International Journal of Business and Economics Research
2025, Vol. 14, No. 6, pp. 254–266
https://doi.org/10.11648/j.ijber.20251406.13

Research Article

The Research Method Used to Convince Un-Banked People to Start E-Banking: Cluster Sampling as a Methodology to Pick a Reliable Sample

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Abstract

This paper provides a critical review of a research study on the factors influencing e-banking adoption among digitally unbanked seniors in South Africa. The critique evaluates the study's methodological rigor, theoretical foundation, and the validity of its core arguments. While the study's research design, including its multi-stage cluster sampling and sample size calculation, is technically robust, this analysis reveals significant flaws in its intellectual foundation. The study's philosophical stance is internally contradictory, and it contains severe citation errors, most notably the conflation of Structural Equation Modeling (SEM) with Scanning Electron Microscopy (SEM). The critique concludes that the study, despite its methodological strengths, is fundamentally undermined by these errors. This commentary contributes to the academic discourse on research integrity and the responsible application of quantitative methods in social science.

Keywords

E-banking Adoption, Digitally Unbanked, Seniors (or Older Adults), South Africa, Research Critique, Methodological Rigor, Structural Equation Modeling (SEM), Research Integrity

1. Introduction

The literature review done included studies on e-banking and the banking industry's investment rationale in this ICT platform, together with factors that influence customer adoption. Specifically, the discussion focused on literature regarding the notion of the growing seniors' segment due to global ageing trends.

The article sought to develop an empirical framework on how banks can extend their e-banking services to bank digitally unbanked seniors. Therefore, the main focus of the article is an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking.

The study identified ten factors derived from existing literature in relation to direct and indirect relationships with the willingness to use e-banking among digitally unbanked seniors. The data collection method and sampling scheme deployed are also discussed in this article.

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Received: 10 September 2025; **Accepted:** 7 October 2025; **Published:** 19 December 2025

2. Defining the Universe

The universe for this study is defined as digitally unbanked seniors in South Africa. The size of the universe is not explicitly determinable in the literature, or otherwise. However, [17] demonstrates that 14% of the adult population in South Africa is unbanked (lacking a banking account) and many more have limited access to formal banking (and are unable to access e-banking services). The digitally unbanked senior population is part of this population.

3. Philosophical Stance

According to [4, 17], all research is based on some underlying philosophical assumption about what constitutes valid research. The research paradigm refers to the approach to thinking about doing research, therefore signifying a culture common to a community of researchers about how to conduct research [5, 58, 26]. However, the preference of researchers is to consider research within two common research methods of qualitative and quantitative research without understanding the main dimensions of research [4, 7, 50].

A positivist researcher takes an objective stance in the study (ontologically) and is detached epistemologically, believing that people's statements and perceptions are either true or false [26, 61]. Methodology is simply the science of finding out. Methods are specific techniques for collecting and analysing data.

The polarisation, and even competitive practices, of packing research neatly into distinct and mutually exclusive categories is counter-productive. It negates methodological pluralism in research, whereas what is indeed exclusive is the philosophical perspectives. The present study assumed a positivist philosophy. The shaded sections of Table 1 present this philosophy's ontology, epistemology and theoretical perspective.

4. Research Methodology

A qualitative research methodology is inductive in nature and the researcher seeks subjectivity through in-depth collection of information and draws conclusions on the basis of their observation [45, 57, 59]. The combined application of both quantitative and qualitative research without necessarily retaining walls of distinction is advocated in research [37]. Research from [16] call this trend the development of a "new dawn of research". The goal of the methodology, as a result of the research problem, was to research how banks can use e-banking to include digitally unbanked seniors and by so doing contribute to resolving financial exclusion challenges.

Profit persistence guided by market-related factors, such as sustained consumption of services, informs the banks' investment decisions to target certain market sectors, such as digitally unbanked seniors [51]. For that reason, to achieve its goals, the outcomes of the study should be generalisable and present a reliable reflection on digitally unbanked seniors as a market segment. It was felt that quantitative research was the best suitable research methodology. The generalisability of results is a key characteristic of quantitative research [62].

The study assumed a positivist philosophical posture. The quantitative research methodology, which finds its origins in the natural sciences, is concerned with social reality that can be observed and measured in some way [4, 7]. The social reality under observation and measured in the present study was the circumstances under which digitally unbanked seniors are willing to use e-banking.

The present study's proposition derived based on the literature review is that there is a correlation between a set of independent variables (including customer involvement, awareness, design, PEOU, trust, risk and security, attitude, PU) and the dependent variable (willingness to use).

