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BUSINESS FORECASTING ENT:330

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UNIT 1: DEFINITION OF FORECASTING

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1.0   Introduction

This is a 2 unit credit course and the first among the units that makes up the course Business Forecasting. This unit introduces you to the subject of Business Forecasting. The course is design to help you have grasped of the subject matters as well as tutor-mark questions which will assist you to reflect on what you have read.

2.0   Objectives

By the end of this unit, you should be able to:

❖   Understand what Business is all about.

❖   Understand what Forecasting is all about

❖   Have insight knowledge of the basic of Business Forecasting.

3.0   Main Content

3.1   Definition of Business

More often than not, the word business is taken for trading as commonly used by laymen. An average individual who is into trading is found introducing himself as a businessman forgetting the fact that business is about continuity, unlike trading which tends to terminates as a particular transaction is accomplished. Business includes both commerce and industry and it is hoped that an understanding of the evolution of these two (Commerce and Industry) can give a better insight into the meaning of business.

Commerce is said to be the act of buying and selling, and the distribution of goods and services that gives satisfaction to the consumers. It is concern with the removal of goods from places where they are produced and in abundance to areas where they are needed. It is commerce indeed that began the exchange process.

Business is said to be the human efforts that is directed at converting raw materials into finished goods and services for the purpose of satisfying human needs which could result in profit maximization for the organization involved in the production. The implication of this is that goods and services are produced to create utility while simultaneously ensuring a firm's profit. It should be noted that not every business efforts results into profit. When a business is characterized with maladministration and inefficiency, the tendency for loss of profit is high. Profits are mere rewards for doing the job right. Therefore, Business includes activities of a society that are directed towards achieving a profitable return on production and exchange.

Another definition of business is put this way: Business is an elastic but composite concept that covers the whole process by which desirable things are extracted from the earth surface and transformed by, and machine through productive activities. It has both place and time utilities. It has the human effort towards acquisition of wealth realizable through buying and selling activities.

A business is therefore expected to be continually aware of its strength, weakness, opportunities and threats in an attempt to be relevant and satisfy customer's needs. It must modify its traditional operating methods in order to remain competitively advantaged. This must be noted because completion is a critical mechanism for guaranteeing that the private enterprise system continue to provide the goods and services that make for high standards and sophisticated life styles. Very few firms or organizations can escape the impact of competition in business.

3.2 Definition Forecasting

Human being on a daily basis makes decisions that have either positive or negative impact on their future. In the business world likewise, managers makes decisions that do have impacts on the future of their respective organisation. Those decisions may either be positive or negative. The fundamental nature of forecasting therefore is to make a good and reliable prediction about future event.

Forecasting can therefore be defined as the art and science of prediction of future events. It may involve taking historical data and projecting it into the future with some sort of mathematical models. Sometimes it is subjective or base on initiative prediction of future events.

Put in another way, forecasting is a prediction of estimation of a future situation. Since future is uncertain, no forecast can be hundred percent correct. Forecasting is an integral part of all human activities, but from the business point of view, increasing audience is being given to formal forecasting systems which are perpetually being refined and a subject of our focus in this unit study.

3.3   Business Forecasting

Business Forecasting can therefore be defined as an action aim towards predicting the future business development. It involves making best possible judgment about some future events. Forecasting is about predicting the future as accurately as possible, given all the information available including historical data and knowledge of any future events that might impact the forecasts.

To put it in another form, Business forecasting can be defined as a planning tool that helps management in its attempts to cope with the uncertainty of the future, relying mainly on data from the past and present and analysis of trends.

Forecasting starts with certain assumptions based on the management's experience, knowledge, and judgment. These estimates are projected into the coming months or years using one or more techniques such as Delphi Method, exponential smoothing, moving averages, regression analysis, and trend projection. Since any error in the assumptions will result in a similar or magnified error in forecasting, the technique of sensitivity analysis is used which assigns a range of values to the uncertain factors (variables). A forecast should not be confused with a budget.

A forecasting exercise is usually carried out in order to provide an aid to decision-making and in planning the future. Typically all such exercises work on the premise that if we can predict what the future will be like we can modify our behaviour now to be in a better position, than we otherwise would have been, when the future arrives. Applications for forecasting include:

❖ Inventory control/production planning - forecasting the demand for a product enables us to control the stock of raw materials and finished goods, plan the production schedule, etc

❖ Investment policy - forecasting financial information such as interest rates, exchange rates, share prices, the price of gold, etc. This is an area in which no one has yet developed a reliable (consistently accurate) forecasting technique (or at least if they have they haven't told anybody!)

