

ORIGINAL RESEARCH ARTICLE

Challenges and Prospects of Marketing Nigerian-Made Computer Software: A Study on Attitudes and Marketability.

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ABSTRACT

This research aims to investigate the challenges and opportunities associated with marketing Nigerian-made computer software. Specifically, it aims to explore the negative perception of locally produced goods and the consequent advantage enjoyed by foreign products. Through the analysis of people's attitudes towards Nigerian-made software, the study aims to identify strategies that can enhance its marketability. The study involved the participation of fifty computer science students and lecturers, and the results indicate that persuading organizations to adopt locally produced software is a significant challenge. To promote healthy competition against foreign software, it is necessary to create a conducive environment for Nigerian computer scientists. Additionally, the quality of the software should be ensured with a focus on security, graphics, and user-friendliness. This research has significant practical implications for businesses and offers opportunities for researchers and consultants to delve deeper into the field. Furthermore, the findings of this study can potentially inform academic advancements in this area.

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INTRODUCTION

The term "software" refers to a set of instructions, data, and programs that enable electronic devices, such as computers, to perform specific tasks (Ayanda & Laraba, 2011). "Made-in-Nigeria software" refers to software created by Nigerian citizens within the country (Alami et al., 2022; Aminu Muazu et al., 2023). In 1988, the Nigerian government introduced the Enterprises Promotion Decree to promote local goods, create job opportunities, and reduce foreign control. However, Nigeria still faces challenges such as inadequate management, leadership, and a lack of vision that affect businesses of all sizes (Margaret Wilson, 2001).

Marketing involves identifying, anticipating, and meeting customer needs for profitability. To drive profitability, it is essential to understand consumer needs, segment the market, and establish a competitive advantage. Despite the potential benefits of made-in-Nigeria software, challenges such as inadequate infrastructure and a lack of software engineering practices hinder progress (Michel & Wagner, 2002; Nowduri, 2011). On the other hand, the Nigerian software developers face significant challenges in becoming global players in the high-value ICT sector, including a lack of support from the government and limited access to funding and technology. Additionally, uncoordinated business ideas, poor product quality, and

political and social instability hinder marketing efforts for locally made products. Therefore, the current study aims to identify the challenges of marketing Nigerian-made software by conducting a literature review on the topic, highlighting the marketing obstacles, and suggesting strategies to address these challenges.

As software plays a crucial role in the global knowledge economy, and the adoption of ICT tools and technologies further amplifies its value (Alami et al., 2022). The software presents a significant opportunity for Nigeria to establish a strong position in the global ICT value chain, including creators, distributors, resellers, and consumers. While Nigeria's ICT market is active in trade, imports, and consumption, these alone are insufficient for success in the new economy. The software industry can unlock opportunities, leveraging Nigeria's educated, young, and innovative population. To achieve this, the Nigerian government collaborates with software practitioners through the Nigerian Software Development Initiative (NSDI) (Barnabas, 2013).

Small and Mid-size Enterprises (SMEs) play a vital role in the production of locally made goods, generating industrial wealth and contributing to real economic development (Ayanda & Laraba, 2011). To promote e-farming in Nigeria, a framework for the application of

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Nigerian e-farming was proposed and developed, emphasizing the need for infrastructural facilities and IT education (Barnabas, 2013).

Another research project successfully developed a software application for secondary schools that streamlines the processing of students' results. This application has been thoroughly tested and proven to work as intended. It offers high-speed and accurate storage and processing of students' results, generating output in the required formats. Key benefits include cost reduction, time savings in result computation, automatic generation of class positions, and elimination of duplicate efforts compared to manual record-keeping systems (Añulika et al., 2014).

STI&C is a software that presents the design, structure, and programming process of the Telemetry, Tracking, and Control subsystems for a Nigerian satellite modelled after SPOT4. The satellite's daily operations rely on commands received from the operations control centre. The flight software manages tasks such as scheduling imagery acquisition based on customer requests when the satellite passes over the desired area. It also performs orbit corrections to maintain the satellite's trajectory and monitors all equipment by communicating with each subsystem (Nwachinemelu & Anyaegbunam, 2016).

