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A CRITICAL REVIEW OF MIXED CROSS-SECTIONAL STUDY ON USAGE OF ELECTRONIC PAYMENT SYSTEM AMONG VISUALLY IMPAIRED USERS IN CHENNAI DISTRICT

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ABSTRACT:

Introduction: In India, the electronic payment system is growing day by day, even in the petty shop, it's possible to see QR code scanning. Many studies were done in the area of digital financial inclusion, satisfaction, and perception of users. Still, none of the studies address the experience of the visually impaired (VI) digital payment users in Chennai, Tamilnadu, India.

Methods: This study is a mixed cross-sectional study; the researcher uses quantitative and qualitative data collection methods. In the first section, the qualitative study is based on the interview method and four theme-based questions had been framed to interact with VI users. The second section is based on the questionnaire method where two factors had been framed with five indicating variables each. Totally 90 respondents have participated in the study. Both sections follow the snowball sampling method for data collection. The researcher clearly explained the study's aims, methods, and general outcome to the participants. Therefore under "Informed consent" the researcher received consent from the participants before starting the data collection.

Result: The first section reveals the feasible mode of transaction for VI users and the supporting application for carrying out the successive digital payment transaction. The second section brought out the adoption and ease of use in digital payment.

Discussion: The first section put forth the problems in accessing their own bank digital wallets and the second section is about how the ease-of-use factor paves the way for the adoption of a digital payment platform for VI users. Still, some banks are heisted to provide a debit card to the VI clients.

Implication and practice: In India Reserve bank of India (RBI) is the central bank, without the support of RBI, here nothing is possible to implement changes in the accessibility of digital payment to VI users. Therefore, RBI needs to take respective actions.

Keywords: Usage, visually impaired users, Digital payment, snowball sampling, adoption, and ease of use.

1. Introduction:

Digital payment service is the way to reach digital financial inclusion and mobile payment service paves the way toward digital India. In India, the demonetization of 500- and 1000-rupee notes resulted in a decrease in Cash handling and started using electronic payment applications for fund transactions (Fouillet et al., 2021) After demonetization, people slowly start to use this digital platform and during the pandemic, people also adopted digital culture. For availing of internet banking and mobile banking facility, one should open an account in a respective bank, and the account holder has to wait for the activation of the account. And after the activation account holder has to wait for a few more days for starting the electronic transaction because it will take time to add and approve the beneficiary details (Aurazo & Vega, 2021). When it came to modern financial transactions, very few steps are required to complete the transaction like scan, tap, and click now-a-day digital payment applications made things easier(Li et al., 2021).

On the other side, visually impaired users also adopt the digital culture. They also use the android mobile with the support of the E-speak and talkback application and most of the visually impaired users are using a unified Payment interface. The Reserve Bank of India issued orders to all banks to ensure that all banking services, including cheque books and third-party cheques, ATMs, Net banking, lockers, retail loans, credit cards, and so on, are made available to the visually impaired without discrimination(Chief General Manager-in-Charge, 2008) All at the same, the visually impaired have been denied access to multiple banking services, especially the issuing of ATM cards(Aditi R, 2020). Hence this study attempted to explore the usage of digital payment systems among visually impaired users in the Chennai district.

