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ICT, ITs' Impact in Agro Forecasts in Nigeria

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Abstract: *Agricultural sector in Nigeria is not embraced with rapid advancement in Information and Communication Technologies (ICTs), which led to its' challenges such as poor productivity of the agro products, inadequate dissemination of information, manual processing of agro products and mismanagement of the agro resources. This paper proposes an agro system that utilizes ICT effectively to enhance on the above mentioned challenges in agricultural sector and make a forecast on both raw material and production of the products to enable the rural farmers to make adequate decisions on the agro products.*

Keywords: *forecast, data, forecasting theory, agro products, computer*

1. INTRODUCTION

Information and Communication Technology (ICT) involves the process of collecting, processing, storing, retrieving and communicating the relevant information for the purpose of efficient management operations and for business planning in any organization,[9]. The success of effective decision making is considered to be the heart of any administrative process and is highly dependent partly on available information, and partly on the functions that are the components of the process,[6]. One of the central processes of an organization and vital components of planning is knowing the inventory records of the organization and using it to make predictions. Thus, this requires the effective implementation of Information and Communication Technology (ICT) not only in enhancing the agro production but also in managing the agro products such that the annual product records will be taken for both raw material and production, which will facilitate the decision making process.

Agricultural sector in Nigeria is not embraced with ICT, which led to its challenges such as poor productivity of the agro products, inadequate dissemination of information and mismanagement of the agro resources. Nigeria is highly blessed with agricultural soil and land mass, but there is no substantial information that will boost farming activities in this soil, together with its agro products in the country. It is based on this background that the study on "Information and Communication Technology in Agro Forecast in Nigeria has been undertaken. Hence, when this is implemented and utilized effectively, definitely, it will empower the agro farmers and youths to develop interest in agro farming, thereby reducing unemployment in the country as well as enhancing the agro productivity and effective management of agro resources in Nigeria.

The information obtained is a tool that is instrumental to forecasting. Inventory accuracy is the ability to predict the demand of a product. Trying to control inventory with bad information is futile. All replenishment decisions are based on the status of your inventory. Information Technology provides real time information which enables partners forecast accurately. Forecasting model for the potential of Information Technology (IT) in support of rural agricultural famers in South East, Nigeria is a time series method which was used to make decisions in order to avoid any scarcity on the production of Apis Mellifera in South East, Nigeria.

2. REVIEW OF RELATED LITERATURE

Every organization needs information to support decision making and minimize uncertainty. This can easily be achieved by utilizing the Management Information System (MIS) to reduce the challenges of decision making in agricultural sector in Nigeria. [5] describes Management Information System (MIS) as an Organizational method of providing the past, present and projected information related to internal operations and external intelligence. It supports the planning, control and operation functions of an organization by furnishing uniform information in the proper time frame to assist the decision makers. Also, the roles of MIS have been described as a useful tool for making business decisions, by gathering data and information from MIS systems [1]. This concept is relatively stated by[3] that MIS is mainly concerned with processing data into information for appropriate decision making.

[2] claimed that MIS concentrate on the automation of many business activities that can to provide better methods of planning, reporting and operation control. Thus, MIS, which is often referred to as "Information System" has attempted to provide methods to manage problems and situations around all perspectives of the management of information,[4]. Having good decision choices guarantees viable decision in organization [8]. [7] avers that Management Information System (MIS) gives managers quick access to Information. This can include interactions with other decision with other decision Support systems, information, cross referencing of external Information and potential data mining techniques.

Drawing from the foregoing, it is very necessary to use the available information and make effective and timely decisions, the historical data is suitable for making any decision in an organization. Making decisions, simply means forecasting, and forecasting therefore is the process of predicting changing conditions and future events that might significantly affect the business in an organization, which is very important to both planning and decision making.

