# Perception of Poultry Farmers in Kaduna Metropolis of Northern Nigeria on the Significance of Big Data Analytics

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**ABSTRACT**

***Big data has the capacity to transform the nature of any business outfit. Essentially, numerous businesses have been revolutionized by tapping solely into the resources that big data provides. Big data analytics is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. This study investigated poultry farmers' perception of the application of big data analytics on poultry farming data such as birds' feed intake, water intake, weights, humidity, temperature, ventilation and so on. The survey method was used in the form of a structured questionnaire to gather the required farm data. The questionnaire consisted of fifteen (15) questions divided into three main sections. A total number of one hundred and one (101) questionnaires were distributed. Eighty-two (82) questionnaires were returned while eight (8) was discarded for incomplete data. Seventy-four (74) questionnaires were ready for the final analysis giving a response rate of 73%. The Statistical Package for Social Sciences (SPSS) version 23 was used to analyze the collected data. This is due to its robustness, availability and flexibility in statistical analysis. The findings showed that the application of big data analytics have a positive significant effect on poultry farming in the Kaduna metropolis of Kaduna State, Nigeria.***

**Keywords:** *Big data, analytics, Kaduna metropolis, Nigeria, Poultry farming*

**African Journal of Computing & ICT Reference Format:**

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## I. INTRODUCTION

Big data are datasets that are compounded and large that conventional data processing applications are incapable of handling. Big data is a term encompassing the use of techniques to capture, process, analyze and visualize potentially large datasets in a reasonable time frame not accessible to standard IT technologies [1]. In fact, big data can simply be defined by explaining the 3V's – volume, velocity and variety which are the key dimensions of big data characterization.

[1] discussed these three dimensions thus. Volume: This essentially concerns the large quantities of data that are generated continuously. Initially storing such data was problematic because of high storage costs. However with decreasing storage costs, this problem has been kept somewhat at bay as of now. However this is only a temporary solution and better technology needs to be developed. Velocity: In what now seems like the pre-historic times, data was processed in batches. However this technique is only feasible when the incoming data rate is slower than the batch processing rate and the delay is much of a hindrance. At present times, the speed at which such colossal amounts of data are being generated is unbelievably high.

Facebook for example, generates 2.7 billion like actions/day and 300 million photos amongst others roughly amounting to 2.5 million pieces of content in each day while Google now processes over 1.2 trillion searches per year worldwide. Variety: This comprises documents, databases, excel tables, pictures, videos and audios in hundreds of formats portraying that data is now losing structure. Structure can no longer be imposed like before for the analysis of data. Data generated can be of any type- structures, semi-structured or unstructured. The conventional form of data is structured data, for example text. Unstructured data can be generated from social networking sites, sensors and satellites [1].

According to [2] big data analytics is the strategy of analyzing large volumes of data. Big data analytics allows analysts, researchers, and business users to make better and faster decisions using data that was previously inaccessible or unusable. Using advanced analytics techniques such as text analytics, machine learning, predictive analytics, data mining, statistics, and natural language processing, businesses can analyze previously untapped data sources independently or together with their existing enterprise data gain new insights resulting in better and faster decisions [3]. Today, we live in an era of data and poultry farmers are no exception to this, with more data than ever being collected [4]. Basically, poultry farming is the process of cultivating birds such as chickens, ducks, turkeys and geese for the purpose of farming meat or eggs for food.

Kaduna State is located in the North-west geo political zone of Nigeria. The capital city of the state is Kaduna. It is on the Kaduna River and has a total area of 1,190 sq mi (3,080 km2) and its coordinates are 10°31'23'N'7°26'25''E. It is a major economic hub in the region, a trade centre and transportation axis to nearby agricultural areas and states. Kaduna is an industrial center of Northern Nigeria, manufacturing products like textiles, machinery, steel, aluminium, petroleum products and bearings. Additionally, it has been blessed with fertile land and a variety of crops [5]. A number of large farms exist within the Kaduna metropolis such as Olams farms, Aisha farms, Plethora farms, Butim farma, Buhamuu farms, Peora farms, Skyfresh poultry, Poultry Dotcom farms etc.

Olam Nigeria, for instance, has established a state-of-the-art Integrated Poultry facility, in Kaduna, Kaduna State, comprising of hatchery and poultry farm, on one hand, and feed mill factory, on the other, to close the wide chicken deficit, by creating high-end chicken in Nigeria, for Nigeria. With a combined capacity of 720,000 metric tonnes of poultry feed annually, Olam's facilities directly address a significant supply gap for poultry meat in Nigeria, giving farmers and distributors access to high-quality feed and millions of Day old chicks (DOC) at competitive prices [6]. However, studies show that most of these farms are yet to embrace the big data technology.

