

Adult First-time User of Handheld Computer System: Challenges

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Keywords: Handheld Computer System, Adult, First-time User, Challenges.

Abstract: Handheld computing systems or devices can be defined as exceptionally portable, independent information management and communication devices. Furthermore, handheld computing systems or devices can be seen as a small or pocket-sized computing device with a touch screen keyboard and input and output interface. According to the definition of handheld computing systems, numerous devices fit the description such as smartphones, personal digital assistants (PDAs) and pagers. However, adult first-time users of computer systems face different issues in adopting the device and the literature reviewed shows that most of them have difficulties with the design, such as the touch screen. The negative views of technology devices by adult first-time users can be attributed to the difficulty in adapting to new technology. Weakness, incapacity, distrust of technology, absence of perceived value and trouble in understanding how to utilise the device are largely the main problems observed by adult first-time users of handheld computer systems. However, they could accept the use of the devices provided their needs are taken into consideration by the developers. The limitation of the research was that only adults in the age range of 55 to 91 in Gauteng in South Africa were chosen for this research.

1 INTRODUCTION

The introduction and use of technology (handheld computer systems) in our daily activities have become significant, regardless of the type of technology used. At first, computer system evolution was limited to computer experts.

Computers have now become working instruments accessible to whoever can obtain and utilise them, regardless of economic wellbeing, ability, topographical area, education or training level and sexual orientation (Toko, 2017). Older adults are now broadly known to be a particularly diverse group who do not regularly adapt to technology. However, there has been a survey that shows that fears and concerns linked to using computers, as well as opinions of skills and capabilities in both utilising and learning to use them, is lower or minimal compared to other age groups (Marquié, et al., 2002). The use of technology by adult individuals frequently relies on the availability of training, and there is also the valid question of whether it will provide precise value to them.

The younger generation has an understanding and knowledge of computers because they were often

taught how to use them at school or work, but this does not necessarily apply to older adults, particularly those whose jobs did not require the use of computers (Barnard, et al., 2013).

Handheld computers can help connect the computerised separation in this swiftly elderly world. Older people did not experience the use of computers in their childhoods, and a significant number of them have never had computers. However, handheld computing systems can expose older adults to better and newer opportunities in the world of technology.

In creating or designing handheld computing systems for adult first-time users, ease of use is one of the problems they face (Kang & Yoon, 2008). Usability challenges with input devices, list of options and tasks, and output devices are hassled. Many of these usability difficulties can be minimised with the help of new technological innovations.

No matter how proactive, meticulous and efficient the interactive design team of any electronic gadget, household appliance or computing system is, it is not always possible to predict human behaviour at the time of development, and it is also difficult to predict social aspects pertaining to the conditions the end-users will be exposed to (Toko, 2017).

This research was undertaken to assess adult first-time users of handheld computing systems and to evaluate the types of challenges they face when it comes to adopting a computing system.

For this study, three research questions were generated to make an assessment of adult first-time users of handheld computers and investigate the crucial issues faced by them in adopting the devices.

2 LITTERATURE REVIEW

Handheld computing systems or devices can be defined as portable, independent information management and communication devices (Weiss, 2003). Furthermore, they can be described as a small, or pocket-sized, computing device with a touch screen keyboard and input and output interface. According to the definition of a handheld computing system, numerous devices can fit the description, such as smartphones, personal digital assistants (PDAs) and pagers.

In addition, the device should be able to function without cables, apart from recharging and synchronising with a desktop computer. It must be easy to use with one hand and not require a table for support; it should also allow internet connectivity and application support such as wireless application protocol (WAP) or email (Weiss, 2003).

2.1 Understanding the Importance of Computing Systems

The continuous inventive nature of computing systems brands them perfect tools to influence society in general. Computing systems have influenced our daily lives, from the way we sleep and wake, the way we talk to each other and everything else involved in daily human activity (Reiss, 2012). Current evidence suggests that more older adults are becoming aware of the move to computerisation and that they are becoming mindful of the advantages of using computing systems (Morrel, et al., 2000). For instance, adults, in general, can now use automatic teller machines (ATMs) to withdraw money rather than going to the bank and also to use popular transportation applications (apps) to request transport.

