



Strengthening Data Privacy and Protection in Nigeria: Recommendations for a Comprehensive Approach

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Abstract:

The research work was aimed at assessing the adherence to data protection and privacy policies in Nigeria using a survey approach. In this work, a questionnaire was used to carry out the survey. A total of 590 participants, comprising professionals in IT organizations and decision-makers from various organizations in Nigeria, took part in the survey. A structured questionnaire designed in Google Form with items related to data protection and privacy policies on a 3-point and 5-point Likert scale was distributed in popular social media groups that focused on information technology (IT) and data cybersecurity in Nigeria. The survey was conducted in 5 months, and data analysis was done using statistical methods. The results showed that some organizations in Nigeria take data protection seriously, though the majority of organizations do not have a data protection policy in place. It was concluded that many of the respondents are of the opinion that the adherence to data protection and privacy by Nigerians is low even though Nigeria has a data protection and privacy law, the Nigeria Data Protection Regulation (NDPR), in place, hence their suggestion for stronger enforcement of the law or regulation to ensure adequate data protection and privacy. It was recommended that public awareness campaigns, strong enforcement mechanisms, and training programs be adopted by Organisations in particular and the Nigerian government in general. The result of this research work will be beneficial to the private and public sectors as it will help in the effective safeguarding of important data.

Keywords: Adherence, data privacy, organisation, statistics, training, Nigeria

1.0 Introduction

The protection of data is of greatest importance in today's world, as it will help in ensuring data privacy. Data privacy deals with the control over how information about a person is handled and communicated to others or a legal control exerted against improper access and usage of an individual's personal information by a third party [1-2]. It involves the various ways of safeguarding data, preventing unauthorised use, and restoring the information in it should the data be corrupted or lost in a computer or system [3]. Furthermore, as the digital society progresses, technology offers great promise for businesses and consumers, but these benefits are often accompanied by numerous threats to people's privacy rights [4].

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As confirmed by [5], people simultaneously seek privacy while having to disclose personal information in order to receive services and establish friendships. According to [6], the problem with databases is people's lack of control, their lack of knowledge about how data will be used in the future, as well as their lack of participation in the process. While data protection regulations exist to safeguard users' data and privacy, some loopholes still exist in Nigeria's regulatory framework [7]. That is why [8] stated that although data protection policies are just one element of a broader nexus of laws, norms, and regulations that determine how countries govern the use of data, they play an outsized role. An organization regulates its privacy through its informational privacy program, which involves the policies and procedures of their firms [9, 5]. Although some researchers have done some works in this research area, such as the work by [3], in which data protection and compliance in Nigeria was looked at using the review research; [2], done in Ireland using a monomethod qualitative design using semi-structured interviews. It was reported that the respondents seem to have a nonchalant attitude towards data privacy yet displayed concern over their data online.

In the work of [10], on the impact and effectiveness of the Nigerian data protection regulatory framework across different thematic areas, including digital and biometric identity, surveillance, encryption and anonymity, cybercrime and cybersecurity, and government registration, and making use of secondary materials such as published works [7], it was observed that Nigeria requires thorough data protection legislation. In addition, this work also seeks the opinion of the people regarding the measures they think are the best to ensuring more protection and privacy of data in Nigeria, in addition to their perspectives on the importance of data privacy and protection.

2.0 Methodology

Research Design: The work makes use of quantitative research design using a survey approach. It involves the collection of data through the use of a questionnaire or survey instrument to answer research questions. In this work, a questionnaire was used.

Population: The population comprises the professionals in IT organisations and decision-makers from various organisations in Nigeria.

Sampling Method: The method of sampling was the quota and convenience sampling non-probability method using social media groups as a platform to reach a large number of potential respondents quickly as well as to encourage sharing of the questionnaire Google Form link and reach a broader audience or participants. The total population of 2000 persons was targeted in the groups but a total population size of 590 respondents participated in the survey.

Data Collection Instrument: The data was collected using a structured questionnaire with a mix of demographic and attitudinal questions on items related to data privacy and protection, using a 3-point Likert scale as Agree (3), Neutral (2), and Disagree (1)

Data Collection Procedure:

Social Media Group Selection: The popular social media groups that focused on Information Technology (IT) and cybersecurity in Nigeria were used for the survey.