2. Literature review:

2.1 Adoption of digital banking

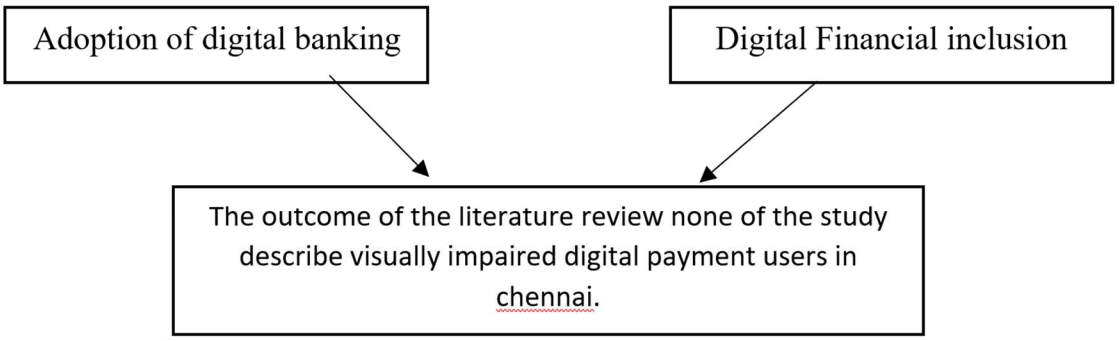
"A deductive approach has been used to understand mobile banking adoption in Nigeria. Cultural values play a lead role in promoting mobile banking usage in Nigeria, local culture should be taken into account when incorporating technologies such as mobile banking services"(Bankole et al., 2011). "China has taken steps towards continuing to develop technology-based banking in remote areas, at the same time a financial inspection of mobile banking would shield the rights and interests of rural residents"(Zhu et al., 2021). In Malaysia, presumed willingness had no direct effect on digital payment service adoption, however, The study shows significance when it includes "Risk and Intrinsic Motivation" as a variable, the researcher suggests that the government and financial institutions had to come forward to develop the robust technology in the payment system which does not ease to hack, this action would build trust among the users, then they will accept the digital payment system without any fear(Balakrishnan & Shuib, 2021) In Malaysia, "Electronic banking and mobile banking" are very useful for completing the transaction with minimum effort, for that reason the existing users had to accept the digital payment system, this study guides the banks to improve the advanced features of the mobile payment system this action would result in the adoption of digital payment by more users(Tan et al., 2010) Mobile banking is changing the way of delivering financial services for their users this would be the reason for

increasing the adoption among users when the users are prioritized while constructing the payment mechanism that would result in the adoption of payment system among the users(Sulaiman et al., 2007) "A qualitative study on mobile banking technology acceptance by the rural unbanked"(Tobbin, 2012) insists that the "unbanked demand for mobile banking services is connected to their demand for savings and loan services" As a result, for traditional banking to successfully adopt mobile banking, operators must promote the use of mobile banking services for savings and loans. Firms should think about educating users further through demonstrations and training to better enable them to manage mobile banking systems. When customers feel more competent in using the system, they will find it much easier to use and will be more likely to be used. In India, consumer behaviour and attitude will be considered for acceptance of the digital payment system among users, which could predict the intention to use is determined by the behaviour and intention towards digital payment(Patil et al., 2020). The reason behind the adoption of digital and mobile payment is that features such as ease to handle, comfort while using, anywhere they can carry out the transaction, and post benefit all are a significant impact adoption intention of mobile banking(Jebarajakirthy & Shankar, 2021).

2.2 Digital financial inclusion

In the United States, digital peer-to-peer payments include the elements of modern web and mobile technologies, the smart payment system reduces the burden of carrying physical cash and the simplified methods of payment, helps to control at any time, and users took modern financial lifestyle and its advantage(Li et al., 2021) Developing countries are concentrating in the adoption and intention study for digital payment acceptance, were as the financial needs of users is neglected while designing the application, if they would have conduct a research in users' needs and impact of technology before designing the application it would be successful one but many service application providers are failed to do so(Duncombe & Boateng, 2009). In India, credit cards are a highly preferred mode of availing loans and immediate payment and it is a trusted one, but this credit card is familiar with business people and high profile people it will show the financial soundness of the person and it is not affordable for the lower and middle-class section it apparent the discrimination in availing the service, whereas in the digital payment system it is available to all and there is no discrimination in availing the service(Venkatraman & Reddy, 2021). Payment for transport is digitalized in EU countries and this innovation is considered as an improvement of service, this service is inclusive of getting tickets through an application and passengers could pay through digitalized mode, this innovative service is possible just because of penetration of mobile phone with an affordable internet connection, the level of financial inclusion also increased, and income, education, and financial awareness has an effect on digital payment in EU countries(Frączek & Urbanek, 2021). Indian banks are working diligently for financial inclusion but low-income section people are not ready to accept the new technology banking, this scenario needs to be changed because the majority of small transactions are carried out by this low-income section only(Kanungo & Gupta, 2021).

Fig. 1. Gap findings from the review of literature



Source: Researcher Own work.