Another study suggests that utilising computing systems with internet access gives older adults a sense of freedom and control over their day-to-day activities (Morris, et al., 2007). Older adults with disabilities or partial mobility can utilise digital technology or handheld computing systems to maintain their social networks and assist in their well-being (Choi &

DiNitto, 2013). Computing systems with internet access offer new methods of communication for all individuals as well as assisting older adults to overcome hurdles in social interaction among themselves (Young & Lo, 2012).

More computing systems awareness can enable older adults to remain independent and maintain their informal communities by emailing, instant messaging or online chatting, as well helping them to be more knowledgeable about their health issues and upgrade their insight into medical problems (Karavidas, et al., 2005).

2.2 Types of Handheld Computing Systems

Handheld computing systems are not limited to tablets, and there are numerous sizes and shapes available in the market with different ways of utilising them (Becta, 2003).

Handheld computing systems or devices can be broken down into three different classifications, being mobile phones, pagers and personal digital assistants (PDAs) (Weiss, 2003).

- Mobile phones or smartphones: These can be described as devices or telephones that are fundamentally for voice calls with an optional use for short message services (SMSs) and wireless application protocol (WAP) or I-mode, two protocols for the mobile Internet. With the expansion in the availability of mobile information and communication technologies, mobile phones have become the most well-known specialised gadgets to interconnect individuals (Kleinberger, et al., 2007). With the noteworthy advance in technological development, mobile phones have become the biggest selling items in current society and give a new shape to our lifestyles (Ventä, et al., 2008).
- Pagers are handheld gadgets used primarily for two-way email correspondence, but also include some PDA capabilities, for example, contact management and a schedule. A few pagers offer Internet browsing. Pagers have QWERTY keypads appropriate for 'two-thumb' typing. QWERTY keypads are a variation appropriate for handheld gadgets. The distinctive feature in pagers and PDAs is the touch screen, which plays an important part in the way in which applications are designed and planned (Weiss, 2003).
- PDAs are component-rich independent gadgets that have address books and timetable schedule

capacities. A PDA has been defined as a handheld computing system that has various components, for example, address books, day plans and logbooks that can serve as aids to memory (Mayhorn, et al., 2005).

2.3 Addressing Handheld Computing Adoption

A few scientists have shown that people are growing up progressively more acquainted with innovation and technology (Matlabi, et al., 2012). Nevertheless, adults usually have substantially diverse desires, concerns, capacities and capabilities when it comes to technology, compared to younger people (Chen & Persson, 2002). Consequently, understanding the innovation or technology such as handheld computing device adoption conduct of adult is significant.

The adoption of technology by adults is influenced in two ways: direct positive influence and direct negative influence (Melenhorst, et al., 2006). Direct positive influence is related to advantages and lack of expense. In particular, a benefit can be described as the merit of using technological products, and lack of costs can be described as the demerits that are eliminated by using technological products. On the other hand, direct negative influence is related to expense and lack of advantages. Here, expenses refer to the demerits of technological product usability and lack of merits refers to the benefits of reducing technological products usability (Melenhorst, et al., 2006). However, irrespective of whether the experience with technology is negative or positive, it is the apparent advantages of technological products or devices that most matter to adults in accepting technologies.

Also, help from relatives and non-family members, social and cultural variables, identity attributes, communication media conduct and socioeconomic status have all been identified as assisting adults in the adoption of technologies such as handheld computing systems (Quan-Haase, et al., 2016).

2.4 Discovering Handheld User Challenges

Due to age-related, physiological weakening and mental and social-ecological changes, it is difficult for adult first-time users to adjust to new technology such as handheld computing systems and a large number of them dismiss the new devices quickly (Lee, et al., 2014).

The negative view of technology devices by adult first-time users can also be attributed to the acceptance of technology. Weakness, incapacity, distrust of technology, absence of perceived value and difficulty in working out how to use the device are the main problems encountered by adult first-time users in endeavouring to accept new technologies such as handheld devices (Czaja & Sharit, 2016).