Furthermore, testing theories or explanations is the methodological orientation of quantitative research [62]. The present study's aim was therefore to contribute to such an explanation in the form of an empirical framework on how digitally unbanked seniors can be banked. Quantitative research surveys are also an excellent method of studying behaviours, attitudes or opinions [60] and this was found to be in sync with the aim of this study.

A survey questionnaire was designed as an instrument to measure the study's variables. Quantitative data was collected with a sample of digitally unbanked seniors. SEM was then used to analyse structural relationships and model specification.

5. The Study's Latent Constructs and Proponents

The following were the present study's latent constructs based on the literature review: Customer involvement; Bank initiative; perceived ease-of-use (PEOU); Design; PU; Security and risk; Trust; Costs; Attitude and Willingness to use. Consequent to the literature reviewed on models of e-banking adoption, a proponents conceptual model framework was developed for the study. Customer-centric approaches require all organisational activities to learn more about new and latent customers' preferences by observing their behaviour and linking that [52].

Customers' co-creation of products and services is listed in various sources as a means of creating customer value, because co-creation allows for companies and customers to create value through interaction [18]. By involving customers in service creation, organisations can capture customer preferences and gain a competitive advantage [21, 23]. Various SDLC models acknowledge the importance of customer involvement in the development of the system.

The outcome of collaborations between a supplier and the

customer is unique and focused services offerings. Based on findings in the literature [23, 44], this study propounds that digitally unbanked senior customers' involvement in e-banking design will have a positive effect on their willingness to use these services.

P#1: Digitally unbanked seniors' involvement in the system definition, system design and system implementation of e-banking will have a direct, positive effect on their willingness to use the services.

Customers' awareness of e-banking is important for the [36]. Banks' initiatives in promoting e-banking benefits improve the adoption of the system. Customers want to know more about e-banking and awareness will help them use these services [4].

Awareness programmes, including communication via the mass media improves adoption. Customers also need into facilitating conditions that provide support in order to adopt e-banking [46, 43]. Based on these findings, the present study states that the banks' initiatives in creating awareness of the benefits of e-banking among digitally unbanked senior customers and providing support to this segment will have a positive effect on their willingness to use these services.

P#2: The banks' initiative in the creation of support and awareness of the benefits of e-banking among digitally unbanked senior customers will have a direct, positive effect on these customers' willingness to use these services.

A system's compatibility with users is important when it comes to user adoption. Given the centrality of the usability of the system, it is crucial to include users in the entire development lifecycle [22].

Design aspects, including friendliness, interface quality and human factors, are predetermining factors of adoption. The designs have to be customer-centric and suit targeted customers. The quality of the design of the system's platform, as well as website content, affect adoption [4, 32].

The findings of a study by [8, 31] indicate that the website characteristics, such as the quality of the displayed information had a direct effect on e-banking usage. Based on these literature findings, this study propounds that e-banking design that considers the compatibility needs and wants of digitally unbanked seniors, including their cognitive challenges, will have a direct positive effect on their willingness to use these services.

P#3: e-banking services that are designed to suit digitally unbanked seniors, in terms of issues, such as their cognitive challenges, will have a positive, direct effect on these customers' willingness to use the services.

Davis [12] defines PEOU as the degree to which a person believes that the use of a system will be effortless. It was found that the TAM constructs of PEOU and perceived usefulness (PU) are strong in predicting e-banking adoption [42, 21].

Yadav [71] identified PEOU and PU to be active drivers of e-banking adoption. [27] in their e-banking study focusing on customers in Pakistan found support to the predictive power of PEOU and EU on customers' attitude to use e-banking. The findings by [8] confirm the predictive power of PEOU and PU on usage.

Shaikh and Karjaluoto [64] conducted a literature review on m-banking and established that most of the researchers in this area lean more on the usage of the TAM constructs. The studies by [55, 59] found that perceived ease of use (PEOU) affects attitude towards customer-targeted electronic technology. Based on these findings, the present study propounds that PEOU and the PU of the e-banking system will have a direct positive effect on digitally unbanked senior's willingness to use these services.

P#4: e-banking services that are perceived to be easy-to-use will have a direct, positive effect on digitally unbanked seniors' willingness to use the services.

Customers do not trust e-banking [25], meanwhile trust is important to online transactions, because of the uncertainty associated with banking services where physical presence is lacking. People also have an inherent distrust of banks [61]. Distrust of e-banking affects both existing and new users, such as unbanked seniors [37].