A proposed and developed framework for cow identification in Nigeria has utilized an algorithmic method to calculate a check digit for code matching. This software aims to reduce incidents of cattle theft and trespassing on farmlands, while also facilitating the management of animal health information and performance records (Bello & Abubakar, 2019).

A Nigerian-made software testing strategy was developed for pairwise testing. The strategy utilizes the harmony search algorithm to generate optimized final test suites and is capable of purposefully testing a configuration to identify faults that may arise during interactions between system components (Aminu Muazu & Maiwada, 2020).

ALAT is a cutting-edge online business software from WEMA that offers a complete digital banking experience to its users. With ALAT, individuals can easily open and manage a bank account from the comfort of their homes using any internet-connected device. The platform is accessible via a web interface and a mobile app that is available for both Android and iOS devices. I was impressed by the platform's positive user reviews and its 4.2-star rating on the Play Store, which prompted me to give it a try. Signing up for ALAT was a breeze, as it only required me to provide my phone number, BVN (Bank Verification Number), and date of birth, followed by entering the OTP (One-Time Password) sent to my registered BVN phone number. The platform automatically retrieved my personal details, such as my full name, gender, and date of birth, from my BVN registration information and prompted me to verify them. A password setup and security question selection

completed the registration process, and I was able to access my fully functional ALAT account within minutes (Soetan et al., 2021).

Despite the limitations of existing software, let's now shift our focus to the current research trend, which aims to investigate the challenges and opportunities associated with marketing Nigerian-made computer software. Through an analysis of people's attitudes toward Nigerian-made software, this study will identify strategies to enhance its marketability. However, the following section will explore how the study was conducted.

MATERIALS AND METHODS

This study conducted and validated the challenges and opportunities associated with marketing Nigerian-made computer software using a questionnaire in six phases: case study, survey instrument, questionnaire design, validity of instrument, and analytical techniques. The Department of Computer Science Research Ethics Board at Umaru Musa Yar'adua University approved the study through a comprehensive review process. Additionally, all participants provided informed consent.

Case Study

The study is conducted in Nigeria, one of the most populous countries in Africa. According to the National Population Commission, Nigeria's population is about 280 million, a number disputed by the Nigerian Government and deemed unreliable by the Commission itself.

Survey Instrument

The main research instrument for this study is a questionnaire, which is used to gather essential data from the sample respondents, addressing the research questions and hypotheses. It is divided into two sections: Section A collects personal data, and Section B contains research statements related to research questions and hypotheses. Respondents are given various options to choose from as they answer the survey.

Questionnaire design

The researcher used the convenient sampling method to choose 50 participants from the departments of Mathematics & Statistics, and Computer Science at Umaru Musa Yar'adua University Katsina, considering the significant population of the study area. The process involved in creating and improving questionnaire items, alongside a review of pertinent literature (Kennedy et al., 2019), was undertaken. To enhance the accuracy of measurements, the authors formulated questions to be concise and readily comprehensible. We utilized simple sentence structures and included definitions, following the methodology described in (Khorramrouz et al., 2022). While most questions offered multiple choices, questions related to attitudes were evaluated using a 5-point scale ranging from 'strongly disagree' to 'strongly agree'.

Furthermore, we recognized the value of qualitative insights in enhancing the reliability of our findings. Therefore, in addition to the quantitative data gathered through the questionnaire, we opted to conduct interviews with a subset of respondents. This qualitative aspect of our research allows us to delve deeper into their perspectives, experiences, and opinions on the subject matter. This qualitative data serves as a valuable complement to the quantitative findings, providing a richer understanding of the topic and adding an extra layer of reliability to our study.

Validity of Instrument

To safeguard the validity of our study, we employed the test-retest method as a key strategy adopted in (Noble et al., 2019). We gave participants the same questionnaire twice with some time in between to see how consistent their responses were over time. In our questionnaire design, we made sure the questions were clear, easy to understand, and free from ambiguity. We avoided unnecessary complexity to maintain the questionnaire's validity. This careful approach ensures that our questions effectively measure the things we're interested in and reduces the chance of participants misinterpreting or getting confused by them.