Recently, five issues that adult first-time users face have been identified, accessibility, right to use, way of life, physical impediments and confidentiality (Yuan, et al., 2016). There are a few physiological capabilities that are basic requirements for the use of technology devices, for example, vision, hearing and memory, all of which decline with age (Schewe, 1998). Adults in general slowly lose fundamental physical capabilities which change their perspectives about technology such as handheld computing systems (Buckner, 2004).

3 RESEARCH QUESTION

What is the importance of handheld computing systems in adulthood? What are some of the challenges when it comes to adopting handheld computing systems? What are the best mechanisms to have when it comes to adopting handheld systems? What is a Handheld Computing System?

4 METHODOLOGY

Methodology is an understandable set of approaches that complement each other and also have the capability to deliver suitable data and results that will answer the research question as well as uniform research purpose (Castro, et al., 2010). Research methodology can be portrayed as the methodical, hypothetical examination of methods associated with a field of study. A methodology does not set out to provide answers. It is not the same thing as a method but offers hypothetical support for understanding which set of methods, or best practices can be used for particular research (Ishak & Alias, 2005).

In addition, methodology is a framework of theories and principles based on the methods and procedures used. Research methodology can be grouped into two aspects which are quantitative and qualitative research methodologies (Bryman, 2012).

A quantitative method was used for this study, based on the empirical investigation of social incidence with the help of statistical, mathematical or numerical data techniques (Kaplan, 2004). A

descriptive research design was also used as it explains the incidence of a variable, the connection between different variables and also assists in deciding when and how many observations or interviews to use in assessing the challenges faced by adult first-time users of handheld computing systems. In addition, a survey was included because it is a non-experimental strategy which was used to evaluate parameters such as age, sex, conjugal status, conduct, assessments and emotions for a particular subject (Shaughnessy, et al., 2011).

4.1 Data Collection Techniques

Data collection can be defined as the orderly assembling or gathering of data from numerous sources for a particular reason and can include questionnaires, interviews, observations or records that already exist. Quantitative or qualitative techniques can be used for collecting data (KPMG, 2010). In this case, a quantitative technique was used to collect data with the help of a well-structured questionnaire.

A questionnaire can be described as a cluster or sequence of questions aimed at producing data from a source or respondent when administered an interviewer or by filling in the questionnaire. Questionnaires can be categorised into three types, namely unstructured, semi-structured and structured (Guo, 2015).

4.2 Research Population

A research population is the number of items, subjects or members that conform to a set of specifications (Yogesh, 2006). The research population is the entire group of a well-defined class of individuals, items, places or proceedings identified as a result of the research question (Hawe & Potvin, 2009). A population is also said to be an accumulation of all the objects, subjects or members that obey a set of plans.

A target population refers to a set of individuals, objects, or features that might add important and constructive documentations of the kind of effort they may give (Marczyk, et al., 2005). Hence, the targeted population for this research was adults in Gauteng province, South Africa, who were first-time users of handheld computing systems or those who had never used any form of ICT device except a cellular telephone.

4.3 Research Sampling

Sampling can be described as the process whereby individuals are selected from the population in such a way that each individual has an equal opportunity to be chosen (Yogesh, 2006). A sample is a portion of the population selected for particular research. It is a subset of a population, and the technique for selecting the sample might be centred on probability and non-probability.

Probability sampling, individual partaker of the population has a known non-zero probability of being chosen. The probability technique consists of random, systematic and stratified sampling. In non-probability sampling, participants are assigned from the population in a non-random manner. The non-probability technique comprises convenience, judgement, quota and snowball sampling.

Probability sampling was selected for this study because sampling errors can be calculated and eliminated. A sampling error is the degree to which a sample might vary from the general population (Marczyk, et al., 2005).

4.4 Research Sample Size

The bigger the sample, the more representative it will be, smaller samples give less reliable results as they are probably going to be less representative of the population (Depoy & Gitlin, 2005). The decision about sample size is not a direct one; it relies on various considerations and does not have a conclusive answer.

