

## Enhancing AEPS Literacy: Improving Public Understanding and Adoption of Aadhaar-Enabled Payment Services

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### Abstract:

The scope of this study is to build an advanced artificial intelligence system which uses Convolutional Neural Networks (CNNs) to identify and categorize tumors as benign or malignant and to predict the cancer stage for early diagnosis. The suggested model will provide precise and trustworthy diagnostic outputs by utilizing a labeled medical image dataset, enabling prompt cancer detection by medical professionals. Through offering a user-friendly interface which enables real-time analysis and seamless integration with electronic health records (EHRs), this initiative aims to improve treatment outcomes and reduce diagnostic errors. To enhance the solution's potential application, the project also explores 3D tumor modeling, predictive analytics, and multi-cancer detection capabilities. By resolving crucial issues like data accessibility, algorithm sensitivity, and clinical workflow integration, this creative strategy seeks to revolutionize diagnostic tools for patients, researchers, and healthcare professionals. Our ultimate objective is to equip medical professionals with state-of-the-art tools that improve cancer detection, forecast cancer stages, and enhance patient care in general.

**Keywords:** CNN-based Tumor Classification, Malignant vs. Benign Tumor Analysis, Cancer Staging with AI, Medical Image Processing, 3D Tumor Modeling, AI-Driven Cancer Diagnosis

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### Abstract

The Aadhaar Enabled Payment System (AEPS) is a pivotal tool for fostering financial inclusion in Bharat, especially in rural and underserved regions. It played a vital role during the COVID-19 lockdown, ensuring continued access to financial services when traditional banking was disrupted. AEPS enhances security through biometric authentication, safeguarding user identity and privacy. This study aims to assess the awareness and adoption of AEPS among the rural population, identifying the challenges and opportunities in enhancing digital payment literacy. By leveraging the Aadhaar number for banking transactions, AEPS effectively bridges the gap between the unbanked population and formal financial services. The study synthesizes insights from various Scopus-indexed research,

providing a comprehensive overview of AEPS literacy. It evaluates the awareness levels of AEPS functions using chi-square tests on non-parametric distributions through SPSS software. The key elements of the AEPS model include steps to use AEPS, enhancing awareness, and essential banking functions such as balance inquiry, cash withdrawal, cash deposit, Aadhaar-to-Aadhaar fund transfer, and BHIM Aadhaar Pay, all aimed at promoting financial inclusion in remote areas.

**Keywords:** Digital payment, Financial Inclusion, Aadhaar enabled payment system, services awareness, chi square test, enhancing awareness, AEPS procedural and Aadhaar-Based Government Schemes, Multiple Regression Analysis.

## INTRODUCTION

To promote financial inclusion in India, the RBI formed two working groups to focus on MicroATM standards and Aadhaar-based transactions infrastructure, including representatives from RBI, UIDAI, NPCI, IDRBT, banks, and research institutions. They successfully tested UIDAI's authentication and encryption standards for MicroATMs. The Aadhaar Enabled Payment System (AePS) facilitates interoperable financial transactions at PoS via MicroATMs through Business Correspondents (BCs), supporting cash deposits, withdrawals, fund transfers, balance inquiries, and mini statements, leveraging Aadhaar for seamless access. This initiative aligns with the GoI and RBI's financial inclusion goals ([National Payment Corporation of India](#)). The Role of Aadhaar in Payments Aadhaar, introduced by UIDAI, is a 12-digit identification number created from demographic and biometric information. It supports financial inclusion by facilitating secure digital payments, simplifying KYC procedures, and acting as a portable financial identifier. Aadhaar improves welfare delivery by removing duplicate identities and enhancing subsidy management. It enables secure financial transactions and consolidated access to welfare benefits for users, while offering policymakers better transparency in fund distribution. Recognized as a valid KYC document by regulatory authorities, Aadhaar integrates seamlessly with banking, insurance, and telecom sectors. Its authentication system ensures reliable identity verification, with update centers ensuring accurate and up-to-date data management, making it a cornerstone of India's digital ecosystem. (Block & District, 2012). The National Payments Corporation of India (NPCI) reports a success rate of 99.55% or higher for Aadhaar-enabled Direct Benefit Transfer (DBT) payments, compared to about 98% for account-based payments. The Aadhaar-Based Payment Bridge System (ABPS) ensures payments reach genuine beneficiaries, reducing corruption by eliminating fake entries. While Mahatma Gandhi NREGS uses a mixed payment route (NACH and ABPS), the Government of India aims to fully transition to APBS due to its security and efficiency. As of July 2023, 88.51% of wage payments under NREGS were processed via APBS, with 81.89% of active workers eligible for it. Out of 14.33 crore active beneficiaries, 13.97 crore Aadhaar numbers have been seeded, and 13.34 crore authenticated. Beneficiaries are not denied work for lacking Aadhaar, and job cards cannot be canceled solely for ineligibility under APBS. The system, operational since 2017, provides a streamlined, secure mechanism for transferring payments, benefiting both beneficiaries and the program's efficiency ([Press Release 2023, pib.gov.in](#)). The Ministry of Health's focus on integrating digital payments, coupled with initiatives like the 'Jan Dhan Aadhaar Mobile Yojana,' highlights the growing importance of digital financial solutions. Collaboration between technology and policy can drive progress, with fintech innovations offering cost-effective solutions and adaptive policies fostering competitiveness,

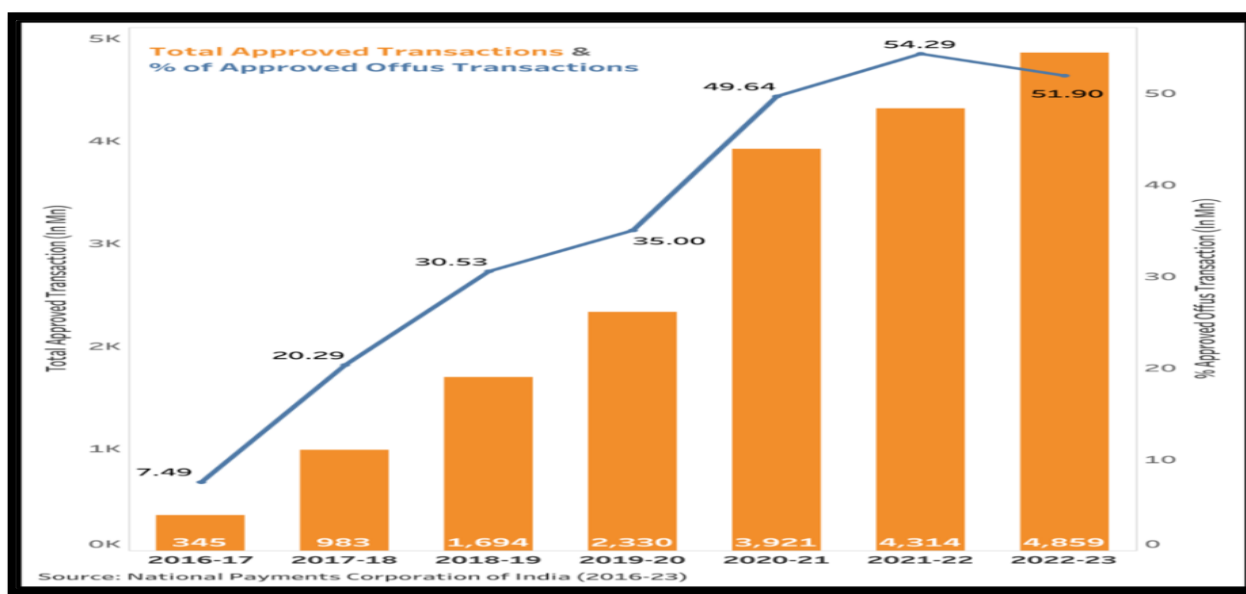
innovation, and efficiency (Pathak et al., 2024). The RBI has introduced measures such as Digital Payment Security Controls, multi-factor authentication, the establishment of the Indian Computer Emergency Response Team, Financial Literacy Week for rural and elderly communities, and a robust grievance redressal mechanism to bolster digital payment security. The Ministry of Electronics and IT's "Pradhan Mantri Gramin Digital Saksharta Abhiyan" aims to enhance digital literacy and promote secure payment practices in rural areas, while NPCI focuses on raising awareness about BHIM-UPI fraud prevention (Wiwoho et al., 2022). Collaborations between traditional financial institutions and metaverse companies could pave the way for the creation of specialized payment systems tailored to the metaverse. However, security remains a significant challenge for digital payments within this space. As the metaverse evolves and becomes more profitable, digital assets could become prime targets for hackers and cybercriminals. To mitigate these risks, developers must build strong security frameworks to safeguard users' assets and prevent unauthorized access (Mariana et al., 2025). Policymakers should enhance the integration of digital technologies in administrative and financial systems to accelerate trade in mineral resources (Alsagr et al., 2024). The study enhances the understanding of digital payment adoption in emerging markets, offering valuable insights into digital financial technologies for practitioners, policymakers, and educators (Ly & Ly, 2024). The study highlights that the effective transformation of R&D outcomes through digital finance is reliant on strong financial regulation. Its findings serve as a useful reference for the government to enhance the conversion rate of scientific and technological innovations (Xie & Wu, 2024). Certain researchers suggest that the successful transformation of scientific and technological advancements depends on sufficient financial backing from governments, industries, and various other contributors (Xie, Z., Du, J. & Wu, Y, 2022). Sufficient financial resources are considered a crucial factor in the successful transformation of scientific and technological innovations (Scarrà & Piccaluga, 2022). A well-developed financial services infrastructure, including mobile banking and digital wallets, can help extend financial services to underserved communities (Tay et al., 2022). These findings highlight how financial inclusion influences the effectiveness of remittances in contributing to the achievement of SDGs. This positive effect is linked to increased access to financial services, better investment opportunities, and stronger risk management strategies and Policymakers should focus on enhancing access to financial services, especially for populations that are currently underserved (Barkat et al., 2024). Effective financial tools, such as decentralized finance platforms and smart contracts, can bridge credit gaps and enhance transaction efficiency (Phani et al., 2023). Government initiatives, such as China's digital finance programs and India's Digital India campaign, highlight the need to align Fintech advancements with national strategies (Feng et al., 2023; Gupta et al., 2022). Governments contribute to advancing financial inclusion by encouraging the adoption of digital technologies and facilitating the integration of Fintech solutions (Hua and Huang (2021). Government backing and well-structured regulations are crucial for fostering the growth of Fintech ecosystems (Sheng (2021). A novel economic and organizational model has the potential to enhance government operations, bridging the gap between centralized and localized public service delivery debates. It provides a systematic framework for platform application (Brown et al., 2017). Fintech leverages advancements in information and communication technologies (ICTs), including the internet and mobile devices, to develop digital platforms that provide personalized and efficient services. This innovation enhances access to essential financial services for underserved individuals and businesses (Adugna, 2024).