Content Validity

Content validity assesses how well a tool captures the elements of the construct it aims to measure (Kennedy et al., 2019). In this study, we use the Likert scale method with a five-point scoring system described in (Taherdoost, 2019): "Strongly Agreed" (SA) scored 5, "Agreed" (A) scored 4, "Undecided" (U) scored 3, "Disagreed" (D) scored 2, and "Strongly Disagreed" (SD) scored 1. This system allowed respondents to indicate their level of agreement or disagreement with the questionnaire statements, facilitating analysis of their responses. When evaluating the correlation coefficient "r," certain rules guide the decision-making process: if the tabulated "r" value is higher than the calculated "r," the alternative hypothesis (H_1) is accepted, and the null hypothesis (H_0) is rejected. Conversely, if the calculated "r" value is higher than the tabulated "r," the null hypothesis (H_0) is accepted, and the alternative hypothesis is rejected. These guidelines determine the evaluation of "r" in the study's context.

Participant validity

Participant validity refers to the extent to which a measurement accurately represents the intended construct from the perspective of the participants involved (Kennedy et al., 2019). In this study, we selected a convenience sample of 50 students from the departments of Mathematics & Statistics, and Computer Science at Umaru Musa Yar'adua University, Katsina. These students

were chosen because they demonstrated a basic understanding of software use and development. Students from other programs were excluded from the study.

Participants completed a paper version of the questionnaire and also took part in brief five to ten-minute interviews to provide additional feedback. During these interviews, we aimed to understand their perception of what the questionnaire was measuring. We recorded the percentage of respondents who identified each section of the questionnaire.

Analytical Techniques

The data collected through questionnaires were tabulated and analysed using the simple percentage method to ensure efficiency and accuracy. The research will also employ the statistical technique of correlation to test hypotheses and predict relationships between variables. Conclusions will be drawn based on the observed values from the questionnaires and critical values of the hypotheses.

RESULT AND DISCUSSION

In this section, we thoroughly explored the gathered data to address the research questions. We illustrated fifty (50) questionnaires among participants, which were presented in tabular format. After collecting and organizing the completed questionnaires, we found that all were accounted for, except for two that were missing. Figure 1 present the correlation between the participants to assess the stability of the questionnaire.

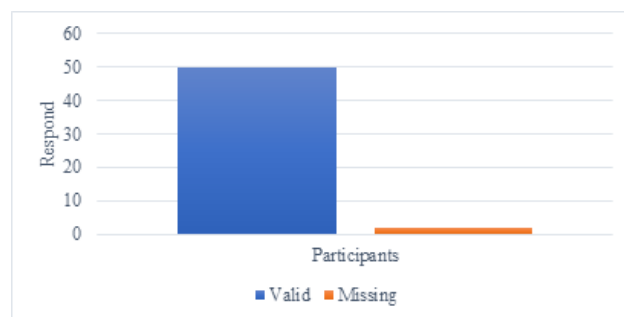


Figure 1: Correlation between the participants to assess the stability of the questionnaire.

Based on the results presented in Figure 1, this enabled a comprehensive analysis and interpretation using simple frequency tables with statistical methods. The tables below contain detailed information about the respondents, including age groups, gender distribution, educational background, marital status, and computer proficiency. These tables provide valuable insights into the participants' demographics and technological aptitude, enabling a comprehensive analysis of their characteristics.

Table 1: Analysis of the Total Number of Respondents statistically

Question	Gender respondents	Age grade respondents	Educational background	Marital status respondents	Comp of literacy
No. of Valid	50	50	50	50	50
No. of Missing	2	2	2	2	2
Mean	1.40	2.76	3.10	2.00	1.30

Referring to the results in Table 1, the total number of respondents used for the research is 50 in number, although two were found missing.

