

The Differential Levels of Challenges in Using Forecasting Software

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Abstract: This study focused on the differential levels of challenges in using forecasting software. In this way, high quality data set patterns are examined. On the other hand, various levels of challenges and their differentials among forecasters are discussed. One hundred and twenty-five (125) professionals were interviewed. Twelve percentage (12%) of the population being fifteen (15) persons were Software developers, Eight percentage (8%) being ten (10) persons were Lecturers and Eighty percentage (80%) being One hundred (100) were Graduate students. This formed the target population and was adopted as the sample size for this study. We collected data from both primary and secondary sources, to elicit information from stakeholder. It was unraveled that there is a high level of challenges in using forecasting software especially in understanding forecasting outcomes, absence of enterprise technology in most packages, errors in data sets used, computing environment not friendly, software expensiveness, user competency requirements and stringent measures in activating users access rights. Finally, recommendations were made based on the findings to address these challenges which includes, designing friendly software interface, built-in enterprise technology, reduction in software cost, forecasters' training for competency, improvement in data quality, reducing complex forecasting outcomes and Proper definition of users access rights.

Keywords: Algorithms, Forecasting, Forecasting software, Forecasters, Statistical software packages

1.0 INTRODUCTION

In accordance with the opinion of [1], software has become a vital component of almost every business in recent times. Increasingly, advancements in software and computer technology have revolutionized business, providing executives with desktop access to powerful computing capability. These advancements have also affected forecasting software capability which has made complex algorithms accessible to forecasters through the incorporation of numerous automated features [2]. The sheer number of forecasting software packages and options can be daunting for forecasters.

Despite the wide range of software choice and the enormous technical advancements, it appears that most business forecasting is still done judgmentally with the computer merely supporting the effect by providing the historical [3]. [4] Posits that corporate analysts use spreadsheets as their primary analysis tool and choose to avoid forecasting software out of fear it would take years to master. Even though forecasting software capability is powerful and accessible, the practice and profession of computer based numerical forecasting have reached a crossroads. Forecasting tools and availability of high-quality data have improved enormously in recent decades, but not forecast quality. Nevertheless, software solutions are available, but they vary widely. Even though forecasting software capability is powerful and accessible, the question is whether the users are taking advantage of this capability, how they are using it, and whether, they are satisfied with their choices. Using Excel and Excel add-in for forecasting, [5] opined that users typically go about forecasting by reviewing the data to identify and evaluating appropriate forecasting methods.

He pointed out that sometimes the dataset is not telling and statistical analysis is needed help determine an appropriate forecasting method. It is in the light of the above that this study seeks to establish the level of challenges that confront usage of forecasting software.

The objectives of this study among others are:

- i. To highlight forecasting software systems.
- ii. To establish the level of challenges that confronts forecasters in using forecasting software.
- iii. To relate levels of challenges among forecasting software users.
- iv. To focus on preserving and guaranteeing important components of the data set accessed during the forecasting process.

The relevance of this study lies in structuring a more promising approach, characterized by emergent properties, qualities that can be predicted in advance from knowledge of the software components. This aid in handling high volumes of quality data efficiently, avoid errors, avoid partial results, downtime and ultimately enhance the ease with which we manage systems approach to forecasting processes.

2.0 REVIEW OF RELATED LITERATURE

2.1 Forecasting and Forecasting Software (Definition and Evolution)

Many scholars have defined forecasting in unique way, but are will consider its definition by [6] which said that “A forecasting is a process of predicting or estimating the future based on past and present data, providing information about the potential future events and their consequences for the organization”. The definition above clearly depicts forecasting as a means of predicting, guessing or peeping into the future in order to make an informed decision. Forecasting is useful in government, business, and schools; in fact all sectors of a nation’s economy. [7] and [8] argued that judgmental forecasts were strongly influenced by biases such as favoring a desired outcomes. To press further, [9] agreed that a system forecasting is a more promising approach, one that takes advantage of mathematical techniques and concepts that have been developed for complex systems, such as agent- based models, network analysis, and system dynamics.

Forecasting has two prominent methods:

- **Qualitative methods:** These forecasting methods are based on judgments, opinions, intuition, emotions, or personal experiences and are subjective in nature.
- **Quantitative methods:** These types of forecasting methods are based on mathematical, (quantitative) models and are objective in nature.