Government reports indicate significant savings due to the use of Aadhaar in delivering public services and facilitating payment transfers (Arner et al., 2018).

### Transaction Growth Over the Years and Significant Spike in 2020-21

In its first year (2016-17), AePS had 345 million transactions, reflecting cautious early adoption. By 2022-23, transactions surged to 4.86 billion, showing rapid acceptance. Notably, in 2020-21, there was a dramatic increase of 1.6 billion transactions in one year, highlighting significant growth. The chart shows AePS growth from 2016-17 to 2022-23. Here's a breakdown of the key elements:

**Figure 1 Transaction Growth Over the Years and Significant Spike in 2020-21**



Source: <https://blogs.isb.edu/bhartiinstitute/2023/05/05/aadhaar-enabled-payment-system-aeps-bridging-the-gap-in-indias-financial-inclusion-journey/> (Bharti Institute of Public Policy)

Figure 1 highlights the impressive growth of the Aadhaar Enabled Payment System (AePS) from the fiscal year 2016-17 to 2022-23. It highlights a significant increase in the total number of approved transactions, which surged from 345 million in 2016-17 to 4.86 billion in 2022-23. Additionally, the graph shows the percentage of approved off-us transactions, which indicates transactions conducted at a different bank than the account holders. This percentage rose from 7.49% in 2016-17 to peak at 54.29% in 2021-22, before slightly decreasing to 51.90% in 2022-23. Overall, the image depicts the expanding adoption and reliance on AePS for digital payments across India, demonstrating its increasing role in facilitating secure and convenient financial transactions.

### Aadhar Enabled Payment System

AEPS, leveraging the Aadhaar ID, is a major government initiative in India for secure financial transactions. Issued by UIDAI, Aadhaar provides proof of identity and address. AEPS enhances trust, accountability, and inclusive access to banking services through a centralized system.

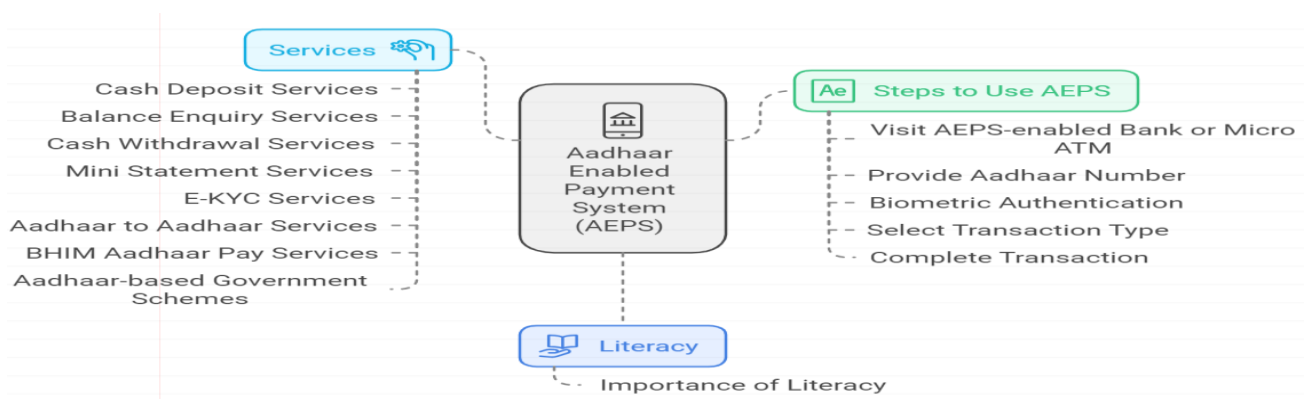
**Figure 2 Services offered by the Aadhaar-enabled Payment System (AePS)**



overview of the Aadhaar Enabled Payment System (AePS), emphasizing its various services and usage steps. At the top left, the AePS logo and title are prominently displayed, underscoring the significance of this payment system. Below the logo, an illustration shows a mobile device with a fingerprint scanner, highlighting Aadhaar-based e-KYC for user authentication. The services provided by AePS are arranged in a circular format around the logo, including cash deposit, mobile/DTH recharge, money transfer, mobile POS transactions, Bharat Bill Payment System (BBPS), general payments, balance inquiry, UTI/NSDL services, and cash withdrawal. This array of services demonstrates the Apes' comprehensive capabilities in facilitating diverse banking transactions. The importance of the AePS is visually represented, highlighting its role in promoting financial inclusion in India. By leveraging Aadhaar for biometric authentication, AePS ensures secure, convenient, and accessible banking, particularly benefiting rural and underserved populations. This holistic model integrates multiple banking services into a user-friendly system, supporting the vision of a cashless economy and enhancing financial accessibility.

**Aadhar Enabled Payment System Literacy**

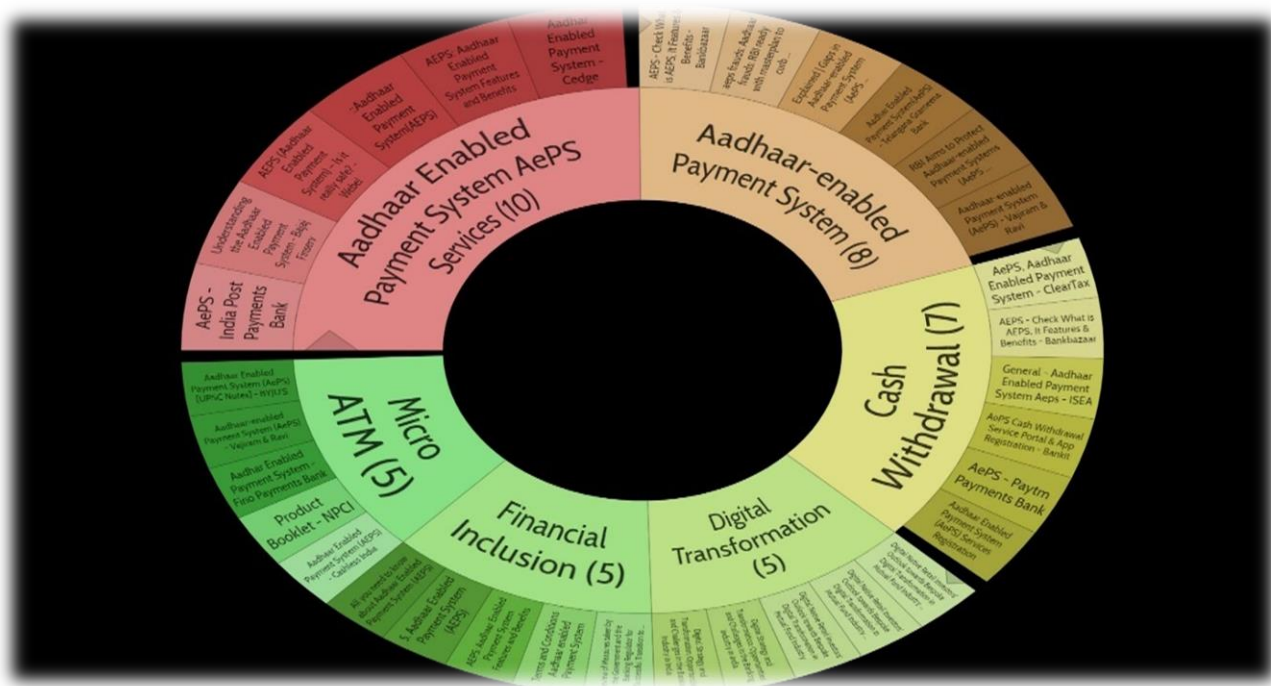
**Figure 3 Aadhaar Enabled Payment System (AEPS)**



The figure 3 The AEPS model highlights three sections: services, usage steps, and literacy. Services include cash deposits, balance inquiries, cash withdrawals, mini statements, E-KYC updates, Aadhaar-to-Aadhaar transfers, BHIM Aadhaar Pay, and integration with Aadhaar-based schemes. Usage steps involve visiting an AEPS-enabled bank or Micro ATM, providing an Aadhaar number, biometric authentication, selecting the transaction type, and completing the transaction. Literacy emphasizes the

importance of understanding AEPS. The central "Enhancing Awareness Level" connection links procedural steps to services, underscoring the need for awareness to boost adoption and use. The diagram emphasizes AEPS literacy and procedural awareness for accessing services, promoting financial inclusion, and ensuring secure transactions.

**Figure 4 Comprehensive Overview of Aadhaar Enabled Payment System (AePS) and Related Digital Financial Services**



The pie chart categorizes various services and topics related to AePS, including services like Cash Withdrawal, Digital Transformation, Financial Inclusion, and Micro ATM. It highlights the role of AePS in promoting financial inclusion and digital services. Key categories such as Digital Financial Services, Account, Money, Launched, and BBPS are further detailed with subcategories like AePS, UPI, and Direct Benefit Transfer. This visually striking representation emphasizes the interconnectedness and diversity of digital financial services, enhancing financial access and literacy.