Table 2: Analysis of the Gender of the Respondents

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Male	30	57.7	60.0	60.0
Female	20	38.5	40.0	100.0
Total	50	96.2	100.0	160.0

According to the data provided in Table 2, it is evident that 30% of the population consists of male students, amounting to a total of thirty (30) individuals. Similarly, female students constitute 20% of the population, with a count of twenty students.

Table 3: Analysis of the Age Grade of the Respondents

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Age between 15-20years	9	17.3	18.0	18.0
Age between 21-30years	15	28.8	30.0	48.0
Age between 31-40years	10	19.2	20.0	68.0
Age between 41-50years	11	21.2	22.0	90.0
Age above 50years	5	9.6	10.0	100.0
Total	50	96.2	100.0	324.0

According to the data presented in Table 3, it was found that 17.3% of the population, equivalent to 9 students, are within the age range of 15-20 years. Furthermore, the age

group of 21-30 years comprises 28.8% of the population, with a total of 15 students. Additionally, 19.2% of the population, consisting of 10 students, falls within the age range of 31-40 years. Moreover, the age group of 41-50 years represents 21.2% of the population, with a count of 11 students. Lastly, there are 5 students above the age of 50 years, accounting for 9.6% of the population.

Table 4: Analysis of the Educational Background of the Respondents

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Primary school certificate	5	9.6	10.0	10.0
WAEC/NECO/SSCE/NABTEB	10	19.2	20.0	30.0
BSC/HND/OND	15	28.8	30.0	60.0
MSC/PGD/PHD	15	28.8	30.0	90.0
OTHERS	5	9.6	10.0	100.0
Total	50	96.2	100.0	

Based on the data in Table 4, we can observe that 9.6% of the population holds primary school certificates, represented by 5 students. Additionally, 19.2% of the population has qualifications like WAEC/NECO/SSCE/NABTEB, comprising 10 students. 28.8% of the population consists of BSC/HND/OND holders, totalling 15 students. Another 28.8% of the population, also consisting of 15 students, holds higher qualifications like MSC/PGD/Ph.D. Finally, there are 5 individuals, accounting for 9.6% of the entire population, who possess other certifications.

Table 5: Analysis of the Marital Status of the Respondents

Question	Frequency	Percent	Valid Percent	Cumulative Percent
No. of Single	20	38.5	40.0	40.0
No. of Married	15	28.8	30.0	70.0
No. of Divorced	10	19.2	20.0	90.0
No. of Widowed	5	9.6	10.0	100.0
Total	50	96.2	100.0	300.0

In Table 5, the data for 20 students shows that 38.5% of the population (20 students) are single, 28.8% (15 students) are married, 19.2% (10 students) are divorced, and 9.6% (5 students) are widowed.

Table 6: Analysis of Computer Literacy of the Respondents

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, the response to literacy	35	67.3	70.0	70.0
No, response to literacy	15	28.8	30.0	100.0
Total	50	96.2	100.0	170.0

Table 6 shows that 67.3% of the population (35 students) possess computer literacy skills, while 28.8% (15 students) do not have proficiency in using computers.

Table 7: Analysis of Nigerians love Nigerian computer software.

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly agreed	5	9.6	10.0	10.0
Agreed	10	19.2	20.0	30.0
Undecided	5	9.6	10.0	40.0
Disagreed	20	38.5	40.0	80.0
Strongly disagreed	10	19.2	20.0	100.0
Total	50	96.2	100.0	260.0

According to Table 7, 9.6% (5 students) strongly agreed and 19.2% (10 students) agreed that Nigerian-made software is not effectively marketed. Additionally, 9.6% (5 students) were undecided about its effectiveness. In contrast, 38.5% (20 students) disagreed, and 19.2% (10 students) strongly disagreed with the notion that Nigerian-made software is effectively marketed.

Table 8: Analysis of Nigerian software is fake software.

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agreed	15	28.8	30.0	30.0
Agreed	10	19.2	20.0	50.0
Undecided	5	9.6	10.0	60.0
Disagreed	10	19.2	20.0	80.0
Strongly Disagreed	10	19.2	20.0	100.0
Total	50	96.2	100.0	320.0

According to Table 8, 28.8% (15 students) strongly agreed, 19.2% (10 students) agreed, 9.6% (5 students) were

undecided, 19.2% (10 students) disagreed, and 19.2% (10 students) strongly disagreed.

