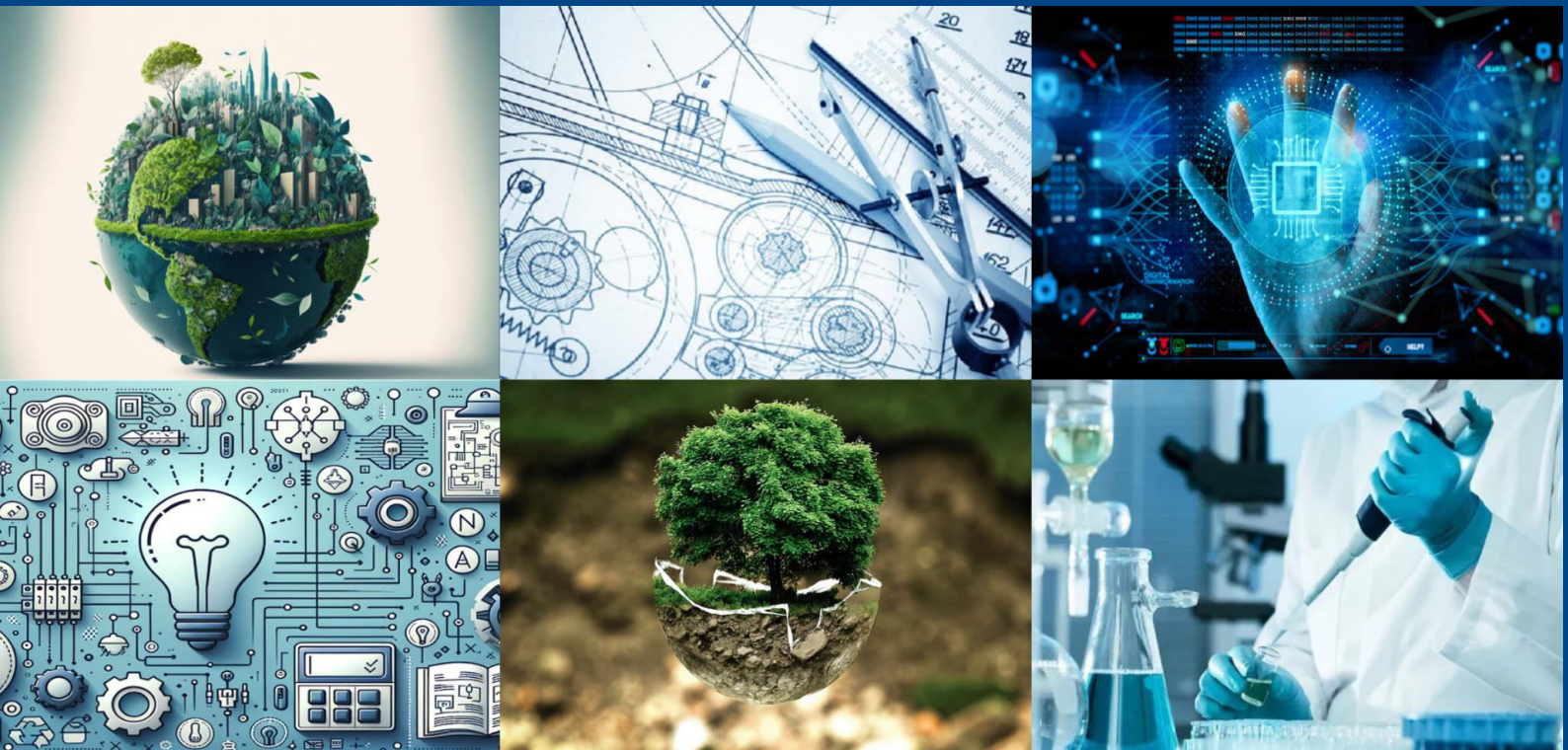




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Echo Print-Application And Device Integration For Enhanced Sales Efficiency

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ABSTRACT: In order to expedite retail transactions, this study presents an integrated salesman application with a smart gadget that combines a soundbox and a thermal printer. It reduces errors and delays by enabling dynamic billing, fast receipt creation, and real-time voice payment confirmation, all of which are tailored for small and medium-sized vendors. The solution boosts productivity and the uptake of digital payments with its Bluetooth and Wi-Fi connectivity, rechargeable battery, and intuitive user interface. Its viability is demonstrated by the minimal viable prototype (MVP), which provides a portable and reasonably priced tool to enhance payment verification and invoicing in retail operations.