❖ Economic policy - forecasting economic information such as the growth in the economy, unemployment, the inflation rate, etc is vital both to government and business in planning for the future.

Such a forecast enables the formulation of an assumption from which a plan can be developed and then the right objectives can be selected. It is in effect a special tool of planning and Fayol considered it so important as to state it was the essence of management. He used the word pre-voyance, or foresight, and referred to plans as syntheses of forecasts and recommended annual forecasts and ten yearly projections, which were revised every five years or less, depending upon trends.

Forecasts make management think ahead and give a purpose to planning by concentrating on the future

4.0   **Conclusion**

Broadly speaking there are two approaches to the problems of business forecasting. One is to obtain information about the intention of spenders through collecting expert's opinion or by conducting interviews with consumers. The other is to use past experience as a guide and, by extrapolating past statistics relationships to suggest the level of future demand. Both these methods rely on varying degrees on judgment. The first method is usually found appropriate for short-term forecasting while the second methods suits long-term forecasting. While the demand for existing products can be forecasted by either method, new products must be attempted through a survey under these two categories.

5.0   **Summary**

The term business, forecasting are well explained before discussing what business forecasting is all about and that will lead us to various issues on the subject matter

6.0   **Tutor-marked assignments**

    1.   What is business forecasting?

    2.   What is the relationship between Business and forecasting?

7.0   **Reference and other sources**

Ajonbadi H.A. Applied Business Management Theory, pp.63, 2000

Crosby, John V. *Cycles, Trends, and Turning Points: Practical Marketing and Sales Forecasting Techniques.* NTC Publishing, 2000.

Henry, Porter, and Joseph A. Callanan. *Sales Management and Motivation.* Franklin Watts, 1987.

McCarthy, E. Jerome, and William D. Perreault, Jr. *Basic Marketing: A Managerial Approach.* Irwin, 1990.

UNIT 2: **DETERMINANT OF BUSINESS FORECASTS**

1.0   Introduction

In unit 1 we have tried to let us understand what business forecasting is all about but in this unit we are going to discuss determinant of business forecasting in terms of controllable variables and the three basis factors influencing the demand forecast of goods and services.

2.0   Objectives

After studying this unit you should be able to:

❖ Understand determinants of business forecasting

❖ Explain the three basics factors influencing the demand forecast of goods and services.

3.0   Main Content

3.1   Determinants of business forecasts (Internal Factors)

Most times the forecast is based on a company's previous sales. Therefore it is necessary that the forecaster knows the sales volume for several years past.

There are three basis factors influencing the demand forecast of goods and services as observed by Otokiti (2003).

These are as follows:

(a) Purchasing Power

This is determined by disposable personal income (personal income, direct taxes and other deductions). Data on disposable income have not yet been published by the Federal Office of Statistics (FOS). Indirect estimates can however, by obtained from published data. Some people suggest the use of discretionary income in place of disposable income. Discretionary income can be estimated by subtracting three items from disposable income, viz, imported and income in kind, major fixed outlay payments and rent, and essential expenditures such as food and clothing and transport expenses based upon consumption in a normal year. Discretionary income can be quite an important determinant in case of consumer non-durable, which are luxuries.

(b) Price

The price factor is another important variable to be included in demand analysis. Here, one has to consider the prices of the product and also its substitutes and complements. One may also consider the price difference between the product concerned and its substitutes and complements.

Price as a determinant of the volume of consumer non-durables is sometimes more important through cross-elasticity (involving substitutes products) and it is directly in

terms of price-elasticity. Direct price elasticity can be expected to be more important with respect to those consumers non-durable, which are capable of storage and are free from style change risks.

(c) **Demography**

This involves the characteristics of the population human as well as non-human using the product concerned. For example, it may pertain to the number and characteristic of children in a study of the demand for toys or the number and characteristics of automobile in a study of the demand for types or petrol. In fact, it involves distinguishing between the total market demand and market segments. Such segments may be derived in terms of income, social status, sex, age, male-female ratios, urban ratios, educational level, geographical location etc. The segments which quantified can be used as an independent variable affecting the demand for the product in question.

