



Prospects and challenges of android phone maintenance and repairs among electronic craftsmen in Niger State

Sunday A Alome¹, Bamidele AO Ogumah²

¹ Industrial and Technology Education Department, Federal University of Technology, Minna, Nigeria

² Department of Electrical/Electronics, Federal College of Education (Technical) Gombe, Nigeria

Abstract

The study was conducted to ascertain the prospects and challenges of android phone maintenance and repairs among electronic craftsmen in Niger state. The study was a survey research in which data was collected through a 20 items questionnaire on a population of 50 respondents purposely sampled. 6 electronic teachers, from Federal University of Technology (FUT) Minna, College of Education (COE) Minna and Government Technical College (GTC) Minna and 44 electronic technicians from Bida, Minna, Kontagora and Suleja. Data collected from the research questions was analysed using mean and standard deviation on a 4-point rating scale, while t-test was used to test the null hypothesis at 0.05 level of significance. Findings of the study revealed prospects and challenges of android phone maintenance and repairs amongst electronic craftsmen in Niger state, it further revealed the challenges associated with electronic technicians in the use of modern tools and equipment in maintenance and repair of android phone. the study suggested that Government should open skill acquisitions centres for training and retraining of electronic craftsmen to equip them with the requisite skills to enable them cope with modern challenges in new technological innovations in android phone maintenance and repairs.

Keywords: android phone, maintenance and repairs, electronic craftsmen

Introduction

Android is a mobile operating system developed by Google. It is used by several smartphones and tablets. The Android operating system (OS) is based on the Linux kernel. Unlike Apple's iOS, Android is open source, meaning developers can modify and customize the OS for each phone in mobile communication technologies. Mobile communication technologies are modified computers with communication features. They have the capability of receiving, processing, transmitting data, voice and video signals through wireless link. Darby (2005) stated that Android mobile communication technologies are those technologies which depend upon the broader phenomenon of internet protocol (IP) convergence when data, voice and video travel over a single channel.

According to the Report of United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2005) IP includes devices such as internet, which converts the package that belongs to a voice, data or video exchange into the appropriate presentation. Android phones can enable someone to use a variety of communications technologies such as: (i) wireless fidelity (Wi-Fi) - a type of wireless local area network technology; (ii) Bluetooth - connects mobile devices wirelessly; (iii) global system of mobile (GSM) for communications and general pocket radio service (GPRS) data networking services for android mobile phones; (iv) dial-up services - data networking services using modems and telephone lines and (v) virtual private networks - secure access to a private network. An android phone is also called mobile phone, hand phone, handset or mobile. It is a portable telephone that uses wireless cellular technology to send and receive phone signals. Hahn and Kibora (2008) described android phone as an electronic device used to make mobile

telephone calls across a wide geographic area. David (2011) said that mobile phone is a cordless telecommunication device. Business Link (2011) reported that that an android phone can make and receive telephone calls to and from the public telephone network which includes other mobiles and fixed-line phones across the world. It does this by connecting to cellular network owned by a mobile network operator.

Android phone is a telephone that does not have wires and works by radio wave that can carry calls to anywhere. Feig-Nancy (2007) stated that android phones and their network vary very significantly from provider to provider and country to country. However, the basic communication method of all of them is through the electromagnetic microwaves with a base station.

Android phones that offer advanced computing abilities are referred to as smart phones. They are capable of sending and receiving emails, editing documents and storing files. Prasart (2006) described smart phones as third generation (3G) mobile phones which mostly use Symbian operating system, linux and windows. Smart phones are non-touch screen devices that offer a robust mobile operating system (James, 2011). Among the common components found in android phones are a rechargeable battery to provide power source for the phone functions, input mechanism (keyboard and touch screens) and display to allow the user to interact with the phone. Subscriber identification module (SIM) card allows an account to be swapped among devices. David (2011) mentioned components of android phones to include liquid crystal display (LCD), menu button, keypad, antenna, battery, microphone, earpiece, power switch, battery terminal, power integrated circuit, oscillator, frequency divider, central processing unit, flash chips and SIM. Android phones and

their components are prone to faults like hardware faults, software faults and setting faults (Boniface, 2008).