I. INTRODUCTION

As part of this digital transformation phase, the retail and sales industry is experiencing a massive transition toward a tech-enabled, integrated solutions environment. However, small and medium-scale vendors find themselves constantly challenged with regard to manual billing, inefficient payment validation and lack of instant receipt generation, especially among vendors engaged to sell vegetables, fruits and fast-moving consumer goods (FMCG). These problems lead to delays, transactional mistakes, and an entire less-than-optimal customer experience. This study investigates the creation of a novel salesman application that is integrated with a smart gadget that combines a soundbox and a small thermal printer in order to address these issues. By allowing vendors to add product specifications, dynamically modify billing, and instantaneously create receipts, this technology is intended to expedite the sales process. By offering real-time voice confirmation of payments, the device further improves productivity by lowering dependency on frequently inaccurate cellphone alerts. Due to its affordability, ease of use, and portability, this solution is especially advantageous for small businesses and mobile sellers. The solution guarantees adaptability in a range of retail settings by combining Bluetooth and Wi-Fi connectivity with a rechargeable battery. This system's minimal viable prototype (MVP) consists of a wireless soundbox-printer device and a simple application that manages. Our goal in conducting this study is to evaluate the viability, effectiveness, and influence of this integrated solution on retail transactions. This innovation has the potential to revolutionize small-scale retail operations and hasten the adoption of digital payment systems by tackling major pain points in the current invoicing and payment verification process.

II. REVIEW OF LITERATURE

Retail transaction digitization has accelerated significantly, especially for small and medium-sized enterprises. Numerous studies have examined the drawbacks of conventional billing and payment verification systems, emphasizing errors and inefficiencies that affect both customers and vendors. A thorough analysis of the literature on point-of-sale (POS) technology, digital payment systems, smart billing solutions, and small vendors' use of these technologies is given in this part.

Issues with Conventional Payment and Billing Systems

Small retail firms' traditional billing practices mostly rely on cash transactions, paper-based receipts, and manual entry—all of which are vulnerable to theft, human error, and inefficiency. According to studies by Gupta and Sharma (2019), manual billing causes inconsistencies in sales records, which costs small sellers money. In a similar vein, poor transaction speeds discourage client retention and lower overall sales efficiency, according to Kumar et al. (2020). Bansal and Mehta (2021) also looked at the drawbacks of using mobile devices for payment verification. They pointed out that depending too much on mobile alerts to confirm payments raises the possibility of fraud and disputes because it may be difficult for suppliers to check transactions instantly.



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Development of Electronic Payment Methods

Digital payment techniques' quick uptake has revolutionized commercial interactions all around the world. The number of digital payments in India has increased, with UPI (Unified Payments Interface) becoming the most used method, according to the RBI Digital Payments Report (2022). Ensuring smooth payment verification is still a major difficulty, though, especially in tiny and unstructured retail settings. The increasing trend of incorporating sound-based payment confirmations, which allows merchants to rapidly check transactions without depending on smartphones, is covered by Patel et al. (2021).

Intelligent Billing Innovations and Point-of-Sale (POS) Systems

Large retail settings have long employed point-of-sale (POS) systems, but small merchants are discouraged from implementing them due to their high cost and complexity. When Chatterjee and Singh (2018) contrasted mobile-based solutions with conventional point-of-sale terminals, they discovered that vendor acceptance is greatly increased by simple, affordable billing devices. According to BharatPe and Paytm Soundbox reports from 2022, combining audio-based payment confirmation and receipt printing onto a single device improves vendor productivity by lowering operational friction.

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Smart Devices' Function in Retail Transactions

Digital receipts, automated billing, and smooth payment platform integration have all been made possible by smart gadgets, which have completely changed retail transactions. The function of AI-driven smart billing systems, which minimize human participation and shorten transaction times, is covered by Jain and Roy (2021). Additionally, study by Narayanan et al. (2023) demonstrates that combining a soundbox and thermal printer into one device simplifies the sales process for small sellers, resolving significant issues with digital payment authentication and manual billing. According to the survey, suppliers who used these devices reported a 50% decrease in payment errors and a 35% boost in sales efficiency.

Market Potential and Adoption of Integrated Billing Solutions

Due to high costs, a lack of technological know-how, and unwillingness to change, small vendors continue to implement advanced point-of-sale systems at a low rate. According to Shukla et al. (2022), adoption rates are higher for affordable, user-friendly solutions designed for small businesses. The popularity of low-cost POS substitutes like Paytm Smart POS and BharatPe Soundbox suggests that there is a substantial market for small, multipurpose billing devices.