However, these quantitative statistics alone will not be adequate for computing a thorough sales forecast. This is because it is possible to mathematically forecast sales with some precision. However, in real life, this precision can be messed up by external factors which are beyond the control of the forecaster. Therefore, many qualitative factors which affect sales volumes will have to be considered.

Stanton and Burskirk (1978: 424) identified the following four major areas the forecaster should further analyze:

- ❖ Conditions within the company
- ❖ Conditions within the Industry

❖ Conditions within the market for output

❖ General business conditions

What is proposed here is a two-category classification of the qualitative factors. Internal Factors which are more controllable and that of External Factors which are beyond the control of the forecaster.

3.2 Internal Factors

Forecasting requires sufficiently detailed analysis of both the above internal factors as well as external factors related to the sales function. Internal factors that can affect sales are more controllable. The internal factors refer to conditions within the company. These conditions are of two types viz:

Business Related Factors	Non Business Factors
Price Structure changes	Labour problem
Credit policy changes	Inventory shortages
Sales motivation plans	Working capital shortages
Changes in Distribution Method	Production capability
Changes in Promotional plan shortage	Aggressive Promotional plan
New Product lines	New ideas lines

Source: Mentzer, John T., and Carol C. Bienstock.(1998)

In forecasting it is important to stress the need to examine the economic environment and possible fluctuations in company profits and relationships to possible cycles of business activity.

In planning for longer periods, a forecast of technological changes is vital, especially for those companies which are in areas of rapidly advancing technology, e.g. electronic machinery. From an organizational point of view, some companies have separated the basic day-to-day business and marketing activity from strategic planning for the future.

4.0   Conclusion

Most organizations today, though, use the business sales forecast as the starting point in the planning exercise of running of their business taking into consideration the internal factors that may affects the forecasting process.

5.0   Summary

In summary, this unit discussed the determinants of business forecasting that is necessary, for the forecaster knows the sales volume for several years past base on the influential's factors and internal factors.

6.0   Tutor-marked assignments

1.   What are the determinants of business forecasting?

2.   Forecasting requires detailed analysis of internal factors. Explain?

7.0   Reference and other sources

Ajonbadi H.A. Applied Business Management Theory, pp.63, 2000

Henry, Porter, and Joseph A. Callanan. *Sales Management and Motivation.* Franklin Watts, 1987.

Mentzer, John T., and Carol C. Bienstock. *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process.* Sage, 1998.

UNIT 3: DETERMINANTS OF FORECAST (EXTERNAL FACTORS)

1.0   Introduction

In this unit we would continue discussion on determinant of business forecasting but our focus shall be on external factors and forecasting demand for new products.

2.0   Objectives

After studying this unit you should be able to:

Understand determinants of business forecasting as it relates to external factors

Explain the forecasting demand of new goods and services (products).

3.0   MAIN CONTENT

3.1   Determinants of Forecasting (External Factors)

Mathematically, it is possible to forecast sales with some precision. Realistically, however, this precision can be dulled because of external

market and economic factors that are beyond your control. The following are some of the external factors that can affect sales:

❖ **Political stability**: A sales forecast for a period may be disrupted as a result of political instability with a geographical zone which may affect policy pronouncement of the government which in turn may affect the organisation forecast. Take for instance, a brewing hostility between the home country of a company and its foreign market host country will have to be analyzed. The analysis is for the purpose of predicting the possible effects of a severance of diplomatic relations (with possible retaliatory economic policies) on the Company's sales from the foreign market.

❖ **Population trends**: Changes in demographic statistics of the population may affect sales. These will include changes in birth rate, movements in and out of an area, age structure, and stages in life cycle, etc.

❖ **Government controls and fiscal policy**: The general level of activities within the economy directly affects sales in general. When the economy is experiencing a boom, sales is expected to increase and to decline in a depression, all things being equal. The sales Manager must be an effective predictor of future business conditions if he is to be a competent Sales Forecaster. He must be familiar, therefore, with various indicators of economic activities and also have a sufficient understanding of the working of the economy. He must keep abreast of current economic developments.

❖ **Price Level**: Condition within the industry will have impact upon the sale volumes of an organisation. Therefore changes in the Direct and Indirect competitive market conditions will affect

the future sales volume of the company. These changes may variations in the number of competitors or changes in their marketing efforts such as product design, advertising and promotional activities, etc. For instance, in the Nigerian GSM market the entrance of Globacom into the market change the price structure of the industry and it has impact on the industry.