Android phones help in selling and buying of goods and services with ease but has created some management problems to the users in the areas of maintenance, repair and servicing (James, 2011). Most of the users could not easily locate efficient craftsmen who can repair and service faulty android phones thereby making users whose android phones are bad to abandon them for the purchase of new ones. If the faults could be repaired or maintained, it will reduce continuous spending of money and electronic wastage which can cause health problems such as cancer to people especially where they are disposed carelessly. In order to maintain damaged or malfunctioning android phones, there is need to train electronic craftsmen for android phone maintenance and repair. Electronic craftsmen maintaining android phones in Nigerian society are not formally trained and therefore use trial by error approach during maintenance and cause more problems to android phones contracted to them (Sarah, 2010).

Maintenance is the process of preserving something or state of being maintained. Maintenance according to Olaitan and Nwoke (1999) is a set of measure or steps taken to ensure that a given piece of equipment or infrastructure is kept in good operational order until it attains its maximum possible life span. In the Report of Microsoft Corporation (2009) maintenance is described as the work done regularly to keep a machine, building, or piece of equipment in good condition and working order. According to the Report, two major types of maintenance can be carried out on android phones. They are preventive and corrective maintenance. Preventive maintenance is systematic inspection, detection, correction and prevention of incipient failures, before they become actual or major failures. Corrective maintenance is the activity undertaken to detect, isolate and rectify a fault so that the failed equipment, faulty android phone, machine or system can be restored to its normal operable state.

Maintenance therefore is the activities carried out to repair, service, flash, upgrade, jail break and configure damaged or malfunctioning android phones. Since these android phones are made of integrated circuits, these integrated circuits are made up of microchips, thus making the appliance to be more sophisticated and delicate to handle. The importance of android phone in our day to day activities are too numerous to mention, for instance calls are made in the comfort of our house, we can easily send emails and receive in micro time, WhatsApp, Instagram, and so many other thing too numerous to mention, this features has made android phone an important tool in our day to day life.

In today's electronic workshops, the expected maintenance practice has changed from manual method of diagnosing faults to the use of diagnostic scan tools, equipment and machines to enhance accuracy in fault diagnosis and repairs. The change in the expected maintenance practices is due to the various technological innovations in modern electronic appliances intended to increase high output, safety, and improved comfort to the users. The emergence of these new innovations due to technological dynamism has however made the Android phone more sophisticated. Hence the need of expertise is required in maintenance and repair practice.

Purpose of the study

The purpose of this study is to ascertain the prospects and challenges of android phone maintenance and repairs among electronic craftsmen in Niger state, specifically the study sought to:

Determine the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state.

Identify challenges of android phone maintenance and repairs among electronic craftsmen in Niger state.

Research questions

What are the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state?

What are the challenges of android phone maintenance and repairs among electronic craftsmen in Niger state?

Research Hypothesis

There following null hypothesis were formulated and tested at 0.05 level of significance

H0₁: There is no significant difference in the mean responses of electronic teachers and electronic craftsmen on the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state.

H0₂: There is no significant difference in the mean response of electronic teachers and electronic craftsmen on the challenges of android phone maintenance and repairs among electronic craftsmen in Niger state.

Methodology

The study was a survey research design. the design was used to gather opinion on the prospects and challenges of android phone maintenance and repairs among electronic craftsmen in Niger state. Olaitan and Nwoke (1999) defined survey research design as one in which a group of people or items in studied by collecting and analysing data from people or items considered to be representative of the entire group. A purposive sampling technique was used to select the study area which are Bida, Minna, Kontagora and Suleja. These areas were considered because they have high concentration of electronic craftsmen and workshops. A Structured questionnaire containing 20 items on a 4 point rating scale was used to collect data from the respondents, the questionnaire was structured to indicate the degree to which respondents agree to each item as Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) the response category was assigned numeral values as 4 3 2 and 1.