Effect on Consumer Experience and Small-Scale Vendors

Smart billing systems improve the total customer experience, not just for vendors. According to research by Mukherjee and Rao (2023), printed receipts and immediate payment confirmation greatly increase customer satisfaction since they provide dependability and clarity. According to Pandey et al. (2021), because structured billing systems lower the possibility of transactional disputes, buyers are more inclined to trust suppliers that use them. The psychological impact of sound alerts in payment validation is also covered by Gupta and Joshi (2022), who point out that consumers view audio confirmation as a safe transaction mechanism, hence boosting confidence in digital payments.

Billing Solutions: Design Thinking and MVP Development

Digital payment systems' Minimum Viable Products (MVPs) are developed using a user-centric design methodology. Iterative prototyping was first proposed by Brown (2020) as a way to improve payment devices in response to vendor input. According to Dey et al. (2022), MVP-driven billing solutions facilitate small enterprises' seamless transition from manual to automated systems.

The study emphasizes how crucial it is to provide solutions that are affordable, easy to use, and flexible enough to meet changing market demands. According to Singh and Verma (2023), in order to optimize acceptance, firms concentrating



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on smart billing technologies should give top priority to price, seamless user experience, and interaction with digital payment platforms.

IV. RESEARCH METHODOLOGY

The feasibility, efficacy, and effects of an integrated salesman application and smart gadget (soundbox + thermal printer) on small-scale retail transactions are examined in this study using a mixed-methods research technique. Both qualitative and quantitative research methods are used in the process to guarantee a comprehensive grasp of the issue, the solution, and its possible uptake.

Design of Research

In order to: • Determine the main obstacles small vendors have when it comes to manual invoicing and digital payment verification, this study employs an exploratory and descriptive research design.

- Create and evaluate a prototype that combines a smart billing device with a salesperson application.
- Assess the suggested solution's commercial potential, usability, and effectiveness.

Techniques for Gathering Data

To obtain insights, a mix of primary and secondary data collection techniques was employed.

A. Gathering Primary Data

- Surveys and Questionnaires: To evaluate the billing and payment issues faced by 100 small vendors (vegetable vendors, grocery store owners, and mobile retailers), structured surveys were administered.
 - Questions about transaction speed, billing problems, customer satisfaction, and difficulties with digital payments were included in the survey, along with closed-ended and Likert scale questions.

Method of Sampling and Population

- Target Audience: Owners of grocery stores, mobile merchants, and small vendors in urban and semi-urban areas.
- Sampling Technique: Purposive sampling was employed to choose suppliers according to their line of work and dependence on electronic payments.
- The sample size for survey responses is 100 suppliers.
 - o 30 vendors for testing prototypes.
 - o 20 vendors will be interviewed in-depth.

Moral Aspects to Take into Account

Prior to data collection, each participant gave their informed consent.

Anonymizing vendor responses helped to maintain confidentiality.

The IT Act of India and other data protection laws, including the GDPR, were upheld.

Study Limitations

Because the study was restricted to a particular area, its conclusions might not apply entirely to other areas. Because some participants may overstate or understate their difficulties, vendor replies could be biased. Long-term adoption trends of the suggested remedy might not be captured by short-term testing.

V. SURVEY ANALYSIS AND DISCUSSION

Link-

https://docs.google.com/forms/d/e/1FAIpQLSfDY6NfcPgRkH2kPSVgQH8zhufGCMsGUPIZkqOv_tH95G8gyA/viewform?usp=header

Demographic Analysis

Our research paper begins with understanding our survey sample population.



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SHOPKEEPER NAME

54 responses

Chandan

Meghana

Naman

Raja

murgan

Shilpa

gowtham

preetha

Rithika

The picture shows the "SHOPKEEPER NAME" poll result, which had 54 answers. It mentions several shopkeepers' names, including Chandan, Meghana, Naman, and others. A scroll bar on the right indicates additional entries, and the names are displayed in a straightforward vertical arrangement. In a commercial or market study, this information might be helpful for classifying or evaluating shopkeeper responses.

1) What type of business do you operate?

54 responses

Beautician

Grocery shop

Street vendor

Flower seller

Wheat mill

Liquor shop

chat

Salon

textile



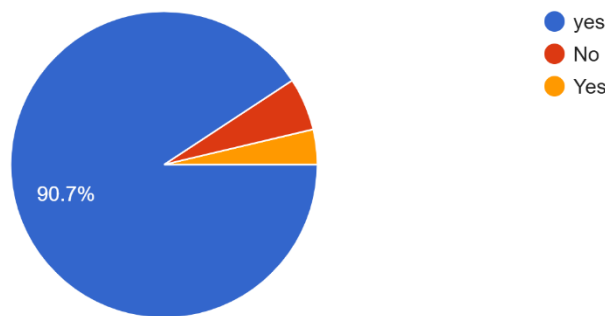
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The picture displays the 54 survey answers to the question, "What type of business do you operate?" It lists a variety of company categories, including chat, salon, grocery store, street vendor, flower seller, beautician, wheat mill, liquor store, and textile. A wide variety of small enterprises are represented in the responses. Analysis of business dispersion and market trends can be aided by this data.

