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Scrapify- Digital Solution for Efficient Scrap Collection

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Abstract: *In the traditional method, purchasing and selling scrap materials manually is a complicated process. The customer has to visit the shop or wait for the ragmen for selling the items, because of this the customer can't compare prices with the other ragmen and only a limited of them visits in your area. So, it is quite time-consuming for selling scrap/waste materials. We are developing an Online platform to reduce the communication difficulty between Customers and Scrap Dealers. This Web app allows the scrap dealer and customer to buy/sell scrap materials online. They can view the contents at any time. It analyses the full the details of buyer or seller to verify the authenticity. The clients can advertise their scrap/waste by sitting at home, large quantities can be sold and it is a user-friendly Interface.*

Keywords: Scrap Collector, Ragmen, Android Application, E-waste, Whole seller, Recycling Companies

I. INTRODUCTION

In India, millions of tonnes of scrap are generated annually. And this metric is increasing day by day every year. The most common type of scrap produced by consumers globally is steel. We need a large workforce and recycling methods to manage this scrap. Also, India is the largest importer of scrap in the world [1]. The rise of android apps in the education sector led to the conversion of textbooks into E-books, shifting from computers to mobile phones, etc [2]. In the contemporary corporate climate, online platforms are extremely important. Particularly mobile application development to address challenges in the actual world and turn them into a business model. As mentioned in this research study, many business models, such as the freemium model, subscription model, and revenue through advertising, can be used depending on the needs of the organization [3]. This research paper comprehensively summarizes and discusses the following list of main questions: I. How to digitalize the scrap selling process? II. How to minimize the need for landfills? III. How to effectively manage Environmental waste? IV. How to give customers the best price for their scraps? V. How to provide anytime anyplace service to the customers? Our research is based on the households who want to sell their scrap either having to wait for the ragmen to visit their neighbourhood or having to manually visit the scrap dealer to sell their scrap. Also, the frequency of ragmen visiting your area is once a week, so you have to wait for a whole week in order to sell your scrap. This is such a hectic process. Also, most of the Office workers don't have time to carry out this process as they are busy the whole day with their work. After coming back home from the office, they don't have enough energy to go to the scrap dealer to sell the junk. Our motivation for conducting this research comes from the fact that we see ragmen working tirelessly day and night in order to earn a basic livelihood. In our locality, I as well as my crew members regularly observe how hard these scrap collectors strive. Sometimes they work from day to night. Yet, they are not able to get above their poverty line despite all their effort [4]. People in developing nations are turning to lowpaying jobs like waste pickers because there aren't enough jobs available in their communities. This has increased competition in this area as well. Their situation inspired us to help these scrap collectors[5]. Also, we identified another problem in our locality if an office worker wants to sell their scrap then he/she doesn't have enough time to wait for the ragmen to arrive in their area. After arriving from the office he/she doesn't have enough energy to go to the scrap dealer and sell the scrap. Due to this, he/she is not able to sell the scrap. So, these were the observation that made us find a solution. As a solution to the above problem, we decided to develop an application that will ease the process of handling scrap waste. On this platform, the customer will be able to sell their scrap waste online at their doorstep. Just they have to register and login into our system and use the functionality that will help them to sell scrap easily. Scrapify is an android app that will ease the process of scrap selling and helps scrap

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collector to get more customers so that they can earn a better livelihood. Firstly the user who wants to sell their scrap will choose the type of scrap they have and upload a photo of their scrap with their pickup location in this app. Then this pickup address will be sent to the scrap collector's mobile via message and goggle link for mapping out the user's location. After that, the Scrap collector will visit the destination and collect the scrap at a specified rate. The rate of the scrap will be already mentioned in the app so there must not be any disagreement upon the rate of the particular type of scrap. This is how the scrap collector will get more customers and can earn a better livelihood which they were not able to do so.

II. LITERATURE SURVEY

A survey comprised of questions and pre-selected responses were used as the primary research tool. The questionnaire was developed using well-researched literature on survey design, research question development, and connections between theories and the survey's overall framework.