There are a lot of problems encountered in commercial poultry farming using the traditional ways of rearing birds such as predicting the bird's body weight, detecting unfavorable weather and disease outbreak and these affect the farmers' decision and productivity. It should be emphasized that many poultry farmers in Nigeria and Kaduna metropolis in particular are less equipped to mitigate risks associated with production, consumption, income, assets and their health. This could lead to eventual collapse of poultry industry if intensive and collaborative efforts are not made by government and stakeholders to salvage the situation [7]. Therefore, the purpose of this study is to examine big data analytics in poultry farming in Kaduna metropolis and show how it

can aid the poultry farmers in their production activities and decision making.

## II. LITERATURE REVIEW

[8] performed a profitability analysis on a flock of broilers raised for the purpose of meat production. Sensitivity analysis was used to test the robustness of the feasibility study under several different pricing scenarios. The analysis showed that the operation is predicted to be profitable, or at least break even, at all the forecasted extremes of input and output prices including low meat prices coupled with high feed and chick costs.

[9] conducted a study to determine the profit efficiency of poultry production in four peri-urban Local Government Areas in Lagos state. Data obtained were analyzed by the use of descriptive statistics and stochastic Cobb-Douglas profit frontier model. The result indicated that the poultry farmers are not fully profit efficient.

[10] carried out an analysis of poultry (layers) enterprises in Igabi Local Government Area of Kaduna State. Fifty four farmers were purposively selected in the area for the study. Data were collected using structured questionnaires and analyzed using descriptive statistics, farm budget model and multiple regression analysis. The major constraints affecting the producers include high cost of feeds and inadequate capital among others. Thus, the study recommends that producers should be encouraged to formulate feeds in their farms and to form cooperative societies in order to have easy access to formal sources of financing their business and benefit from group marketing in the study area.

[11] noted that high population growth and growing income lead to increasing demand for poultry products in Nigeria. The paper revealed the opportunities and threats of a market entry for private investors based on a PESTEL analysis and a SWOT analysis.

[12] explained the term big data as it relates to farmers and the potential implications this might have for Australian agriculture. The study revealed that big data farming systems for broadacre farm businesses are only in their infancy and are often targeted towards assisting farmers to make specific critical decisions. The paper further noted that there is of course a tremendous upside likely to emerge from the application of big data to agriculture with the potential of a new leap forward in farm productivity.

[13] examined how the automatic monitoring system can assist manual monitoring in poultry behavior. Sophisticated data mining techniques were used to leverage the data collected by RFID devices. The results demonstrated that accurate classifications could be obtained according to the poultry characteristics, and the clustering results matched with the results obtained by manual method to identify the poultry groups.

[14] reviewed the latest technological developments with potential to be applied to poultry welfare, especially for broiler chickens and laying hens. Some of the examples that were presented and discussed include the following: sensors for farm environmental monitoring, movement, or physiological parameters; imaging technologies such as optical flow to detect gait problems and feather pecking; infrared technologies to evaluate birds' thermoregulatory features and metabolism changes that may be indicative of welfare, health and management problems. The paper noted that all these technologies have the potential to be implemented at the commercial level to improve birds' welfare and to optimize flock management, therefore, improving the efficiency of the system in terms of use of resources and, thus, long term sustainability.

[15] outlined a framework for machine learning and data mining and offered a glimpse into how they can be applied to solve pressing problems in animal sciences. The authors pointed out the availability of data mining and machine learning tools for analyzing big data, outlined their statistical framework and illustrated examples from animal sciences.

[16] reported the achievements and rural development in rapid deployment of big data technology. The purpose of the paper was to capitalize on big data to help address market price volatility, reduce losses caused by meteorological disasters, pests and diseases and promote high-quality development of agriculture.

The review of literature revealed that though a number of researches have been carried out on poultry farming not much have been done with regards to big data analytics and poultry farming. Also within the Nigerian context and particularly in Kaduna metropolis, little or no research has been done on poultry farming and big data analytics. Hence the urgent need to bridge or narrow this gap.

## III. METHODOLOGY

The survey method was used in this research. Quantitative structured questionnaire was used to gather the required data. The survey questionnaire was distributed in hard copies to selected poultry farmers and workers in Kaduna metropolis. A total number of one hundred and one (101) questionnaires were distributed. Eighty-two (82) questionnaires were returned while eight (8) were discarded for incomplete data making the total number seventy-four (74) questionnaires ready for analysis. The response rate is 73%. The data collected from respondent was analyzed using the Statistical Package for Social Sciences (SPSS) version 23 due to its robustness, availability and flexibility in statistical analysis. See Figures 1 and 2 in Appendix B.