**Review of Literature**

Aadhaar data is utilized for identity verification when accessing government services, receiving subsidies, opening bank accounts, and performing other identity-based transactions. This framework enhances the efficiency of authentication services within India's public delivery systems (Sadhya & Sahu, 2024). The Biometric Cryptosystem offers an in-depth review of security and privacy concerns related to biometric templates and explores how cryptographic techniques can address these challenges (Sharma et al., 2023). To authenticate user documents, the company verifies KYC information with government records. Additionally, a proposed blockchain-based solution provides a single trusted authority for KYC verification, enabling the reuse of verified KYC data for new accounts and future verifications (Sai et al., 2023). Unlike offline identification documents, Aadhaar offers an online and cost-effective method for verification and authentication. Its online functionality was designed to

address issues such as duplicate and fake identities, making it reliable proof of identity (Mukhopadhyay et al., 2019). An effective digital identity system must integrate safeguards to ensure security, protect privacy, promote inclusivity, and provide accessibility for all citizens (Mir et al., 2020). To boost Aadhaar card enrollment and its benefits, the government should raise public awareness, reduce application rejection rates through better training, and implement targeted policies, technologies, and facilities for senior citizens (Dayal & Singh, 2016). In recent years, the adoption of digital payment systems and financial services has significantly increased in many developing nations, driven by advancements in information and communication technology (Aurazo & Gasmi, 2024). India's push for financial digitization, driven by initiatives like Digital India, aligns with technological advancements in microfinance and digital financial inclusion, leveraging progress in computing, connectivity, and mobile adoption (Ghosh, 2021). Aadhaar was initially introduced to facilitate access to public services and government benefits in India. Aadhaar significantly contributes to governance and financial inclusion by verifying individuals' identities for various services and transactions. However, the use of biometric data has raised concerns about privacy and data security, leading to ongoing debates and legal challenges (Sadhya & Sahu, 2024). This approach ensures that appropriate care is delivered to the intended individual. Additionally, biometric recognition is utilized in various government initiatives, including border control, national identification systems, and e-passports (Ryu et al., 2021). Digital transformation is commonly understood in information systems (IS) research as a process aimed at improving an entity by implementing significant changes using information, computing, communication, and connectivity technologies (Vial, 2019, p. 118). Although these findings offer valuable insights, their applicability to government-led digital transformation, especially in resource-limited contexts, remains uncertain. Furthermore, there is a significant gap in research focused on theorizing the practical implementation process of digital transformation (Carroll, 2020). Governments tend to adopt a more cautious approach to digital transformation compared to organizations. Unlike organizations, where the primary objectives often center on generating profit, gaining market share, and achieving competitive advantages through enhanced efficiency and effectiveness, government priorities may differ significantly (Li, 2020). These distinctions underscore the need for research focusing on government-led digital transformation. Scholars have emphasized the importance of exploring transformations that impact entire sectors and society (Carroll et al., 2023; Majchrzak et al., 2016; Tana et al., 2023). There is an increasing need for diverse theoretical perspectives to achieve a deeper understanding of the digital transformation process (Rowe & Markus, 2023). Research on digital transformation in government largely centers around the integration and application of transformative technologies such as social media (Yuan et al., 2023), artificial intelligence (Madan & Ashok, 2023), skill development (van Noordt & Tangi, 2023), and efforts to improve public value (Aguerre & Bonina, 2023; Datta, 2020; van Donge et al., 2022).

**Table 1. Keywords and Authors of Literature Review**

Category	Focus	Author
Fintech	Fintech, Financial Education, Financial Inclusion and Financial Stability	Nicole Jonker et al. (2022)

Fintech	Fintech , digital financial services and income inequality	Adugna et al., (2024)
Fintech	Government digital initiatives, Digital participation, Push-pull-mooring, Government social media, cultivation, PLS-ANN	(Yuan et al., 2023)
Fintech	Behavioral economics, Diffusion of innovations theory, Digital payment systems, Financial literacy, TAM and TPB	(Ly & Ly, 2024)
Fintech	Digital Financial Literacy, fintech, financial literacy, financial well-being Technology	(Golden & Cordie, 2022)
Fintech	FinTech, SERVQUAL TAM, Service quality, Payment services. Financial technology, Technology adoption and Behavioural intentions	(Sharma et al., 2024)
Fintech	Financial Literacy and Fintech	Panos and Wilson (2020)
Fintech	Fintech, Digital Payment Systems, Payment Service, Access Technology and Financial Inclusion	(Aurazo & Gasmi, 2024)
Fintech	Digital Transformation, Digital Branching Strategy, Ambidexterity, FinTech Ecosystems, Process Model Government	(Senyo et al., 2024)
Fintech	Bibliometrics, Developing countries, Digital innovation, Financial inclusion and Fintech; Mobile money	(Persaud & Thaffe, 2023)

The table titled "Table 1. Keywords and Authors of Literature Review" provides a comprehensive overview of various research topics within the field of Fintech. Under the broad category of Fintech, the table highlights specific focus areas such as financial education, financial inclusion, financial stability, digital financial services, income inequality, government digital initiatives, digital participation, behavioral economics, diffusion of innovations theory, digital payment systems, financial literacy, and technology adoption, among others. Each focus area is paired with the respective authors and publication years, demonstrating the contributions made by different researchers. Notable authors include Nicole Jonker et al. (2022), Adugna et al. (2024), Yuan et al. (2023), Ly & Ly (2024), Golden & Cordie (2022), Sharma et al. (2024), Panos and Wilson (2020), Aurazo & Gasmi (2024), Senyo et al. (2024), and Persaud & Thaffe (2023). This table serves as a valuable resource for understanding the breadth and depth of research in Fintech, offering insights into the diverse topics explored and the scholars who have contributed to the literature.

**Figure 5. Complex Network Visualization of Keywords**

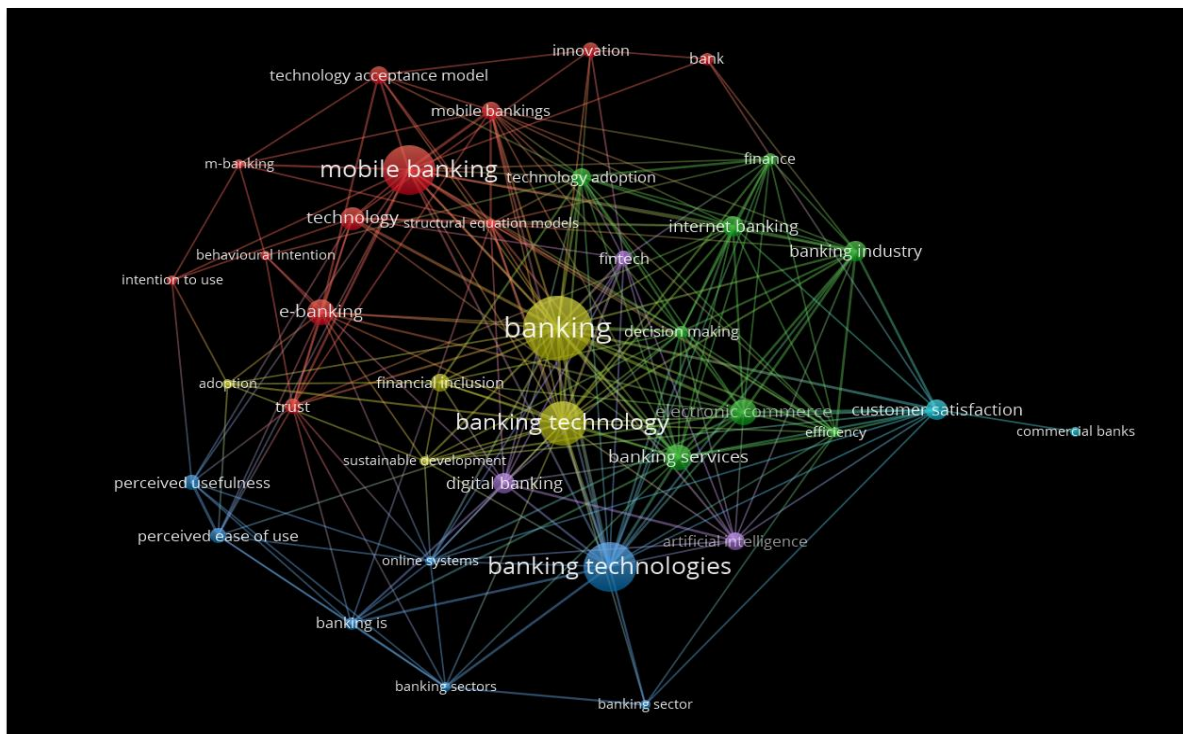


Figure 5 The network graph maps various terms related to banking and technology, connected by lines indicating their relationships. Terms are color-coded and grouped into clusters, suggesting different themes. Banking is the central node, highlighted in yellow. Mobile banking (red) focuses on services via mobile devices. Banking technology (green) covers technological advancements. Internet banking (green) highlights online services, and customer satisfaction links to technology's impact. Digital banking (yellow) represents the overall digital transformation. Technology adoption (red) refers to the rate of adopting new tech in banking. Artificial intelligence (blue) discusses AI's role. Financial inclusion (yellow) aims to include underserved populations. Fintech (green) covers financial innovations, while e-banking (red) concerns electronic services. Online systems (blue) involve implementing online infrastructure, and commercial banks (green) adopt new technologies. The graph showcases the interconnectedness and complexity of banking technology, useful for research and understanding industry trends.

**Table 2: Bibliometric Analysis: Productivity and Citation Impact**

Author	Documents	Citations	Total Link Strength
bhuvana m.; vasantha s.	2	17	1
jerene w.; sharma d.	2	16	1
bhasin n.k.; rajesh a.	2	17	0

isakin m.; serletis a.	2	1	0
ramesh v.; jaunky v.c. and roopchund r.	2	7	0

In the table 2 consists of five columns titled “Selected,” “Author,” “Documents,” “Citations,” and “Total link strength.” This table appears to be a bibliometric analysis, showing the productivity and citation impact of various researchers. The “Selected” column indicates whether the author(s) have been selected for further analysis or consideration. The “Documents” column shows the number of documents published by each author, while the “Citations” column indicates the number of times these documents have been cited. The “Total link strength” column represents the strength of the connections or collaborations between the authors.

**Table 3: Comparative Analysis of Research Output and Impact Across Countries**

Country	Documents	Citations	Total Link Strength
Malaysia	11	82	13
United States	12	215	10
India	50	229	7
Indonesia	20	97	6
United Arab Emirates	6	19	6
United Kingdom	7	54	5
Jordan	5	87	4
Nigeria	5	23	3
Russia Federation	12	53	2
Sweden	5	31	2
China	10	208	1
Iran	6	41	1
Brazil	5	42	0

Table 3 the highlights compares various countries based on three metrics: Documents, Citations, and Total link strength. This table provides a comparative analysis of research output and impact across these countries. The highest citations countries are United States, India and China.