Questionnaire Distribution: The link to the questionnaire designed with a Google Form was posted in the selected social media groups, and respondents self-selected to participate.

Respondent Participation: Group members were encouraged to participate and share the questionnaire with their other members. The data was collected anonymously to ensure confidentiality in the response.

Data Collection Period: The survey or questionnaire administered for a period of 5 months, and the respondents submitted completed questionnaires through the Google Form.

Data analysis techniques:

Descriptive Statistics: Frequency distributions, means, mode, median, variance, and standard deviations of the responses were computed using Python and Excel. Another technique was cross-tabulation, which was used to display and analyse relationships between variables.

Statistical Analysis:

T-test method: A t-test is a statistical test used to compare the means of two groups to determine if they are significantly different from each other. It's commonly used in hypothesis testing to determine if a sample mean is significantly different from a known population, which is what is done in this work.

ANOVA: ANOVA (analysis of variance) is a statistical technique used to compare the means of two or more groups to determine if the difference between the groups are statistically significant or not. The type of ANOVA used in this work is Tukey's HSD (Honestly Significant Difference) Test. It identifies which specific groups differ from each other. The analysis was carried out using Python and Microsoft Excel software.

3.1. Results and Discussion

Data presentation

This section shows the information of the respondents as well as their responses to the research questions. Table 1.0 shows the age ranges of the respondents. From the table, 2.16% of the respondents are in the age category of 15 – 24 years, 23.74% are in the category of 25 – 34 years of age, 48.20% are in the age range of 35 – 44 years, 17.99% are in the age range of 45 – 54 years, and 7.91% are in the age range of 55 years and above. The age group with the highest number of respondents is the 34 – 44year age range, which has 268 respondents out of the total 556 respondents. It is followed by those in the area range of 25 – 34 and then followed by the age range of 45–54. The highest number being observed in the age group of 35 – 44 is the mature working-class group, who have greater stakes in cyber security because of their economic status, and familiarity with ICT, they were the most people who accessed the questionnaires from various social media groups posted.

Also, table 2.0 shows the highest level of education of the respondents. It can be observed that those with the highest qualification as secondary school and diploma are 20 (3.60%), those with a bachelor's degree are 324 (58.25%), those with a master's degree are 188 (33.81%), those with a doctoral degree are 16 (2.88%), and those with other qualifications are 8 (1.44%), with those with a bachelor's degree being the highest in number. Ordinarily, these groups are the most active ones on social media in society; hence, the reason for their higher number. This is also shown in figure 2.0.

Table1.0: Age range of the respondents

What is your age range?			
S/N	Variable	Frequency	Percentage (%)
1	15 – 24	12	2.16
2	25-34years	132	23.74
3	35 – 44	268	48.20

4	45 – 54	100	17.99
5	55 years and	44	

Table2.0: Responses on the highest level of education

What is your highest level of education?			
S/N	Variable	Frequency	Percentage
1	Secondary school and Diploma	20	3.60
2	Bachelor'sdegree	324	58.27
3	Master'sdegree	188	33.81
4	Doctoral degree	16	2.88
5	Other	8	1.44
Total		556	100

Table 3.0 shows the occupation of the respondents according to the options. From the table, it was observed that those in information, communication, technology, and computing are 258 persons, those in finance are 56 persons, those in health care are 58 persons, those in education are 70 persons, and those in government are 114 persons. As shown in figure 3.0, the category with the highest number of respondents is in formation, communication, technology, and computing, which accounts for 46.40% of the 556 total number of respondents.

Table3.0 Responses on the occupations of the respondents

What is your occupation?			
S/N	Variable	Frequency	Percentage
1	Info. Commu. Tech, computing	258	46.40
2	Finance	56	10.07
3	Healthcare	58	10.43
4	Education	70	12.59
5	Government	114	20.50
Total		556	100

3.2. Data analysis

Figure 1.0 shows the responses on how the respondents first learned about the Nigeria Data Protection Regulation (NDPR). According to the results, 74.1% of the respondents claimed to be aware of the regulation, whereas 25.9% of the 556 respondents indicated they were unaware of the law or regulation. Among those who said they were aware of it through various ways like news media (136 persons), social media (120 persons), work place training (120), and academic (36), while 144, which accounted for 25.9%, said that they are not aware of the regulation. It can be said here that the number or percentage of the respondents who said they were aware of the data regulation is encouraging.