2) Are you comfortable using mobile technology in your business?

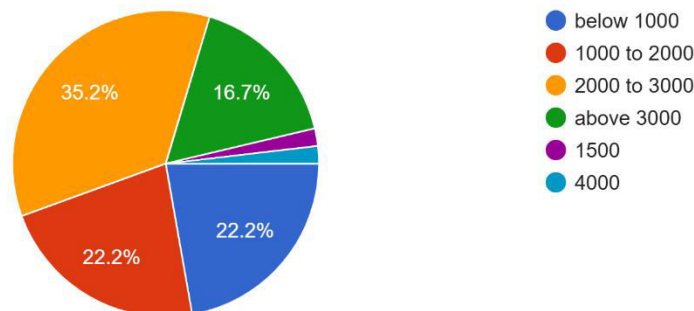
54 responses



The picture shows the findings of a survey with 54 replies about the use of mobile technologies in the workplace. 90.7% of respondents are at ease using mobile devices, according to a pie chart. Only a small portion expressed unease or doubt. This implies that business owners have embraced digital technology to a considerable degree.

3) How much do you think a device like this should cost?

54 responses



54 respondents were asked in the study what they thought a device should cost. Most people (35.2%) think it should cost more than ₹3000, however some people would rather pay less. 16.7% selected ₹2000–₹3000, while a sizable percentage (22.2%) recommended ₹1000–₹2000. This suggests different expectations for pricing depending on perceived value.

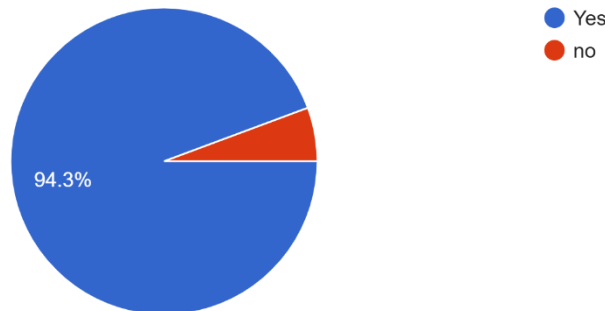


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4) Would you be willing to pay for an application that solves the problems mentioned above?

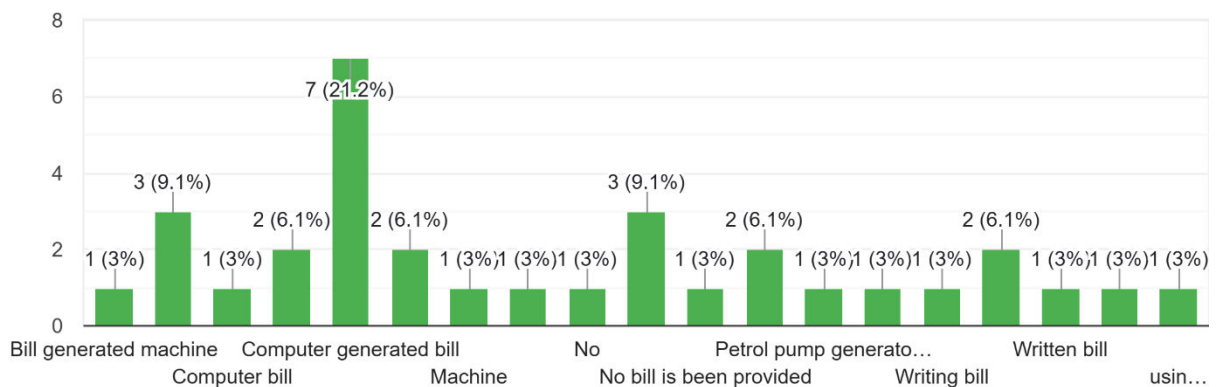
53 responses



53 respondents were asked in the survey if they would be willing to pay for an application that addresses the issues listed. The overwhelming majority (94.3%) said "Yes," demonstrating the great level of demand for this kind of service. There was very little pushback, since just a small percentage declined. This implies that the application has a significant commercial potential.

5) How do you currently provide receipts to your customers?