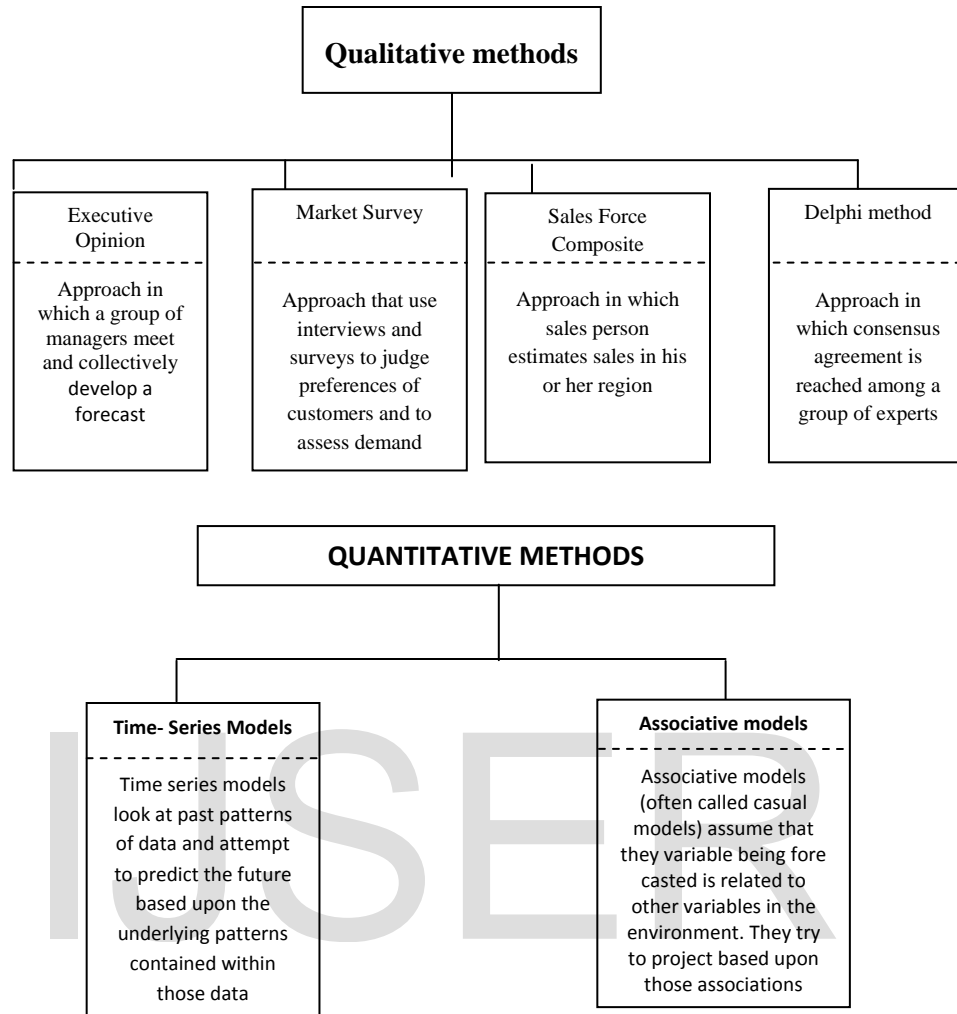


Fig 1: Forecasting Method

2.2 Development Periods of Forecasting Software

While computer development was evolutionary, the development and use of forecasting software can be categorized into phases. Its genesis preceded the introduction of the 05/360 architecture by IBM in 1967 [10].

Phase 1: Mainframe forecasting software until the introduction of the IBM PC in 1984

Phase 2: PC and workstation period, mainly single user- oriented, until 1995.

Phase 3: Advancement of process- oriented and highly integrative software through to the present [11].

2.3 Forecasting Software Development for Analysts and Market Researchers

Forecasting for Analysis and Market Research concentrates on the solution of specific forecasting problems. In these situations, forecasters apply complex and sophisticated methods, such as multivariate modeling and Delphi processes. The introduction of PCs in the 1980s, and the development of spreadsheet software such as VisiCalc, lotus 1-2-3, and MS- Excel, hastened a shift from mainframe applications to PC- based designs [12]

2.4 Forecasting Software Development for Business and Operational Planners

Business planning occurs on a regular basis often with the development of monthly sales plan. Business planning forecast are usually produced on monthly quarterly or annual basis for product groups. An operational plan is the basis for production and logistic decisions. It usually includes all aspects of the company's supply chain by the

mid-1980s, Peer Planner, Demand solutions, and forecast pro had appeared on the market along with, a wide variety of forecasting packages [13]. Graphical facilities, interfaces to databases, spreadsheets, external data sources numerically and statistically robust methods, and simple automatic algorithms for the selection and specification of forecasting models were now common features of business forecasting software.

