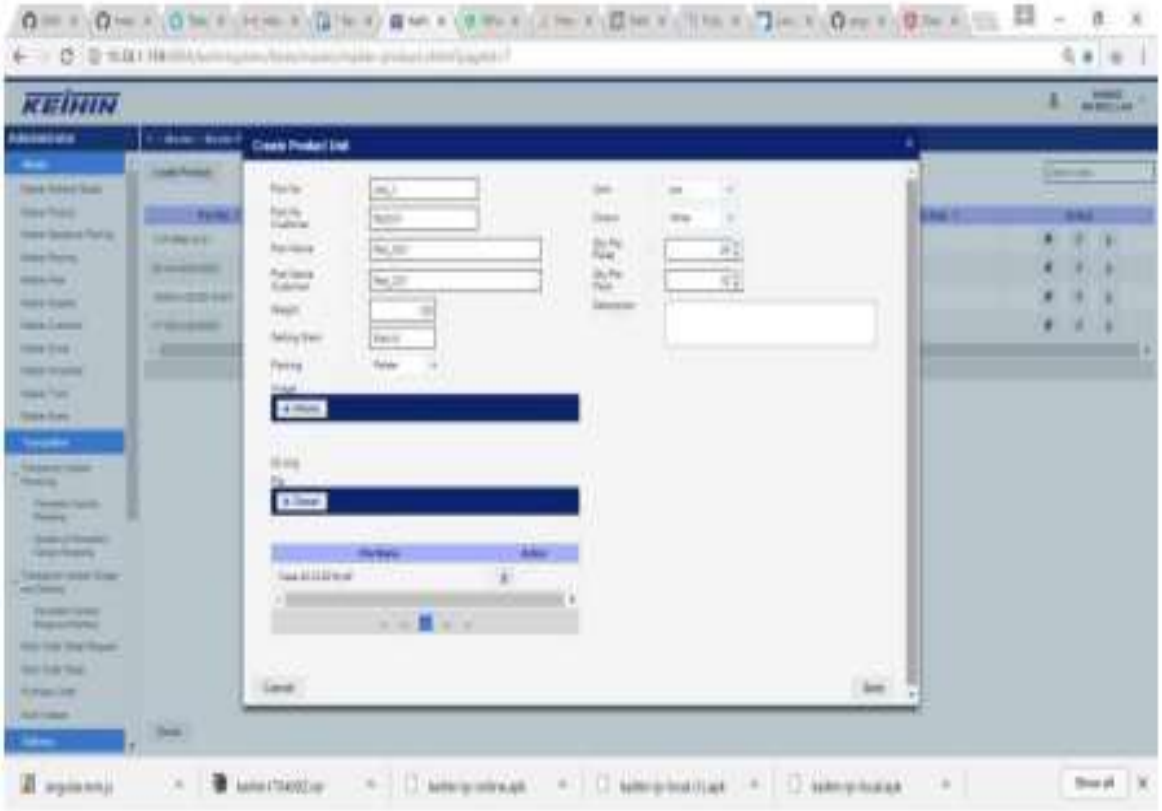

Figure 4. Master Product for Unit/Pcs

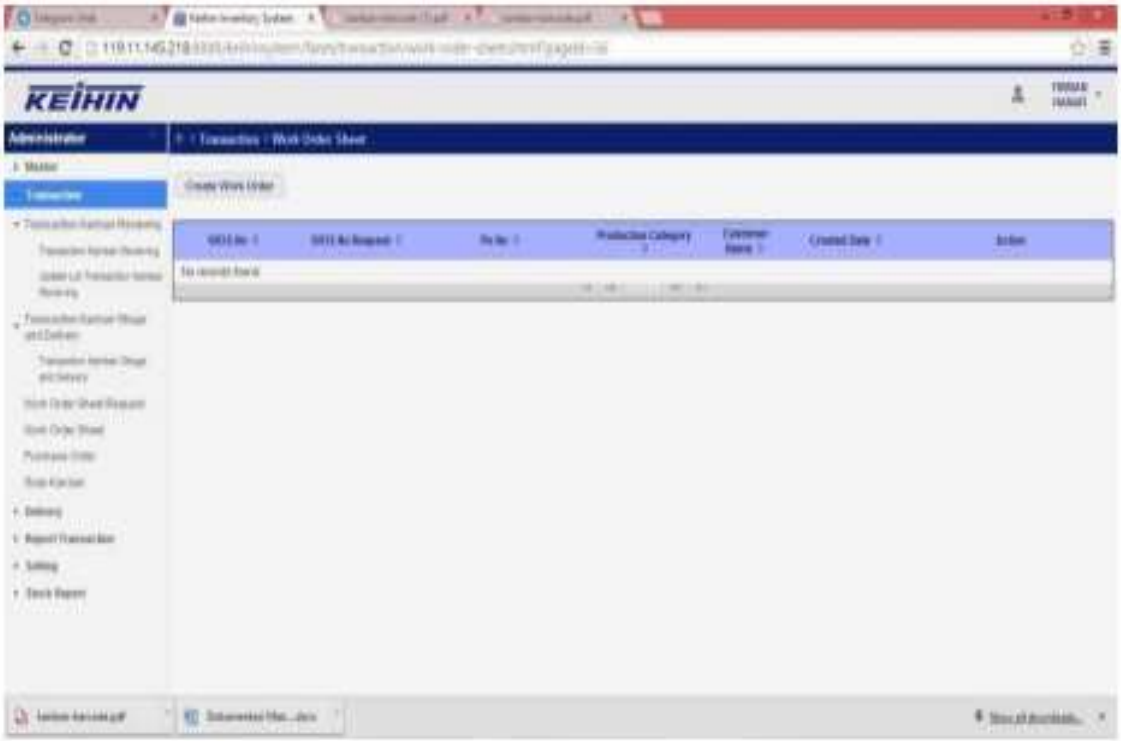

Figure 5. Work Order Sheet

4. CONCLUSION

This application system, which is available via the web and Android devices, was created expressly to help three different manufacturing businesses with their warehouse logistics operations. These companies include

two confectionery factories that specialize in candy making and an automobile factory. The following assertions summarize the authors' conclusions about the system's fundamental prerequisites:

- Every region or location is mapped. A flowchart outlining the reprocessing phases for each product is provided, with assistance from the master data section. This procedure is facilitated by the use of sophisticated packaging that integrates the parent-child system.
- Product movements are comprehensively documented at their origin and destination. The following can help in the process of scanning product barcodes. Before sending the product, scan the barcode region, then scan the product's barcode, and finally scan the barcode region at the destination.

The application was successfully designed and implemented at a company that manufactures vehicle components.

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