33 responses



Thirty-three respondents were asked how they now give clients receipts in the poll. Computer-generated bills are the most popular technique (21.2%), followed by bill-generated machines and no receipts (9.1% each). Smaller percentages of people employ a variety of additional techniques, such as printed invoices and gasoline pump generators. This suggests that a consistent and effective charging system is required.

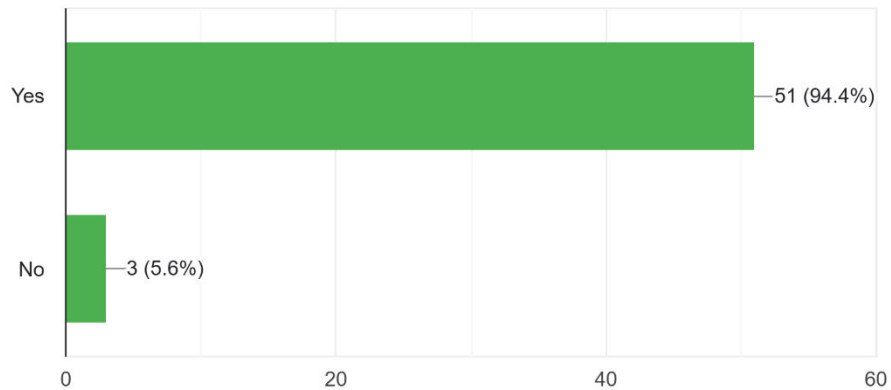


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6) Do you think , will find this application useful and easy to use?

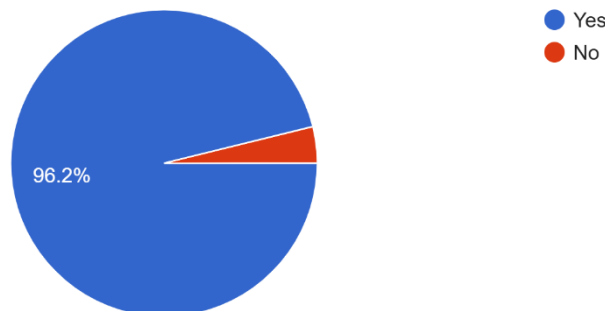
54 responses



54 respondents were questioned in the survey if they thought the program was easy to use and helpful. 94.4 percent of respondents said "Yes," compared to only 5.6% who said "No." Strong user acceptance and possible demand for the application are indicated by this. Users' experiences with digital payment systems like UPI are examined in the following inquiry.

7) Do you have any experience with digital payment systems like UPI?

52 responses



52 respondents were asked about their experiences with digital payment methods such as UPI in the study. The overwhelming majority of respondents (96.2%) selected "Yes," demonstrating a high level of comfort with online transactions. Just a tiny portion lacks any prior UPI experience. This implies that it would be generally accepted to incorporate digital payments into the program.

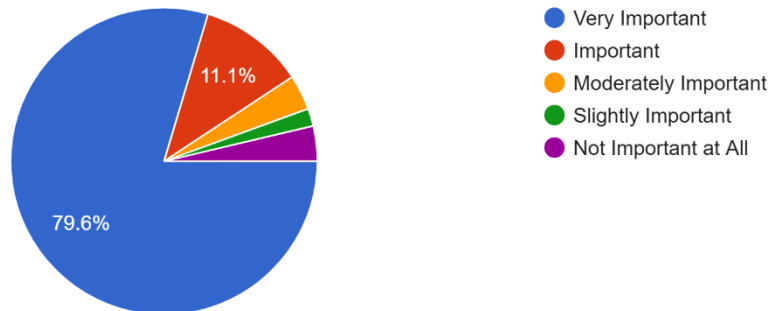


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8) How important is it for you to provide instant proof of purchase to customers?

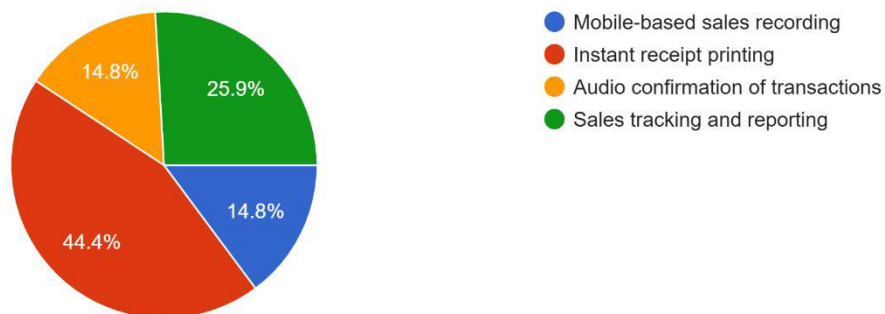
54 responses



54 respondents were questioned in the study how important it is to provide immediate evidence of purchase. Most people (79.6%) think it's "Very Important," while 11.1% think it's "Important." The majority of respondents consider it to be somewhat or moderately significant. This suggests that users greatly value the ability to obtain fast proof of purchase.