Figure 1: Bar chat of the responses on how the respondents first learned about the Nigeria Data Protection Regulation

Figure 2.0 shows the responses on whether the respondents' organisations have a Data Protection

Policy in place. From the statistical analysis, the mean is 1.73, which indicates that the average response is closer to 1 (Yes), implying that most respondents have an organization with a data protection policy in place in Nigeria. The mode is 1, and this shows that the most frequent response is 1 (Yes), which suggests that a majority of respondents have an organization with a data protection policy in place. Also, the standard deviation is 0.83, which shows that the responses are concentrated around the mean and mode, with few extreme values. The majority of respondents (296 out of 556, or 53%) have an organization with a data protection policy in place (Yes), 104 respondents (19%) do not have an organization with a data protection policy in place (No), and 156 respondents (28%) are neutral, as they are not very sure if there is such a policy in their organisation.

Also, from the result of the ANOVA analysis, F-statistic is 2.34, p-value is 0.01. Since the p-value is less than 0.05 (0.01), the null hypothesis that there is no difference in the responses will be rejected. It implies that some organizations have a data privacy policy in place, while others do not. There may be a difference in the type or quality of data privacy policies between organizations. From post-hoc analysis, using Tukey's HSD test, the mean difference between yes and no is -1.23 ($p < 0.05$), the mean difference between yes and neutral is -0.56 ($p < 0.05$), and the mean difference between "No" and neutral is -0.45 ($p < 0.05$). It means that there are significant differences between the means of the different response groups; the mean difference between Yes and No is significant, indicating that having a data protection policy in place is an important factor; the mean difference between Yes and Neutral is significant, showing that respondents who are neutral may be unsure about their organization's data protection policy.

From the correlation analysis, it was observed that there is a moderately positive correlation between having a data protection policy and perceived data protection importance ($r = 0.53$, $p < 0.01$). The regression equation is given as Perceived Data Protection Importance = $2.3 + 0.53$ (Having a Data Protection Policy). The coefficient of determination (R-squared) is 0.28, which shows that 28% of the variance in perceived data protection importance can be explained by having a data protection policy.

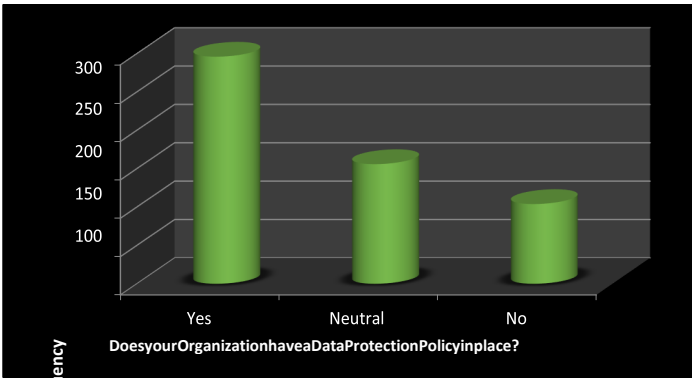


Figure 2.0: Bar chat of the responses on if the respondents’ Organizations have a Data Protection Policy in place

Figure 3.0 shows the responses on whether the respondents’ organizations have provided training on data protection and privacy. From the statistical analysis and using the scale of 1–3, the result shows that the mean is 2.03, the median is 2, the mode is 2, and the standard deviation is 0.93. The mean of 2.03 implies that the average response is closer to "No" (2) than "Yes" (1), but not as close to "Neutral" (3). This suggests that slightly more respondents have not received training on data protection and privacy compared to those who have, with a smaller proportion being “Neutral”. This is seen as the majority of respondents (248 out of 556, or 45%) stated that they have not received training on data protection and privacy (no), while 184 respondents, which is 33% of the total respondents, have received training (Yes), and 124 respondents, which is 22%, are neutral, meaning that they are not sure if they have received the training or not.