Table 9: Analysis of Foreign Software is More Durable.

Question	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agreed	20	38.5	40.0	40.0
Agreed	10	19.2	20.0	60.0
Undecided	5	9.6	10.0	70.0
Disagreed	10	19.2	20.0	90.0
strongly disagreed	5	9.6	10.0	100.0
Total	50	96.2	100.0	

According to Table 9, 38.5% (20 students) strongly agreed and 19.2% (10 students) agreed that foreign computer software is more durable than Nigerian software. 9.6% (5 students) were undecided, while another 19.2% (10 students) disagreed, and 9.6% (5 students) strongly disagreed with this notion.

Table 10: Analysis of Foreign Software Delivers Value for Money

Question	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly agreed	25	48.1	50.0	50.0
Agreed	10	19.2	20.0	70.0
Undecided	5	9.6	10.0	80.0
Disagreed	5	9.6	10.0	90.0
Strongly disagreed	5	9.6	10.0	100.0
Total	50	96.2	100.0	

Based on the data in Table 10, 48.1% of the population (25 students) strongly agreed, 9.6% (10 students) agreed, 9.6% (5 students) were undecided, 9.6% (5 students) disagreed, and 9.6% (5 students) strongly disagreed.

Table 11: Analysis of Nigerian-Made Software Marketability Improvement.

Question	Frequency	Percent	Valid Percent	Cumulative Percent
strongly agreed	5	9.6	10.0	10.0
Agreed	10	19.2	20.0	30.0
Undecided	5	9.6	10.0	40.0
Disagreed	20	38.5	40.0	80.0
Strongly disagreed	10	19.2	20.0	100.0
Total	50	96.2	100.0	

In Table 11, 9.6% of the population (five students) strongly agreed, 19.2% (ten students) agreed, 9.6% (five students) were undecided, 38.5% (twenty students) disagreed, and 19.2% (ten students) strongly disagreed.

Statistically, the research hypothesis states that there is either no significant change (H_0) or a significant change (H_1) in the overall attitude of Nigerians towards the patronage of Made in Nigeria computer software. The level of significance is set at 0.05, and the decision rule is to reject H_0 if the p-value is less than 0.05. ANOVA will be used to analyse and compare group means to determine if there are any statistically significant differences in the attitude of Nigerians towards the patronage of Made in Nigeria computer software.

Table 12: Statistical Analysis of Changing Marketability of Nigeria-Made Software.

Source	Type III Sum of Squares	df	Mean Square	F	Sig. dif
Corrected Model	0.000 ^a	0	.	.	.
Intercept	578.000	1	578.000	345.390	0.000
Error	82.000	49	1.673		
Total	660.000	50			
Corrected Total	82.000	49			

a. R Squared = 0.000 (Adjusted R Squared = 0.000)

The statistical ANOVA analysis in Table 12 reveals that the obtained p-value (0.000) is lower than the chosen level of significance (0.05). Consequently, we can reject the null hypothesis (H_0) and accept the alternative hypothesis. Therefore, we can conclude that there is a significant change in the purchase attitude towards Made in Nigeria software when comparing the current and past studies.

CONCLUSION

Based on this research, several conclusions can be drawn. Firstly, it was found that Nigerians generally exhibit a preference for foreign computer software over made-in-Nigeria software due to several reasons. One key reason is the belief that foreign software tends to be more durable and offers better value for money compared to domestically produced software. Additionally, there exists a common misconception that many made in Nigeria software are less efficient or even counterfeit.

The study suggests the following recommendations:

- The government should actively promote, and support made in Nigeria computer software, while implementing policies to protect the local industry.
- Public education campaigns should highlight the durability and value of Nigerian software to challenge the notion that foreign software is always better.
- Continuous improvement of made-in-Nigeria software is essential to enhance competitiveness and instil confidence among Nigerians in locally developed computer software.

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