2.1 Agro Forecast Model

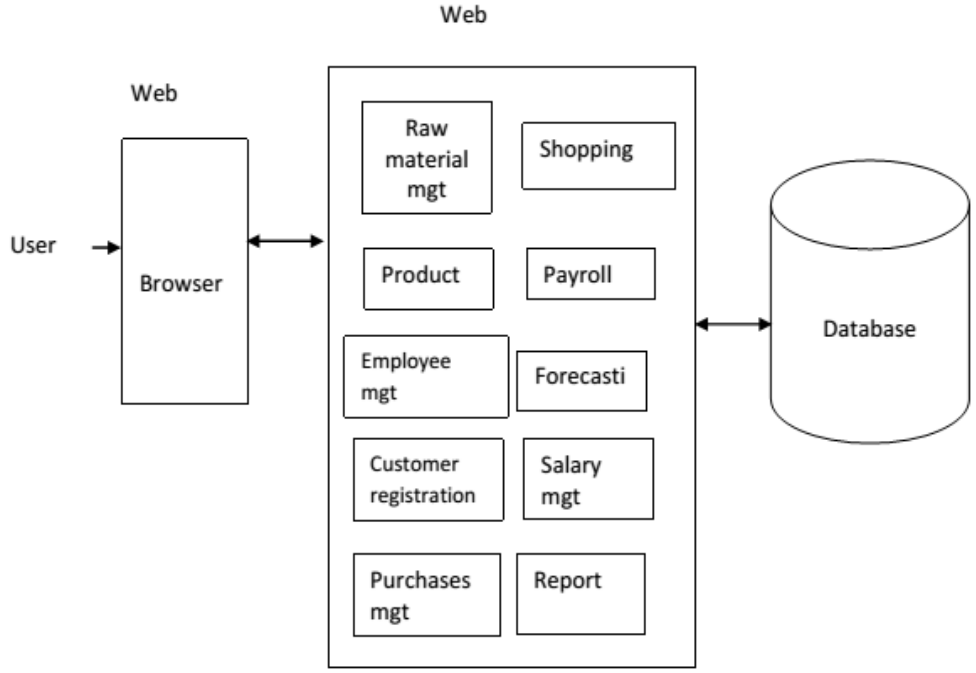


Fig1.*Agro Base Management Information System and forecast*

This model has five functionalities which include raw material management, products management, payroll management, employee management and forecasting. The user interacts with the system through the browser. The interaction simply means to request to the server on each of the functionalities. The web server will process the request, and query the database if necessary. The database will then process the server's query and returns the result of the query to the web server, which then formats the results and send back the responses to the client. Each of the functionality plays a vital role which helps in forecasting. It is when the raw materials needed are known, the available agro products required are also known, and the records of productions and transactions are intact which will help to make effective predictions.

The forecasting model used is time series, which uses a historical data accumulated over a period of time to predict for the future. The method assumes that identifiable historical patterns or trends for demand over time will repeat themselves.

The adjusted exponential smoothing forecast consists of the exponential smoothing forecast with a trend adjustment factor added to it:

Forecast including trend (FIT_t) OR Adjusted Forecast (AF_t) =

Exponentially smoothed forecast (F_t) + exponentially smoothed trend (T_t)

That is,

$T_t = \beta$(This period's Forecast - last period's Forecast) + (1-β) (Trend estimate last period)