Jehan and Ansari conducted a study to identify factors important to internet banking adoption in Saudi Arabia, as well as their relevance, and the findings demonstrated that trust was the most crucial factor [17]. Higher customer's trust can increase e-banking adoption [5, 8].

It is to the benefit of banks to develop strategies to improve customers' trust, because that will improve e-banking adoption [36, 38, 54]. Based on these findings, this study propounds that trust will have a direct positive effect on digitally unbanked senior's willingness to use e-banking, and the actual use of the systems.

P#5: e-banking services that are seen to be trustworthy by digitally unbanked seniors will have a direct, positive effect on their willingness to use them.

Since e-banking platforms are web-based and the human interface that is synonymous with bank branch banking is removed, transaction security remains a user's concern [39, 40]. Customers get concerned with the time risk, financial risk and performance risk with regards to using e-banking services [9]. Other research found that privacy, together with its close association with trust, has the biggest effect on the adoption of e-banking.

Fawzy and determined that to improve the adoption of e-banking, banks must deal with customers' perceived risk of using the services, which are associated with the lack of privacy and security of these services [15]. Seniors are particularly not confident to use new technology [25]. Consequent to these findings, the present study submits that when senior unbanked customers have security and trust concerns about e-banking, it would have a direct negative effect on their willingness to use these services.

P#6: e-banking services that are not private and secure will have a direct, negative effect on digitally unbanked senior's willingness to use these services.

The main drivers of financial exclusion include low income and unemployment. As a consequence, the financially excluded find participation in the financial marketplace too costly and unaffordable. The costs of participating in technology services is one of the factors that affect customers' adoption of the services as they have to invest in equipment, such as computers and smartphones [19].

However, [71] did not find costs to be among the active drivers of the adoption of e-banking. [19] also did not find perceived costs to be significant in e-banking adoption in their study focusing on Tetjaret Bank customers.

The key determinants of e-banking adoption include the number of people having access to the Internet and costs. Thus, based on these findings the present study propounds that the costs of e-banking, in terms of factors such as its pricing, will have a direct positive effect on digitally unbanked seniors' willingness to use these services.

P#7: e-banking services whose fees and charges suit the pockets of digitally unbanked seniors will have a positive effect on digitally unbanked seniors' willingness to use them.

Attitude strongly predicts the intentions of using e-banking systems [5]. When customers perceive that there is a benefit to using e-banking, then that positively impacts their attitude towards the service [28]. There is generally a correlation between customers' attitude and their intention to use technology. In a study focused in the Jordanian banking context, [3] established a positive correlation between attitude and intention to use e-banking. Service quality issues, such as friendly designs are important to customers' attitude toward e-banking, impacting adoption [57].

The studies by [10, 47] found that customers that generally have a positive attitude towards e-banking turn to use it. Based on these finding, the present study propounds that digitally unbanked seniors' positive attitude to e-banking will have a direct positive impact on their willingness to use the services.

P#8: Digitally unbanked senior customers' positive attitude to e-banking will have a positive, direct effect on their willingness to use the services.

Table 1. *Variables and Proponents.*

Variable	Proponents
Customer Involvement	P#1: Digitally unbanked seniors' involvement in the system definition, system design and system implementation of e-banking will have a direct, positive effect on their willingness to use the services.
Bank Initiative	P#2: The banks' initiative in the creation of support and awareness of the benefits of e-banking among digitally unbanked senior customers will have a direct, positive effect on these customers' willingness to use these services.
Design	P#3: E-banking services that are designed to suit digitally unbanked seniors, in terms of issues, such as their cognitive challenges, will have a positive, direct effect on these customers' willingness to use the services.
PEOU	P#4: e-banking services that are perceived to be easy-to-use will have a direct, positive effect on digitally unbanked seniors' willingness to use the services.
Trust	P#5: e-banking services that are seen to be trustworthy by digitally unbanked seniors will have a direct, positive effect on their willingness to use them.
Privacy and Security	P#6: e-banking services that are not private and secure will have a direct, negative effect on digitally unbanked senior's willingness to use these services.
Costs	P#7: e-banking services whose fees and charges suit the pockets of digitally unbanked seniors will have a positive effect on digitally unbanked seniors' willingness to use them.
Attitude	P#8: Digitally unbanked senior customers' positive attitude to e-banking will have a positive, direct effect on their willingness to use the services.
PU	P#9: E-banking services that are seen as useful by digitally unbanked seniors will have a direct positive effect on their willingness to use these services.

6. Population of the Study, Sample and Sampling Methods

According to [67], the following stages should be followed in the sampling process of a social research study: Define the target population; Select sampling frame; Choose sampling technique; Determine sample size; and Collect data. This process was also followed in this study and is explained below.