Table 1: Forecasting Software for Analysts/ Market Researchers and Business/operational planners

S/N	Analysis/Market Researchers	Business/operational planners
1	Call stat pack, FAMS , Visicalc, Lotus 1-2-3, MS- Excel, SPSS and S- Plus	LOGOL, FORSYS, Peer planner, Demand solutions, forecast pro

Table 2: Some Forecasting Software and developers

S/N	Software	Developers	Year
1	Excel and Excel add-ins	Microsoft	1982
2	Advanced collaborative planning	Advanced computer software group Plc	1995
3	4 Cast Pro	Richard Walliker	1990
4	PROPHIX	Prophix	2000
5	IBMCOGNOS TML	IBM	2009
6	SAGE 50 Forecasting 2007	HBP Group	1998
7	Go forecast	Financegofer	2009
8	Oracle Hyperion planning	Oracle	1998
9	Cash flow wizard	Decision curve	1994
10	IBM Cogross Express	IBM	2009
11	Quantrix Modeler	Quantrix	1991

Source: <https://en.wikipedia.org/wiki>

3.0 Methodology

The following are discussed in this study, research design, the population from which the samples are drawn, the sample and the sampling technique, the instrument and data analysis. The study used a cross – sectional survey of the descriptive research design. The choice is that it allows the determination of the proportion of people who believe in certain ways [14]. The population of the study spans across the three (3) selected Universities geographically located in Rivers State, Nigeria. One hundred and twenty – five (125) professionals were interviewed. This formed the target population and was adopted as the sample size for this study. The sample was stratified according to their occupations. Twelve percentage (12%) of the population being fifteen (15) persons were Software developers, Eight percentage (8%) being ten (10) persons were Lecturers and Eighty percentage (80%) being One hundred (100) were Graduate students.

3.1 Data Collection

We studied the differential levels of challenges in using forecasting software from two main sources thus:

- a. **Primary Source:** We carried out a study using questionnaire with 10-point items. The 10-point items were structured to acquire the operational objectives of the study using the modified 5-point likert scale. The opinion of 125 respondents were sampled. Out of these, 10 were lecturers, 15 were software Developers selected from three different universities in Port Harcourt namely: **University of PortHarcourt, Rivers state University of science and Technology, Nkpolu –Oroworukwu and Ignatius Ajuru University of Education, Iwofe, PortHarcourt**, all in Nigeria. The questions sought the views of the above named groups of persons on the differential levels of challenges in using forecasting software.
- b. **Secondary Source:** We extract information from existing computer science journals text books, forecasting manuals and manuscripts, etc, the internet was a major source of the secondary data. People views were equally considered.

3.2 Data Analysis and Results Presentation

Table 3 shows the occupational distribution of the interviewee. The opinions of 125 respondents were sampled and responses collected and analyzed on a 5- point like type scales as shown in table 4.

Table 3: Occupation Distribution of Interviewed Respondents

S/N	Respondents Occupation	No	Percentage (%)
1	Software developers	15	12%
2	Lecturer	10	8%
3	Graduate student	100	80%
	Total	125	100%

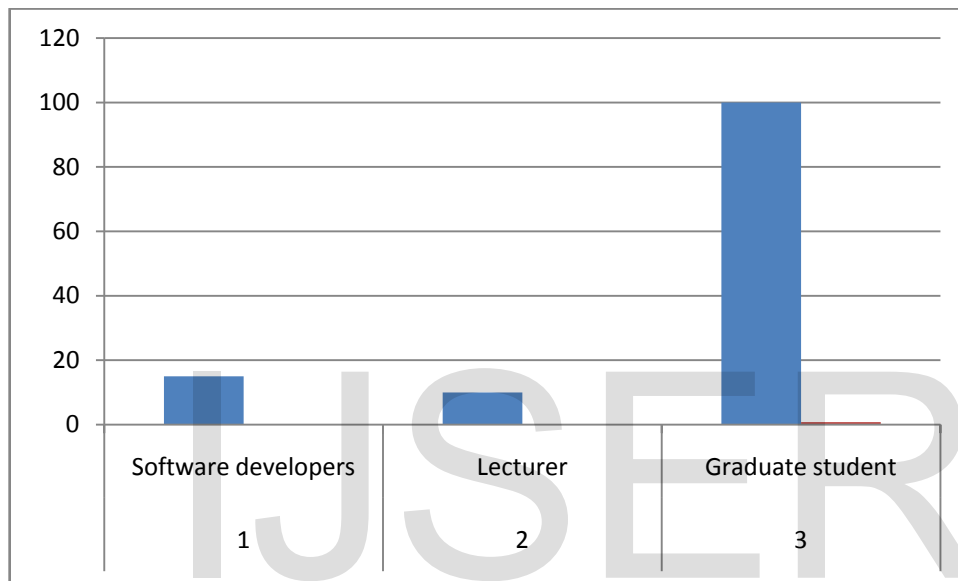


Fig. 2: Column bars showing the occupational distribution of interviewed respondents.