$T_t = \beta(F_t - F_{t-1}) + (1- \beta)\ T_{t-1}$ for all $t \geq 2$

F_t = exponentially smoothed forecast of the data series in period t

T_t = exponentially smoothed trend in period t

A_t = actual demand in period t

α = smoothing constant for the average

β = smoothing constant for the trend

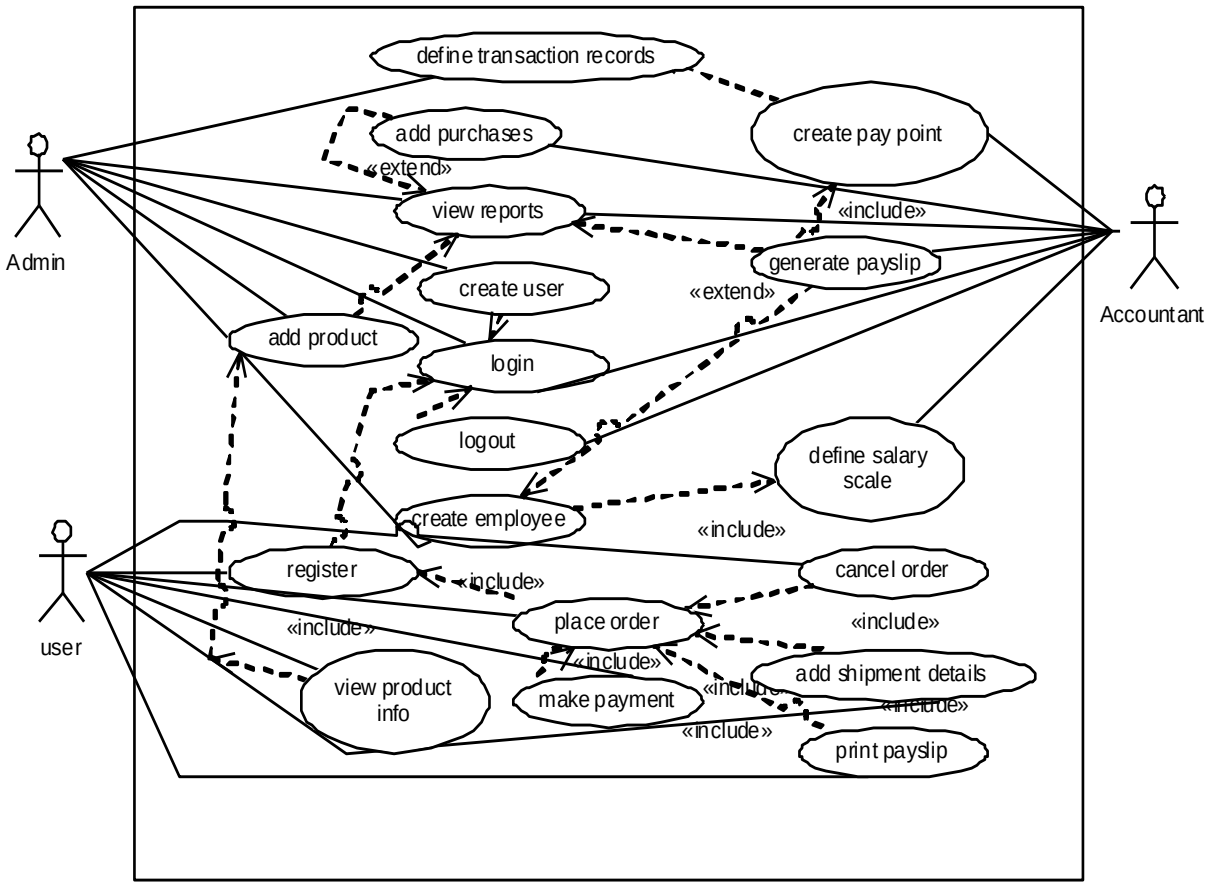
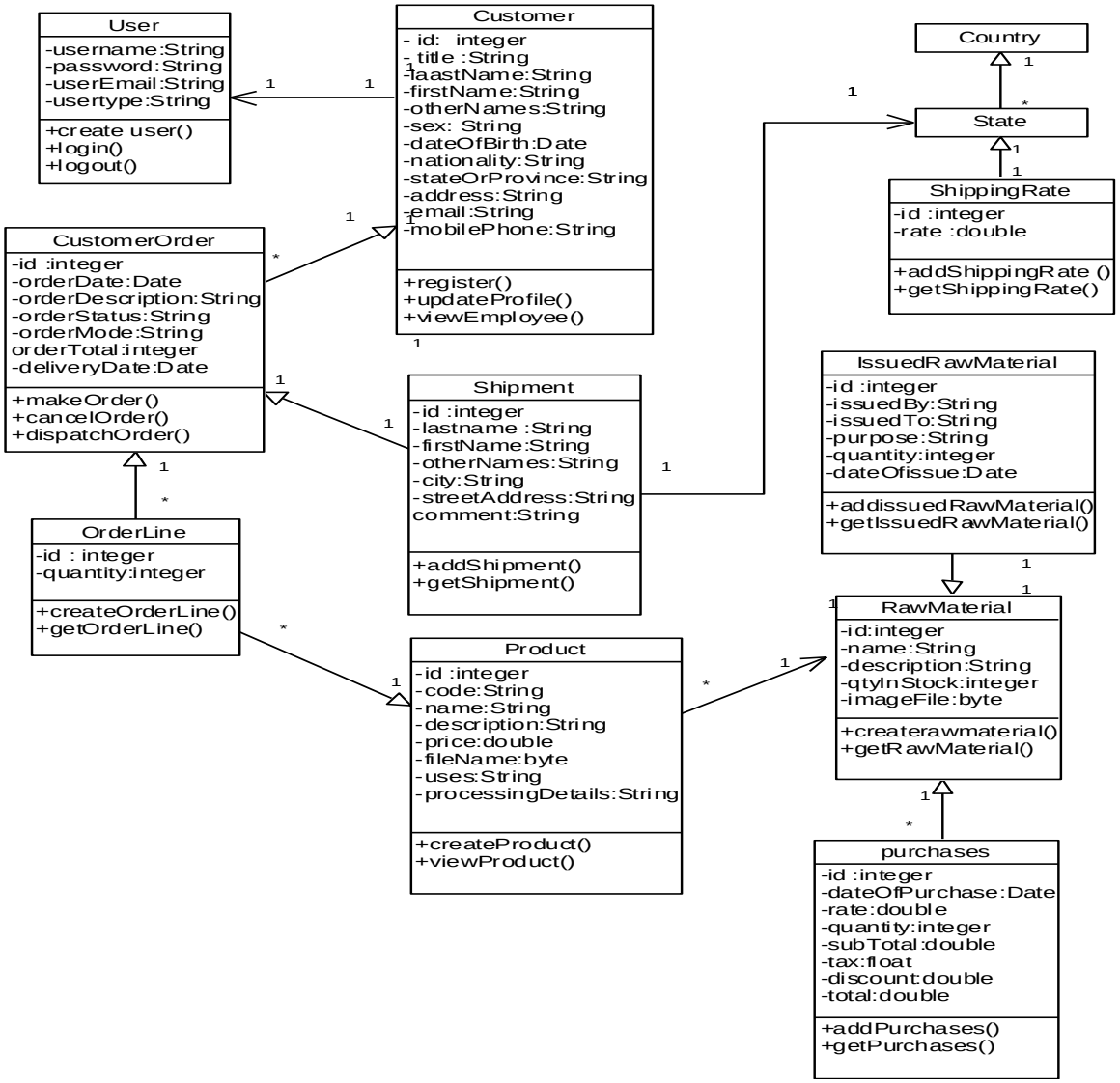