The questionnaire was divided into three sections which are: the demographic characteristics of the participant, poultry farming and big data analytics in poultry farming. The sample of the questionnaire is found in Appendix A.

**Hypothesis Testing**
The hypothesis testing is based on the fact that:

If probability < 0.05 then Ho refused and Ha accepted.
If probability > 0.05 then Ho accepted and Ha refused.
Where:
Ho is the null hypothesis and Ha is the alternative hypothesis.

The paper tested the hypothesis:

Ho: The application of big data analytics does not have a significant effect on poultry farming.
Ha: The application of big data analytics does have a significant effect on poultry farming.

## IV. RESULTS

**The Demographic Characteristics**
The demographic characteristics of the overall respondents are presented in Table 1. The proportion of sex of the participants has more males with a total of 48 represented by 64.9% while females are 26 representing 35.1%. Most of the respondents are between the age 30−39 years which represents 47.3%, 20-29 years of age is represented by 23.0% and 40-49 years of age is represented by 20.3% of the entire sample. They have National Diploma denoted by 45.8% and a Bachelor's /HND degree shown by 40.5%. The occupation of respondents is distributed thus: business men/women 70.3%, civil servants 17.6%, public servants 8.1% and students 4.1% as shown in Table 1.

**Respondents Perception of Big Data Analytics**
Majority (44.6%) of the respondents have practiced poultry farming from between 0-11months while 29(39.2%) have practiced from between 1-10 years. The others 12(16.2%) have practiced from between 11-20 years. About 34 (45.9%) of the respondents have heard about big data. 40(54.1%) have not heard about big data. Most of them 62 (83.8%) think big data can bring about improvement in poultry farming. Majority of the respondents 60 (81.1%) think that big data analytics tools can diagnose disease outbreak in birds, detect the humidity, temperature and lighting of the birds' living environment with the aid of sensors. Again, most of the respondents 61(82.4%) believe that using big data technology is better than old farm practices while a handful 13(17.6%) do not think so. All these and other responses from the participants are shown in Table 2.

**Hypotheses Testing**
The result of the hypothesis testing is shown below:
Ho stated as: The application of big data analytics does not have a significant effect on poultry farming and the Ha as: The application of big data analytics does have a significant effect on poultry farming". $\beta = 0.646$, $p = 0.000$, $p < 0.001$. The null hypothesis, Ho is rejected and alternative hypothesis Ha is accepted at $p < 0.001$ as shown in Table 3 and in Figure 3, Appendix B.

## V. DISCUSSION

The results from the respondent demographics table showed that 48 of the respondent were male and 26 of them were females having the percentage of 64.9% and 35.1% respectively implying that more males responded. It also showed that respondent within the age range of 20-29 years were seventeen (17) those within the age range of 30-39 years were thirty –five (35). Those within the age range of 40-49 years were fifteen (15), those within the age range of 50-59 five (5) and those within the age range of 60 and above were two (2) and their percentages are 23.0%, 47.3%, 20.3%, 6.8 and 2.6% respectively. The implication is that most respondents are within the age range of 30-39years of age.

The respondent demographics as depicted in table1 also showed out of the 74 respondents, two (2) had Masters/PhD, thirty (30) were Bachelor/HND degree

holders, thirty-four (34) of them were OND degrees holders and eight (8) of them were SSCE degree holders. The marital status of the respondents as shown in table 1 revealed that 40 were married, 21 were Single, Six(6) of them were divorced and seven(7) were widowed and they had percentages 54.1%, 28.4%, 8.1% and 9.5% respectively. Table 1 also showed the occupation of the respondent implying that most respondents were OND holders.

Table 2 showed the duration of farmers' practice of poultry farming implying that most farmers have practiced for duration of between 0 and 11 months (44.6%). Table 2 also showed that most respondents think that using big data technology is better than old farm practices (82.4%). This implied that poultry farmers are ready to embrace the big data technology.

The hypothesis Ho: The application of big data analytics does not have a significant effect on poultry farming. The correlation showed $\beta = 0.646$ and $p = 0.000$. The Ho is rejected and Ha is therefore accepted at $p < 0.001$ since the p value of 0.000 showed a statistically significant correlation. Also the $\beta$ of 0.646 showed a strong relationship between the variables indicating that an increase in big data analytics signifies an increase in poultry farming. Therefore, the more respondents (poultry farmers) engage big data analytics the more their poultry farming will improve or be better.