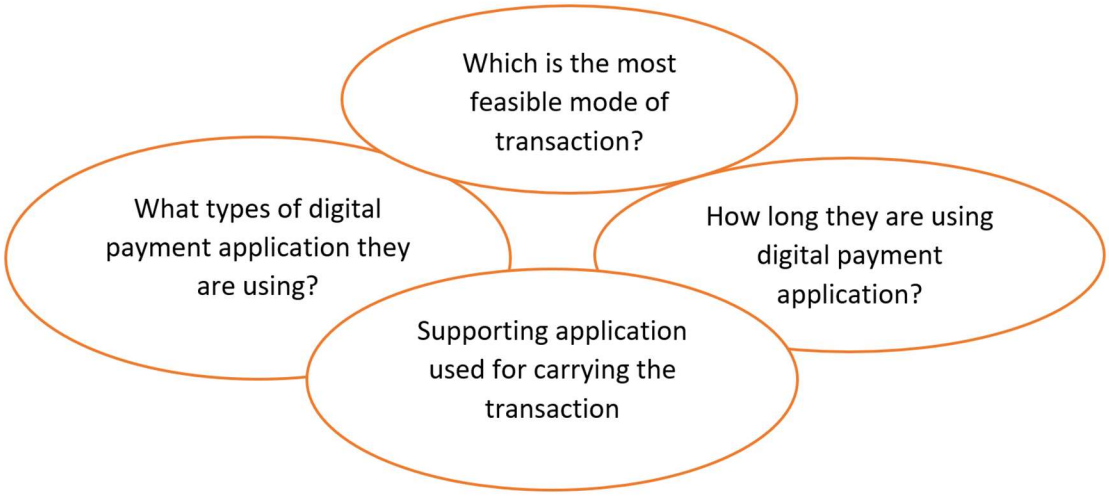
Interview:

This study follows the mixed method of the qualitative and quantitative methods of data collection, based on the cross-sectional study the researcher divides the data collection into two parts, the first part is a theme-based interview method and the second one is a set of ten questions regarding the usage of digital payment which is broadly classified into ease of use and adoption of digital payment.

A qualitative analysis was done by interviewing the visually impaired users (Dreyer et al., 2021)Interview was done through mobile phone and the study follows snowball sampling technics. From one respondent the researcher got the contact information of another visually impaired digital payment user. Between October -November 2021, a total of 40 respondents participated in this interview schedule. For this study, semi-structured interview questions based on themes were developed to study better understand the usage of the digital payment system(Knight et al., 2021)

The second section of data collection is based on a questionnaire method in that data collection the researcher framed ten questions based on ease of use and adoption of digital payment among the visually impaired. This session also follows a telephonic interview method for data collection and a snowball sampling method. 50 visually impaired users participated in the second section. Since it is a cross-sectional study, the researcher did not include the first section participants in the second section.

Fig. 2. Theme-Based Interview Question



Source: Researcher frame these questions to study the usage of digital payment system among visually impaired users in first section.

2.3 Feasible mode of transaction:

In this interview, the researcher asked, which is the most feasible mode of the transaction? And the researcher found that the majority of the visually impaired users are more comfortable with digital payment and they are happy with the online mode of transaction. "The wide adoption and use of the internet and smartphone devices facilitated the development of electronic payments and baking"(Alkhowaiter, 2020) "That technological trust significantly impacts the rationale for using different payment methods or money transfer services/providers"(Szumski, 2020).

2.4 Type of digital payment application:

The second question asked in the interview was "What type of digital payment applications are using?". The researcher got the answer that most visually impaired users are using third-party payment applications such as google pay, phone pay, and Paytm. Since it is a telephonic semi-structured interview, the researcher asked "why you were stuck to these payment applications?" and the respondent said, these applications are user-friendly for visually impaired users. "The huge growth of smart mobile devices has enticed many apps to incorporate third-party in-app payments, which involve more advanced interactions between multiple participants than traditional payments"(Yang et al., 2019).

2.5 Supporting application:

The third question in the interview was based on "which supporting applications are used for carrying the transaction?". And the researcher got a response from all the visually impaired users that the entire respondent is using E-speak. And along with E-speak, they use other supporting applications such as a voice keyboard, magnifier, insta reader & envision, and Google Go. "Screen

readers, auditory output, touch gestures, voice, and soft Braille keyboards are the most common non-visual text entry methods(Alajarmeh, 2021).

2.6 How long they are using:

The fourth question is based on the usage of digital platforms. The researcher found out that most respondents are using this digital platform for the past three years. After demonetization, in India, people slowly adopted digital platforms since visually impaired users also adopted the digital culture. Reserve Bank of India had launched a mobile application MANI (Mobile Aided Note Identifier) for the visually impaired to identify the denomination of new currency notes.