**Figure 6: Network Graph Depicting Global Interactions with India**

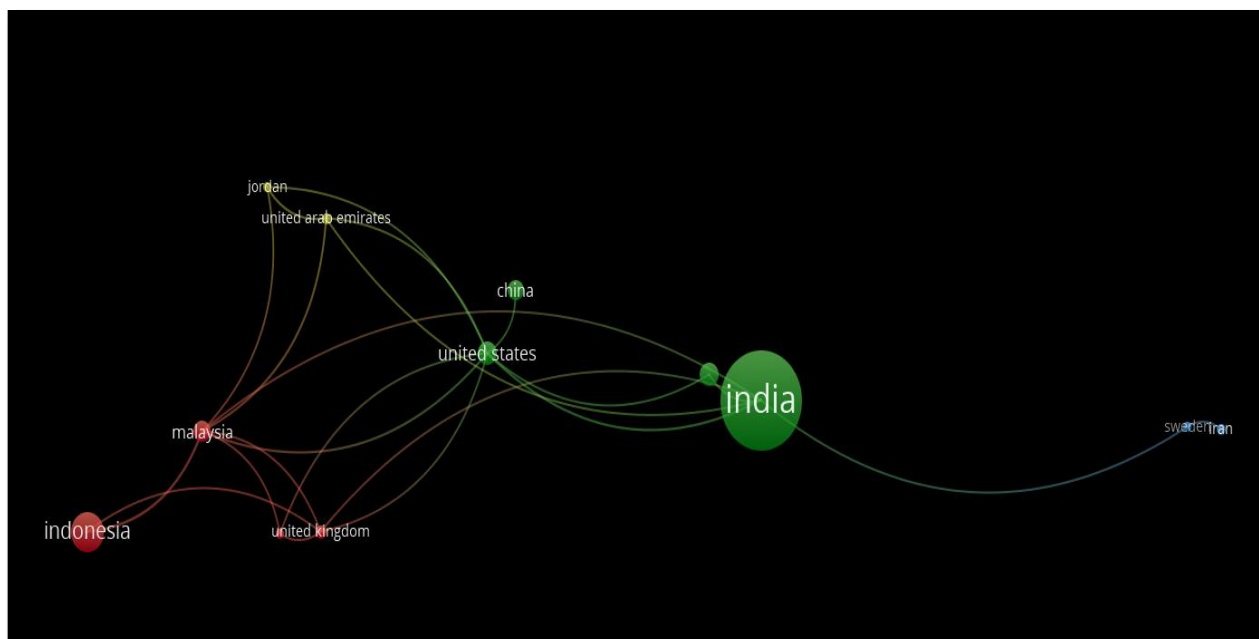


Figure 6 presents a detailed network graph comprising various nodes and connecting lines, vividly depicting international interactions. The most prominent node, highlighted in green, is labeled "India," signifying its central role in the network. Encircling this central node are smaller nodes, each connected to India by lines of different colors. These lines represent various countries, including China, the United States, the United Kingdom, Indonesia, Malaysia, and Sweden. The interconnecting lines suggest relationships or interactions between India and these nations, emphasizing India's interconnectedness on a global scale. The graph's black background enhances the visual impact of the colorful connections, making them stand out more vividly. This visual representation is particularly useful for illustrating complex data concerning international interactions involving India, highlighting how these global relationships are interwoven, and the significant role India plays within this network.

## **Model and Hypothesis Development**

### **Procedure to Use AEPS Awareness**

H1. Awareness of the procedure to use the Aadhaar Enabled Payment System (AEPS) has a moderate relationship with awareness of Aadhaar-based government schemes, awareness of Aadhaar Enabled Payment System services, and the overall awareness difference level.

### **Aadhaar Based Government Schemes Awareness**

H2. Aadhaar-based government schemes has a moderate relationship with the awareness of the procedure to use the Aadhaar Enabled Payment System (AEPS), awareness of AEPS services, and the overall awareness difference level.

individuals, businesses, and start-ups with access to financing through online platforms, offering alternatives to traditional methods like banks, venture capital, angel investors, and government funding programs ([Gomber et al., 2017](#)). Government backing and well-structured regulations are crucial for

fostering the growth of Fintech ecosystems [Sheng \(2021\)](#). While academic research on the subject remains limited, the idea of platforms in government service delivery has garnered interest from various nations, including India. The concept is often referred to as Government as a Platform (GaaP) [\(Brown et al., 2017\)](#). Government reports indicate significant savings due to the use of Aadhaar in delivering public services and facilitating payment transfers [\(Arner et al., 2018\)](#).

### **Aadhaar Enabled Payment System Services Awareness**

H3. Awareness of Aadhaar Enabled Payment System (AEPS) services has a moderate relationship with the awareness of the procedure to use AEPS, awareness of Aadhaar-based government schemes, and the overall awareness difference level Overall Awareness Difference Level.

The awareness of artificial intelligence (AI) impacts the counterproductive work behaviors exhibited by frontline service employees towards customers (CWBC) and the occurrence of work-family conflict (WFC), with negative emotions acting as a mediating factor [\(Zhou et al., 2024\)](#). The importance of financial literacy in encouraging individuals and households to adopt digital financial services, as discussed by yang [\(Yang et al., 2023\)](#). The study explores various concepts of Digital Financial Services (DFS) awareness, including knowledge of credit and debit cards, interest rates, inflation, time value of money, risk perceptions, online payment systems, and SIPs. Increased awareness of DFS positively influences the intention to adopt digital financial services, ultimately contributing to the goal of financial inclusion [\(Rai & Sharma, 2019\)](#). This research supports government efforts to enhance financial inclusion by equipping individuals with the necessary knowledge and skills to utilize digital financial services effectively [Yadav, M. and Banerji, P. \(2023\)](#)

### **Overall Awareness Difference Level**

H4. Overall awareness difference level has a moderate relationship with the awareness of the procedure to use the Aadhaar Enabled Payment System (AEPS), awareness of Aadhaar-based government schemes, and awareness of AEPS services

H5. Different levels of gender awareness regarding Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS) have a moderate relationship with AEPS services awareness and enhanced secured banking transactions

H6. Different levels of age awareness regarding Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS) have a moderate relationship with AEPS services awareness and enhanced secured banking transactions

H7. Different levels of qualification awareness regarding Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS) have a moderate relationship with AEPS services awareness and enhanced secured banking transactions.

### **Research Methodology of the Study**

#### **Objectives**

- To examine if AEPS procedural awareness and Aadhaar-based government schemes Awareness significantly enhance the awareness levels of Aadhaar-enabled payment system services in Bharat.

### **Data Collection**

Primary data has been collected through the Questionnaire. 605 samples have been collected from Uttar Pradesh, Odisha, Delhi, Uttarakhand, Rajasthan, and Madhya Pradesh. Secondary data has been collected from many books and several journals like Springer, IEEE, Research Gate and Scopus.

**Questionnaire has been developed with the following research items to assess the awareness of Aadhar Enabled Payment System in Bharat**

#### **Section 1: Procedure to Use AEPS Awareness**

1. Aware of visiting an AEPS-enabled bank/Micro ATM
2. Know you need to provide your Aadhaar number
3. Familiar with biometric authentication
4. Know how to select a transaction type

#### **Section 2: Aadhaar-Based Government Schemes Awareness**

1. Aware of Pradhan Mantri Jan Dhan Yojana
2. Heard of Direct Benefit Transfer
3. Know about Pradhan Mantri Gramin Digital Saksharta Abhiyan
4. Familiar with National Social Assistance Programme
5. Are you aware of Public Distribution System
6. Heard of Mahila Shakti Kendra Scheme
7. Familiar with Mahatma Gandhi National Rural Employment Guarantee Act
8. Aware of Atal Pension Yojana (APY)

#### **Section 3: Aadhaar-Enabled Payment Services Awareness**

1. Have you come across the Cash Deposit Service
2. Do you know about the Balance Enquiry Service
3. Are you aware of the Cash Withdrawal Service
4. Do you make use of the Aadhaar to Aadhaar Fund Transfer Service
5. Do you know about the BHIM Aadhaar Pay Service

### **Tools and Software Use**

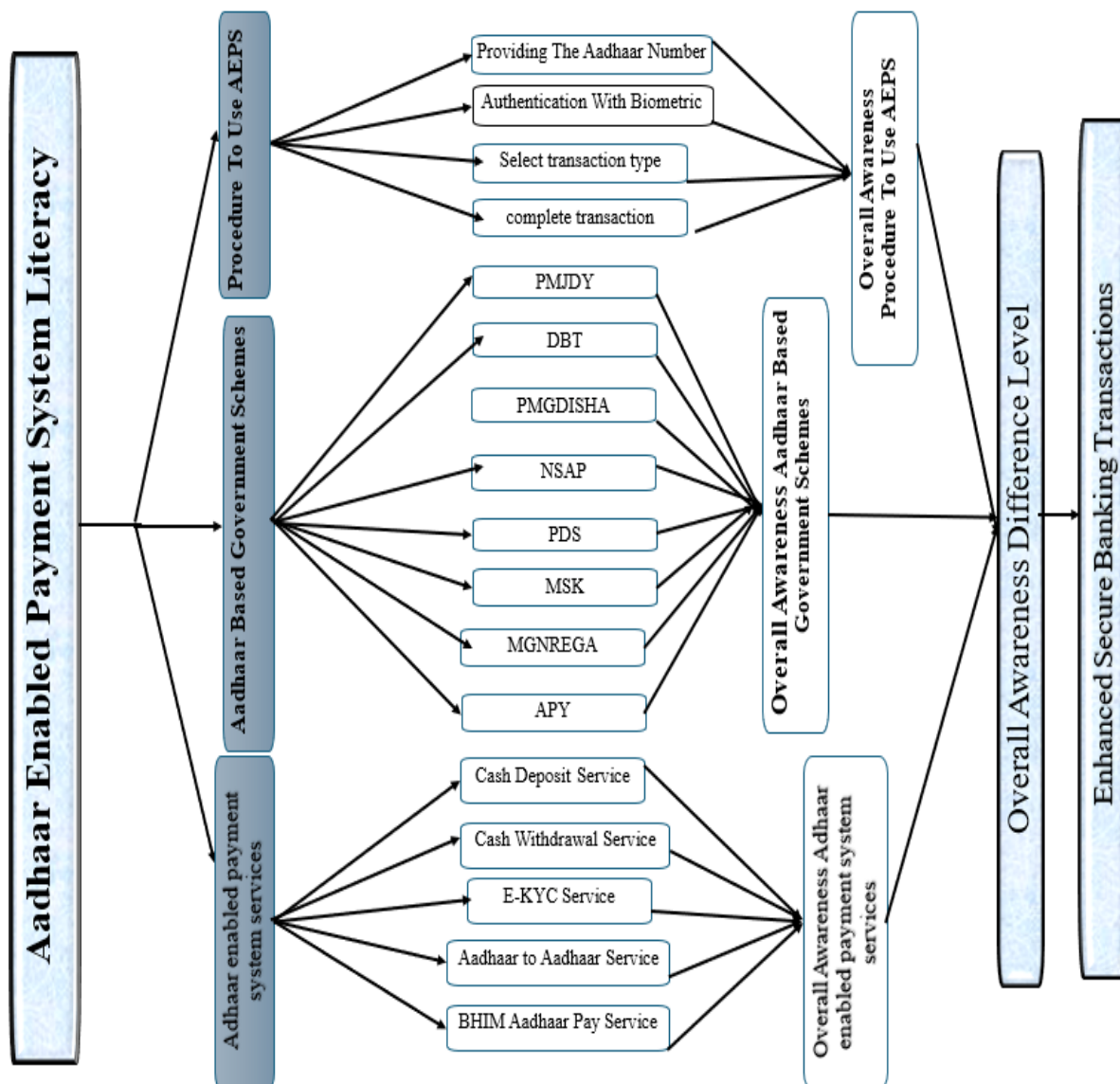
Smart PLS 4 software, Descriptive Statistics, Mean, Standard Deviation, Percentage and.