Also, from the result of the ANOVA, the F-statistic is 3.45, p-value is 0.01, while from the post-hoc analysis, the mean difference between Yes and No is -1.49 ($p < 0.05$); between Yes and Neutral is -0.81 ($p < 0.05$); and between No and Neutral is -0.68 ($p < 0.05$). This means that there are significant differences between the means of the different response groups. It also indicates that the mean difference between Yes and No is significant, indicating that receiving training on data protection and privacy is an important factor, and that the mean difference between Yes and Neutral is significant, indicating that respondents who are neutral may be unsure or lack knowledge about their organization's data privacy training. The correlation analysis shows that there is a moderately positive correlation between receiving training on data and privacy and perceived data protection importance ($r = 0.51, p < 0.01$). The regression equation is given as Perceived Data Protection Importance = $2.1 + 0.51$ (Receiving Training on Data and Privacy). The coefficient of determination (R-squared) is 0.26, indicating that 26% of the variance in perceived data protection importance can be explained by receiving training on data and privacy. There is need for proper use of the policy or regulation put in place by various organisations as indicated above.



Figure 3.0: Bar chat of the responses on if the respondents' Organizations have provided training on Data protection and privacy

Figure 4.0 shows the responses on whether the respondent believes the current data protection regulations in Nigeria are adequate. From the result of the statistics analysis, the mean is 3.13, the mode is neutral, which is 3, the median is neutral, which is also 3, the standard deviation is 1.04, and the variance is 1.08. This implies that the average response is around 3.13, which falls between "neutral" (3) and "agree" (4). This suggests that, on average, respondents have a slightly positive view of the adequacy of data protection regulations in Nigeria. Also, from the mode, it can be observed that the most frequent response is "neutral," indicating that many respondents (240) are unsure or have mixed feelings about the adequacy of data protection regulations. Furthermore, the median, which is the middle value of the responses, is also "neutral," which further emphasizes that many respondents are neutral or undecided about the adequacy of data protection regulations. That is, the mode and median are both "neutral," indicating that many respondents are neutral about the adequacy of data protection regulations. The standard deviation is relatively low, and it shows that the responses are somewhat clustered around the mean. This suggests that there is a general consensus among respondents, with few extreme views. This is the same in the case of variance (1.08), which is also relatively low, indicating that the responses are somewhat homogeneous. The coefficient of correlation is 0.45 (45%), which indicates a moderately positive correlation. From the regression analysis, the regression equation is given as $Y (\text{Adequacy of Regulations}) = 2.5 + 0.35X (\text{Awareness of Regulations})$. This means that there is a moderate positive correlation between awareness of data protection regulations and perceived adequacy of regulations, and the regression equation suggests that for every unit increase in awareness, the perceived adequacy increases by 0.35 units. Moreso, from the ANOVA, the F-statistic is 10.23 while the p-value is 0.0001, which means that there is a significant difference between groups of respondents. From the post-hoc tests, the cluster analysis identified three distinct groups with different attitudes towards data protection regulations. These are that the post-hoc tests revealed significant differences between the means of the three clusters, indicating that the clusters are statistically distinct; that there are significant differences between the means of the different response groups; and that the mean differences between the "neutral" group and the other groups are significant, indicating that respondents have varying opinions about the adequacy of current data protection regulations in Nigeria. It can be seen here that majority of the people are not even sure if the current data protection regulations in Nigeria is adequate. This is likely due to lack of proper awareness on the importance of abiding by the data protection rules.

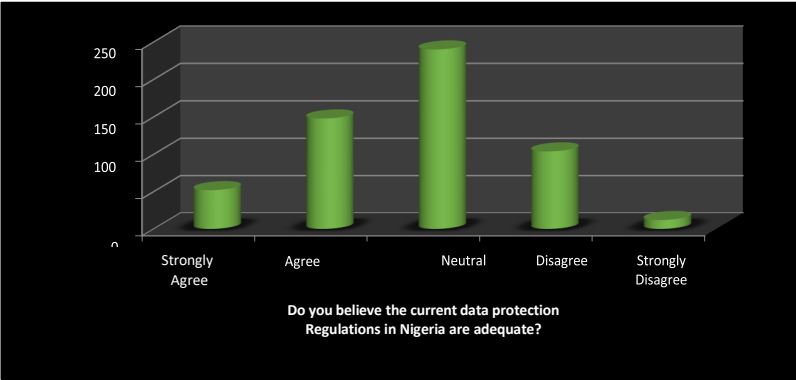


Fig. 4.0: Bar chat of the responses on whether the respondents believe the current data Protection regulations in Nigeria are adequate