In this research, 50 questionnaires were distributed to the targeted population, and 27 of the participants responded about the challenges being faced by them as first-time adult users of handheld computing systems or devices.

4.5 Data Collection Procedures

The literature reviewed stated that adult first-time users of handheld computing systems face some challenges in using them. We met with various participants of the research population and administered structured questionnaires that contained open-ended questions. The survey questionnaires allowed participants to answer questions centred on individual involvement with handheld computing systems and the challenges they faced. The structured questionnaire consisted of the following attributes and was the instrument used to measure the integrity of the data collected.

Validity can be referred to as the level of truth or erroneousness of the data collected with the help of the research instrument. It can also be characterised as both the external and internal validity of the measuring instrument (Graeme, et al., 2006). Validity states the level of truth or erroneousness of the predicted challenges adult first-time users of handheld computing systems experienced while using it.

Reliability states the regularity of amount of a concept (Singer, 2003). Reliability can be considered as the measure of normality with which the instrument estimates a characteristic (Shaughnessy, et al., 2011). It can also be referred to as the sum to which autonomous direction of a similar instrument delivers similar results under proportionate conditions (Thyer, 2001). The less variety the instrument yields in repetitive estimations of an element, the higher the reliability. There is comparability connection among reliability as well as validity. An instrument that is not valid can never be reliable in research. Data Analysis and Discussions

Data analysis is the procedure of getting raw data and translating it into valuable information for decision making by users or researchers. Data are gathered as well as investigated to respond to questions, test hypotheses or negate theories (Judd, et al., 2011).

Tukey et al (1962) characterised data analysis as the methodology for investigating data, techniques for deciphering the outcome of such procedures, methods for arranging the collection of data to make its investigation simpler, more detailed or more exact and all the apparatus and after-effects of (scientific) which apply to analysing data [40].

Data analysis is the procedure of methodically applying arithmetical and coherent systems to explain and demonstrate, summarise, recap and assess data (Shamoo & Resnik, 2003).

4.6 Data Analysis Techniques and Procedures

Data analysis techniques allow research analysts to re-evaluate assembled data and develop surmising or reason from the data. There are different types of data analysis, including quantitative and qualitative analysis. Quantitative data analysis can be referred to as the process of quantifying

5 RESULTS ANALYSIS

Collected data either numerically or arithmetically, while qualitative data analysis is non-numeric or non-

arithmetic, its method is principally steered by the actual material at hand.

Quantitative data analysis was used in this study and can be categorised into various aspects which include descriptive statistics, exploratory data analysis, confirmatory data analysis and correlation and regression data analysis. In this research, descriptive data analysis was used to analyse the collected data. Descriptive data analyses are used to portray the fundamental highlights of the data in an investigation or a research project and they offer basic summaries about the sample and the measures (Trochim, 2006). Descriptive data analyses are used to present quantitative explanations in a convenient structure. Descriptive data analysis also helps us to condense huge amounts of data in a reasonable way with simple graphics analysis.

There are numerous methods and software packages available for data analysis. The appropriate and most ideal procedure for data analysis is to collect the data and check for validity and reliability before entering it into Excel or any other data analysis software. The procedure of data analysis also checked for the variables of the analysed data before displaying it, and a likely scale of point ranging from strongly no to strongly yes was used in the research data analysis.

5.1 Demography

Demography can be referred to as the study of a particular population for research based on things such as age, race and sex, although, other areas can also be involved in the demographics of research.

The demography for this research was based on sex or gender, age and ethnicity. Below is a pie chart depicting this.

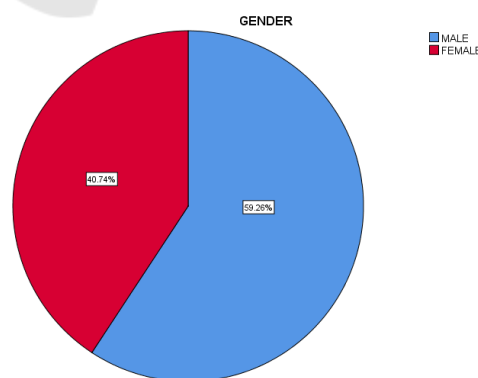


Figure 1: Gender.