### **Statistical test**

Anova Single factor test, T test.

### **Conceptual framework model of the research**

**Figure 7 Framework Model Of Aadhaar Enabled Payment System Literacy**

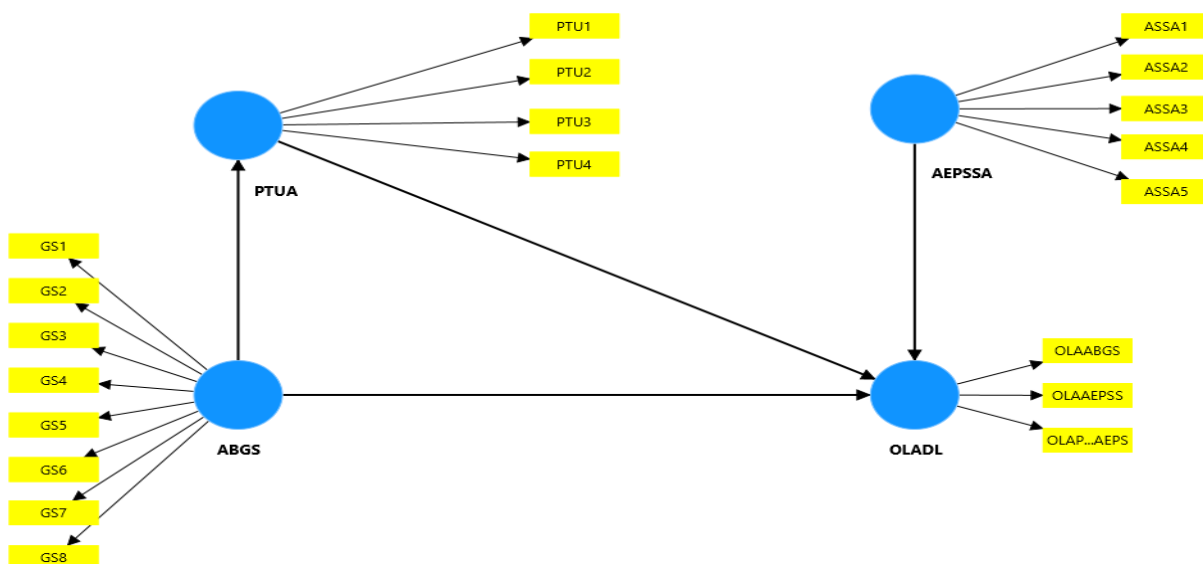


**Model Overview**

Figure 7 provides The "Aadhaar Enabled Payment System Literacy" model highlights the intricate relationship between various elements of the Aadhaar Enabled Payment System (AEPS) and their collective impact on overall user awareness and secure banking transactions. This model is systematically divided into three comprehensive sections, each playing a crucial role in enhancing financial inclusion and security through the use of Aadhaar. Firstly, the Procedure to Use AEPS outlines the step-by-step process involved in utilizing AEPS for financial transactions. This procedure begins with the user providing their Aadhaar number, followed by biometric authentication, which ensures secure access. Users then select the type of transaction they wish to perform, such as cash deposits or withdrawals, and complete the transaction. This detailed procedural outline ensures that users understand how to efficiently and securely use AEPS, fostering trust and usability. Secondly, the model emphasizes the importance of Aadhaar Based Government Schemes. This part includes various

government initiatives linked to Aadhaar, such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), Direct Benefit Transfer (DBT), Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), National Social Assistance Programme (NSAP), Public Distribution System (PDS), Mahila Shakti Kendra (MSK), Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), and Atal Pension Yojana (APY). Awareness of these schemes is crucial for individuals to leverage the benefits provided by the government, thereby enhancing their socio-economic status and financial stability. The third section, Aadhaar Enabled Payment System Services Awareness, encompasses various services available through AEPS. This includes cash deposits, cash withdrawals, electronic Know Your Customer (e-KYC) verification, Aadhaar to Aadhaar fund transfers, and BHIM Aadhaar Pay. Knowledge of these services is crucial for maximizing the utility of AEPS and ensuring that users can conduct secure and efficient banking transactions. These components collectively contribute to the "Overall Awareness Difference Level," which signifies the extent to which users are informed about and capable of utilizing AEPS and associated government schemes. This heightened awareness directly impacts "Enhanced Secure Banking Transactions," indicating that informed users are better equipped to perform secure and reliable financial transactions. The model underscores the importance of literacy in using AEPS, understanding government schemes, and being aware of various AEPS services. By fostering a comprehensive understanding of AEPS procedures, government schemes, and services, the model aims to bridge gaps in financial literacy and promote secure banking practices across diverse demographic segments. It also highlights the need for targeted interventions and educational initiatives to ensure inclusive and effective digital financial inclusion. This comprehensive approach ensures that users can fully benefit from the digital financial ecosystem, thereby contributing to their overall financial well-being and security.

**Figure 8 Smart PLS 4 Model Framework Of Aadhaar Enabled Payment System Literacy**



**Model overview**

Figure 8 The structural equation model (SEM) titled "Smart PLS 4 Model Framework of Aadhaar Enabled Payment System Literacy" provides a comprehensive visual representation of the hypothesized relationships between several key constructs related to the literacy and usage of the

Aadhaar Enabled Payment System (AEPS). This model is comprised of four primary constructs: Procedure to Use AEPS Awareness (PTUA), Aadhaar-Based Government Schemes Awareness (ABGS), Aadhaar Enabled Payment System Services Awareness (AEPSSA), and Overall Awareness Difference Level (OLADL). Each construct is linked to specific indicators, which measure various aspects of awareness and usage related to AEPS. For instance, PTUA includes indicators such as understanding the procedural steps involved in using AEPS, while ABGS encompasses awareness of different government schemes linked to Aadhaar, such as PMJDY and DBT. AEPSSA evaluates users' awareness of AEPS services, and OLADL captures the overall level of awareness across these constructs.

The model illustrates the hypothesized relationships between these constructs using path coefficients, which indicate the strength and significance of these relationships. Significant values in the model, such as the relationships between PTUA and ABGS, PTUA and OLADL, and between ABGS, AEPSSA, and OLADL, underscore the importance of comprehensive awareness in effectively using AEPS, understanding government schemes, and ensuring secure banking transactions. This detailed model highlights the critical role of education and awareness in promoting financial inclusion and security, providing valuable insights into the factors influencing Aadhaar Enabled Payment System Literacy.

By visualizing these relationships, the SEM model underscores the interconnectedness of various awareness factors and their collective impact on overall financial literacy and security. This professional analysis aids researchers in understanding the dynamics of AEPS usage and the significance of fostering comprehensive awareness to enhance secure banking practices and financial inclusion.

### Data interpretation

**Table 4. Demographic Details of Respondents**

<i>Particular</i>	<i>Number</i>	<i>Percentage</i>
<b><i>Gender</i></b>		
<b>Male</b>	312	51.57%
<b>Female</b>	293	48.43%
<b>Total</b>	605	100%
<b><i>Age</i></b>		
<b><i>Below 18 Years</i></b>	79	13.06%

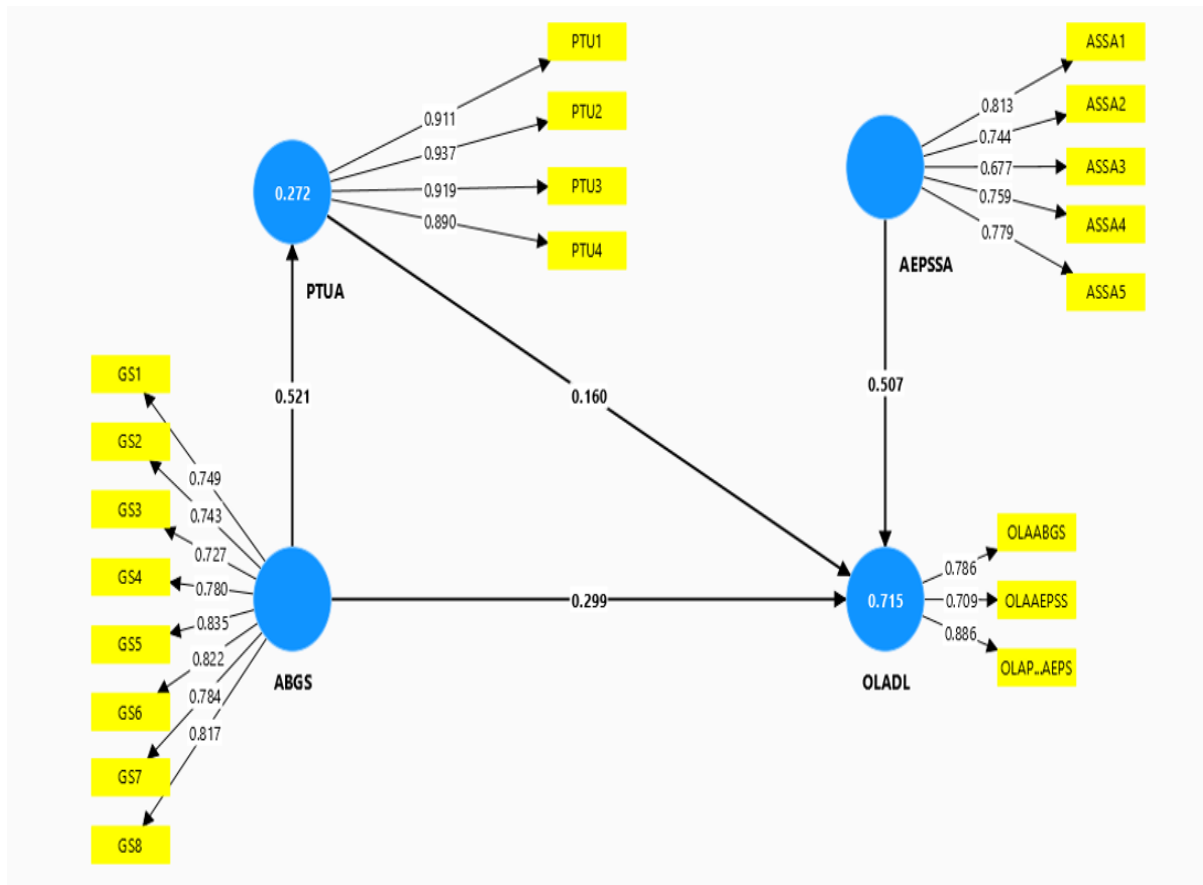
<i>18 Years - 36 Years</i>	508	83.97%
<i>37 Years - 54 Years</i>	18	2.98%
<i>Total</i>	605	100%
<b><i>Education</i></b>		
<i>Up to 10<sup>th</sup> grade</i>	44	7.27%
<i>12<sup>th</sup> grade</i>	90	14.88%
<i>Undergraduate</i>	306	50.58%
<i>Post graduate</i>	165	27.27%
<i>Total</i>	605	100%
<b><i>Occupation</i></b>		
<i>Student</i>	529	87.44%
<i>House Wife</i>	5	0.83%
<i>Business Men</i>	9	1.49%
<i>Employed</i>	62	10.25%
<i>Total</i>	605	100%
<b><i>Relationship Status</i></b>		
<i>Married</i>	60	9.92%
<i>Unmarried</i>	545	90.08%
<i>Total</i>	605	100%