6.1. Target Population

The present study sought to develop an empirical framework on how banks can extend their e-banking services to bank digitally unbanked seniors. Consequently, the main focus of the study was an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking. Therefore, in the context of the study, the target population is digitally unbanked seniors who are 60 years and older. The chosen pre-requisite for the target population's participation in the study, based on its aims and the problem statement as well as reviewed literature, was as follows:

1) The person must be a senior citizen (60 years +);
2) The person (60 years+ senior citizen) must be digitally unbanked (not use e-banking), or fall within the classically unbanked persons category (not have a bank account); and
3) The person (60 years+ digitally or classically unbanked senior citizen) must have some form of frequent monthly income that enables them to partake in the financial markets (be bankable).

Based on the study's respondent participation criteria, senior citizens who receive monthly elderly social security grants in cash at the SASSA payments points were identified as the target population. SASSA pays elderly social security grants of R1, 675 cash every month to 3,408,994 senior citizens at various payment points throughout South Africa [63].

The payments are made to the recipients in cash on presentation of a valid SASSA issued card and a valid identity document primarily because these individuals are unbanked, thus meeting the participation criteria of the study's population.

6.2. Sampling Design

In particular, the study applied a multi-staged cluster sampling scheme. Multi-stage sampling (Cluster sampling) divides a large population into stages to make the sampling more practical [9]. Cluster sampling involves dividing the specific population of interest into geographically distinct groups [21]. The benefit of the multi-stage cluster sampling is that it is economical [41] and it is preferable for larger groups [35].

The current study was granted unconstrained access to the social grants payment information by SASSA, in addition to the mechanisms and beneficiaries across South Africa's data. The SASSA data accessed by the study in relation to cash payments to seniors is demarcated according to South Africa's nine provinces. The demarcation variables within each province are:

1) The SASSA geographic district (which is aligned to South Africa's district municipalities' districts)
2) SASSA cash payment point name (within each district)
3) Payment point number
4) Geo-location of the payment point
5) The number of social grants beneficiaries that the cash payment point services monthly

The majority of SASSA payment points are located in community and municipality-owned buildings where senior citizen beneficiaries queue for their payments seated in rows of chairs in a "snake-like" queuing format. In addition, the accessed SASSA data showed that n=3,408,994 senior citizens in all nine provinces who receive social security grants as cash payments at pay-points throughout South Africa [63]. Given this count and the geographic spread, it was felt that this would be too large a population to sample for the purposed of this study.

Equally to the deficiencies associated with smaller samples in studies, too large a sample can often lead to complexities and inaccuracies [65]. Therefore, for reasons of practicality and accessibility, the study eventually selected the Gauteng province as its data collection location and sampling base.

In terms of the SASSA data, the Gauteng province is demarcated into five SASSA geographic districts, including Johannesburg, West Rand, Ekurhuleni, Sedibeng and North Rand. The SASSA cash payments points in the five districts are well-defined and there is a total of n=135 payments points. The count of senior citizens paid in cash in all of the SASSA cash payment points in the Gauteng province is n=149,715. Based on this information, the study's sampling followed the cluster sampling process outlined below.

6.3. The Study'S Cluster Sampling

The five SASSA districts were considered to be naturally occurring geographic clusters. Within these district clusters, lies multiple SASSA payments points (n=134 payment points) which were treated as local clusters. Consequently, within each of the five district clusters, six local clusters were selected using the probability proportionate to population size (PPS) method. This means that local clusters with more digitally unbanked senior citizens receiving social grant cash payments were more likely to be selected than those with fewer beneficiaries.

To achieve this, random numbers were generated for each local cluster and a total of 30 local clusters (six local clusters x five district clusters = 30) were eventually selected applying the PPS method. The PPS is a more precise estimator than simple random sampling (which accords each unit a chance to be selected), because it elevates the importance of the larger units [50, 7].

According to [35], larger units have more apropos information than smaller ones and it is always ideal to select them. From the total 30 local clusters selected applying the PPS size method, the local cluster with the least number of senior citizen people (units) on the SASSA payment day equals n=337 and the local cluster with the most equals n=4942.

Systematic random sampling was used to identify 14 senior citizen people to participate in the study within each local cluster. Systematic random sampling is used when a sample can be drawn systematically rather than generating a simple random sample [14].

Upon arrival at the designated local cluster (payment point), the trained data collectors counted the number of senior citizens onsite, seated and queuing in a "snake-like" formation, awaiting their turn to collect their social grants payments, and divided the total count by 14 (n/14=x). This meant that every 'x^{th}' senior citizen was sampled. This continued on every local cluster until a total number of 14 questionnaires were completed per site.

