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Android-Based Mobile Application for Operations and Inventory Management

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Abstract: ***In this era, many small-scale industries have been facing problems regarding the management of their supply chains resulting in delays in their deliveries. This happens due to a lack of commitment from the suppliers and other components of the supply chain. This affects the manufacturer's reputation which leads to losses in the long term. In this paper, we are introducing a mobile application called "Invento", which aims to help manufacturers and suppliers to manage their inventories and operations effectively and hence increase their productivity. It uses a reward-based system to encourage suppliers to deliver the required material to the manufacturer on time.***
Keywords: Application, Inventory Management, Supplier, Manufacturer, Industry, Delivery.

I. INTRODUCTION

Nowadays many people tend to use mobile apps in their day-to-day lives. As these apps are free to use and due to internet connectivity they can be used by many worldwide. One of the major problems in various manufacturing industries is managing the inventory effectively to deliver the order on time. This is a quite complex process as this requires commitment from all the suppliers. Many firms nowadays outsource the manufacturing of various subparts of their final product. Sheer commitment from these suppliers is required so that the firm can produce and deliver the product on time. This also requires effective and responsive supply chains prone to disruption because of many factors like climate, disasters, demand fluctuation, etc.

This mobile application aims to solve this problem using a reward-based system to encourage all the suppliers in a particular industry to deliver the required components for creating the final product before the deadline. This can be a game changer for many small-scale B2B businesses which aim to manage their inventories and track their orders effectively. The app will contain all the information about the components such as the quantity, quality, weight of the shipment, expected delivery date, etc. RFID tech can also be added to this application for implementation in warehouses to count the inventory and get more data about the shipment.

A. Objectives

1) To help small and medium-scale industries to manage their inventories effectively.
2) To track delivery time and order.
3) To create a platform for industries to manage their supply chain easily.
4) To make the manufacturer aware of other suppliers in the market.
5) To encourage the suppliers to deliver the required components on time using a reward-based system.
6) To create an affordable marketing platform to enhance the growth of local businesses.

B. Scope

In the future we would create a platform to connect various manufacturers with potential suppliers and empower small-scale industries locally and globally.

C. Features

1) Easy tracking of the delivery time and schedule.
2) Easy to maintain past and future data of the suppliers.
3) Easy to select suitable suppliers from the available list.
4) Ease in manufacturing products before the deadlines

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II. LITERATURE SURVEY

Shaolong Hu et al[1], elaborate on how suppliers should be selected and their selection criteria. It also identifies the gaps in the supplier selection model and also the further directions proposed. It also suggests that supplier characteristics play a key role in identifying the right suppliers. These characteristics include procurement price, reserve capacity, agreement cost, procurement prices (which vary with order quantity and lead time), return price, bonus, commitment quantity, production capacity, transportation cost, delivery time, and substitute. During the research, they found out that the most frequently considered objectives are procurement cost, transportation cost, holding cost, and fixed costs

Truong Ngoc Cuong et al[3], discussed the improvement in seaport operations through system optimization. They also tell about the novel management strategy which provides managerial insights and innovative solutions for seaport authorities to make more efficient strategic planning and manage maritime operations effectively.

They also discuss the port management strategy to manage logistics.

P.Manco et al[4], did research that focuses on various topics such as the technology selection methods, the scheduling and production planning, the spare parts management, the supply chain management, and the impact of AM processes on the environmental sustainability of the production systems. These concepts are discussed regarding additive manufacturing and metal additive manufacturing.

Mona Taheri et al[5], did research focusing on the financial considerations in inventory management problems. The research is carried out taking into account the dairy industry. It proposes a model to manage cash flow effectively along with inventory management. According to the research, the Cost Of Goods Sold(COGS) is the most important effect of cash flow management combined with inventory management.

III. PROPOSED SYSTEM

This application can be used by all industries to manage their inventory and keep track of their deliveries effectively. All the employees of the industry right from the operations manager, inventory manager, and the workers can be notified about the order details and expected delivery date. A list of alternate suppliers will also be provided to the manufacturer in case an issue arises with the primary supplier. Following is the interface of the proposed application:

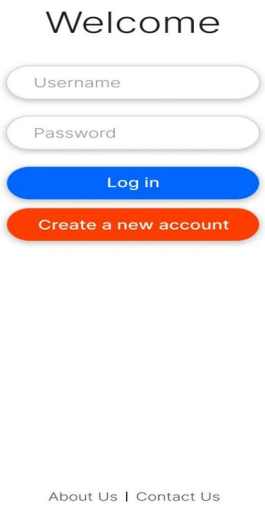


Fig 1. Login Page

Here the manufacturer or supplier can log in to their respective profile. The supplier will be redirected to the supplier homepage and the manufacturer will be redirected to the manufacturer's homepage. New users can register themselves by creating a new account by providing the necessary details of their firm.

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After registering the supplier is redirected to the following page. Here they have to enter details such as material, location(address), supply history, and contact details. In the material section, they have to mention the specific grade of the material. Their exact address will be required as it will be used to connect them to the manufacturers nearby. In the supplier history, they have to mention the manufacturers to whom they have previously supplied. This helps new manufacturers to select the best suppliers for the required material.