Fig2.*Use Case Diagram of Agro Based Management Information System and Forecast.*

Everything inside the rectangle is part of the system under development outside the rectangle are the actors that act upon the system.



2.2 Class diagram of the system

The class diagram of the system uses the Unified Modeling Language (UML), which is the state structure diagram that describes the structure of the "ICT" impact in agro forecasts in Nigeria.

2.3 The actual values for both raw material and production of agro forecasts

Table A: *Actual values of the production for forecasting*

1990 - 65136
1991 - 66421
1992 - 63511
1993 - 65007
1994 - 63883
1995 - 65266
1996 - 64251
1997 - 63456
1998 - 64151
1999 - 63885
2000 - 62636
2001 - 66258
2002 - 64761
2003 - 65015
2004 - 64133
2005 - 65003
2006 - 63876
2007 - 63831
2008 - 64763
2009 - 62747
2010 - 65136
2011 - 62671
2012 - 64511
2013 - 65086
2014 - 65021

Table B: *Actual values of the raw materials for forecasting*

1990	52109
1991	53137
1992	50809
1993	52006
1994	51107
1995	52213
1996	51401
1997	50765
1998	51321
1999	51108
2000	50109
2001	53007
2002	51809
2003	52012
2004	51307
2005	52003
2006	51101
2007	51065
2008	51811
2009	50198
2010	52109
2011	50137
2012	51609
2013	52069
2014	52017

The tables A and B gave the actual data values for both raw material and production, which were used against the periods i.e. number of years the forecasts were made. Equally on fig A and B were the forecasts of raw material and production. A close look at the graph shows the periods where we had challenges in carrying out the research. These periods are, year 2025, year 2034 and year 2036 in both raw material and production forecasts.