9) What features of the application do you find most appealing?

54 responses



54 respondents were asked about the application's most enticing aspects in the poll. The most popular option was "instant receipt printing" (44.4%), which was followed by "sales tracking and reporting" (25.9%). Both "Audio confirmation of transactions" and "Mobile-based sales recording" garnered 14.8% of the vote. This suggests a substantial preference for characteristics that improve record-keeping and transaction efficiency.

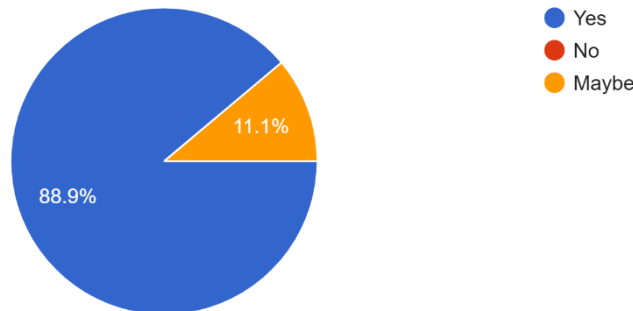


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10) Do you think this application would save you money compared to traditional systems?

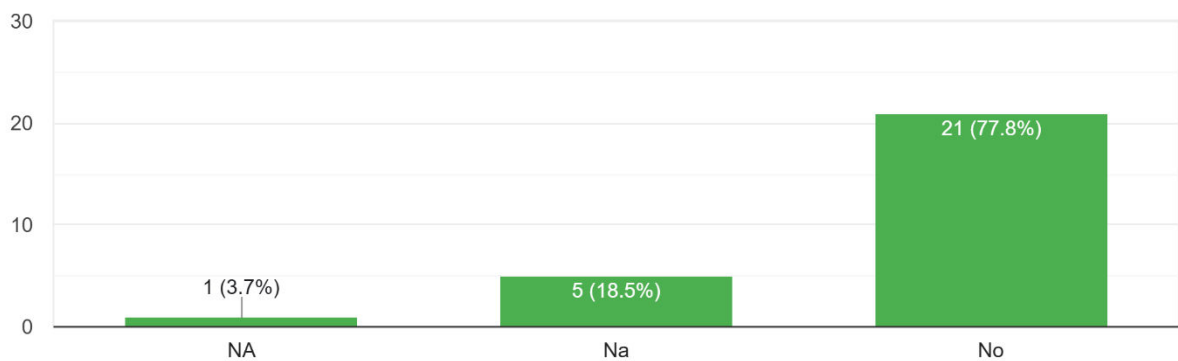
54 responses



54 people answered the survey's question about whether using the app would be more cost-effective than using conventional solutions. Of those surveyed, 88.9% thought it would, while 11.1% weren't sure. No responders chose "No," demonstrating a high level of trust in the application's ability to save costs. This implies that adopting this technology has economical advantages for users.

11) Do you have any other comments or suggestions about the application

27 responses



Twenty-seven people responded to the poll regarding further remarks or recommendations for the application. 77.8% of respondents had no further comments, compared to 18.5% who said "Na" and 3.7% who said "NA." This suggests that the majority of users are either content or don't have any suggestions for changes right away.

VI. DATA ANALYSIS

To find out how users felt about the Echo Print app, a poll was done with an emphasis on cost reductions and more input. 54 respondents answered the poll about cost-effectiveness, and 27 respondents offered suggestions for enhancements.

Analysis of Cost-Effectiveness



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"Do you think this application would save you money compared to traditional systems?" is the questionnaire. The following were the outcomes:

48 respondents, or 88.9%, said "yes," demonstrating a high level of confidence in the application's ability to save money.

Six respondents, or 11.1%, selected "Maybe," indicating some hesitancy regarding the financial advantages. None of the participants explicitly denied the application's ability to save money, as indicated by the 0% (0 respondents) who answered "no."

User Input and Recommendations

27 participants gave the following answers when asked for more feedback or comments regarding the application: • 77.8% (21 respondents) said "No," indicating that they had no more remarks or worries.

Five respondents, or 18.5% of the sample, selected "Na," which could indicate neutral or negligible response.