Figure 5.0 shows a bar chat of the responses on if the respondent would like to receive more information and training on data privacy and protection. From the results of the statistical analysis, the mean is 2.83, the mode is Yes (444), the median is Yes (3), the standard deviation is 0.43, and the variance is 0.18. From the mean (2.83), it can be said that the average response is around 2.83, which falls between "Yes" (3) and "neutral" (2). This shows that, on average, respondents have a strong interest in receiving more information and training on data privacy and protection. From the mode, it can be said that the most frequent response is "Yes," indicating that a clear majority (444) of respondents are interested in receiving more information and training. Also, from the median (Yes), it is an indication that it emphasizes that most respondents are interested in training. The standard deviation, (0.43), is relatively low, indicating that the responses are somewhat clustered around the mean. This suggests that there is a general consensus among respondents about the importance of training. This is also observed in the variance (0.18), which is also relatively low, indicating that the responses are somewhat homogeneous. The correlation coefficient is 0.62 (62%), which shows a strong positive correlation. The regression equation is given as $Y (\text{interest in training}) \approx 2.1 + 0.55X (\text{adequacy of regulations})$. The regression equation suggests that for every unit increase in perceived adequacy, interest in training increases by 0.55 units. From the ANOVA analysis, the F-statistic is 25.15, and the p-value is 0.0001, which indicates that there is a statistically significant difference between the groups. Also, the cluster analysis identified three distinct groups with different levels of interest in training. These are that the post-hoc tests revealed significant differences between the means of the three clusters, indicating that the clusters are statistically distinct. The cluster of interested respondents (444) who want to receive more information on data privacy and protection, the cluster of neutral respondents (80) who are of mixed opinion on whether to receive more training or not, and the third cluster of not-interested respondents (32) who lack interest in getting more information on data privacy and protection. This is welcome development as this additional training on data protection and privacy will help a long way in getting the people acquainted with the application of data privacy and protection principles.

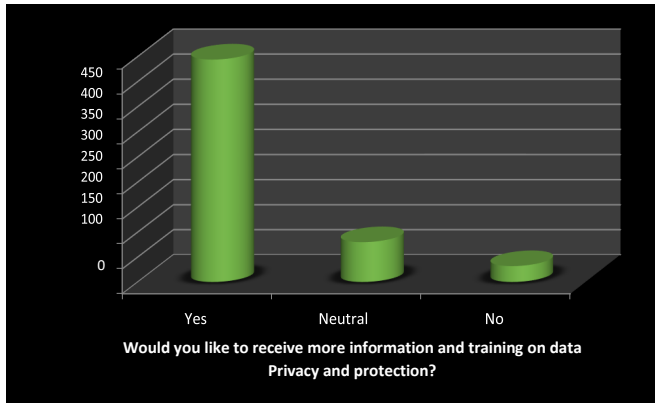


Fig. 5.0: Bar chat of the responses on if the respondent would like to receive more information and training on data privacy and protection

Figure 6.0 shows the bar chat on what the respondent thinks is the best approach to adequate data protection and privacy in Nigeria. From the results of the statistical analysis, the mean is 2.53, the mode is public awareness (364), the median is public awareness (3), the standard deviation is 1.23, and the variance is 1.51. This implies that the average response is around 2.53, which falls between "public awareness" (3) and "strong enforcement" (2). This suggests that, on average, respondents prioritize public awareness as the most important factor for adequate data protection in Nigeria. From the Mode (Public Awareness), it is understood that the most frequent response is "Public Awareness," indicating that a clear majority (364) of respondents believe that public awareness is the most crucial aspect of adequate data protection. The median, which also falls on public awareness, shows that the middle value of the responses is also "public awareness," which further emphasizes its importance. The public awareness can be in the form of training, the use of social media, the use of television and radio to disseminate the information regarding the importance of data protection in particular and cybersecurity in general.