## VI. CONCLUSION

The paper investigated poultry farmers' perception of big data analytics by observing their opinion on poultry farming data such as birds' feed intake, water intake, weights, humidity, temperature, ventilation and so on. Survey questionnaire was used in getting the required data for analysis in the study. The results gotten from the survey showed that although poultry farmers do not seem to have used big data analytics they have heard about the technology and are willing to engage it as they believe that big data analytics will bring tremendous improvement to their poultry business. Further, the hypothesis Ho, that "the application of big data analytics does not have a significant effect on poultry farming" showed a significant positive relationship. This indicated that the application of big data analytics does have a significant effect on poultry farming signifying that an increase in the application of big data analytics implies an increase in poultry farming.

## ACKNOWLEDGEMENT

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Table 1: Demographic Characteristics of respondents

| Demographic items | | Frequency | Percentage |
|---|---|---|---|
| Sex | Male | 48 | 64.9 |
| | Female | 26 | 35.1 |
| | Total | 74 | 100.0 |
| Age | 20-29 | 17 | 23.0 |
| | 30-39 | 35 | 47.3 |
| | 40-49 | 15 | 20.3 |
| | 50-59 | 5 | 6.8 |
| | 60 and above | 2 | 2.6 |
| | Total | 74 | 100.0 |
| Qualification | Masters/PhD | 2 | 2.7 |
| | Bachelor/HND | 30 | 40.5 |
| | OND | 34 | 45.8 |
| | SSCE | 8 | 11.0 |
| | Total | 74 | 100.0 |
| Marital Status: | Married | 40 | 54.1 |
| | Single | 21 | 28.4 |
| | Divorced | 6 | 8.1 |
| | Widowed | 7 | 9.5 |
| | Total | 74 | 100.0 |
| Occupation | Civil Servant | 13 | 17.6 |
| | Public Servant | 6 | 8.1 |
| | Business Man/Woman | 52 | 70.3 |
| | Student | 3 | 4.1 |
| | Total | 74 | 100.0 |

Table 2: Perception of big data analytics

| Variables/Items | Options | Frequency | Percentages |
|---|---|---|---|
| Duration of practicing poultry farming | 0-11 months | 33 | 44.6 |
| | 1-10 years | 29 | 39.2 |
| | 11-20 years | 12 | 16.2 |
| | Total | 74 | 100.0 |
| Have you heard about big data? | Yes | 34 | 45.9 |
| | No | 40 | 54.1 |
| | Total | 74 | 100.0 |
| Do you think big data can bring about improvement in poultry farming? | Yes | 62 | 83.8 |
| | No | 12 | 16.2 |
| | Total | 74 | 100.0 |
| Do you think big data analytics tools can diagnose disease outbreak in birds, detect the humidity, temperature and the lighting of birds' living environment with the aid of sensors? | Yes | 60 | 81.1 |
| | No | 14 | 18.9 |
| | Total | 74 | 100.0 |
| Will big data analytics tools be able to accurately predict the flock and egg uniformity in Kaduna metropolis? | Yes | 52 | 70.3 |
| | No | 22 | 29.7 |
| | Total | 74 | 100.0 |
| Can big data analytics tools be used to predict birds' body weight and estimate nutrition strategy? | Yes | 58 | 78.4 |
| | No | 16 | 21.6 |
| | Total | 74 | 100.0 |
| Do you think using big data technology is better than the old farm practices | Yes | 61 | 82.4 |
| | No | 13 | 17.6 |
| | Total | 74 | 100.0 |

Table 3: Hypotheses Testing

| Hypothesis | β value | P value | Result |
|---|---|---|---|
| Ho: The application of big data analytics does not have a significant effect on poultry farming.<br>Ha: The application of big data analytics does have a significant effect on poultry farming. | 0.646** | 0.000 | Ho is rejected therefore Ha is Accepted ($p < 0.001$) |

## APPENDICES

**APPENDIX A:** Sample Questionnaire

DEPARTMENT OF COMPUTER SCIENCE

NIGERIA DEFENCE ACADEMY,

KADUNA, NIGERIA

## QUESTIONNAIRE

**INTRODUCTION/INSTRUCTION**

This is part of a master's research on "big data analytics in poultry farming in Kaduna metropolis" which is a partial fulfilment of the requirements for the award of a Master of Science in Computer Science, NDA Kaduna, Nigeria.

Please, kindly read and answer the questions below. Your participation is voluntary, confidential and very important to the success of this project. The obtained information will be used strictly for the reasearch purpose only.

Kindly tick as appropriate. Thank you for your participation.