Northern American local governments are putting in place a variety of rules and techniques for environmentally friendly organic waste recycling, which can help to slow climate change. Trash management, service privatisation, and urban sustainability are all highly effective approaches that have achieved zero waste targets in major American cities such as New York, Los Angeles, and others [5].

Chris Hartmann's research describes the life of a waste picker. His main area of interest was the analysis of household data through the use of questionnaires, interviews, and observations to examine a variety of topics such as household composition, employment, individual and household income, and a few open-ended questions. Furthermore, according to his research, the per capita income of those individuals is extremely low when compared to income from other sources [6].

Suruliraj and his colleagues created the app Bot, which focuses on sustainable waste management. They have divided the waste into several categories on their software, including garbage, recyclables, and organic waste. A real-time website where users can locate these types of trash disposal facilities has also been provided [7].

Zimring, Carl A. "Cash for your trash," Paul Revere said after recycling. Readers may be surprised to learn that one of the heroes of the American Revolutionary War engaged in a practise typically associated with the twentieth century. Revere saved old metal objects for reuse, just as we do with cans and bottles today, but he did not call what he was doing "recycling"—that term was popularised by the petroleum industry in the 1920s [8].

D. K. Lad and K. R. Jaybhaye (n.d.). Online Marketplace for Purchasing and Selling Industrial Scrap as Raw Material The Proteus Journal We will provide you with a platform where you can sell your scrap and request a raw material made from scrap based on your desired dimension and material description. It is an online platform for selling and purchasing industrial scrap as raw material. Industries can sell their scrap at a good price and profit handsomely each year [9].

Buyers will look for raw materials from scrap, and they will be able to obtain the required size of raw material from scrap at a low price. Hull, Isabel V. "A Scrap of Paper"- He compares the impact of legal considerations on decision-making during World War II in Germany, the United Kingdom, and France. She demonstrates how differences in state structures and legal traditions influenced how the three combatants conducted their respective wars. The debates over military decision-making are reconstructed in A Scrap of Paper, and it is made clear what role law played in each situation—where it limited action, where it was manipulated, where it was ignored, and how it evolved during combat. It is a fervent defence of the need for the rule of law to govern interstate relations in both peace and war [10].

Francis Bannerman III, "Rags and old iron," In September 1872, he bought items from a scrap trader named Peter Dixon in Glasgow that he thought were of extremely poor quality. Bannerman, a Brooklyn businessman, bought and sold a variety of items, including rope, trash paper, and artefacts from various wars. Bannerman complained to Dixon about a shipment of grass rope trimmings and waste paper, alleging that it only contained a small amount of high-quality material covering lower-quality tarred and water-damaged materials. Bannerman was concerned because he intended to sell the paper [11].

"Being green is difficult", claims the research paper. - To say Michael Bloomberg took office as mayor of New York City during a difficult period would be an understatement. Bloomberg was elected shortly after the World Trade center attacks and took office in the aftermath of tragedy and severe budget shortfalls. During his first few weeks in office, he

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tried to save money wherever he could. In April 2002, Bloomberg's administration announced that one of the city's budget cuts would be the elimination of curb side pickups of glass and plastic containers. According to New York City Sanitation Commissioner John J. Doherty, while the city [12].

III. METHODOLOGY

3.1 Background

This research aims to determine or identify what the problem is, then explain possible solutions. Our goal is to gather data and information that will allow for a more accurate and thorough depiction to get a better solution to the problem. The study employs a deductive method, which involves reasoning that moves from the general to the specific. It is helpful to explain causal linkages between concepts and variables using a logical method, as well as to quantify concepts. This approach is thought to be suited for adequately addressing the stated goal and research questions due to the nature of the chosen subject of study.