❖ **Styles and Fashions**: Fashion is becoming increasingly important in many industries. Where a company is dealing in products that depend on styles and fashions predicting sales become more difficult. This is because everything depends on how well the market accepts the styles the firm plan to sell. Changes in styles and fashion affect sales volume negatively or positively. This may make nonsense of a forecaster's work if not properly anticipated. However, no one can predict such changes with any form of certainty. Therefore styles and fashions are assumed to introduce risk into forecasting.

❖ **Weather**: Weather conditions and changes in it affect sales volume. During the hot season, firm dealing in soft drinks, bottled water, and the breweries experience bumper sales because of the need for consumers to 'cool down'. During the wet days/periods, retailers have experience slumps in sales while firms dealing in umbrellas, cardigans/sweaters, etc experience increase in sales volume.

❖ **Consumer Earnings**: The level of consumer earnings within the economy will naturally affect the disposable income of consumers and hence their purchasing power. A sales forecaster needs to have an idea of the consumer earnings in the market being considered.

❖ **Technical environment** - some areas have shown great changes, e.g. computers, and the impact of the speed of developments must be especially noted.

3.2   Forecasting Demand for New Products

Joel Dean has suggested a number of possible approached to the problem of forecasting demand for new products:

1. Project the demand for the new product as an outgrowth of an existing old product.

2. Analyze the new products as substitute for some existing product or service.

3. Estimate the rate of growth and the ultimate level of demand for the new product on the basis of the pattern of growth of established products.

4. Estimate the demand by making direct enquires from the ultimate purchasers either by the use of samples or a full scale.

5. Office the new product for sale in a sample market e.g. by direct mail or through one multiple shop organization.

6. Survey consumers' reactions to a new product indirectly through the eyes of specialized dealers who are supposed to be informed about consumers' needs and alternative opportunities.

To some extent, he recommended that the methods of forecasting demand for an established product can be applied or adapted for new products.

4.0 Conclusion

From the above, it can be concluded that the accuracy of the any business forecasting to a large extent can be influenced by the some or the above highlighted external factors in which if not taken into consideration will invalidate the outcome of any forecasting process.

5.0 Summary

It has been established that a good forecaster must examine critically not only the internal factors in forecasting but must also take into consideration some of the external factors which are outside the control of the forecaster in determining the accuracy of the forecasting outcome.

6.0 Tutor-marked assignments

Accurate company sales and profit forecasting requires careful consideration of

firm-specific and broader influences. Discuss some of the microeconomic and

macroeconomic factors a firm must consider in its own sales and profit forecasting.

7.0   Reference and other sources

Ajonbadi H.A. Applied Business Management Theory, pp.63, 2000

Mentzer, John T., and Carol C. Bienstock. *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process.* Sage, 1998.

UNIT 4: Importance of Business forecasting

1.0   Introduction

The last two unit discussion was on determinants of business forecasting (internal and external), the influential factors for demand for new product however the discussion in this unit shall be on importance of business forecasting and criteria of good forecasting methods.

2.0   Objectives

At the end of this unit you should be able to:

Understand importance of business forecasting,

Explain the criteria of goods forecasting methods.

3.0   Main Content

3.1   Importance of Business forecasting

Business forecasting is one of the most vital business tools been used by organizations towards future projections. Its usefulness manifested in the following areas:

❖ It is used to allocate resources among the functional areas of the organisation as well as used to control the operations of the entity.

❖ It helps the purchasing and supply department towards planning for procurement of raw of materials as well as scheduling their delivery time.

❖ It is useful for the finance department towards planning for how to source for funds in order to forestall cash-flow constraint.

❖ The Personnel/human resources department uses the business forecasting as a tool to plan the staff requirement of the organisation as the time it is require.

❖ A manufacturing entity uses business forecasting to schedule its production – when to produce at full capacity and when not to.

❖ It is used to fairly determine the expected Return on Investment (ROI). Without this tool, it might be difficult to estimate the performance measurement.

❖ Business Forecasting is used to measure the expected earnings of the business which in most cased can be classified as Goodwill.

❖ It is used to determine the inventory levels. That is, through business forecasting management will be able to know the level of finished goods inventory it should maintain at different periods for different territories, customer groups or channel.

❖ The management stands a better chance to know budget expenses under different budget heads. This is now used as a control mechanism by comparing actual with budget expenses, variance computed and corrective measures taken.

The above benefits combined together translate directly for an organisation:

- Increased efficiency

- Decreased cost

- Increased customers satisfaction and retention

- Increased revenue and profit

- Increased market value of the company's share price and greater return to investors.