The questionnaire was validated by three experts from FUT Minna, COE Minna and GTC Minna. Corrections and observations made by experts were effected before the administration of the instrument. The weighted mean (X) and Standard Deviation (SD) were used to answer the research questions. Therefore, items with mean score below 2.50 were considered as disagreed while those with score at 2.50 and above were considered as agreed. The t-test statics was used to test the hypothesis at 0.05 level of probability. The t-critical (t-table) value of accepting or rejecting the null hypothesis was ± 1.98 .

Research Question 1

What are the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state?

Table 1: Mean and standard deviation of respondents on prospects of android phone maintenance and repairs among craftsmen in Niger state

S/NO	Item	Electronic craftsmen			Electronic Teachers		
		X	SD	DEC	X	SD	DEC
1	Government should plan loan facilities for electronic craftsmen	3.06	.72	A	2.87	.640	A
2	Electronic craftsmen should be trained on the knowledge of modern tools and equipment.	3.00	.68	A	3.33	.724	A
3	Electronic craftsmen should be trained on knowledge to interpret readings on the meter	2.80	.86	A	2.93	.594	A
4	Electronic craftsmen should have adequate knowledge of diagnostic trouble code (DTC)	2.77	.90	A	2.73	.799	A
5	Electronic craftsmen should be trained on adequate knowledge of correct procedures for maintenance and repair of android phone	2.57	1.00	A	2.87	.743	A
6	Electronic craftsmen should be more conversant with digital meters for precision	2.86	.73	A	2.73	.884	A
7	Electronic craftsmen should have adequate knowledge of modern tools to read ratings on faulty component of android phone	3.06	.76	A	2.67	.617	A
8	Electronic craftsmen should have adequate knowledge in identifying of integrated circuit (ic) in maintenance and repairs of android phone	2.77	.97	A	3.00	.535	A
9	Electronic craftsmen should have modern tools and equipment.	3.11	.71	A	3.07	.458	A
10	Electronic craftsmen should use correct tools and equipment for maintenance and repairs of android phone	3.40	.60	A	2.53	.640	A

Analysis on table 1 shows that 10 of the items presented had their weighted mean values ranged from 2.80- 3.75. These values are above the cut of point of 2.50 who implies that the respondent agreed with the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state.

Research Question 2

What are the challenges of android phone maintenance and repairs among electronic craftsmen in Niger state?

Table 2: Mean and standard deviation of respondents on the challenges associated with android phone maintenance and repairs among electronic craftsmen in Niger state

S/NO	Item	Electronic craftsmen			Electronic Teachers		
		X	SD	DEC	X	SD	DEC
11	Electronic craftsmen adopt obsolete diagnostic procedure in their maintenance and repair practices	3.00	.76	A	2.93	.59	A
12	Electronic craftsmen depend on old experience rather than modern technique	3.34	.63	A	3.00	.53	A
13	Electronic craftsmen use old and worn out equipment in their jobs	2.94	.76	A	3.07	.59	A
14	Electronic craftsmen use trial and error method in fault diagnosis and repair practices	3.03	.70	A	3.07	.70	A
15	Electronic craftsmen have inadequate knowledge to interpret meter reading in maintenance and repair practices	3.00	.70	A	3.27	.70	A
16	Electronic craftsmen commonly neglect standard procedures for troubleshooting faults in android phone maintenance and repair	3.23	.69	A	2.80	.94	A
17	Electronic craftsmen usually neglect the use of electrical/electronic circuit in the maintenance and repair of android phone	3.14	.64	A	3.13	.74	A
18	Electronics craftsmen use wrong tools and equipment in maintenance and repair practices	3.20	.63	A	3.13	.64	A
19	Electronic craftsmen cannot interpret circuit diagrams perfectly	3.09	.65	A	3.27	.79	A
20	Electronic craftsmen rarely make references to manual in maintenance and repair of domestic appliances	2.94	.72	A	2.87	1.06	A

The data analysed in table 2 revealed that all the items had their mean values ranged from 2.60 – 3.80. Since the cut off value is 2.50, it indicates that the respondents agreed to all the challenges with android phone maintenance and repairs among electronic craftsmen in Niger state.