**Awareness of Aadhaar Enabled Payment System Among Respondents**

Table 4 represent the Out of 650 respondents, 51.57% of males and 48.43% of females are aware of Aadhaar Enabled Payment System (AEPS) services, with males being more aware. Among age groups, 13.06% are below 18, 83.97% are 18-36 years, and 2.98% are 37-54 years, with the 18-36 group being

the most aware. In terms of education, 7.27% have up to a 10th-grade education, 14.88% have a 12th-grade education, 50.58% are undergraduates, and 27.27% are postgraduates, with undergraduates being the most aware. Occupation-wise, 87.44% are students, 0.83% housewives, 1.49% businessmen, and 10.25% employed, with students being the most aware. Marital status shows 9.92% married and 90.08% unmarried, with unmarried respondents being more aware of AEPS services.

**Figure 9. Model Testing**



**Table 5. Discriminant Validity – Heterotrait - Monotrait Ratio (HTMT) – Matrix**

	ABGS	AEPSSA	OLADL	PTUA
ABGS				
AEPSSA	0.775			
OLADL	0.789	0.73		
PTUA	0.662	0.66	0.731	

Table 6 Discriminant validity is essential in psychometric analysis to confirm that constructs in a study are distinct. The Heterotrait-Monotrait Ratio (HTMT) is a robust method to assess this validity,

comparing correlations between items across constructs (heterotrait) with those within the same construct (monotrait). A well-constructed HTMT matrix provides an overview of these relationships.

In the matrix provided, four constructs—ABGS, AEPSSA, OLADL, and PTUA—are analysed. HTMT values between constructs are below the common threshold of 0.85 or 0.90, confirming discriminant validity. For instance, the HTMT value between ABGS and AEPSSA is 0.775, indicating a moderate and distinct relationship. Similarly, ABGS shows correlations of 0.789 with OLADL and 0.662 with PTUA, both within acceptable limits. AEPSSA correlates at 0.73 with OLADL and 0.66 with PTUA, while the HTMT value between OLADL and PTUA is 0.731.

These values demonstrate that the constructs are sufficiently distinct, ensuring reliability in the study. Discriminant validity enhances the clarity of research findings by confirming that each construct represents a unique theoretical concept. Using HTMT analysis, researchers can strengthen the validity of their models, ensuring their conclusions are robust and theoretically sound.

**Table 6. Construct Reliability and Validity**

Construct reliability and validity overview	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
<b>ABGS</b>	0.909	0.912	0.927	0.613
<b>AEPSSA</b>	0.822	0.877	0.869	0.571
<b>OLADL</b>	0.708	0.733	0.838	0.635
<b>PTUA</b>	0.935	0.935	0.953	0.836

Table 6 Construct reliability and validity are crucial in evaluating the robustness and precision of measurement models. Key indicators such as Cronbach’s alpha, composite reliability (rho\_a and rho\_c), and average variance extracted (AVE) provide insights into the internal consistency, reliability, and convergent validity of constructs.

In the provided data, all constructs—ABGS, AEPSSA, OLADL, and PTUA—demonstrate acceptable reliability and validity. Cronbach’s alpha values for all constructs exceed the commonly accepted threshold of 0.70, indicating strong internal consistency. Composite reliability (rho\_c) values also surpass the recommended benchmark of 0.70, confirming that the constructs are reliably measured. For instance, ABGS has a rho\_c of 0.927, and PTUA shows an even higher value of 0.953, reflecting excellent reliability.

Convergent validity is assessed using AVE, with a threshold of 0.50. All constructs meet this criterion, suggesting that more than half of the variance in their items is explained by the latent construct. PTUA, in particular, demonstrates outstanding validity with an AVE of 0.836. While ABGS and AEPSSA have AVEs closer to the minimum threshold (0.613 and 0.571, respectively), they still indicate acceptable convergent validity.

Overall, the constructs in this model exhibit strong reliability and validity, ensuring that the measurement model is both reliable and theoretically sound.

**Table 7. R- Square – overview**

R- Square- overview	R-square	R-square adjusted
<b>OLADL</b>	0.715	0.714
<b>PTUA</b>	0.272	0.271

The table 7 titled "R-Square-overview" provides an analysis of the goodness-of-fit measures for two models: OLADL (Overall Awareness Difference Level) and PTUA (Procedure to Use AEPS Awareness). For OLADL, the R-square value is 0.715, indicating that approximately 71.5% of the variance in the dependent variable can be explained by the independent variables in the model. The adjusted R-square value is 0.714, which is very close to the R-square value, suggesting that the model is well-fitted and the number of predictors does not excessively impact its explanatory power. On the other hand, for PTUA, the R-square value is 0.272, showing that about 27.2% of the variance in the dependent variable is explained by the independent variables. The adjusted R-square value is 0.271, slightly lower than the R-square value, reflecting an adjustment for the number of predictors. This indicates a moderate fit of the model for PTUA, with the independent variables explaining a substantial, though not dominant, portion of the variance. In summary, the high R-square and adjusted R-square values for OLADL suggest a strong fit, while the moderate values for PTUA indicate a reasonable explanatory power of the model for this variable. These measures are essential for understanding how well the independent variables contribute to explaining the variance in the dependent variables within the study.

**Table 8. Total indirect effect- Mean, STDEV, t value, p value**

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
<b>ABGS -&gt; OLADL</b>	0.083	0.084	0.017	4.865	0.000

The table titled "Table 8. Total Indirect Effect" provides a detailed statistical analysis of the indirect effect of Aadhaar-Based Government Schemes (ABGS) on Overall Awareness Difference Level (OLADL). The "Original Sample (O)" column shows a path coefficient of 0.083 for the relationship between ABGS and OLADL, indicating a moderate indirect effect. The "Sample Mean (M)" column displays an average path coefficient of 0.084, which is very close to the original sample value, suggesting consistency in the results. The "Standard Deviation (STDEV)" measures the variability of the path coefficient, with a value of 0.017, indicating low variability and suggesting stability across different samples. The "T Statistics (|O/STDEV|)" column presents a T statistic of 4.865, which is quite

high, indicating a strong level of significance for the relationship. Finally, the "P Values" column shows a p-value of 0.000, well below the standard threshold of 0.05, signifying that the indirect effect is statistically significant.

In summary, this table provides a comprehensive analysis of the indirect effect of ABGS on OLADL, demonstrating that the relationship is both moderate and statistically significant, with low variability and a robust T statistic. This highlights the importance of Aadhaar-Based Government Schemes in influencing the Overall Awareness Difference Level through indirect pathways.

**Table 9. Path Coefficients - Mean, STDEV, T values, P-values**

	<b>Original sample (O)</b>	<b>Sample mean (M)</b>	<b>Standard deviation (STDEV)</b>	<b>T statistics ( O/STDEV )</b>	<b>P values</b>
<b>ABGS -&gt; OLADL</b>	0.299	0.297	0.039	7.569	0.000
<b>ABGS -&gt; PTUA</b>	0.521	0.523	0.036	14.345	0.000
<b>AEPSA -&gt; OLADL</b>	0.507	0.509	0.032	15.737	0.000
<b>PTUA -&gt; OLADL</b>	0.160	0.159	0.029	5.540	0.000

Path coefficients are critical in structural equation modeling as they quantify the relationships between constructs in a model. Key metrics such as the original sample, sample mean, standard deviation, T-statistics, and P-values help assess the significance and strength of these relationships. The table 7 titled "Path Coefficients - Mean, STDEV, T-values, P-values" provides an in-depth analysis of the relationships between different variables in the study, focusing on Aadhaar-based services and government schemes. The columns in the table represent various statistical measures, including the path coefficients derived from the original sample (O), the average path coefficients from multiple samples (M), the standard deviation (STDEV), T statistics (|O/STDEV|), and P values indicating the significance level of these path coefficients. The first relationship assessed is between Aadhaar-Based Government Schemes (ABGS) and Overall Awareness Difference Level (OLADL). With an original sample path coefficient of 0.299, a T statistic of 7.569, and a P value of 0.000, this relationship is statistically significant, suggesting a strong connection. Similarly, the relationship between ABGS and Procedure to Use AEPS Awareness (PTUA) is also significant, with a path coefficient of 0.521, a T statistic of 14.345, and a P value of 0.000, highlighting the importance of awareness of government schemes in understanding AEPS procedures. The relationship between Aadhaar Enabled Payment System Services Awareness (AEPSA) and OLADL is analysed next, showing a path coefficient of 0.507, a T statistic of 15.737, and a P value of 0.000, indicating a significant and strong relationship. Additionally, the relationship between PTUA and OLADL is examined, with a path coefficient of 0.160, a T statistic of 5.540, and a P value of 0.000, further underscoring the importance of procedural awareness in overall awareness levels. Overall, the table demonstrates significant relationships across all examined paths, underscoring the critical role of comprehensive education and awareness in promoting secure and efficient digital financial inclusion through the Aadhaar Enabled Payment

System. These findings highlight the importance of understanding AEPS procedures, government schemes, and services to enhance secure banking transactions and overall financial literacy.