**SECTION A- DEMOGRAPHIC CHARACTERISTICS**

1. How old are you? A.20-29 [ ] B.30-39 [ ] C. 40-49 [ ] D.50-59 [ ] E.60 and above [ ]
2. Sex: A.Male [ ] B. Female [ ]
3. Marital status: A. Married [ ] B.Single [ ] C. Divorced [ ] D. Widow [ ]
4. Education: A. Masters/ PhD [ ] B. Bachelors/HND [ ] C.National Diploma [ ] D. SSCE [ ]
5. Occupation: A. Civil servant [ ] B. Public Servant [ ] C. Business man/woman [ ] D. Student [ ] E. Unemployed [ ]

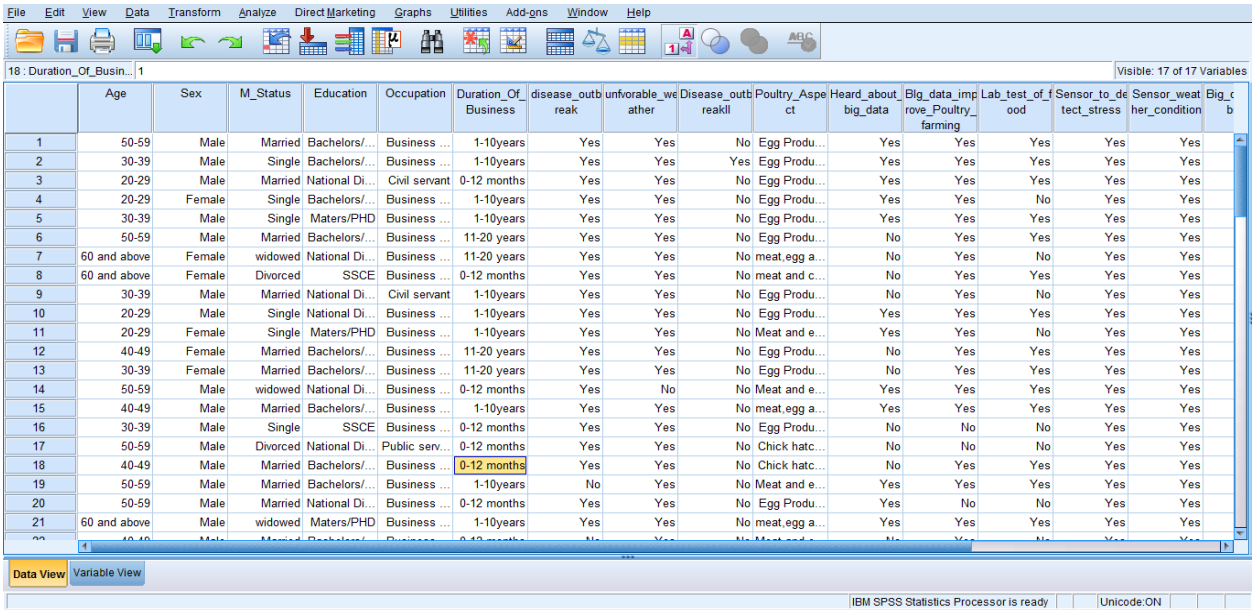
**SECTION B- POUlTRY FARMING**

6. How long have you been practising poultry farming?
   A. 0-12 months [ ] B. 1-10years [ ] C. 11-20 years [ ] D. 21-30 years [ ] E. 30 years and above
7. The best method of rearing birds. A. deep litter [ ] B. Cage system [ ] C. Free range [ ] D. yarding [ ]
8. How regular do you vaccinate your birds? A. 0-6 month [ ] B. 7-12months [ ] C.13 months and above [ ]
9. What aspect of poultry farming are you involved in? A. egg production [ ] B. chick hatchery [ ] C. Meat production [ ]