These actually are challenges encountered when some portions of land under study were leased by the traditional rulers of the community in that locality. To this effect, it attracted reduction in size of the portions of land under study and some trees needed for the research were cut down.

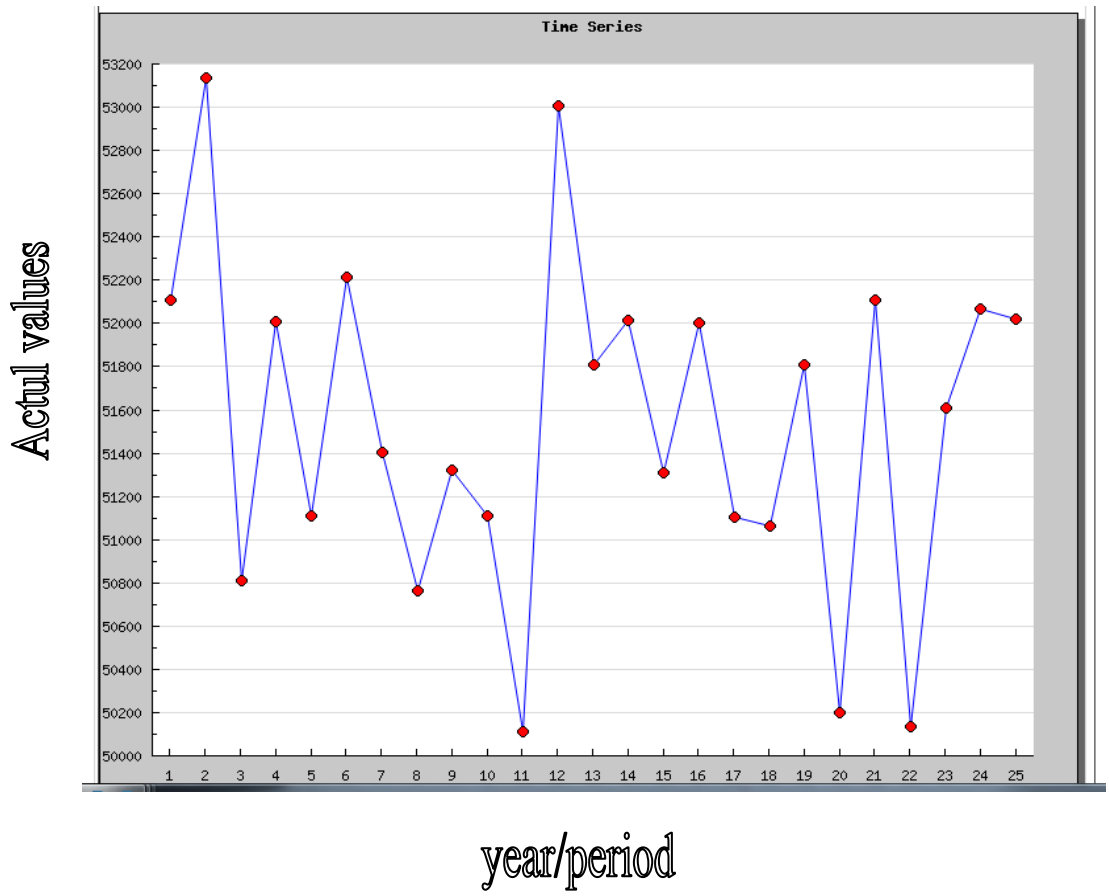


Figure A: *Raw Material Forecasting Results*

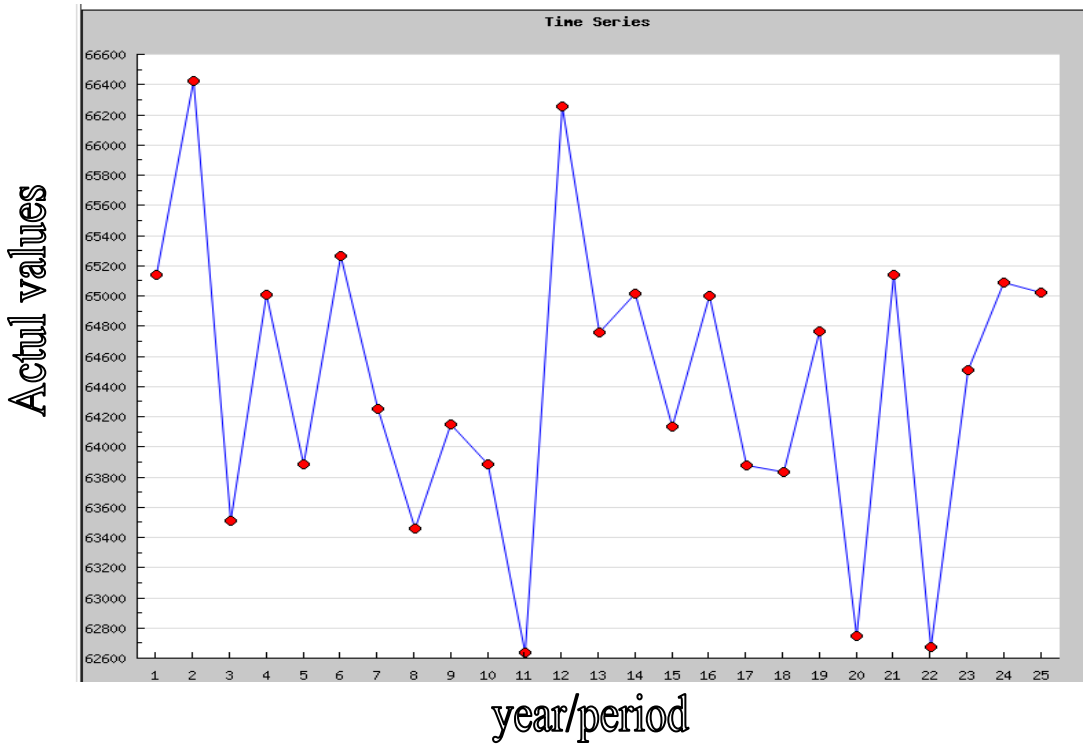


Figure B: *Production Forecasting Results*

3. CONCLUSION

Information pave way for a bright future. Implement every line of action when a research is made to achieve a desirable goal.

REFERENCES

[1] Asemi, A; Safari, A and Zavareh, A. A; (2011): The role of Management Information System (MIS) and Decision Support System (DSS) for manager's decision making. International journal of Business and management 6(7), 164 – 173

[2] Beaumaster, S. (2002):Local Government (IT) Implementation Issues: Challenges for public administration. Paper presents at the 35th Hawaii International conference on system sciences, Hawaii, USA.

[3] Das, S. K. (2012): Application of Management Information System in an organization. Paper presented at the national seminar held on 24 – 25 February, 2012 at IACS Jadavpur and Kolkata, India.

[4] Theriuf, R. J, (1994): Effective management and evaluation of Information Technology, New York, Quorum books.

[5] Madiha, S. (2013): Impact of management Information System (MIS) on school administration.

[6] Nath R. P and Badgujar M. (2013): Use of Management Information System in an organization for Decision making. ASM's International e-journal of ongoing Research in management and IT, 2(6), 160 – 171.

[7] Rhodes, J (2010): The role of MIS in decision making ettow. Retrieved 10th Sept, 2010 from http://www.ehow.com/facts.7147006 role information systems decision making html

[8] Vital, A and Shivary, K, (2008): Role of Information Technology and knowledge management in improving projects Management.

[9] Yaser, H. A; Alina, S and Nor, A (2013): The impact of management Information Systems. Adoption in managerial Decision making. vol. 8, No. 4; pp 010 – 017.

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