**Table 10. Model Fit**

	<b>Saturated Model</b>	<b>Estimated Model</b>
<b>SRMR</b>	0.093	0.103
<b>d_ ULS</b>	1.830	2.246
<b>d_ G</b>	0.513	0.518
<b>Chi-square</b>	1946.479	1914.157
<b>NFI</b>	0.747	0.751

Table 10 Model fit statistics evaluate how well a proposed structural model aligns with the observed data. Key indicators such as SRMR, d\_ ULS, d\_ G, Chi-square, and NFI provide insights into the overall fit and accuracy of the model.

In the provided data, the Standardized Root Mean Square Residual (SRMR), a measure of the average discrepancy between observed and predicted correlations, is 0.093 for the saturated model and 0.103 for the estimated model. Both values are close to the acceptable threshold of 0.08, indicating a moderately acceptable fit. The d\_ ULS and d\_ G values, which reflect discrepancies based on different norms, are slightly higher in the estimated model (2.246 and 0.518) compared to the saturated model (1.830 and 0.513), suggesting minor deviations in fit.

The Chi-square values for both models are high—1946.479 for the saturated model and 1914.157 for the estimated model—indicating some lack of fit, which is not uncommon in models with large sample sizes. The Normed Fit Index (NFI) values are 0.747 and 0.751, slightly below the ideal threshold of 0.90, suggesting room for improvement in model fit.

Overall, the model demonstrates a reasonable but not optimal fit, requiring further refinement to achieve better alignment with the observed data.

**4 Data Analysis**

**Table 11. Awareness and Usage of Aadhaar-Based Services and Government Schemes**

No.	Constructs	Items	Average	SD	Percentage
1	Procedure to Use AEPS Awareness	Know you need to provide your Aadhaar number	3.56	1.17	71%
2		Familiar with biometric authentication	3.45	1.22	69%
3		Know how to select a transaction type	3.47	1.23	69%

4		Aware of steps to complete an AEPS transaction	4.50	0.86	90%
		<b>Average</b>	<b>3.74</b>	<b>1.12</b>	<b>75%</b>
5	Aadhaar based Government schemes awareness	Aware of Pradhan Mantri Jan Dhan Yojana	4.40	0.95	88%
6		Heard of Direct Benefit Transfer	4.27	1.05	85%
7		Know about Pradhan Mantri Gramin Digital Saksharta Abhiyan	4.59	0.80	92%
8		Familiar with National Social Assistance Programme	4.05	1.19	81%
9		Aware of Public Distribution System reforms	4.27	1.06	85%
10		Heard of Mahila Shakti Kendra (MSK) Scheme	3.90	1.25	78%
11		Familiar with Mahatma Gandhi National Rural Employment Guarantee Act	3.73	1.31	75%
12		Aware of Atal Pension Yojana (APY)	4.05	1.21	81%
			<b>Average</b>	<b>4.16</b>	<b>1.10</b>
13	Aadhaar enabled payment services awareness	Have you come across the Cash Deposit Service	3.96	1.22	79%
14		Are you aware of the Cash Withdrawal Service	3.90	1.22	78%
15		Are you familiar with the Aadhaar E-KYC Service	3.97	1.21	79%
16		Do you make use of the Aadhaar to Aadhaar Fund Transfer Service	3.78	1.28	76%
17		Do you know about the BHIM Aadhaar Pay Service	3.60	1.35	72%
		<b>Average</b>	<b>4.44</b>	<b>0.89</b>	<b>89%</b>
18	Overall Awareness Difference Level	Overall Awareness of Aadhaar based Government schemes	4.00	1.13	80%
19		Overall Awareness of Procedure to Use AEPS	3.65	1.32	73%

<b>20</b>		Over all Awareness of Adhaar Enabled Payment System Services	4.11	1.17	82%
		<b>Average</b>	<b>3.92</b>	<b>1.21</b>	<b>78%</b>
<b>21</b>	<b>Enhanced Secured Banking Transactions</b>	Over all Enhanced Secured Banking Transactions	<b>3.98</b>	<b>1.15</b>	<b>80%</b>

The table 11 data analysis provides comprehensive data on various aspects of awareness and usage of Aadhaar-based services and government schemes. It is divided into several constructs, each containing specific items, with their corresponding average scores, standard deviations (SD), and percentages. The first construct, Procedure to Use AEPS Awareness, includes items such as knowing the requirement to provide an Aadhaar number, familiarity with biometric authentication, understanding how to select a transaction type, and awareness of steps to complete an AEPS transaction. The average score for this construct is 3.74, with a standard deviation of 1.12 and a percentage of 75%, indicating a high level of awareness among users regarding the procedural steps involved in using AEPS. The second construct, Aadhaar Based Government Schemes Awareness, assesses users' knowledge of various government schemes linked to Aadhaar, including PMJDY, DBT, PMGDISHA, NSAP, PDS, MSK, MGNREGA, and APY. This construct has an average score of 4.16, a standard deviation of 1.10, and a percentage of 83%, suggesting a good level of awareness about these beneficial schemes. The third construct, Aadhaar Enabled Payment System Services Awareness, evaluates awareness of AEPS services such as cash deposit, cash withdrawal, e-KYC, Aadhaar to Aadhaar transfers, and BHIM Aadhaar Pay. The average score for this construct is 3.84, with a standard deviation of 1.23 and a percentage of 77%, indicating that most users are aware of these AEPS services. The Overall Awareness (Difference Level) construct measures comprehensive awareness across all areas of AEPS and related government schemes. This construct has an average score of 4.11, a standard deviation of 0.89, and a percentage of 82%, reflecting a well-informed user base. Finally, the Enhanced Secured Banking Transactions construct assesses the impact of AEPS awareness on secure banking transactions. With an average score of 3.98, a standard deviation of 1.15, and a percentage of 80%, the data indicates a positive correlation between AEPS literacy and the security of banking transactions. Overall, the data in this table shows a significant level of awareness regarding AEPS procedures, government schemes, and services among users. This heightened awareness correlates with enhanced secure banking transactions, underscoring the critical role of comprehensive education and awareness in promoting secure and efficient digital financial inclusion through AEPS.

**Figure 10. Hypotheses testing**

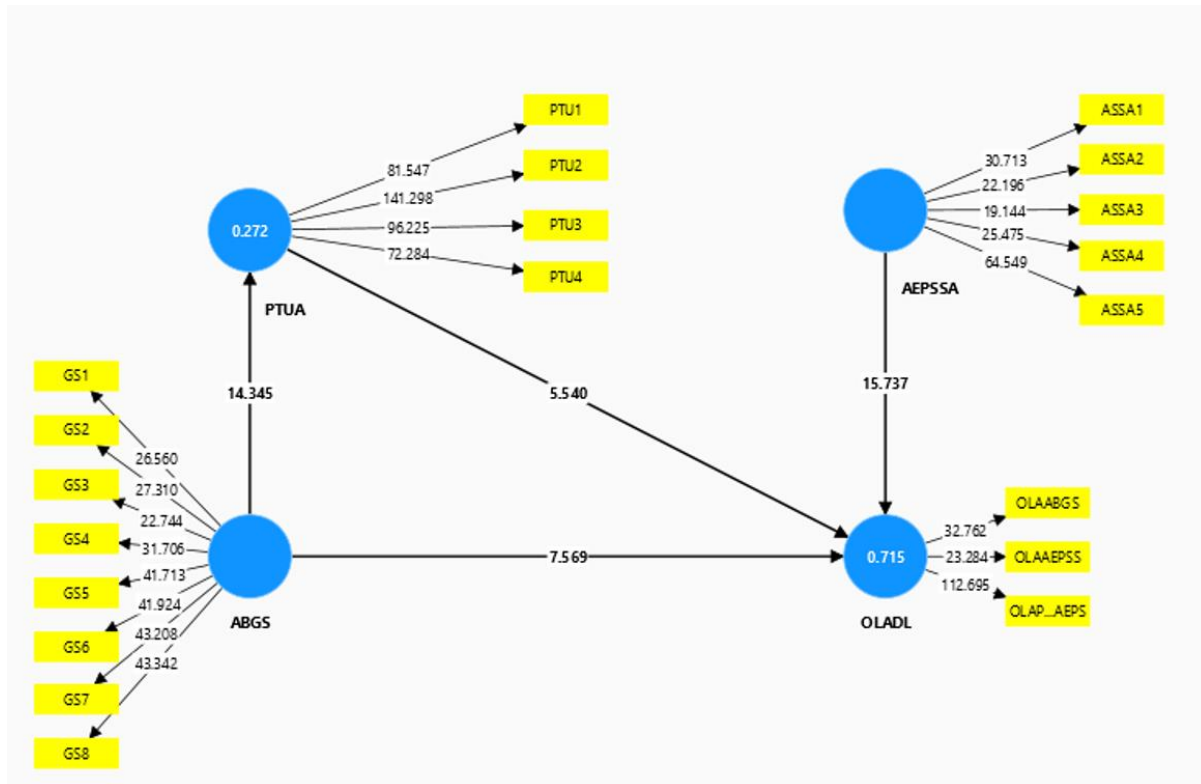


Figure 10 The structural equation model (SEM) diagram provides a visual representation of the hypotheses tested using Smart PLS software, analysing relationships between various latent constructs related to the Aadhaar Enabled Payment System (AEPS) and Aadhaar-based government schemes. The model includes several key constructs: Procedure to Use AEPS Awareness (PTUA), Aadhaar-Based Government Schemes Awareness (ABGS), Aadhaar Enabled Payment System Services Awareness (AEPSSA), and Overall Awareness Difference Level (OLADL). Each construct is connected to specific variables that measure aspects like awareness of steps to use AEPS, awareness of government schemes, and awareness of AEPS services, all showing high factor loadings.