3.2 Data Collection and Analysis

This study investigates the instances using numerous information sources based on the triangulation method to assure reliability and validity. We have created a close-knit environment by using sample families and as customers and sample scrap collectors because this research project was completed in a short amount of time and the entire proposed system cannot be built and implemented in real life in a semester under graduation level. We have measured and recorded the information on how long it takes for scrap to be picked up, how long it takes a scrap collector to find a consumer, and how much money they make over the course of a certain period of time. We will compare the conventional system with our new approach using these data. We began the testing in three different areas with three families and two scrap collectors. From September to November, we collected data for our testing environment. Results have been collected every week. So, in a month, we have three results.

3.3 Existing System

Currently, the Scarp collector is following the workflow given below for collecting and selling the scrap. This system includes customers, Scrap collectors, Wholesalers, and recycling companies in order to successfully recycle the scrap. Firstly, the Scrap collector wanders from area to area in search of scrap. After buying the scrap from customers at a particular rate, they fill their tricycle/handcart with maximum capacity and further sell to the wholesaler at a higher rate and earn a negligible profit. Most of the profit is taken by the wholesaler and recycling companies, the scrap collectors don't even get much out of it. So, we can say this is not a balanced workflow. In this model more and more profit is earned by the Wholesaler's and Recycling companies while the scrap collector has to adjust with it.

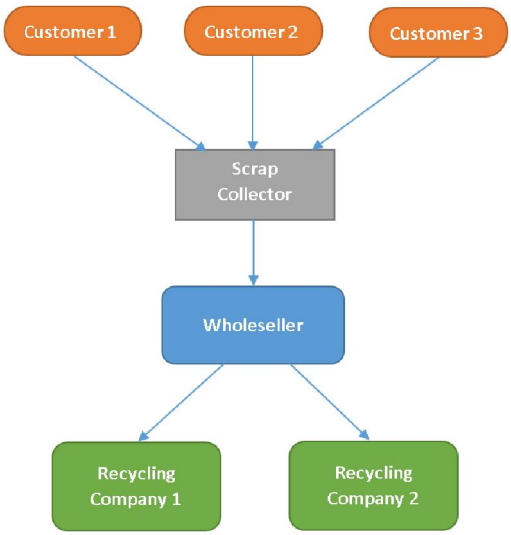

Fig. 1.Existing System for recycling Scrap

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3.4 Proposed System

This new methodology consists of the usage of digital media to reach out to customers and solve real-world problems faced by people. The reach of the customer is not just limited to the physical world but also to digital media. So, we require a digital solution. Therefore, we came up with the solution of digitalizing the scrap collection process. Our new proposed design consists of exactly the same objects as above, but there is an intermediary communication channel (i.e. our app Scrapify) between the customer and scrap collector. This will help the scrap collector to reach out to more customers across the city within a shorter period of time.

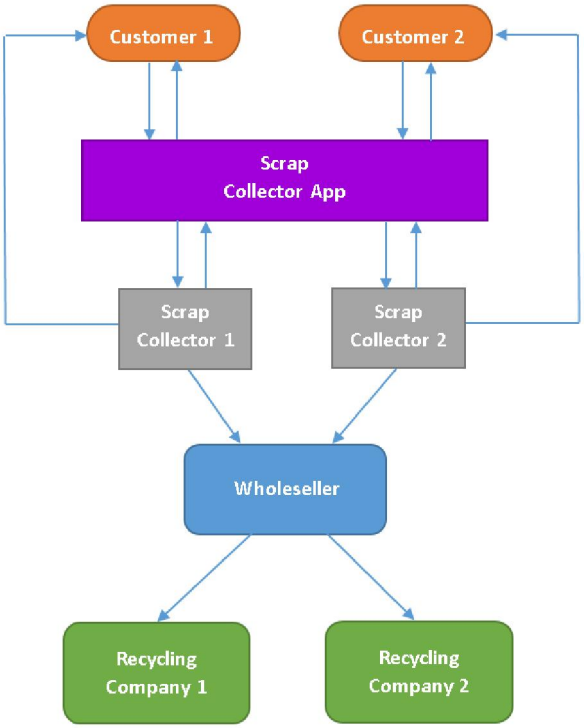

Figure 2: Proposed System for recycling Scrap with Scrapify.