Research Hypothesis 1

H0: There is no significant difference in the mean responses of electronic teachers and electronic craftsmen on the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state

Table 3: t-test analysis of mean responses of respondents on the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state

S/NO	Item Statement	Electronics craftsmen		Electronic Teachers				
		X	SD	X	SD	t-cal	T-Tab	Remark
1	Government should plan loan facilities for electronic craftsmen	3.06	.72	2.87	.64	0.82	1.98	NS
2	Electronic craftsmen should be trained on the knowledge of modern tools and equipment.	3.00	.68	3.33	.72	0.67	1.98	NS
3	Electronic craftsmen should be trained on knowledge to interpret readings on the meter	2.80	.86	2.93	.54	0.83	1.98	NS
4	Electronic craftsmen should have adequate knowledge of diagnostic trouble code (DTC)	2.77	.91	2.73	.79	1.24	1.98	NS
5	Electronic craftsmen should be trained on adequate knowledge of correct procedures for maintained and repair of android phone	2.57	1.00	2.87	.79	1.22	1.98	NS

6	Electronic craftsmen should be more conversant with digital meters for precision	2.86	.73	2.73	.88	0.88	1.98	NS
7	Electronic craftsmen should have adequate knowledge of modern tools to read ratings on faulty component of android phone	3.06	.76	2.67	.61	0.34	1.98	NS
8	Electronic craftsmen should have adequate knowledge in identifying of integrated circuit (ic) in android phone	2.77	.97	3.00	.53	0.77	1.98	NS
9	Electronic craftsmen should have modern tools and equipment.	3.11	.71	3.07	.45	0.63	1.78	NS
10	Electronic craftsmen should use correct tools and equipment for maintenance and repairs of android phone	3.40	.60	2.53	.64	0.82	1.98	NS

The t-test analysis from table 3 revealed that all the items had their t-calculated (t-cal) values less than the t- table (t-tab) values of ± 1.98. This implies that there was no significant difference in the mean rating of the responses of the responded of electronic craftsmen and electronic teachers on the prospects of android phone maintenance and repairs among electronic craftsmen in Niger state

H0₂ There is no significant deference in the mean responses of electronic teachers and electronic craftsmen on the challenges associated with android phone maintenance and repairs among electronic craftsmen in Niger state.

Table 4: t-test of mean responses of respondents on the challenges associated with the use of modern tools and equipment in the maintenance and repair of Android phone by electronic craftsmen

S/NO	Item Statement	Electronic Technicians		Electronic Teachers				
		X	SD	X	SD	t-cal	t-tab	Remark
11	Electronics craftsmen adopt obsolete diagnostic procedure in their maintenance and repair practices.	3.00	.76	2.93	.59	0.44	1.98	NS
12	Electronics craftsmen depend on old experience rather than modern technique	3.34	.63	3.00	.53	.33	1.98	NS
13	Electronic technician uses old and worn out equipment in their job	2.94	.76	3.07	.59	.66	1.98	NS
14	Electronics craftsmen use trial and error method in fault diagnosis and repair practices	3.03	.70	3.27	.70	0.82	1.98	NS
15	Electronics craftsmen has inadequate knowledge to interpret meter readings in maintenance and repair practices	3.03	.74	3.07	.70	1.00	1.98	NS
16	Electronics craftsmen commonly neglect standard procedures for troubleshooting faults in domestic appliance	3.23	.69	2.80	.94	0.78	1.98	NS
17	Electronic craftsmen usually neglect the use of electrical/electronic circuit in the maintenance and repair of domestic appliance.	3.14	.64	3.13	.74	.53	1.98	NS
18	Electronic craftsmen use wrong tools and equipment in maintenance and repair practices	3.20	.63	3.13	.64	0.79	1.98	NS
19	Electronic craftsmen have inadequate knowledge to interpret circuit diagram	3.09	.65	3.27	.79	0.56	1.98	NS
20	Electronic craftsmen rarely make references to manual in maintenance and repair of domestic appliances.	2.94	.72	2.87	1.00	0.55	1.98	NS