The relationships between these constructs are represented by path coefficients, with significant T statistics and P values indicating strong relationships. For instance, there is a strong, statistically significant relationship between PTUA and ABGS, and between PTUA and OLADL, highlighting the importance of awareness of AEPS procedures. Additionally, ABGS and AEPSSA both have strong relationships with OLADL, underscoring the impact of awareness of government schemes and AEPS services on overall awareness levels. The model demonstrates that comprehensive awareness of AEPS procedures, government schemes, and services significantly contributes to enhanced secure banking transactions and financial literacy. This detailed analysis helps researchers understand the interplay between different awareness factors and their impact on overall financial inclusion and security for users.

**Table 12. Outer Weights - Mean, STDEV, T values, P values**

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	P values
<b>ASSA1 &lt;- AEPSSA</b>	0.203	0.202	0.010	20.441	0.000
<b>ASSA2 &lt;- AEPSSA</b>	0.203	0.202	0.014	14.954	0.000
<b>ASSA3 &lt;- AEPSSA</b>	0.226	0.226	0.014	16.687	0.000
<b>ASSA4 &lt;- AEPSSA</b>	0.261	0.261	0.013	20.840	0.000
<b>ASSA5 &lt;- AEPSSA</b>	0.427	0.429	0.030	14.333	0.000
<b>GS1 &lt;- ABGS</b>	0.163	0.163	0.008	19.659	0.000
<b>GS2 &lt;- ABGS</b>	0.168	0.168	0.008	20.757	0.000
<b>GS3 &lt;- ABGS</b>	0.130	0.130	0.009	14.787	0.000
<b>GS4 &lt;- ABGS</b>	0.152	0.151	0.007	20.363	0.000
<b>GS5 &lt;- ABGS</b>	0.157	0.157	0.006	25.916	0.000
<b>GS6 &lt;- ABGS</b>	0.167	0.167	0.008	21.424	0.000
<b>GS7 &lt;- ABGS</b>	0.171	0.171	0.008	21.898	0.000
<b>GS8 &lt;- ABGS</b>	0.169	0.169	0.007	23.842	0.000
<b>OLAABGS &lt;- OLADL</b>	0.361	0.361	0.013	28.404	0.000
<b>OLAAEPSS &lt;- OLADL</b>	0.396	0.395	0.015	26.084	0.000
<b>OLAPTUAEPS &lt;- OLADL</b>	0.492	0.493	0.018	27.586	0.000
<b>PTU2 &lt;- PTUA</b>	0.273	0.273	0.007	41.371	0.000
<b>PTU3 &lt;- PTUA</b>	0.264	0.264	0.007	37.650	0.000
<b>PTU4 &lt;- PTUA</b>	0.288	0.288	0.009	31.448	0.000
<b>PTU1 &lt;- PTUA</b>	0.269	0.269	0.008	35.032	0.000

The table titled "Table 12. Outer Weights - Mean, STDEV, T values, P values" provides a detailed statistical analysis of various indicators related to the constructs in the study. The columns in the table represent key statistical measures: Original Sample (O), Sample Mean (M), Standard Deviation (STDEV), T Statistics (|O/STDEV|), and P Values. Each row corresponds to a different variable, showcasing its respective values for these metrics.

The first variable,  $ASSA1 \leftarrow AEPSSA$ , has an original sample path coefficient of 0.203, a sample mean of 0.202, a standard deviation of 0.010, a T statistic of 20.441, and a p-value of 0.000, indicating a strong and highly significant relationship between AEPSSA and ASSA1. Similarly, the relationships between AEPSSA and other variables like ASSA2, ASSA3, ASSA4, and ASSA5 are also strong and significant, with T statistics and p-values demonstrating their robustness.

For Aadhaar-Based Government Schemes (ABGS) and their corresponding variables (GS1 to GS8), the relationships are consistently strong and significant. For example,  $GS1 \leftarrow ABGS$  has a path coefficient of 0.163, a sample mean of 0.163, a standard deviation of 0.008, a T statistic of 19.659, and a p-value of 0.000. This pattern of high T statistics and low p-values continues across other variables, such as GS2, GS3, GS4, and so forth.

The Overall Awareness Difference Level (OLADL) and its related variables (OLAABGS, OLAAEPSS, OLAPTUAEPS) also show significant relationships. For instance,  $OLAABGS \leftarrow OLADL$  has a path coefficient of 0.361, a sample mean of 0.361, a standard deviation of 0.013, a T statistic of 28.404, and a p-value of 0.000. These values indicate a strong and significant relationship.

Similarly, the relationships between Procedure to Use AEPS Awareness (PTUA) and its corresponding variables (PTU1, PTU2, PTU3, PTU4) are also significant. For example,  $PTU1 \leftarrow PTUA$  has a path coefficient of 0.269, a sample mean of 0.269, a standard deviation of 0.008, a T statistic of 35.032, and a p-value of 0.000, indicating a robust relationship. Overall, the table provides a rigorous statistical evaluation of the relationships between various indicators and constructs within the study. The high T statistics and low p-values across all variables demonstrate the significance and robustness of these relationships, validating the hypotheses and enhancing the understanding of the dynamics within the Aadhaar Enabled Payment System Literacy model.

**Table 13. Hypothesis testing H1, H2, H3, H4**

<i>Factor of hypothesis</i>		<i>A1, A2</i>	<i>V1, V2</i>	<i>Alpha Value</i>	<i>P-value</i>	<i>Support</i>
H1	Awareness of the procedure to use the Aadhaar Enabled Payment System (AEPS) has a moderate relationship with awareness of Aadhaar-based government schemes, awareness of Aadhaar Enabled Payment System services, and the overall awareness difference level.	3.74, 4.04	0.1009, 0.0653	0.05	0.053472	Yes
H2	Aadhaar-based government schemes has a moderate relationship with the awareness of the procedure to use the Aadhaar Enabled Payment System (AEPS), awareness of AEPS services, and the overall awareness difference level.	4.15, 3.88	0.0681, 0.0906	0.05	0.032062	NO

H3	Awareness of Aadhaar Enabled Payment System (AEPS) services has a moderate relationship with the awareness of the procedure to use AEPS, awareness of Aadhaar-based government schemes, and the overall awareness difference level Overall Awareness Difference Level.	3.96, 3.98	0.0595, 0.1180	0.05	0.856077	Yes
H4	Overall awareness difference level has a moderate relationship with the awareness of the procedure to use the Aadhaar Enabled Payment System (AEPS), awareness of Aadhaar-based government schemes, and awareness of AEPS services	3.91, 3.99	0.0376, 0.1092	0.05	0.66412	Yes

The table titled "Hypotheses Testing" provides a comprehensive analysis of the acceptance or rejection of various hypotheses, utilizing average values, variance, and p-values as the criteria. For the hypothesis stating, "Awareness of the procedure to use the Aadhaar," the averages are 3.74 and 4.04, with variances of 0.1009 and 0.0653, respectively. The p-value is 0.053472, which is greater than the alpha value of 0.05, leading to the acceptance of this hypothesis.

The second hypothesis, "Aadhaar-based government schemes have a moderate awareness," has averages of 4.15 and 3.88, with variances of 0.0681 and 0.0906. The p-value of 0.032062 is less than the alpha value of 0.05, resulting in the rejection of this hypothesis.

For the third hypothesis, "Awareness of Aadhaar Enabled Payment System Services Awareness," the averages are 3.96 and 3.98, with variances of 0.0595 and 0.1180. The p-value is 0.856077, which is greater than the alpha value of 0.05, thus accepting the hypothesis.

Lastly, the hypothesis "Overall awareness difference level has a moderate awareness" shows averages of 3.91 and 3.99, with variances of 0.0376 and 0.1095. The p-value of 0.66412, which exceeds the alpha value of 0.05, leads to the acceptance of this hypothesis.

In summary, the analysis indicates that hypotheses regarding awareness of the procedure to use Aadhaar, AEPS services awareness, and overall awareness difference levels are accepted, while the hypothesis about moderate awareness of Aadhaar-based government schemes is rejected. This methodical evaluation based on statistical measures helps determine the validity of the proposed hypotheses, providing clear insights into the relationship between different variables and constructs in the study.

**Table 14. Hypothesis testing H5, H6, H7**

<i>Factor of hypothesis</i>	<i>A1, A2, A3,A4</i>	<i>V1, V2, V 3, V4</i>	<i>Alpha Value</i>	<i>P-value</i>	<i>Support</i>
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H5	Different levels of gender awareness regarding Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS) have a moderate relationship with AEPS services awareness and enhanced secured banking transactions	4.00, 4.03	0.1607, 0.0756	0.05	0.796627	Yes
H6	Different levels of age awareness regarding Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS) have a moderate relationship with AEPS services awareness and enhanced secured banking transactions	4.01, 4.01, 4.03	0.1106, 0.1125, 0.1290	0.05	0.976227	Yes
H7	Different levels of qualification awareness regarding Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS) have a moderate relationship with AEPS services awareness and enhanced secured banking transactions.	4.02, 4.01, 4.01, 4.01	0.1009, 0.0653	0.05	0.999705	Yes

The table titled "Table 14. Hypothesis Testing H5, H6, H7" presents the results of hypothesis testing for three specific hypotheses related to the awareness of Aadhaar-based government schemes and the procedures for using the Aadhaar Enabled Payment System (AEPS). For hypothesis H5, which examines different levels of gender awareness regarding Aadhaar-based government schemes and AEPS procedures, the averages are 4.00 and 4.03, with variances of 0.1607 and 0.0756. The p-value is 0.796627, which is greater than the alpha value of 0.05, indicating support for the hypothesis.

Hypothesis H6 explores different levels of age awareness regarding Aadhaar-based government schemes and AEPS procedures, with averages of 4.01, 4.01, and 4.03, and variances of 0.1106, 0.1125, and 0.1290. The p-value for this hypothesis is 0.976227, also greater than the alpha value, confirming support for the hypothesis.

Finally, hypothesis H7 investigates different levels of qualification awareness regarding Aadhaar-based government schemes and AEPS procedures, with averages of 4.02, 4.01, 4.01, and 4.01, and variances of 0.1009 and 0.0653. The p-value is 0.999705, again greater than the alpha value, indicating support for the hypothesis. In summary, all three hypotheses (H5, H6, and H7) are supported as their p-values exceed the alpha value of 0.05, confirming the statistical acceptance of these hypotheses and highlighting the relationships between demographic awareness levels and AEPS services awareness and secure banking transactions.

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