3.5 Module Description

Our application will basically work for 3 categories of people and every panel has its own functionality to be carried out. Description of them is given below:

A. Seller Panel

- Customer will register/Login into the system by providing location and contact details.
- Upload photos of Scraps that he/she wants to sell.
- Receive a Confirmation message after Scrap Collector accepts the offer.

B. Admin Panel

- Admin will verify customers as well as pick up requests.
- Admin will track scrap collectors.
- Admin will notify scrap collectors on new pick up requests.

C. Scrap Collector

- Will get SMS message that contains different information including address, name, phone number, scrap types.

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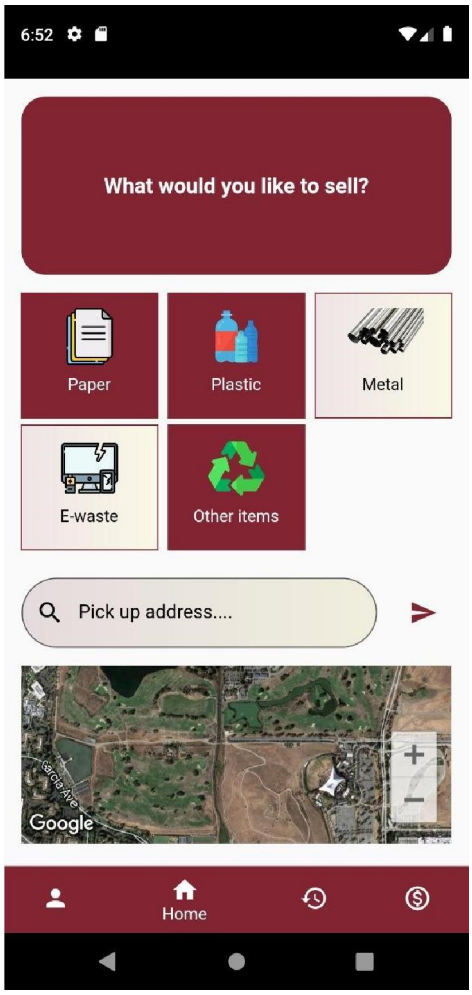