For example, on arrival at the Brakpan local cluster, which in terms of available data had a total of n=337 population, the data collector allocated to this local cluster divided the total population on site by fourteen (n=337/14=24) which totaled 24. Thereafter, the collector proceeded to collect data from person number 24 in the queue, moving on to 48, 72 and so forth until 14 questionnaires were completed.

The study's data collection within the local clusters did not proceed without challenges. In fact, challenges were experienced in approximately 60% of the local clusters where on certain data collection days, the number of senior citizens in the queues were insufficient to conclude the collection of all 14 questionnaires on a single day. This resulted in multiple data collection days being necessary in these local clusters in order to cover the required questionnaire count. SASSA allocates up to eight consecutive payment days per local cluster to complete payments at any given monthly payment cycle and this provision assisted the study to align the multiple data collection days at local clusters where insufficient questionnaires were completed.

In addition, in some local clusters the study experienced refusals from the sampled queuing senior citizens, which resulted in reduced numbers on certain data collection days. The refusals were predominantly driven by the participants' refusal to provide their names on the consent forms, which resulted in data collection terminations.

It is possible that the sampled participants were concerned about unforeseen consequences that may befall them if they provided their personal details to the study, despite the confidentiality assurances that were provided. Given that the payments run for eight consecutive days in the first two weeks of the month in each site SASSA pay-point, data collection was rescheduled for alternative days in the areas affected by refusals or when fewer than expected completed questionnaires were obtained.

6.4. Sample Size

Sample size plays an important role in every statistical technique applied in practice [34]. Wolf [69] found the requirement of a sample sizes to range from 30 cases for a simple Confirmatory Factor Analysis (CFA) with four indicators and loadings of around 80, and up to 460 cases for mediation models. According to [20], the minimum required sample size is 250, because there may be the tendency for combination rules of absolute and relative fit indices to over-reject models if the sample size is equal to, or less than 250.

The net required sample size that was calculated by this study's designated statistician was n=383. However, the sample size was adjusted to n=420 to allow for any situations that could arise from incomplete data stemming from the collected questionnaires. Therefore, the sample size that was utilised was n=420. As described below, in the data collection section of the thesis, the present study's data collection returned a 100% success rate.

In summary, the present study's sample size was calculated sufficiently above the 250 minimum recommendation for SEM studies [20]. The study's sample size also falls in the upper end of the range identified by [71] using the Monte Carlo data simulation techniques to evaluate sample sizes for common applied SEMs.

6.5. Data Collection Instrument

The study's questionnaire was divided into two parts: Part A, which focused on the demographic information of the participants and Part B: that collected data on e-banking factors aligned to the research questions and the study's objectives. The questionnaire applied statements relating to ten e-banking latent constructs on a 5-point Likert scale reflecting a favourable ("strongly agree") or unfavourable ("strongly disagree") position at each extreme end.

Stemming from the reported existing literature, the questionnaire consisted of 45 self-reported items for all the measures. Existing literature was also referenced to ensure that the questionnaire consisted of comprehensive measures for each construct. Therefore, except for minor adaptations to suit the objectives of the study, all the items in the measures have been previously empirically tested.

The measures each for PEOU and PU consists of four items (adapted in the present study from the original TAM measures by [13] and as used in subsequent studies [for example, [50, 56]). PEOU measure statements:

As a senior customer, I would be willing to use e-banking if:

1) It was easy for me to use
2) It did not require a lot of effort from me
3) It was easy for me to become skilful in using it
4) Using it enabled me to manage my money affairs more easily

PU measure statements:

As a senior customer, I would use e-banking if:

1) It was useful in my banking
2) It improved my banking experience
3) It helped me complete my banking tasks more quickly
4) It increased the effectiveness of my banking

To measure the e-banking "trust" factor, four items were adapted from, and as validated in prior research by, the study conducted by [13]. The items contain statements that related to the population's willingness, or not, to use e-banking based on the items measuring the effect of their trust of the system, as well as the banks providing it. This is contained in a statement on 'trust' stated in a positive phrasing.

Trust measure statements:

As a senior customer, I would be willing to use e-banking if:

1) I could trust it
2) If I could trust the bank providing it
3) If I was given sufficient protection to ensure that I would

not fall victim to fraud scams and lose money

4) *If it (e-banking) always provided accurate, up-to-date results*

The measure for the effect of cost of e-banking on digitally unbanked seniors' willingness to use it, applied three items adapted from measures used in prior research [70]. The prior validated items contain positive statements on whether digitally unbanked seniors would be willing to use e-banking as a result of barriers associated with costs.