Table 1: Gender.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	16	59.3	59.3	59.3
	Female	11	40.7	40.7	100.0
	Total	27	100.0	100.0	

The analysis of gender data collection indicated that male respondents were in the majority, being 59.2% compared to the female respondents at 40.74%.

Table 2: Age.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	55-70	19	70.4	70.4	70.4
	71-91	8	29.6	29.6	100.0
	Total	27	100.0	100.0	

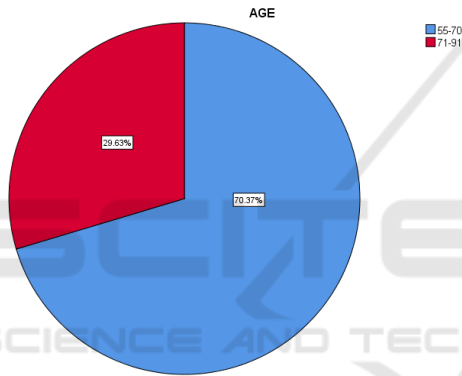


Figure 2: Age.

Adults were divided into two age groups, 55-70 and 71-91. There were 19 respondents in the age group 55-70 (70.37%), and 8 respondents in the 71-91 age group (29.63%).

Table 3: Ethnicity.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BLACK	11	40.7	40.7	40.7
	WHITE	8	29.6	29.6	70.4
	ASIAN	8	29.6	29.6	100.0
	Total	27	100.0	100.0	

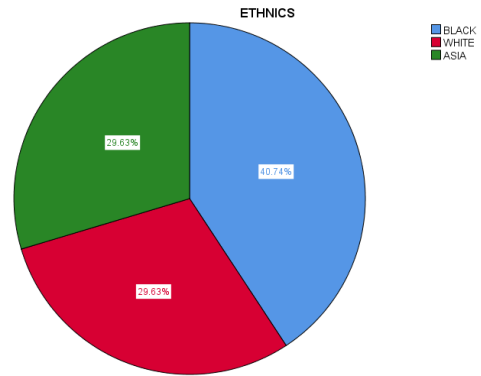


Figure 3: Ethnicity.

The majority of adults who participated in this research were black (40.74%), 29.63% were white, and the remaining 29.63% were Asian. This analysis allows us to know how many adults in each ethnic group participated.

5.2 Answering the Research Questions from the Collected Data

a) *What is the importance of handheld computing systems in adults:* The findings from the data analysis of the first research question which involved the importance of handheld computing systems in adults, are shown in the Tables below.

Table 4: Question 1.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SLIGHTLY YES	5	18.5	18.5	18.5
	YES	11	40.7	40.7	59.3
	STRONGLY YES	11	40.7	40.7	100.0
	Total	27	100.0	100.0	

Question 1: Have you ever accessed the Internet? The majority of the respondents answered Yes meaning 100% of them have accessed the Internet by means of handheld computing or other systems. However, according to the literature reviewed, computing systems with Internet access offer new methods of communication which are available to all individuals as well as to assist older adults in overcoming hurdles in social interaction among themselves (Young & Lo, 2012).

Table 5: Question 2.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	5	18.5	18.5	18.5
	NEUTRAL	2	7.4	7.4	25.9
	SLIGHTLY YES	8	29.6	29.6	55.6
	YES	8	29.6	29.6	85.2
	STRONGLY YES	4	14.8	14.8	100.0
	Total	27	100.0	100.0	

Question 2: Have you ever used a handheld computing system? Data analysis showed that a few respondents (7.4%) answered 'Neutral' to this question; 18.5% of them answered 'No' and 74% answered 'Yes'. With regard to this finding, a few scientists have shown that adults are growing up progressively more acquainted with innovation or technology (Matlabi, et al., 2012). Nevertheless, adults usually have substantially more diverse needs, concerns, capacities and capabilities with technology or innovation compared to younger people (Chen & Persson, 2002).