3. Demography Profile

Table:1 Demography profile of respondent

Measurable variables	Items	Percentage of **First Section**	Percentage of **Second section**
Age	19-25 Years	68%	10%
	26-30 Years	14%	60%
	Above 30	18%	30%
	TOTAL	**100%**	**100%**
Gender	Female	14%	16%
	Male	86%	84%
	TOTAL	**100%**	**100%**
Marital Status	Single	82%	78%
	Married	18%	22%
	TOTAL	**100%**	**100%**
Education Qualification	Up to HSC	18%	0
	UG	41%	12%
	PG	23%	84%
	Professional	18%	4%

	TOTAL	**100%**	**100%**
Occupation	Student	25%	24%
	Government Employee	5%	36%
	Private Employee	65%	38%
	Self Employed	5%	2%
	TOTAL	**100%**	**100%**
Level of Visual Impairments	Low vision	32%	70%
	100% Blind	68%	30%
	TOTAL	**100%**	**100%**

(Source: Primary data)

First Section: Table: 1, third column indicates the first section demography profile of qualitative study, it reveals that most of the respondents are between 19-25 years old male, undergraduate private employees, and their marital status is single. They fall under the 100% blind category.

Second Section: Table:1, fourth column indicates the second section demography of quantitative study, it reveals that most of the respondents are falls between 26 and 30 years old, male respondent frequency is high in section two and they are postgraduates and private employees with 100% blindness.

Null Hypothesis: The model "usage of mobile payment among the visually impaired" has a good fit

Figures 3, 4, 5 & 6 and Table 2 describe the model of ease of use (EOU) and adoption of digital payment among visually impaired users.

Table 2 Model fit Indices

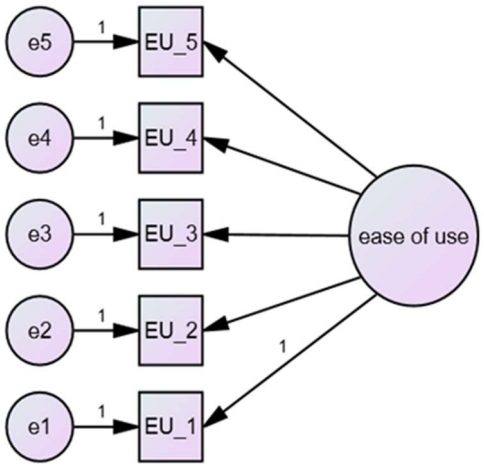
Fit Indices	Result of ease of use	Result of adoption	Suggest value
Chi-square	0.9	1.07	"Greater than 0.0"
CFI	1	1	"Greater than 0.9"
GFI	0.950	0.989	"Greater than 0.9"
AGFI	0.950	0.943	"Greater than 0.9"

NFI	0.910	0.930	"Greater than 0.9"
IFI	1.12	1.06	"Approaches 1"
TLI	1.704	1.295	"Greater than 0.9"
RMSEA	0.00	0.00	"Less than 0.8 or 0.5"
PGFI	0.198	0.198	"Within 0.5"
No of statement before CFA	5	5	
No of statement after CFA	4	4	

(Source: Amos output)

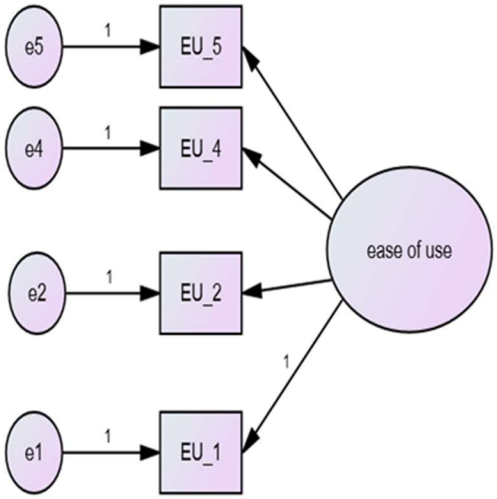
Measurement of the statement: The statement for ease of use, EU_1 denotes "Mobile payment is easy to do the transaction without the help of the third party", EU_2 denotes "Mobile payment is more efficient than traditional payment", EU_3 stands for "Overall mobile payment is useful in day-to-day life", EU_4 stands for "Mobile payment is ease to learn for VI users", and EU_5 refers "Mobile payment is ease to use for VI users".

Fig 3 proposed ease of use statement



"Amos graphics" had been used in this study to prove the model fit of the statement. The researcher used "Confirmatory factor analysis" to eliminate similar questions and evaluate the model's quality.

Fig 4 proved ease of use statement



Based on the review the researcher frames the questionnaire for ease of use and adoption of digital payment among visually impaired users. Figure 3 shows the proposed factor and Table 2, the second column indicates the model fit of ease of use, EOU model satisfied the suggested value such as GFA with 0.95, AGFA with 0.95, and RMSEA with 0.00 level. These three model fit items indicate that the statement for the ease of use is perfectly fit for the factor usage of digital payment among visually impaired users.