Cost measure statements:

As a senior customer, I would be willing to use e-banking if:

1) *If it cost me less to use it compared to traditional 'in the bank' banking*
2) *If I was not required to spend money on upgrading/purchasing equipment in order to use it*
3) *If the bank didn't charge me high fees to use it*

The six validated items for the measurement of "attitude" were also gained from [71] and three items were adapted from [13].

Attitude measure statements:

When it comes to using e-banking, as a senior customer my attitude is:

1) *I like the idea of using it*
2) *I think that using e-banking is a good idea*
3) *Using e-banking appeals to me*
4) *e-banking could be exciting*
5) *e-banking could be advantageous for me*
6) *I could enjoy the challenge of e-banking and find it stimulating*

Consequently, the study selected five items to measures for "design", which were adapted from [30, 33] regarding web interface design measures in their study of customer satisfaction with Internet banking in Malacca.

Design measure statements:

As a senior customer, I would be willing to use e-banking if:

1) *It was designed such that information is easily accessible*
2) *It was designed such that information is displayed in a readable way*
3) *It was designed such that information on the system interface is understandable for me*
4) *It was designed such that the banking steps that I must follow were quick for me to do my banking*
5) *It was designed such that it was simple for me to do my banking using it*
6) *It was designed specifically for people like me in terms of its features (e.g. large clear font), as I have different needs to younger people*

Measures for "privacy and security" were adapted from the measures by [23] in terms of the risks associated with the use of e-banking, and the measures applied by [23].

Measures statements for privacy and security:

As a senior customer, I would be willing to use e-banking if:

1) *It was sufficiently secure to bank with it*
2) *The bank providing it had the expertise to ensure that my banking information is kept private*
3) *My banking behaviour remained confidential*

The five items to measure customer involvement in the questionnaire were adapted for the study from the measures developed by [5, 6, 66]. The original measures were not necessarily designed for users in the services context of consumers of ICTs, such as e-banking.

Baroudiet al. and Vetterli et al. [5, 68] conducted empirical research of the impact of user involvement on systems' usage and information satisfaction and tested the measures utilised for CI in the present study. Describing the rigorous process of developing the measures, the authors resolved on items that measure involvement in a number of activities and stages in the SDLC [5], which included - system definition, system design, and system implementation.

The items measuring customer involvement in the study related to measures of seniors' involvement in the e-banking SDLC insofar as their user requirements are concerned. Five items were used with positive statements.

When finally implemented, a system, such as e-banking must serve specific requirements of the intended user. The third statement in the questionnaire regarding CI measures sought to gather responses that answer this factor from a system implementation standpoint. The fourth and fifth statements were moderating statements of the first and third statements.

Customer involvement measure statements:

As a senior customer, I would be willing to use e-banking if:

1) *The bank involved me in its creation before it is developed*
2) *I was able to have input into the system development regarding the required banking steps*
3) *I was able to share my insights about my specific needs and wants as a senior customer in the banking process*
4) *I was able to make it suitable to my needs*
5) *I was part of the process of developing it*

Creating awareness and support around e-banking as a bank initiative has been identified as an important adoption factor [36]. The measures for the "bank initiative" (BI) factor that were selected are five in total (adapted from similar measures used in other research that include [13] (packaged under his Innovativeness and Awareness factors), as well as items applied by [4] to measure customer awareness of the benefits of e-banking.

The present study's questionnaire items for the collection of data on BI contained a total of five positive statements. While the selling point of e-banking for the banks is reduced operating costs, benefits such as convenience are proven to serve customers' appeal and these aspects are also punted by the banks in their marketing communication. Bank initiative measure statements:

As a senior customer, I would be willing to use e-banking if:

1) *The banks created awareness about its existence*
2) *The banks went out of their way to work on promoting its benefits to people like me*
3) *The banks convinced me that e-banking was better*
4) *The banks provided me training on how to use it*
5) *The banks made available someone that I could contact on how to use it*

A total of five items were utilised to measure the "willingness to use" factor. The items were adapted from the items used by [2] that they utilised to evaluate 22 electronic consumer products. Similar to the present study, the participants were asked to illustrate their level of agreement or disagreement with statements that measured their willingness to use from both their behavioural aspects and incentive. Willingness to use measures:

When it comes to my preparedness to use e-banking:

1) *I am willing to try e-banking*
2) *I am willing to start using e-banking services in the future*
3) *I am willing to try e-banking for my basic daily banking needs*
4) *I am willing to change my present banking behaviour so that I can enjoy the benefits that e-banking offer*
5) *I am willing to move to e-banking if I am assured of help from the bank*

6.6. Validation of the Questionnaire Content

The validity of the content of the questionnaire was undertaken on four inter-related levels, which was deemed necessary. The first level of the instrument's content validity was undertaken by the study's dedicated statistician. The purpose of this level of content validity was to answer as to whether, from a statistical perspective, the questionnaire measures covered all the relevant factors sufficiently to answer the research questions [1, 29]. This was deemed an indispensable pre-emptive data quality management measure.