Table 6: Question 4.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY NO	2	7.4	7.4	7.4
	SLIGHTLY NO	2	7.4	7.4	14.8
	NO	6	22.2	22.2	37.0
	NEUTRAL	9	33.3	33.3	70.4
	SLIGHTLY YES	8	29.6	29.6	100.0
	Total	27	100.0	100.0	

Question 4: Is a handheld computing system useful for your daily tasks? Elements of effectiveness, efficiency and fulfilment ought to be considered as discrete and autonomous parts of understanding the usability of handheld computing systems (Frøkjær, et al., 2000). According to the data analysis, 33.3% of the respondents answered 'Neutral', 37% answered 'No', and 29.6% answered 'Yes' to this question. However, the latest information demonstrates that older adults utilise different types of technology such as automated teller machines (ATMs) compared to the younger ones (Czaja, et al., 2006). In addition, older adults are left behind and are less independent if they do not have access to and are not able to utilise technology. For instance, handheld computing systems with Internet access are quickly turning into a significant means of communicating and distributing information about wellbeing, society and government services.

Table 7: Question 5.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY NO	2	7.4	7.4	7.4
	SLIGHTLY NO	2	7.4	7.4	14.8
	NO	8	29.6	29.6	44.4
	NEUTRAL	10	37.0	37.0	81.5
	SLIGHTLY YES	5	18.5	18.5	100.0
	Total	27	100.0	100.0	

Question 5: Does the handheld computing system interface suit your lifestyle? Based on the outcome of this particular question, the respondents said the interface of handheld computing systems does not suit them; 44.4% said 'No', 18.5% said 'Yes' and 37% were 'Neutral'. The result also showed that not much has been done to make the handheld computing system interface suitable to adult first-time users. Technology may have some adverse impacts on well-being, and it is vital to ensure that the introduction of technology into the lives of older adults is done analytically and with care to suit their lifestyles (Dickinson & Gregor, 2006).

Table 8: Question 14.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY NO	2	7.4	7.4	7.4
	SLIGHTLY NO	4	14.8	14.8	22.2
	NEUTRAL	13	48.1	48.1	70.4
	SLIGHTLY YES	8	29.6	29.6	100.0
	Total	27	100.0	100.0	

Question 14: Will you use handheld computing systems? The findings from this question indicated that the majority of the respondents said they did not know if they would use a handheld computing system, 48.1% were 'Neutral', 22.2% said 'No', and 29.6% said 'Yes'. The usability of handheld computing systems has been explored for some time. Scientists place emphasis on improving ease of use by considering the impact of age-related physical deterioration (Zhou, et al., 2012). The basic reason that adults do not accept handheld computing systems is, by all accounts, as a result of having difficulty in using them. This means that, if ease of use improves, they would more readily accept handheld computing systems.

b) *What are some of the challenges when it comes to adopting handheld computing systems:* The

data collected from the respondent's answers to this question were analysed and discussed in the Tables below.

Table 9: Question 6.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SLIGHTLY NO	1	3.7	3.7	3.7
	NO	1	3.7	3.7	7.4
	NEUTRAL	7	25.9	25.9	33.3
	SLIGHTLY YES	9	33.3	33.3	66.7
	YES	2	7.4	7.4	74.1
	STRONGLY YES	7	25.9	25.9	100.0
	Total	27	100.0	100.0	

Question 6: Do you have issues using a handheld computing touch screen? Based on the feedback from the respondents, 25.9% were 'Neutral', 7.4% said 'No' and 66.6% said 'Yes'. Meaning they are having issues using handheld computing system touch screens. The literature reviewed of handheld computing systems emphasises that adults, in general, slowly lose fundamental physical capabilities which makes their perspectives about technology such as handheld computing systems change (Buckner, 2004).