Figure 3: Main page of the seller panel

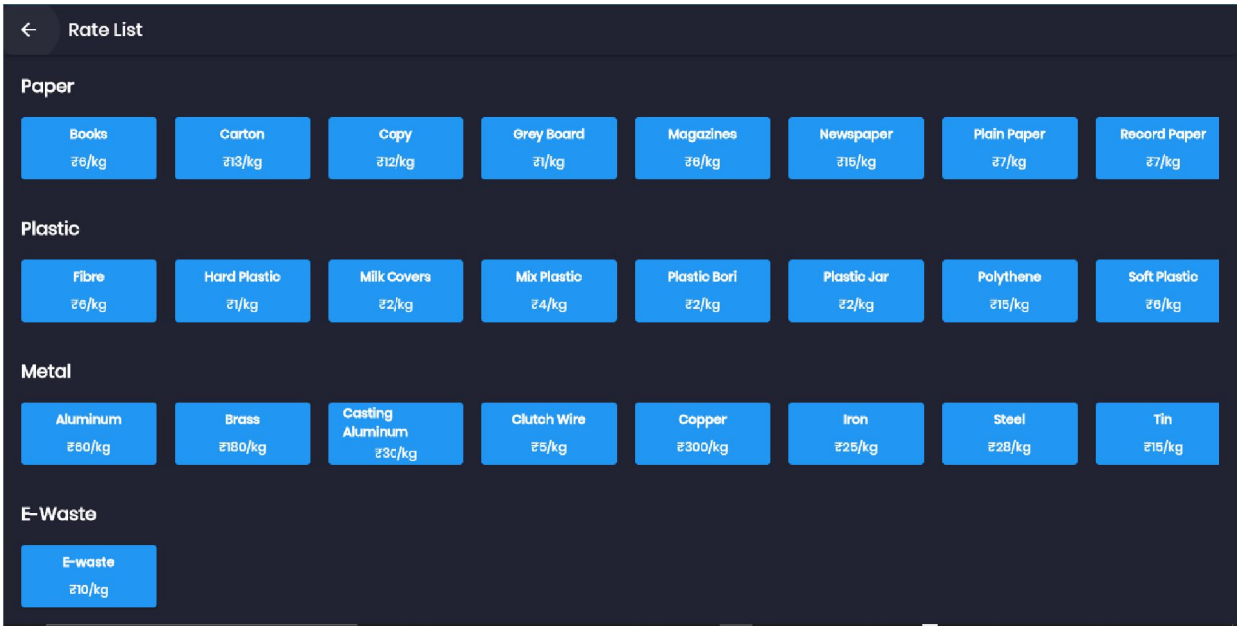

Figure 4: Admin panel rate list.

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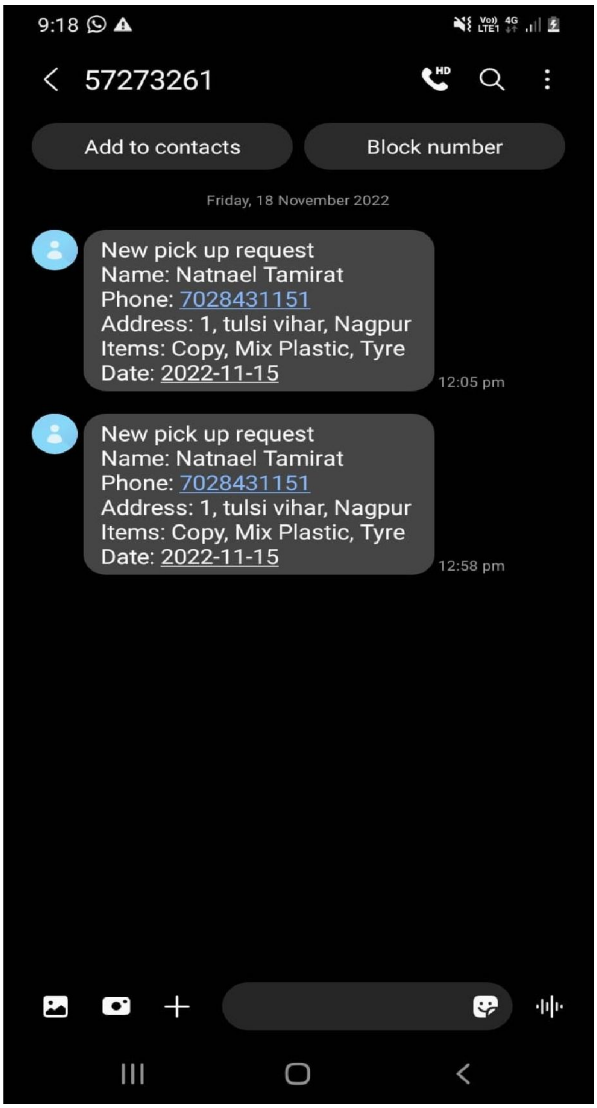

Figure 5: Notification through SMS message

IV. RESULT

Three elements of the findings will be illustrated below using the data we were able to gather during the period of this investigation. The first shows how long it takes for scrap to be picked up, the second shows how long it takes a scrap collector to find a customer, and the third shows how much money scrap collectors make over a given period of time. Result of days it takes for scrap to be picked up from three families using and without using our platform on September and October.

Table I: Days it takes for scrap to be picked up on September

Families	Days it takes for scrap to be picked up	
	Without using app	Using app
A	10	2
B	12	5
C	13	3

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Table II: Days it takes for scrap to be picked up on October

Families	Days it takes for scrap to be picked up	
	Without using app	Using app
A	14	3
B	11	2
C	15	6

4.1 Result of how long it takes a scrap collector to find a customer using and without using the app.

The amount of time required for scrap collector to find a customer depends on how much waste is produced. According to the survey, the majority (75%) of scarp pickers spend 5- 8 hours per day, 19% spend more than 8 hours, and 6% spend less than 5 hours per day without using the platform we proposed.