**SECTION C: BIG DATA ANALYTICS IN POULTRY FARMING**

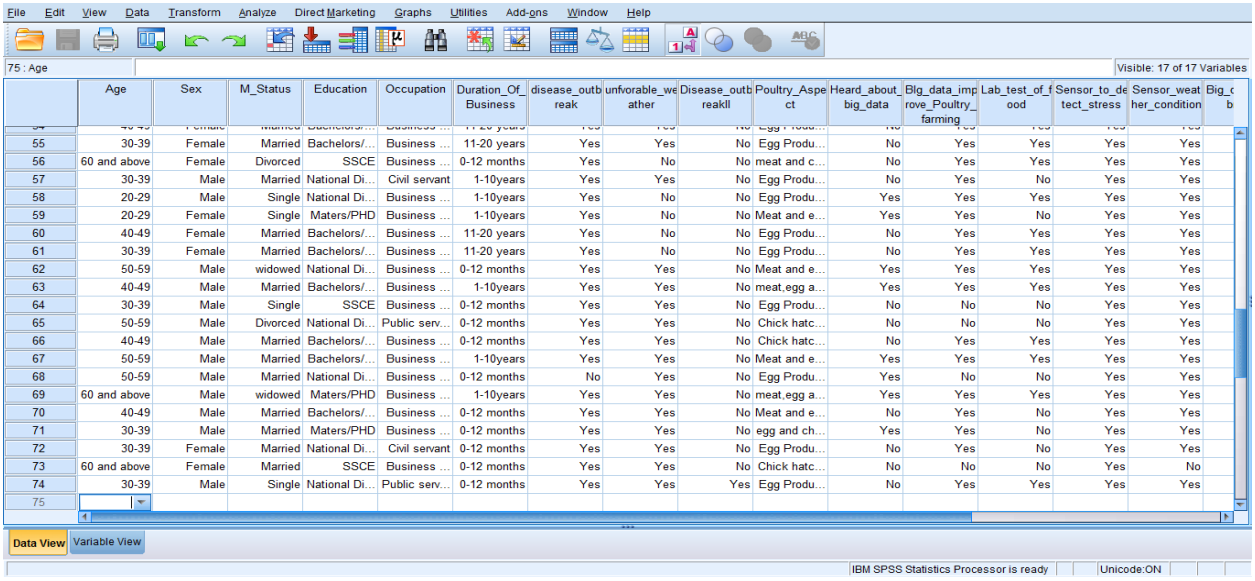
10. Have you heard about big data? A. Yes [ ] B. No [ ]
11. Do you think big data analytics can bring about tremendous improvement in poultry farming? A. Yes [ ] B. No [ ]
12. Will big data analytics tool be able to accurately predict the flock and egg uniformity in Kaduna metropolis? A. Yes [ ] B. No [ ]
13. Do you think that big data analytics tools can diagnose disease outbreak in birds, detect the humidity, temperature and lighting of the birds living environment with the aid of sensors. A. Yes [ ] B. No [ ]
14. Can big data analytics tools be used to predict birds' body weight and estimate nutrition strategy? A. Yes [ ] B. No [ ]
15. Do you think that using big data technology is better than old farm practices.
    A. Yes [ ] No [ ]

## Appendix B: SPSS Screen Shots



| | Age | Sex | M_Status | Education | Occupation | Duration_Of_Business | disease_outbreak | unfvorable_weather | Disease_outbreakII | Poultry_Aspect | Heard_about_big_data | Blg_data_improve_Poultry_farming | Lab_test_of_food | Sensor_to_detect_stress | Sensor_weather_condition | Big_b |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 50-59 | Male | Married | Bachelors/... | Business ... | 1-10years | Yes | Yes | No | Egg Produ... | Yes | Yes | Yes | Yes | Yes | |
| 2 | 30-39 | Male | Single | Bachelors/... | Business ... | 1-10years | Yes | Yes | Yes | Egg Produ... | Yes | Yes | Yes | Yes | Yes | |
| 3 | 20-29 | Male | Married | National Di... | Civil servant | 0-12 months | Yes | Yes | No | Egg Produ... | Yes | Yes | Yes | Yes | Yes | |
| 4 | 20-29 | Female | Single | Bachelors/... | Business ... | 1-10years | Yes | Yes | No | Egg Produ... | Yes | Yes | No | Yes | Yes | |
| 5 | 30-39 | Male | Single | Maters/PHD | Business ... | 1-10years | Yes | Yes | No | Egg Produ... | Yes | Yes | Yes | Yes | Yes | |
| 6 | 50-59 | Male | Married | Bachelors/... | Business ... | 11-20 years | Yes | Yes | No | Egg Produ... | No | Yes | Yes | Yes | Yes | |
| 7 | 60 and above | Female | widowed | National Di... | Business ... | 11-20 years | Yes | Yes | No | meat,egg a... | No | Yes | No | Yes | Yes | |
| 8 | 60 and above | Female | Divorced | SSCE | Business ... | 0-12 months | Yes | Yes | No | meat and c... | No | Yes | Yes | Yes | Yes | |
| 9 | 30-39 | Male | Married | National Di... | Civil servant | 1-10years | Yes | Yes | No | Egg Produ... | No | Yes | No | Yes | Yes | |
| 10 | 20-29 | Male | Single | National Di... | Business ... | 1-10years | Yes | Yes | No | Egg Produ... | Yes | Yes | Yes | Yes | Yes | |
| 11 | 20-29 | Female | Single | Maters/PHD | Business ... | 1-10years | Yes | Yes | No | Meat and e... | Yes | Yes | No | Yes | Yes | |
| 12 | 40-49 | Female | Married | Bachelors/... | Business ... | 11-20 years | Yes | Yes | No | Egg Produ... | No | Yes | Yes | Yes | Yes | |
| 13 | 30-39 | Female | Married | Bachelors/... | Business ... | 11-20 years | Yes | Yes | No | Egg Produ... | No | Yes | Yes | Yes | Yes | |
| 14 | 50-59 | Male | widowed | National Di... | Business ... | 0-12 months | Yes | No | No | Meat and e... | Yes | Yes | Yes | Yes | Yes | |
| 15 | 40-49 | Male | Married | Bachelors/... | Business ... | 1-10years | Yes | Yes | No | meat,egg a... | Yes | Yes | Yes | Yes | Yes | |
| 16 | 30-39 | Male | Single | SSCE | Business ... | 0-12 months | Yes | Yes | No | Egg Produ... | No | No | No | Yes | Yes | |
| 17 | 50-59 | Male | Divorced | National Di... | Public serv... | 0-12 months | Yes | Yes | No | Chick hatc... | No | No | No | Yes | Yes | |
| 18 | 40-49 | Male | Married | Bachelors/... | Business ... | 0-12 months | Yes | Yes | No | Chick hatc... | No | Yes | Yes | Yes | Yes | |
| 19 | 50-59 | Male | Married | Bachelors/... | Business ... | 1-10years | No | Yes | No | Meat and e... | Yes | Yes | Yes | Yes | Yes | |
| 20 | 50-59 | Male | Married | National Di... | Business ... | 0-12 months | Yes | Yes | No | Egg Produ... | Yes | No | No | Yes | Yes | |
| 21 | 60 and above | Male | widowed | Maters/PHD | Business ... | 1-10years | Yes | Yes | No | meat,egg a... | Yes | Yes | Yes | Yes | Yes | |