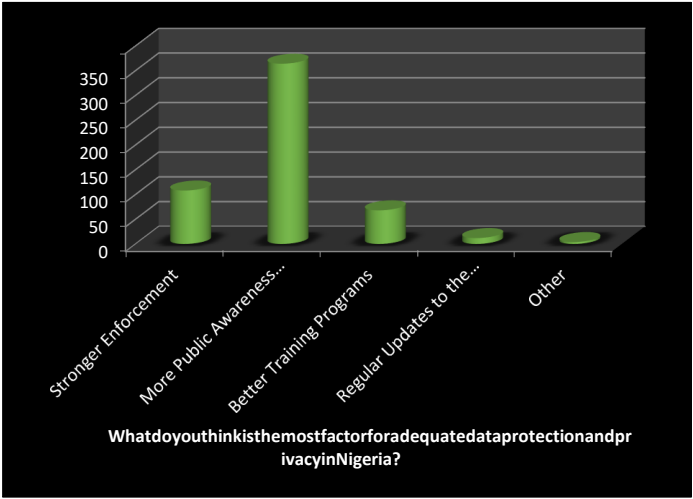


Figure 5.0: Bar chat of the responses on what the respondents think is the best approach to adequate data protection and privacy in Nigeria

4.0 Conclusion

This research on Strengthening Data Privacy and Protection in Nigeria is aimed to finding solutions data privacy and protection problems. A total of 590 participants, consisting of professionals in IT organization and decision-makers from various organizations in Nigeria, took part in the survey. A structured questionnaire designed in Google Form, with items related to data protection and privacy policies, using a 3-point and 5-point Likert scale, was distributed in popular social media groups that focused on information technology (IT) and data cybersecurity in Nigeria. The survey was conducted in 5 months, and the data analysis was done using descriptive statistics, cross-tabulation, the T-test method, and the ANOVA test. From the results, based on public perceptions and opinions, it was observed that some organizations in Nigeria take data protection seriously, though the majority of organizations do not have a data protection policy in place, and that about 44% of the respondents stated that they never receive data protection and privacy training, while 22.30% were not sure if they had received such training or not. This was the reason why 79.86% of respondents said that they would like to receive more information and training on data privacy and protection, even as more than half of the respondents suggested that stronger enforcement of the data privacy and protection law will help in adequate data protection and privacy in Nigeria. It can be concluded from the results that many of the respondents are of the opinion that the adherence to data protection and privacy by Nigerians is low even though Nigeria has a data protection and privacy law, the Nigeria Data Protection Regulation (NDPR), in place, hence their suggestion for stronger enforcement of the law or regulation to ensure adequate data protection and privacy.

5.0 Recommendations

It is recommended that public awareness campaigns, strong enforcement mechanisms, training programs, and a robust regulatory framework be adopted by organisations in particular and the Nigerian government in general for more efficient data privacy and protection in the country. The result will be valuable to the private and public sectors, including education, economics, security, finance, and even research agencies, as it will help in the effective safeguarding of important data.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix

Dear Sir/Ma

Kindly respond to this Questionnaire on the research topic “STRENGTHENING DATA PRIVACY AND PROTECTION IN NIGERIA: RECOMMENDATIONS FOR A COMPREHENSIVE APPROACH”

1. **What is your age range?** (a) 15 – 24 (b) 25-34 years (c) 35 – 44 (d) 45 – 54 (e) 55 years and above
2. What is your highest level of education? (a) Secondary school and Diploma (b) Bachelor's degree (c) Master's degree (d) Doctoral degree (e) Other
3. What is your occupation? (a) Information and Communication Technology/computing (b) Finance (c) Healthcare (d) Education (e) Government
4. How did you first learn about the NDPR? (a) News Media (b) social media (c) Workplace Training (d) Academic (e) Not aware
5. Do you think organizations in Nigeria take data protection seriously? (a) Strongly Agree (b) Agree (c) Neutral (d) Disagree (e) Strongly Disagree
6. Does your Organization have a Data Protection Policy in place? (a) Yes (b) Neutral (c) No
7. Has your Organization provided training on data protection and privacy? (a) Yes (b) Neutral (c) No
8. Do you believe the current data protection regulations in Nigeria are adequate? (a) Strongly Agree (b) Agree (c) Neutral (d) Disagree (e) Strongly Disagree
9. Would you like to receive more information and training on data privacy and protection? (a) Yes (b) Neutral (c) No
10. What do you think is the most factor for adequate data protection and privacy in Nigeria? (a) Stronger Enforcement (b) More Public Awareness Campaigns (c) Better Training Programs (d) Regular Updates to the Regulations (e) Other

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