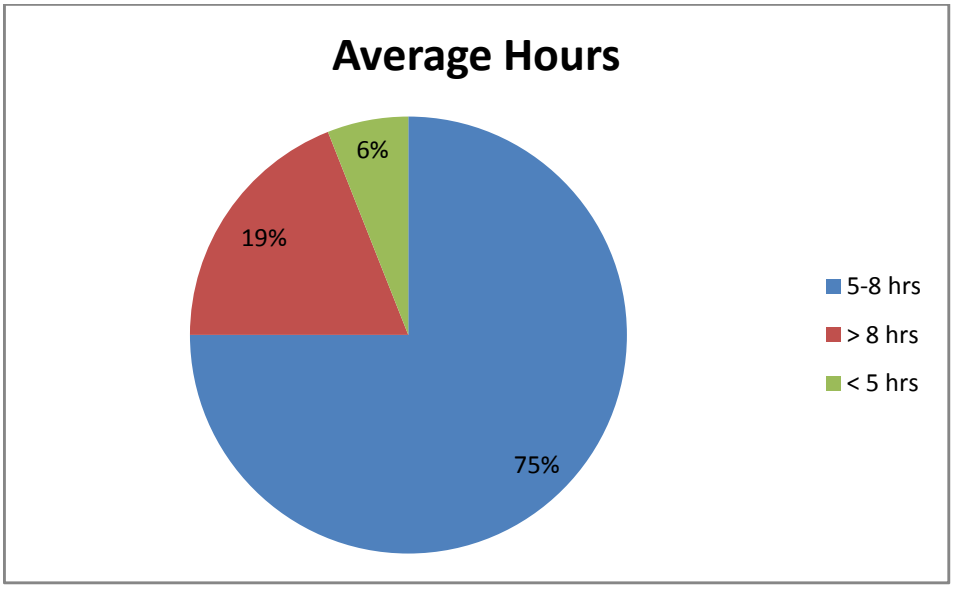

Figure 6: Average Hours it takes a collector to find customer without using our app

However, after using our app, the time it takes scrap collectors to find a customer decreases noticeably.

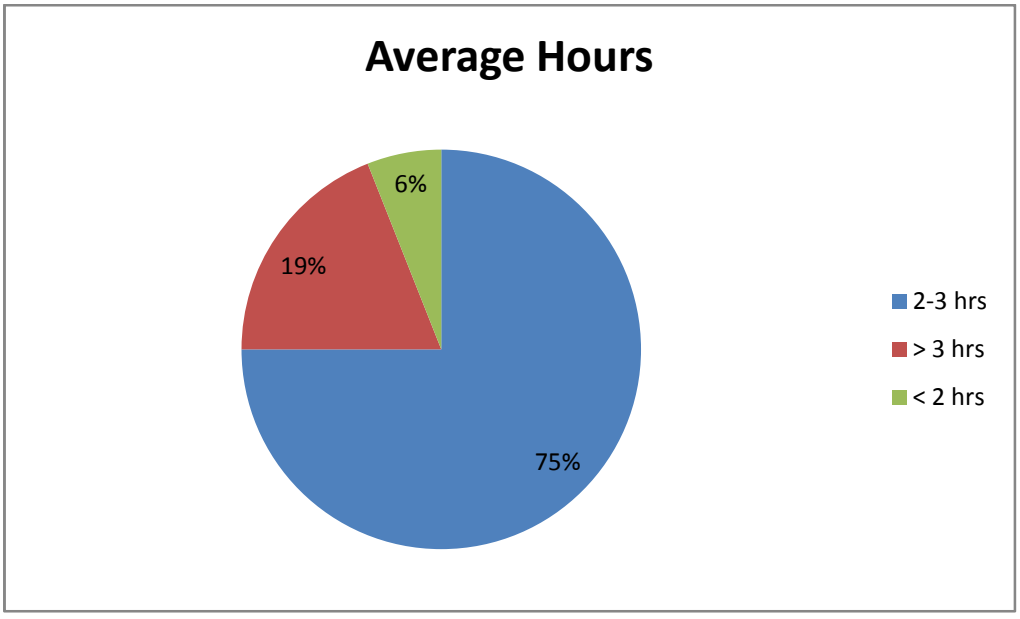

Figure 7: Average Hours it takes a collector to find customer using our app.