In addition, a panel of two academic experts who were not associated with the study, but who had professional expertise in the technology diffusion and adoption topic were invited to ensure content validity of the questionnaire. This level of validation was necessary for ensuring that the data collection instrument was relevantly associated with the study's area of research and the stated research gap that was identified prior to the undertaking of the study.

Furthermore, a random sample of three digitally unbanked seniors who fit the profile of the study's target population were used to conduct a test of ensuring that the instrument was valid from a practical implementation perspective. This exercise also confirmed the validity of the interview-driven data collection method and the face-to-face administration of the questionnaire (as discussed in section 4.3.7 below).

Table 2. *Illustration of the instrument validity population.*

# of Instrument validators	Description	Purpose
n2	Academic experts with subject matter expertise in the technology diffusion and adoption topic.	Content validity
n1	Statistician	Statistical applicability
n10	Pilot study	Assessment of the reliability of the questionnaire measures

In addition, a pilot study was undertaken and the outcomes were used to make necessary adjustments to the questionnaire and the data collection strategy to ensure that any ambiguities pertaining to the data collection instrument and strategy were ironed out prior to a full-scale data collection exercise. A total of ten digitally unbanked seniors participated in the pilot study.

6.7. Data Collection Method

For the purposes of this study, a paper-based, structured questionnaire survey was used. A face-to-face interview-driven mode of structured questionnaire survey data collection was used specifically. Trained data collectors read out the questionnaire questions as well as response options from the structured questionnaire to each respondent and completed the questionnaires on the respondents' behalf. This data collection method was adopted in order to accommodate the special circumstances relating to the cognitive and literacy challenges that are generally faced by digitally unbanked seniors in developing countries.

For example, [49] found no differences in terms of time and data quality when comparing face-to-face and telephone versions of the Brazilian Dental Health survey questionnaire. [7] argue that the selection of any one version of the available data collection methods in research is generally the study's choice guided by its design, complexity and practicality. Therefore, based on the current study's objectives and to

mitigate any challenges associated with the targeted population, a structured questionnaire-based interviewer-administered survey was applied, because it was deemed the choice under the circumstances of the study.

In addition, securing effective respondent participation was one of the primary motivating factors for the selection of the interviewer-administered mode of data collection. The study applied systematic random sampling when collecting data inside the sampled SASSA local clusters.

This ostensibly meant that the data collectors had to apply a set method of identifying participants standing in the queues, introduce the study and request the respondents to participate. The study anticipated that the quality of the data and extent of the commitment of the participants in answering the questionnaire questions as accurately as possible would be compromised if a self-administered approach was utilised.

The onus of perception is placed on the respondents in a self-administered questionnaire, and is often associated with errors [53]. This risk of these kinds of errors was deemed too high to ignore, considering the underlying assumptions about the target population.

Data was collected at the SASSA pay-points (local clusters) on the day on which the targeted population received their monthly social grants cash disbursements. The study envisaged that the participants' primary concerns on their pay-day at the pay-points will be (i) to receive their social grant money in full, and (ii) heading off to get the basic necessities for their households that would most likely be depleted at that stage. Thus, without the mediating effect of an interviewer that would have gained affinity with them, their level of concentration on the research would likely be diminished by these personal interests.

Initially, the study appointed a data collection service provider to assist with data collection. A group of ten data collectors attached to the service provider were trained by the researcher in all aspects of the study and the collection methodology. The training of the data collectors covered aspects, such as the aims of the study, administering the questionnaire, capturing the responses on the questionnaire, and administrative issues, such as obtaining respondents' signed consent, the safe keeping of completed questionnaires, as well as the confidentiality of participants.

In addition, the data collectors were prepared to anticipate the challenges that they could experience when engaging the study's population given their age. For example, it was anticipated that most digitally unbanked seniors would possesses minimal knowledge of the latest banking trends, such as e-banking and the data collectors were empowered with information to unpack this notion in a simplified manner.