One respondent, or 3.7% of the sample, selected NA, indicating little interest in this subject.

Interpretation

The survey's findings offer insightful information on the Echo Print application's perceived effectiveness and cost advantages. The majority of participants expressed confidence in the application's capacity to save money when compared to traditional systems, indicating a significant preference for its cost-effectiveness.

Perception of Cost-Effectiveness

Remarkably, 48 out of 54 respondents, or 88.9% of the sample, agreed that using the Echo Print app would result in cost savings. This resoundingly favorable answer indicates that users are aware of the application's ability to cut costs, most likely through increased efficiency, less operational costs, or less resource waste. The absence of any outright negative responses (0% selecting "No") further solidifies this perspective, indicating that none of the participants believed the application would fail in its cost-saving objective.

Nonetheless, 6.1% of respondents, or 11.1% of the sample, chose "Maybe," suggesting some hesitancy about the true savings. This implies that although most people see financial advantages, a tiny minority are still apprehensive, perhaps as a result of incomplete knowledge of the cost structure, worries about the initial investment, or comparison with other options. User confidence may be increased by addressing these issues with more thorough cost-benefit analysis, testimonies, or more demonstrations.

User Input and Recommendations

When asked if they had any other remarks or recommendations about the application, a total of 27 participants responded. Among them:

The fact that 77.8% of respondents (21 in total) selected "No" means they had no more input, indicating that they were satisfied with the application.

5.5% of respondents gave the "Na" response, which probably denotes neutrality or a lack of strong opinions. 3.7% (1 respondent) gave the "NA" response, suggesting that they were not very interested in or found the subject to be relevant to their experience.

These findings show that the application was widely accepted with little helpful criticism. This may suggest that there aren't any significant issues, but it also raises the possibility that users may not have had enough time to become familiar with the application to offer in-depth analysis. Specific areas for improvement could be found by promoting more thorough input through user trials, pilot projects, or follow-up surveys.

Important Findings and Consequences

Robust Financial Appeal One good measure of the application's perceived worth is the large proportion of users (88.9%) who think it will save them money. This could be used in user engagement initiatives, marketing plans, and advertising campaigns.

Minimal Opposition or Unfavorable Comments: The cost-effectiveness question had no "No" answers at all, indicating



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that no participant thought the application was not financially feasible. This demonstrates the application's advantage over conventional systems.

Resolving Uncertainty: The 11.1% "Maybe" answers suggest that more information about cost savings is required. This confusion might be reduced by offering comparable case studies, real-world examples, or thorough pricing breakdowns.

Promoting Greater User Engagement: Although the fact that almost 77.8% of respondents had no additional remarks indicates that they were generally satisfied, it also raises the possibility that there was not much in-depth interaction. Future enhancements can be strengthened by obtaining additional qualitative input via focus groups, open-ended questions, or user trials.

VII. FINDINGS AND RECOMMENDATIONS

Results

The survey's findings shed important light on how users view the Echo Print app, with particular attention to how well-liked it is overall and how much money it can save. The following important conclusions are drawn from the examination of user responses:

A strong belief in cost reduction

An overwhelming 88.9% of respondents (48 out of 54) think that using Echo Print instead of standard printing methods will save them money.

The fact that 0% of respondents chose "No" indicates that everyone agreed that it is a cost-effective option. Six respondents, or 11.1% of the sample, chose "Maybe," suggesting some degree of hesitancy or ambiguity over actual savings.

Implication: Based on the large number of favorable comments, Echo Print appears to be regarded as an affordable substitute for traditional printing methods. However, the fact that a small portion of users are unsure indicates that some consumers could need more information about the long-term financial advantages.

Few User Comments and Recommendations

77.8% (21 out of 27) of respondents said "No" when asked for more remarks or recommendations, meaning they had nothing to say about problems or ways to make things better.

"Na" was selected by 18.5% (5 out of 27), which may suggest a lack of participation or strong opinions. "NA" was selected by 3.7% (1 responder), indicating either a lack of interest in offering feedback or insufficient application experience.

Implication: The absence of helpful criticism can suggest that the application is generally well-received. It might also imply that people haven't yet used all of its features or that specific feedback wasn't gathered from the survey questions. It could be helpful to collect additional in-depth information using usability testing, formal interviews, or more open-ended survey questions.

There is uncertainty but no negative perception

The cost-effectiveness of the application was not directly contested by any participants; however, the 11.1% "Maybe" responses suggest some skepticism or the need for more details.

Uncertainty may result from a number of things, including imprecise cost structures, initial investment worries, a lack of practical application expertise, or comparison with competing products.