Fig.4 shows the proven output diagram of ease of use, while running the model the researcher uses five statements under ease of use, after running the model the output shows that the third statement "EU_3" had influenced the other indicating variable, it shows the third statement is similar to the second and fifth indicating variable, therefore, it had been removed from the model.

The five statements for the adoption of digital payment are AOMP_1-"VI users can pay for online purchase through mobile payment", AOMP_2-"VI users often use the mobile payment for transactions" AMOP_3-"Often use mobile payment application for recharge", AMOP_4-"QR code scanning is accessible for doing mobile payment" and AMOP_5-"Mobile payment application is used to check account balance".

Fig 5 Adoption proposed statement

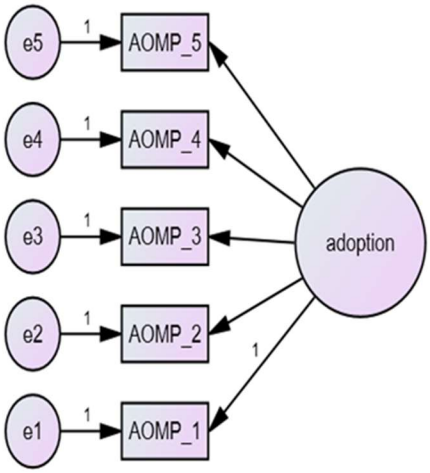


Figure 5 shows the proposed adoption factors and Table 2, the third column indicates the model fit of "Adoption of mobile Payment", AOMP model satisfied the suggested value such as GFA with 0.989, AGFA with 0.943, and RMSEA with 0.00 level. These three model fit items show that the indicating variables for the adoption of mobile payment among the visually impaired are perfectly fit for the factor usage of digital payment among visually impaired users.

Fig 6 Adoption proved statement

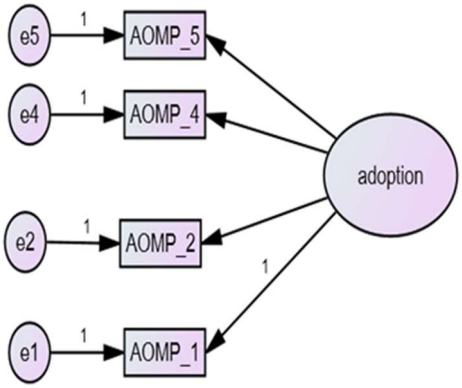


Fig.6 shows the proven output diagram of the adoption of mobile payment, while running the model the researcher uses five statements under ease of use, after running the model the output shows that the third statement "AOMP_3" had influenced the other indicating variable, it shows the third statement is similar to the second indicating variable, therefore, it had been removed from the model. Fig.6 represents the model after the elimination of similar indicating statements.

Therefore, the null hypothesis is accepted.

4. Discussion

Section one discussion: After the theme-based questions, the researcher asked the respondent to share their experience and suggestion on digital payment most of the respondents are happy to

share their experiences but a few respondents refused to share their experiences. The following points are shared by the respondent.