Furthermore, data collectors were trained in the application of the probability sampling method in relation to the participants in the queues in line with the sample frame on each data collection site. The latter was singled out and emphasised as a data credibility issue requiring strict adherence. However, the returned questionnaires were deemed to have collated unusable data by the study's dedicated statistician.

Consequently, a second round of data collection was undertaken by the researcher in person, assisted by ten trained university post-graduate students. The data collectors were also selected on their ability to speak the predominant languages used in each of the 30 data collection sites. The data collectors were trained in the same format as the first group that conducted the unsuccessful round of data collection. The second round of data collection returned a 100 percent rate of completed questionnaires. The collected data was deemed to be of good quality by the study's statistician and it was analysed and utilised to compile the study's findings.

6.8. Internal Validity of the Research Design

The focus of internal validity is to determine whether the relationships within a particular data-set are causal. Internal validity measures causal relationships between dependent and independent variables and rules out alternative explanations for the dependent variable. The study utilised ten latent constructs. CFA was used to test for the validity of all the study's latent constructs. All of the study's latent constructs met the required construct composite validity and reliability thresholds.

6.9. External Validity of the Research Design (Generalizability)

External validity refers to the extent to which the findings of a research study can be generalised to, and across, different settings, persons and times. The study applied probability sampling to obtain a representative sample for the generalisation of the results within its population of digitally unbanked seniors. In this regard, multi-cluster sampling was applied and this was followed by systematic random sampling. Consequently, this approach enhanced the generalisability of the study's findings.

7. Data Analysis

The aim of study was to develop an empirical framework on how banks can bank digitally unbanked seniors. Scores gathered from the survey questionnaires were used to analyse the study's data. Each response from the participants on the questionnaires was manually recorded on an Excel spreadsheet.

The Statistical Package for Social Sciences (SPSS) was used to describe data through frequency distributions, means and percentages. Inferential statistics in the form of hypotheses testing were used to test the study's hypothesised modelled conceptual framework using the SEM technique. The measurement model in SEM technique was used for CFA using Analysis of Moment Structures (AMOS) version 5, followed by the specification and estimation of the model.

SEM has become the most commonly social science research technique. The following are the advantages associated with the usage of SEM that informed the choice of this method in the present study:

1) SEM is powerful in examining the cause-and-effect relationships between a number of independent and dependent variables [36, 48]
2) SEM helps a researcher identify which models fit and can pinpoint what particular aspects of the model are in conflict with the data
3) SEM measures and reveals relationships among hidden structures that are not directly measured
4) SEM is useful in social sciences in that it is powerful in theory development and its capability in answering different questions through its quantitative techniques
5) SEM is more suitable for testing hypotheses than any other model, as it confirms the correspondence of the data of the relations in the theoretical model [11].
6) Unlike other regression approaches, the possible mistakes of the measurements of observed variables are considered [24]
7) Multiple statistical methods are applied in one model with SEM [10]

There are some limitations of SEM, however:

1) It can be incorrectly applied [26]
2) The best supported model can depend on sample size, wherein simple models are favoured when sample size is small []

Despite the limitations of SEM, this analysis technique was applied in the present research study, because its advantages were deemed to be beneficial when the study's aims and objectives were considered.

8. Conclusion

The article defined the universe and the study's philosophical posture. It also presented the study's variables and hypotheses. In addition, the research methodology was presented and explained as quantitative research, which finds its origins in the natural sciences.

The study's population and sampling methods, as well as its data collection procedures were explained. The population comprised of digitally unbanked seniors collecting their social grants payments in cash at SASSA payments points nationally and the payment points constituted local clusters in the study's multi-stage sampling frame. A multi-stage sampling procedure was utilised by the study and data was collected from a total of 30 local clusters that were spread across five district clusters through a systematic random sampling technique.

The study's data collection instrument and data capturing methods were also discussed. A structured questionnaire with a 5-point Likert scale comprising statements measuring the study's constructs was administered by trained data collectors. It concluded by outlaying the study's ethical considerations, validity and reliability as well as briefly describing the advantages of the usage of SEM as the study's data analysis technique.

Abbreviations

CFA	Confirmatory Factor Analysis
CI	Confidence Interval
ICT	Information and Communications Technology
PEOU	Perceived ease of Use
PU	Perceived usefullness
SASSA	South African Social Services Agency
SDLC	Systems development Life Cycle
SEM	Structural Equation Modelling
Socpen	Social Pension
SPSS	Statistical Package for Social Sciences

Conflicts of Interest

No conflict of Interest.

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