Table 10: Question 7.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY NO	1	3.7	3.7	3.7
	SLIGHTLY NO	6	22.2	22.2	25.9
	NEUTRAL	3	11.1	11.1	37.0
	SLIGHTLY YES	8	29.6	29.6	66.7
	YES	9	33.3	33.3	100.0
	Total	27	100.0	100.0	

Question 7: Can you see the display input on handheld computing system? The respondents have different views on this question. When it comes to seeing the display, 11.1% of the respondents said they were 'Neutral', 25.9% said 'No', they cannot see the display input and 62.9% said 'Yes' they can see it.

Table 11: Question 8.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY NO	1	3.7	3.7	3.7
	SLIGHTLY NO	3	11.1	11.1	14.8
	NO	3	11.1	11.1	25.9
	NEUTRAL	10	37.0	37.0	63.0
	SLIGHTLY YES	9	33.3	33.3	96.3
	YES	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

Question 8: Can you navigate through handheld computing system functions easily? The negative views of adult first-time users can be attributed to hurdles in accepting technology. The outcome of this analysis indicated that 37.0% of them chose 'Neutral', 25.9% said 'No', and 37% said 'Yes'. Weakness, incapacity, distrust of technology, absence of perceived value and trouble working out how to utilise the device are the main challenges observed by adult first-time users in endeavouring to accept new technologies such as handheld devices (Czaja & Sharit, 2016).

Table 12: Question 9.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NEUTRAL	2	7.4	7.4	7.4
	SLIGHTLY YES	8	29.6	29.6	37.0
	YES	14	51.9	51.9	88.9
	STRONGLY YES	3	11.1	11.1	100.0
	Total	27	100.0	100.0	

Question 9: Do you struggle to select a specific icon because your thumb feels too big for the device? The data analysis for this research question shows that 7.4% of the respondents chose 'Neutral', 92.6% and chose 'Yes' meaning they are struggling to select a specific icon on the device. Based on the review of the literature, adults are sluggish in movement and make more sub-movements in operating handheld computing systems (Hertzum & Hornbæk, 2010). This impacts content entry and pointing activities.

Table 13: Question 10.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	1	3.7	3.7	3.7
	NEUTRAL	10	37.0	37.0	40.7
	SLIGHTLY YES	5	18.5	18.5	59.3
	YES	5	18.5	18.5	77.8
	STRONGLY YES	6	22.2	22.2	100.0
	Total	27	100.0	100.0	

Question 10: Do you feel that you have to remember too many functions while using handheld computing systems? Adult first-time users of handheld computing systems felt that they have to remember too many functions while using the device; 59.2% of them said ‘Yes’, 37.0% were ‘Neutral’ and 3.7% said ‘No’. On account of age-related, physiological weakening, just as mental and social-ecological changes, it is troublesome for adult first-time users to adjust to new technology devices such as handheld computing systems, and a large number of them quickly dismiss new devices (Lee, et al., 2014).

c) *What are the best mechanisms to have when it comes to adopting handheld systems:* Data collected from the responses to this question were analysed is discussed below for each of the questions.

Table 14: Question 3.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NEUTRAL	6	22.2	22.2	22.2
	SLIGHTLY YES	5	18.5	18.5	40.7
	YES	9	33.3	33.3	74.1
	STRONGLY YES	7	25.9	25.9	100.0
	Total	27	100.0	100.0	

Question 3: Can you afford any kind of handheld computing system? The majority of the respondents (77.7%) said ‘Yes’ and 22.2% chose ‘Neutral’. The adoption of technology, such as a handheld computing system, is influenced by two types of influence: direct positive influence and direct negative influence (Melenhorst, et al., 2006). Direct positive influence is related to advantages, and lack of expense and direct negative influence is related to expenses and lack of advantages.

Table 15: Question 11.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SLIGHTLY NO	1	3.7	3.7	3.7
	NO	3	11.1	11.1	14.8
	NEUTRAL	8	29.6	29.6	44.4
	SLIGHTLY YES	11	40.7	40.7	85.2
	YES	4	14.8	14.8	100.0
	Total	27	100.0	100.0	

Question 11: Did your previous experience as a mobile device user help in accepting a handheld computing system as a tool? The majority of respondents (55.5%) answered ‘Yes’ to this question; 29.6% were neutral, and 14.8% said ‘No’.