Figure 1: SPSS Dataset showing serials 1 - 21



| | Age | Sex | M_Status | Education | Occupation | Duration_Of_Business | disease_outbreak | unfvorable_weather | Disease_outbreakII | Poultry_Aspect | Heard_about_big_data | Blg_data_improve_Poultry_farming | Lab_test_of_food | Sensor_to_detect_stress | Sensor_weather_condition | Big_b |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | 30-39 | Female | Married | Bachelors/... | Business ... | 11-20 years | Yes | Yes | No | Egg Produ... | No | Yes | Yes | Yes | Yes | |
| 56 | 60 and above | Female | Divorced | SSCE | Business ... | 0-12 months | Yes | No | No | meat and c... | No | Yes | Yes | Yes | Yes | |
| 57 | 30-39 | Male | Married | National Di... | Civil servant | 1-10years | Yes | Yes | No | Egg Produ... | No | Yes | No | Yes | Yes | |
| 58 | 20-29 | Male | Single | National Di... | Business ... | 1-10years | Yes | No | No | Egg Produ... | Yes | Yes | Yes | Yes | Yes | |
| 59 | 20-29 | Female | Single | Maters/PHD | Business ... | 1-10years | Yes | No | No | Meat and e... | Yes | Yes | No | Yes | Yes | |
| 60 | 40-49 | Female | Married | Bachelors/... | Business ... | 11-20 years | Yes | No | No | Egg Produ... | No | Yes | Yes | Yes | Yes | |
| 61 | 30-39 | Female | Married | Bachelors/... | Business ... | 11-20 years | Yes | No | No | Egg Produ... | No | Yes | Yes | Yes | Yes | |
| 62 | 50-59 | Male | widowed | National Di... | Business ... | 0-12 months | Yes | Yes | No | Meat and e... | Yes | Yes | Yes | Yes | Yes | |
| 63 | 40-49 | Male | Married | Bachelors/... | Business ... | 1-10years | Yes | Yes | No | meat,egg a... | Yes | Yes | Yes | Yes | Yes | |
| 64 | 30-39 | Male | Single | SSCE | Business ... | 0-12 months | Yes | Yes | No | Egg Produ... | No | No | No | Yes | Yes | |
| 65 | 50-59 | Male | Divorced | National Di... | Public serv... | 0-12 months | Yes | Yes | No | Chick hatc... | No | No | No | Yes | Yes | |
| 66 | 40-49 | Male | Married | Bachelors/... | Business ... | 0-12 months | Yes | Yes | No | Chick hatc... | No | Yes | Yes | Yes | Yes | |
| 67 | 50-59 | Male | Married | Bachelors/... | Business ... | 1-10years | Yes | Yes | No | Meat and e... | Yes | Yes | Yes | Yes | Yes | |
| 68 | 50-59 | Male | Married | National Di... | Business ... | 0-12 months | No | Yes | No | Egg Produ... | Yes | No | No | Yes | Yes | |
| 69 | 60 and above | Male | widowed | Maters/PHD | Business ... | 1-10years | Yes | Yes | No | meat,egg a... | Yes | Yes | Yes | Yes | Yes | |
| 70 | 40-49 | Male | Married | Bachelors/... | Business ... | 0-12 months | Yes | Yes | No | Meat and e... | No | Yes | No | Yes | Yes | |
| 71 | 30-39 | Male | Married | Maters/PHD | Business ... | 0-12 months | Yes | Yes | No | egg and ch... | Yes | Yes | No | Yes | Yes | |
| 72 | 30-39 | Female | Married | National Di... | Civil servant | 0-12 months | Yes | Yes | No | Egg Produ... | No | Yes | No | Yes | Yes | |
| 73 | 60 and above | Female | Married | SSCE | Business ... | 0-12 months | Yes | Yes | No | Chick hatc... | No | No | No | Yes | No | |
| 74 | 30-39 | Male | Single | National Di... | Public serv... | 0-12 months | Yes | Yes | Yes | Egg Produ... | No | Yes | Yes | Yes | Yes | |