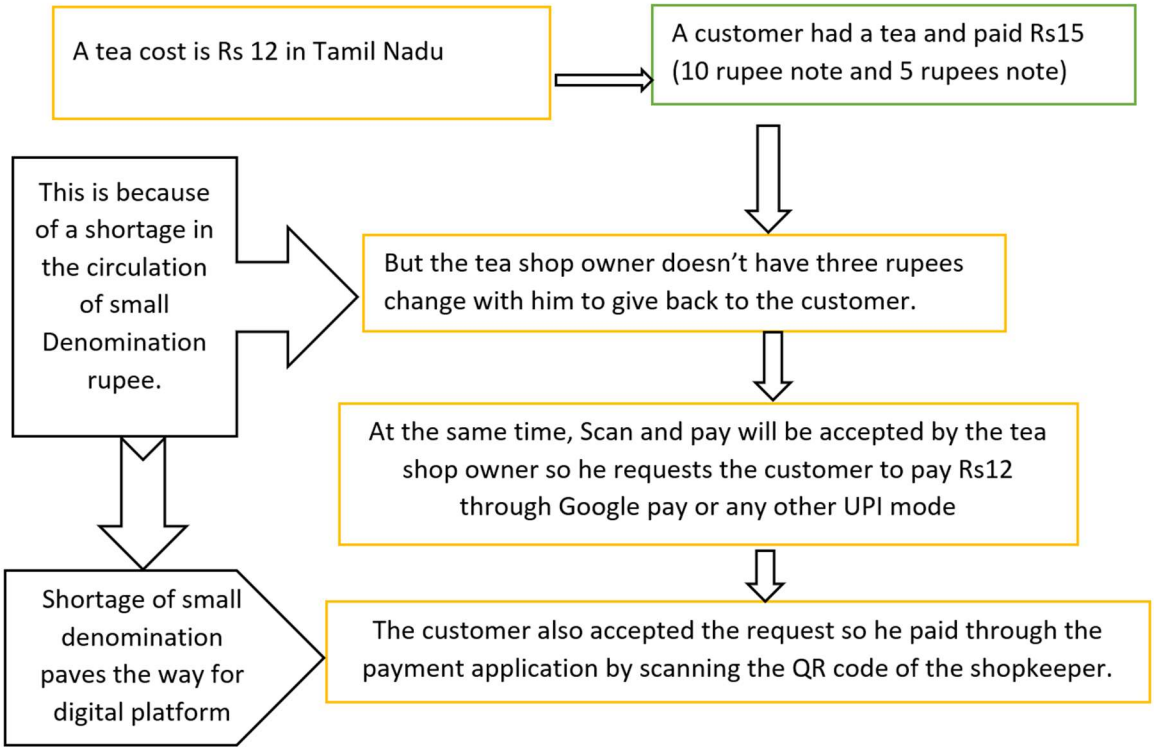
- Most public sector banks are not aware of the RBI order regarding the banking facility should be provided for the visually impaired without any discrimination.
- Most visually impaired users are facing a common problem is talkback feature is not working in their bank payment application.
- Since it is user-friendly the visually impaired are very comfortable with third Party payment applications such as google pay and Paytm.
- Debit card numbers should be readable for the visually impaired. Example: Embossed card
- A talking ATM should be installed or the existing ATM should be upgraded with talking ATM features along with headphones.

Section Two Discussion: Questionnaire-based structured telephonic interview had been conducted, between February – March 2022.

The followings are the outcome of the second section's findings:

- Few visually impaired users are well versed in handling digital payments application.
- VI users are eager to learn new technology.
- In India, we have one, two, five, and ten-rupee aluminum coins and nine denomination printed notes such as one, five, ten, twenty, fifty, hundred, two hundred, five hundred-, and two-thousand-rupee notes. So, in India currency system is mixed with aluminum coins and printed notes.
- After 2016, people slowly started to switch to the digital mode for transactions. Therefore, the circulation of physical currency faces a shortage of coins and rupees.
- This shortage of physical currency circulation made the visually impaired use a digital platform for small transactions.

Fig.7 illustration of small denomination shortage



The above figure 7 shows the exact scenario of shortage of small denominations in circulation, this is the push scenario for visually impaired users, since they are eager to learn new technology, it is easy for them to learn and use the payment application with the supporting talkback and E-speak. Indians are facing a shortage of physical currency circulation in small transactions but it doesn't a problem for sighted users they could use mobile wallets and net banking for transactions on the other side for visually impaired users digital payment is a big challenge, why because mobile wallet which is provided by banks are not easily accessible for VI users, therefore, they started using third-party payment application.

5. Conclusion

The selection of the bank is very important when it comes to digital payment applications because most banks are failed to design the net banking and payment application for visually impaired users. Knowledge of using mobile payment applications is very important because without knowing the method they can't do the transaction in the digital mode. This study suggests the bank's that whenever a blind person is opening a bank account, they must be sent to a one-time workshop on how to handle the payment application and it is a must to be taught how to initiate the transaction safely. And Third-party payment application features should be included in the user's bank payment application. For example, G-pay is easy to pay the transaction whereas the user's bank payment application is not comfortable and it's not easy for visually impaired users for doing the transaction.

This study focused on limited participants and it was based on the comfortable mode of transaction and supporting application, study reveals that users are adopted to third party payment applications since their bank payment applications are not visually impaired users friendly. This study approaches further studies on the visually impaired users' perception, trust in digital payment, and awareness of security threats.

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Declaration of competing interest

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CRediT authorship contribution statement

Ms. Parvathy V: Conceptualization, investigation, and writing – original draft.

Dr.P.Sankar: Supervision, validation and Writing – Review & editing.

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