The t-test analysis from table 4 revealed that the items had their t-calculated (t-cal) values less than the table (t-tab) value of ± 1.98. This implies that items was no significant difference in the means rating of the response of the respondent of electronics craftsmen and electronics teachers on the challenge associated with the used of modern tools and equipment in the maintenance and repair of android phone.

Findings of the study

The following were the major findings of the study on the prospects and challenges of android phone maintenance and repairs among electronic craftsmen in Niger state, findings revealed amongst others that

- Electronics craftsmen adopt obsolete diagnostic procedure in their maintenance and repair practice
- Electronics craftsmen used trial and error method in fault diagnosis and repair practices.
- Electronics craftsmen cannot interpret circuit diagram perfectly.
- Electronics technician has shortage of modern tools and equipment.
- Electronics technician has inadequate knowledge to interpret meter reading in maintenance and repair practices.
- Electronics craftsmen commonly neglect standard procedures for trouble –shooting fault in android phone.
- Electronics craftsmen used wrong tools and equipment in maintenance and repair practices
- Electronics craftsmen used old and worn out equipment in the maintenance and repair of android phone
- Electronics craftsmen are not use to digital meters.

Discussion of findings

Analysis from table 1 revealed that the respondents agree with all the 10 items. For example, the respondent agreements with the items 1: electronics craftsmen adopt obsolete diagnostic procedure in their maintenance and repair work as opined by (Prasart, 2006) that electronics craftsmen are not aware of modern diagnostic procedures.

The respondent views on items 8 indicate that electronics craftsmen used wrong tools and equipment in maintenance and repair practices (Hahn & Kibora, 2008) lamented on the wrong used of tools and equipment in the electronic workplaces.

The acceptance of all items on Table 2 suggest that all the items are valid as regard to the challenges associated with electronic technician in the use of modern tools and equipment in the maintenance and repair of android phones.

On the hypotheses, the study shows that there was no significant difference in the mean rating of the responses of the respondents on: prospects and challenges of android phone maintenance and repairs among electronic craftsmen in Niger state. The study shows that electronics craftsmen has challenge in the used of modern tools and equipment, which call for training and courses on the use of modern equipment in maintenance and repair of android phone.

Conclusion

Based on the findings of the study, it is clear that the prospects are numerous. Challenges of android phone maintenance and repairs among electronic craftsmen in Niger state are numerous. The challenges rages from inadequate tools, lack of modern tools, and the use of wrong tools. These challenges are numerous with

the electronics craftsmen, this deficiency has an adverse effect on the public perception of the electronics craftsmen therefore, there is need to equip the electronics craftsmen, with the requisite work skill to enable him meet up with modern challenges in the maintenance and repair of android phone.

Recommendations

Based on the findings of the study, the following recommendations were made.

- Government at various level, should try to establish technical and training centre for training electronics craftsmen in the used of modern equipment.
- Private individual /companies should consist in providing modern equipment to be use by electronics craftsmen.
- The curriculum planners and developers should emphasis more on practical skills than the theory aspects.
- Training courses and seminars should be organized at intervals to update and upgrade the work skill of electronics craftsmen
- Government should assist electronics craftsmen with soft loans to enable them buy modern tools and equipment.

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