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4.2 Result of how much money scrap collectors make over a given period of time using and without using our platform.

The majority of scrap pickers' earnings come from selling the scrap they collect from customers. Before using our app, 75% of scrap collectors earned between Rs. 1000 and Rs. 1500 per month, 12% earned between Rs. 500 and Rs. 1000, 10% earned between Rs. 1500 and Rs. 2000 per month, and 8% earned between Rs. 200 and Rs. 500 per month

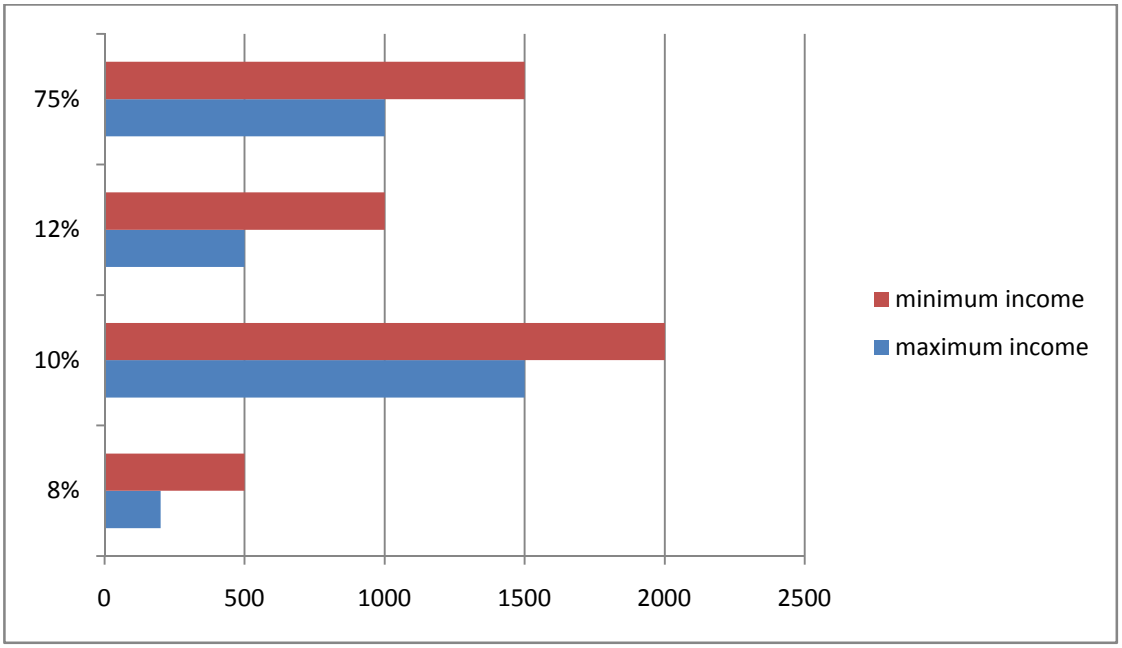

Figure 8: Monthly income of collectors without using our app.

However, once collectors began using our app, their monthly income increased significantly.