Figure 2: The SPSS Dataset showing showing serial 55- 74

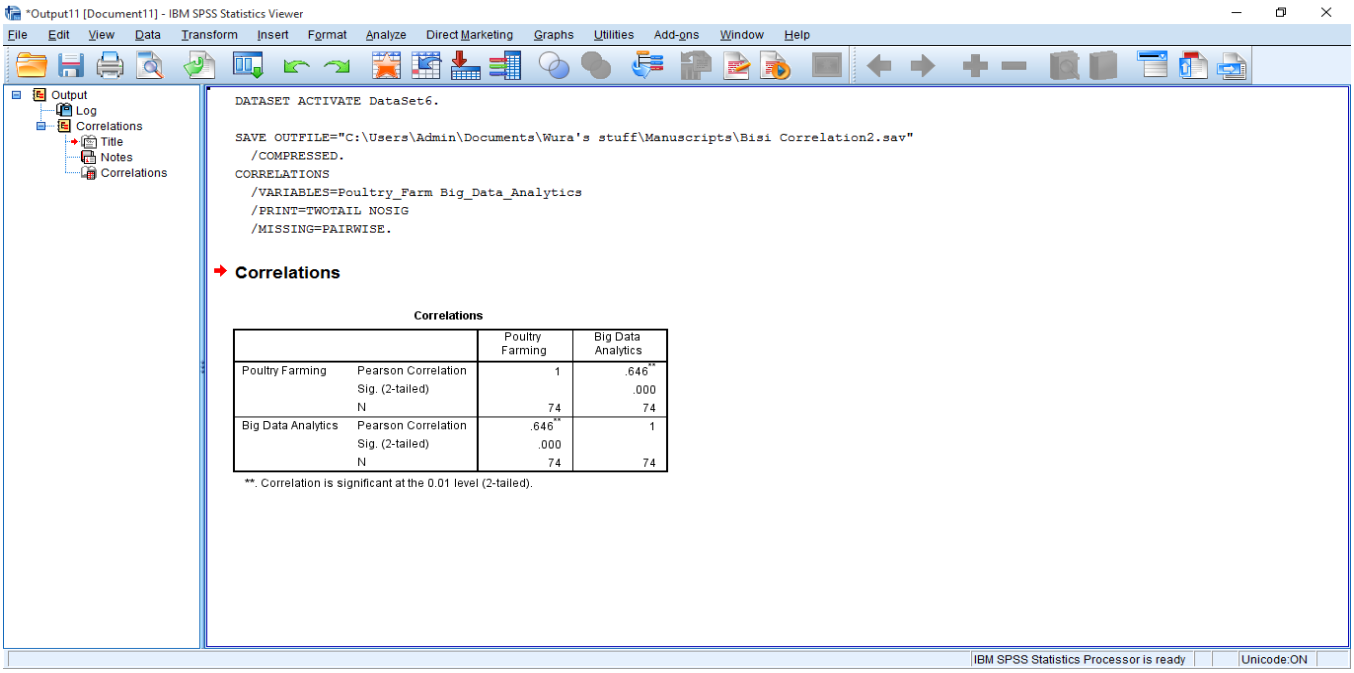



Figure 3: The SPSS Analysis showing the result of the hypothesis Ho