Table 4: shows the opinion of the respondents to the question presented by the interviewer. These questions were presented to Software developers, Lecturers and Graduate students of Computer Science and Informatics Department selected from the three Nigerian Universities mentioned in section 3.1.

Table 4: Questions and responses by respondents

S/N	Questions	X	F	FX	X(MEAN)	%
1	Forecasting software produce easily understandable?					
	• Strongly Agree	1	0	0	4.80	0.00
	• Agree	2	0	0		0.00
	• Undecided	3	0	0		0.00
	• Disagree	4	25	100		20.00
• Strongly Disagree	5	100	500	80.00		
2	Forecasting software encourage building enterprise technology?					
	• Strongly Agree	1	0	0	4.62	0.00
	• Agree	2	0	0		0.00
	• Undecided	3	8	0		6.67
	• Disagree	4	34	136		26.67
• Strongly Disagree	5	83	417	66.67		

3	Quality of data used is key in using forecasting software? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	0 0 8 17 100	0 0 24 68 500	4.74	0.00 0.00 6.67 13.33 80.00
4.	Ease of use is the major component of forecasting software? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	0 0 17 25 83	0 0 51 100 415	4.53	0.00 0.00 13.33 20.00 66.67
5.	Forecasting software provide a central repository of all pertinent forecasting information? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	0 0 91 17 17	0 68 273 68 85	3.41	0.00 0.00 73.33 13.33 13.33
6	Different types of forecasting software are in use? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	8 33 17 42 25	8 66 51 168 125	3.34	6.67 26.67 13.33 33.3 20.00
7	Enterprise software for forecasting is expensive? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	0 0 0 58 67	0.00 0.00 0.00 232 335	4.54	0.00 0.00 0.00 46.67 53.33
8	Forecasting software usage requires competency? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	0 8 8 42 67	0 16 24 168 335	4.34	0.00 6.67 6.67 33.33 53.33
9.	Forecasting software have concept of sell-in data with sell-out information such as point of sale, ex-wholesaler's sale and other audit data? <ul style="list-style-type: none"> • Strongly Agree • Agree • Undecided • Disagree • Strongly Disagree 	1 2 3 4 5	8 0 17 42 58	8 0 51 168 290	4.14	6.67 0.00 13.33 33.33 46.67
10.	To use forecasting software, you need Access Rights to the platform <ul style="list-style-type: none"> • Strongly Agree • Agree 	1 2	0 25	0 50	3.86	0.00 20.00

• Undecided	3	17	51		13.33
• Disagree	4	33	132		26.67
• Strongly Disagree	5	50	250		40.00

4.0 DISCUSSION AND EVALUATION

In the survey, Table 4 shows an analysis of users understanding of forecasting software challenges and their responses. It is clear that a substantial number of the respondents acknowledge actions that constitute challenges in using forecasting software. However, it is important to note that question 1, which centered on understanding forecasting software outcomes were identified by larger percentages of the respondents. In this case, 80% felt that outcomes of forecasting using software were not understandable. Analysis of responses from question **2, 3, 4,7,8,9 and 10** respectively shows high percent responses of strongly disagreed. This is an indication that forecasting practitioners of these levels of challenges in using forecasting software. Despite this fact, responses to forecasting software repository and types of forecasting software in use (**Question 5 and 6**) recorded 13.3% and 20.0% , however in-depth interviews showed 80% of the respondents opined that forecasting software has some levels of challenges, hence, causing a slow patronage of forecasting software in market. Differentiating and resolving these challenges could ensure the development of better and more efficient forecasting software packages. In a nutshell, forecasting software has brought the dawn of a new era in forecasting as a field of study.

5.0 CONCLUSION

The discourse in this study centered on the differential levels of challenges in using forecasting software. In doing this, we administered survey questionnaire to analyzed users' opinions in forecasting software usage and its differential levels of challenges; in a view to highlight various forecasting system, establish the levels of challenges confronting forecasters, relating these levels of challenges to other software engineering concepts and establishing Standard for data sets preservation in line with best practice. Data from respondents were presented and analyzed with percentages, mean and charts to achieve the stated research objectives. To achieve this, the following recommendations were made which includes designing friendly software interface, built – in enterprise technology, reduction in software cost, forecasters' training for competency, improvement in data quality, reducing complex forecasting outcomes and Proper definition of user's access rights.

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