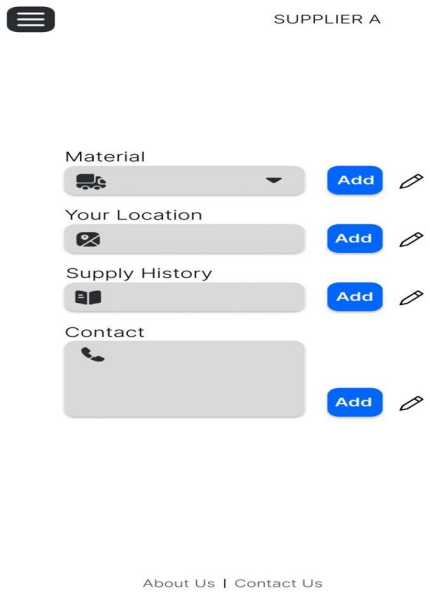


Fig 2. Registration Page

The following page shows you the latest material requests from manufacturers. This includes the material grade, the quantity, and the location to which the shipment is to be delivered. It is the supplier's choice to accept or delete the request.



Fig 3. Material Requests Page

The following page shows the rankings of all the suppliers in a particular industry. These can be referred to by the manufacturer to select the best potential supplier. This ranking is done according to the points obtained by the supplier. The supplier providing better quality products has a better ranking.

If the main manufacturer thinks that he should change his supplier he will be shown all the potential suppliers in the market from the leaderboard. Past performance and records of the supplier will be provided to the manufacturer. One can examine the supplier's past performance up to this point. Every time the provider fulfills an order, he receives reviews and feedback from the clients, which helps him earn points and move up the scoreboard.



Fig 4. Leaderboard

IV. CONCLUSION

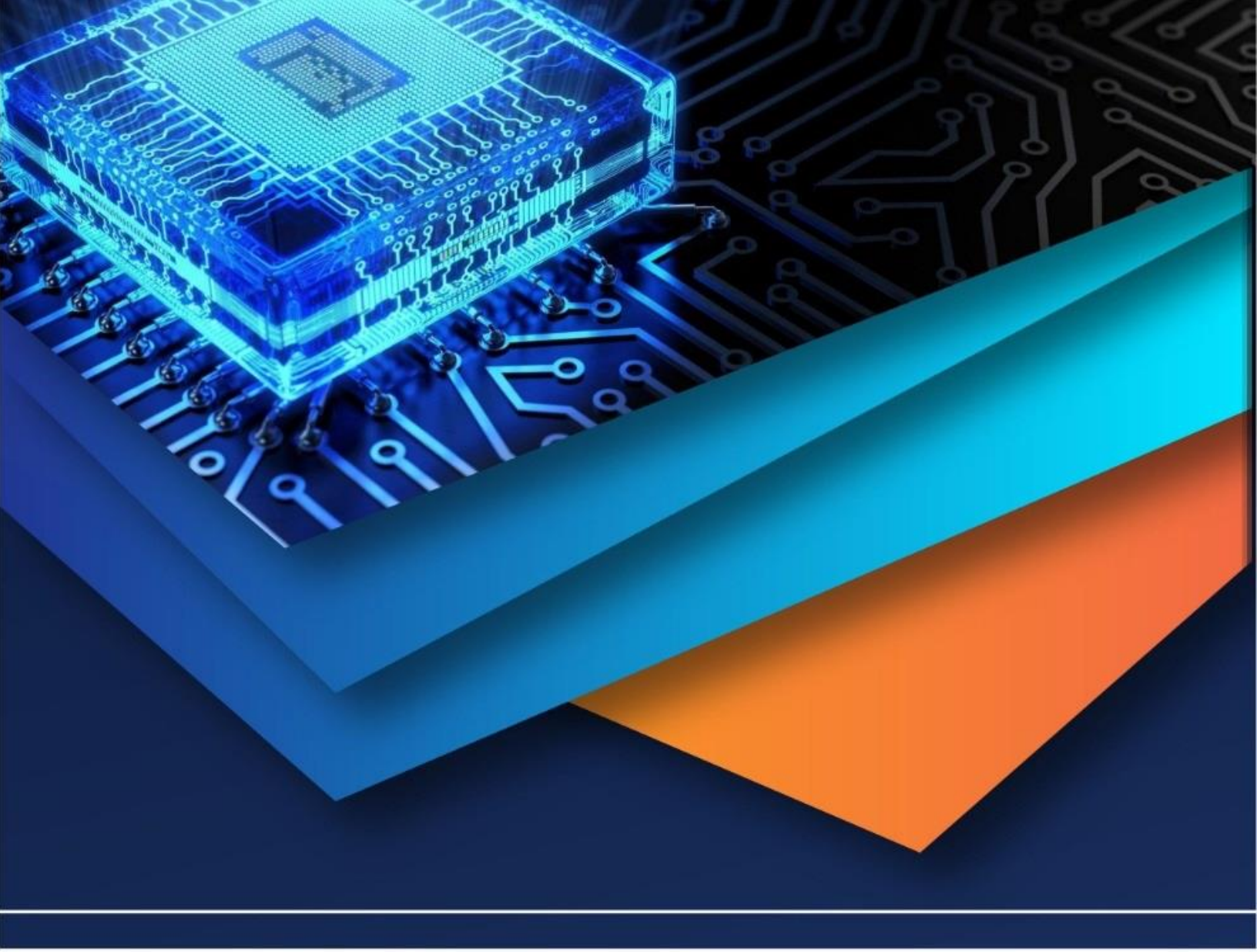
In this modern era, everyone has internet access and mobile phones which can be used to increase productivity at work. This application provides the necessary inventory and operations management tools required to boost productivity in the manufacturing sector and also provides a platform for various local suppliers to compete with the global players.

V. ACKNOWLEDGEMENT

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