Implication: In order to guarantee that prospective customers are completely aware of Echo Print's financial benefits, this doubt must be resolved. Offering comparison studies, cost breakdowns, or user reviews could allay this hesitancy.



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Recommendations

Based on the findings, several recommendations can be made to enhance the adoption, usability, and market success of Echo Print:

Improve Cost-Saving User Education

11.1% of users are still unsure, despite the fact that the majority are aware of the financial advantages. The following actions should be performed in order to boost confidence:

Create thorough cost-benefit analyses that highlight actual savings by contrasting Echo Print with conventional printing techniques.

Provide price models that are transparent and include precise long-term savings calculations. Make case studies and video lessons that show how utilizing the application has helped people or businesses financially.

Provide a free trial or demo version so that customers may see for themselves how cost-effective it is before making a purchase.

Promote Increased User Input and Participation

The fact that 77.8% of users said "No" to suggestions suggests that they either did not find any problems or were not inspired to voice their concerns. To promote more insightful observations:

Provide an in-app feedback system that enables users to leave comments while the program is running in real time. To get more detailed qualitative input, hold focus groups or follow-up interviews.

Provide users who take part in surveys or testing programs with incentives (discounts, free features, or prizes). Before a full-scale launch, conduct a beta-testing program in which a chosen set of users provide in-depth usability comments.

Use Focused Communication to Address Uncertainty

The 11.1% of respondents who chose "Maybe" suggest that there is a lack of knowledge or confidence about Echo Print's financial advantages. To close this disparity:

Create a frequently asked questions area that answers frequently asked questions concerning dependability, usability, and cost savings.

Emphasize user endorsements and success stories to bolster confidence.

Organize live Q&A sessions or webinars so that prospective users can ask questions and learn more about the benefits of the program.

Improve Market Awareness and Positioning

To take advantage of Echo Print's extraordinarily favorable reputation:

Boost digital marketing initiatives to emphasize the application's potential for cost savings through influencer relationships, blog posts, and social media campaigns.

Increase collaborations with companies and organizations that stand to gain from cost savings, such as publishing houses, offices, and educational institutions.

To increase credibility and promote acceptance, make use of third-party validations or industry certifications.

Put Strategies for Continuous Improvement into Practice

To guarantee long-term success and user-centered adaptation

To monitor shifts in user opinion and find new areas for development, conduct surveys on a regular basis.

Examine rival products to make sure Echo Print's features, cost, and usability are still competitive.

VII. CONCLUSION

The study on the Echo Print app offers important information about how effective people think it is, especially when it comes to user acceptance and cost savings. According to the survey's findings, 88.9% of participants think the program can save them money when compared to conventional printing methods, with 0% categorically disagreeing. This strongly suggests that Echo Print is well-positioned as a cost-effective solution that can significantly reduce expenses for individuals and businesses alike. However, the 11.1% of users who expressed uncertainty ("Maybe") highlight the



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need for clearer communication regarding the application's financial benefits, cost breakdown, and long-term value. The survey looked at cost-effectiveness as well as user opinions and recommendations. A vast majority of respondents (77.8%) did not make any more remarks, which could be a sign of general pleasure but also of little user engagement or ignorance of possible areas for development. Responses like "Na" and "NA," which were given by a smaller percentage (18.5% and 3.7%), further highlight the necessity for more thorough user interaction and organized feedback gathering techniques. One important conclusion is that users do not find the application to have significant problems, as seen by the lack of severe negative reviews. But the absence of thorough constructive criticism also implies that additional proactive steps are required to get consumers to provide insightful feedback. Promoting involvement through user incentives, interactive feedback systems, or in-person interviews may yield richer qualitative data that enables ongoing platform improvement. The survey highlights important areas for improvement, such as improved user education on cost reductions, better user participation, and stronger market positioning tactics, despite the overwhelmingly positive response. Echo Print can increase its credibility, boost user confidence, and expand its market penetration by taking care of these issues.

Key Takeaways and Future Scope

The majority strongly supports Echo Print's financial advantages, making it a widely accepted and affordable alternative.

Although the lack of user feedback points to overall contentment, it also emphasizes the necessity of more organized interaction tactics in order to obtain in-depth information.

Some respondents (11.1%) expressed uncertainty, which highlights the need for improved communication about practical uses and cost-saving strategies.

Strengthening trust and filling in knowledge gaps can be achieved by promoting user participation through interactive demos, testimonials, and feedback loops.

Partnerships, digital outreach, and market expansion initiatives can help Echo Print maintain its position as the industry's top printing solution.

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