Table 16: Question 12.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	2	7.4	7.4	7.4
	NEUTRAL	5	18.5	18.5	25.9
	SLIGHTLY YES	11	40.7	40.7	66.7
	YES	7	25.9	25.9	92.6
	STRONGLY YES	2	7.4	7.4	100.0
	Total	27	100.0	100.0	

Question 12: Do you ask for help when using a handheld computing system? The majority of the respondents (74%) answered ‘Yes’, 7.4% said ‘No’ and 18.5% chose to be neutral. With regard to the literature reviewed, help from relatives and non-family members, social and cultural variables, identity attributes, communication media conduct and socioeconomic status have all been identified as assisting adults in the adoption of technologies such as handheld computing systems (Quan-Haase, et al., 2016).

Table 17: Question 13.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SLIGHTLY NO	1	3.7	3.7	3.7
	NEUTRAL	14	51.9	51.9	55.6
	SLIGHTLY YES	1	3.7	3.7	59.3
	YES	4	14.8	14.8	74.1
	STRONGLY YES	7	25.9	25.9	100.0
	Total	27	100.0	100.0	

Question 13: Is a handheld computing system too smart or fast for your liking? The data collected and analysed from this question showed that 44.4% of the

respondents said ‘Yes’ that a handheld device is too smart for them, 51.9% were neutral, and 3.7% said ‘No’ to the question.

Table 18: Question 15.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY NO	12	44.4	44.4	44.4
	SLIGHTLY NO	5	18.5	18.5	63.0
	NO	7	25.9	25.9	88.9
	NEUTRAL	3	11.1	11.1	100.0
	Total	27	100.0	100.0	

Question 15: Do you feel that your needs as an adult first-time user were taken into consideration by systems developers? This particular question was designed for the developers to know what is needed in developing handheld computing systems that will be user-friendly for adult first-time users of handheld devices. However, with the data collected and analysed, 88.8% of respondents said ‘No’ to this question, and 11.1% chose to be neutral.

6 CONCLUSION

The main aim of this research study was to gain an understanding and knowledge of challenges being faced by adult first-time users of handheld computing systems. To provide solutions to these issues, a literature review was carried out to find out the extent of the challenges.

A few of the challenges faced by adult first-time users of handheld computing systems can be described as usability and acceptability of computing systems in general. Adult first-time users have issues with the design interface of handheld computing systems such as screen displays and hieratical menus.

A broad literature review was done to gain full knowledge and understanding of the importance of computing systems in general. Computing systems have changed our lifestyles in the way we live and do things. They also allow us access to information when required. Handheld computing systems can assist adults, in particular, to overcome social exclusion, keep contact and enable them to have free access to information such as health and society information. We also explored different kinds of handheld devices and the value they add to the life of adult first-time users.

A structured questionnaire and suitable population sampling were used to gather data from the research

population. Probability sampling was considered to be the best method of sampling to avoid sampling errors.

Validity and reliability were instruments used in validating collected data and measuring the integrity of data collected from the participants.

The research sample size was 50 adults between the ages of 55 and 91 in Gauteng province, South Africa and was not randomised. The outcome of the research is only relevant to this sample and cannot be generalised.

A large percentage of the data and information originated from the point of view of the research participants. The participants should not have had any motivation to incorporate feelings in their answers, but this does not guarantee the precision of the responses. The participants may not be completely mindful of their conduct or discard data that they have just overlooked

The restricted time to accumulate information and data from research participants impacted how much of it could be assembled. The number, as well as the nature of the questions in the research questionnaire, needed to be completed within a short time, which meant the scope of the questions was limited.

Lastly, adoption and usability of handheld devices by adult first-time users can be seen as a big issue. However, a proper design interface such as considering age-related issues like a decline in vision, hearing and movement should be considered for adult users in general when any technology interface is developed.

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