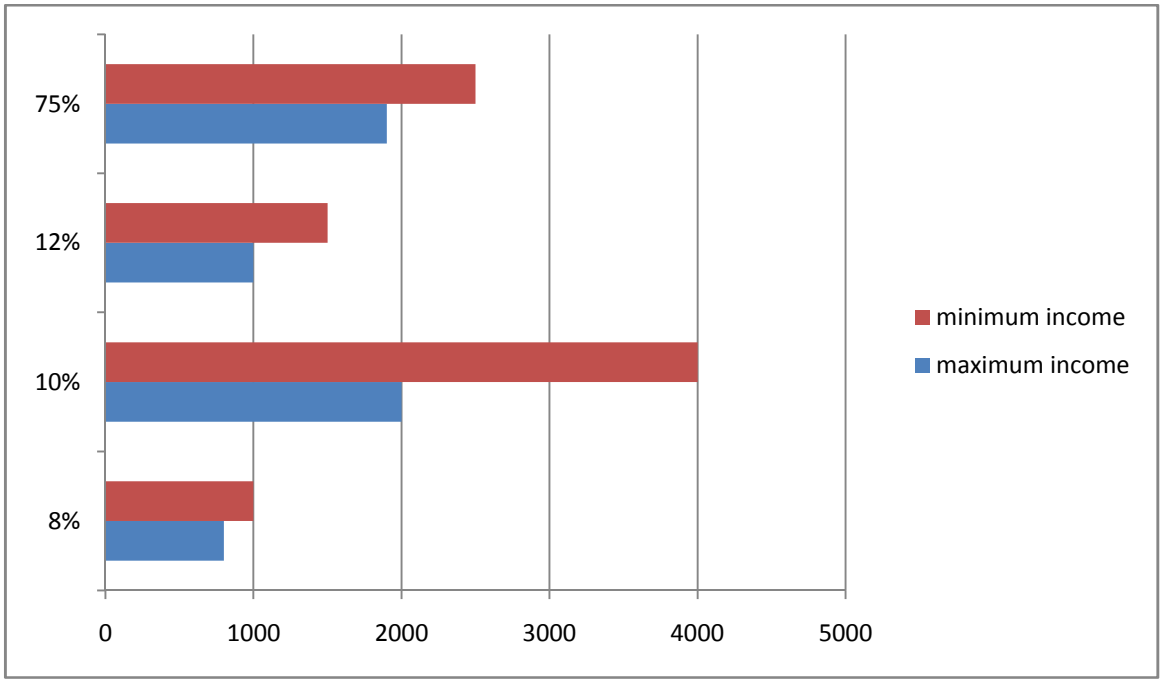

Figure 9: Monthly income of collectors using our app.

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V. DISCUSSION

The research we've done so far has several implications, however, in terms of our main purpose; it is obvious that the current system will not allow us to achieve our goal of effective scrap collection process and enhancing the economic status of scrap collectors. This claim is supported by the fact that it takes several days for scrap to be picked up from three families in September and October, with an average of 12 days in September and 13 days in October. Furthermore, in terms of scrap collector income and hours it takes to find a customer, the scrap collector wastes a lot of time looking for a customer and a scrap; on average, the majority of scrap collectors take 5 to 8 hours, and the majority monthly income is maximum Rs. 1500. This study found that efficient integration of the new scrap collecting system provided useful information for developing future strategies. In order to create smart, liveable communities and improve the lives of scrap collectors, it is essential to convert the current waste management systems with improved technologies and more efficient system. The impacts of this proposed system – will include increased earnings of workers via stable monthly income, digitalization of the current system, improved management of environmental waste. This claim is supported by the fact that the average number of days it takes to pick up scrap has decreased significantly over the past two months, falling from 12 to 3 days in September and from 13 to 4 days in October. Additionally, the average number of hours it takes the average scrap collector to find a customer has decreased significantly, falling from 5 to 8 hours to 2 to 3 hours for the majority of collectors. Because it only takes a short while to find a consumer, scrap collectors are able to start earning a significant rise in monthly income.

VI. CONCLUSION

In conclusion, the Scrap Collector app is a digitally enhanced approach to the challenges of effective scrap collection and selling. Ragman will be able to buy more scrap and make more money as a result of this. Help office workers who couldn't sell their scraps because they ran out of time or there wasn't a good system in place. We anticipate that the majority of people will benefit from this effort on a daily basis. Although our study has some limitations because of the survey's nature (voluntary participation) and the small sample size, we think the results - along with the potential use and implementation of applications and digital solutions - can help to inspire further research on scrap collection and management.

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