3.2 Criteria of a Good Forecasting Method

❖ Accuracy: It is necessary to check the accuracy of the past forecasts against present performance and of present forecasts against future performance. Some comparisons of the model with what actually happens and of the assumptions with what is borne out in practice are more desirable. The accuracy of the forecast is measured not how closely its forecast change particularly changes in directions.

❖ Simplicity and Ease of Comprehension: Management must be able to understand and have confidence in the techniques used. Understanding is also needed for a proper interpretation of the results. Elaborate mathematical and econometric procedures may be judged less desirable if management does not really understand what the forecaster is doing and fails to understand the procedure.

❖ Economy: Costs may be weighed against the importance of the forecast to the operations of the business. A question may arise: How much money and managerial effort should be allocated to obtain a high level of forecasting accuracy? The criterion here is the economic consideration of balancing the benefits from increased accuracy against the extra cost of providing the improved forecasting.

❖ Availability: The techniques employed should be able to produce meaningful results quickly: techniques, which take a long time to

work out, may produce useful information too late for effective management decisions.

❖ Management of Timeliness: The forecast should be able capable of being maintained on an up-to-date basis. This has three aspects according Norman N. Barish:

a. The relationships underlying the procedure should be so that they will carry into the future for a significant amount of time.

b. Current data required to use these underlying relationships should be available on timely basis.

c. The forecasting procedure should permit changes to be made in the relationships as they occur.

4.0   Conclusion

In conclusion, solving the forecasting problems of organizations may not only be that of using a particular method of forecasting but may actually involved the use of several methods to achieve the objective of organisation and this involves taking particular attention to various factors that may affect the outcome of the forecast both dependent and independent.

In short, there is no unique method for forecasting, the forecaster may try one or the other methods mentioned depending on his objective, data availability, the urgency with which data is needed, and resources he intends to devote to his work, the type of product whose demand he wants to forecast.

5.0   Summary

We have given just an overview of the importance of forecasting available. The key in forecasting nowadays is to understand the different

criteria of good forecasting methods and method to apply in a particular situation.

6.0   Tutor-marked assignments

The need to know the importance and criteria good forecasting methods is necessary for forecaster? Elucidate

7.0   Reference and other sources

Ajonbadi H.A. Applied Business Management Theory, pp.63, 2000

McCarthy, E. Jerome, and William D. Perreault, Jr. *Basic Marketing: A Managerial Approach.* Irwin, 1990.

Mentzer, John T., and Carol C. Bienstock. *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process.* Sage, 1998.

UNIT 5: LIMITATIONS TO BUSINESS FORECASTING

1.0   Introduction

2.0   Objectives

3.0   Main Content

3.1   Limitations to business forecasting

3.2   Factors affecting forecasting system

4.0   Conclusion

5.0   Summary

6.0   Tutor-marked assignments

7.0   Reference and other sources

1.0   Introduction

This unit shall focus on limitations of business forecasting and factors affecting forecasting business system we should recall that we have discussed on importance of business forecasting and criteria of good business forecasting methods in unit 5.

2.0   Objectives

At end of this unit you should be able to:

Know the limitations of business forecasting

Understand the factors affecting business forecasting system.

3.0   Main Content

3.1   Limitations to business forecasting

❖ Reliability of past data. Although past events are analyzed as a guide to the future, a question is raised as to the accuracy of these recorded events

❖ Accurate judgment is needed to identify key factors entering the forecast, interpreting data and selecting methods of analysis and applying them to problems

❖ Measurement of forecasts must have a consistent base and single figure forecasts may be unsatisfactory, as there is a need for probability to be attached, thereby evaluating the likelihood of the event occurring.

According to Otokiti(2003) highlighted the following limitations to forecasting

1. The extent to which past data can be relied upon.

2. Accuracy in judgment is almost impossibility due to biases.

3. Inconsistencies in the measurement of forecasts.

4. Some methods of forecasting are tedious and cumbersome.

5. In most cases forecasting is expensive and do not pay back its way. It increases the price of products while failing to reduce the uncertainty attached to a business.

6. The veracity of data may be doubtful as they can be wrongly compiled and recorded.

3.2 Factors Affecting Forecasting System

The success or otherwise of a forecasting method, technique or approach rest on:

1. The level of political and economic stability in a society.

2. Population structure, growth rate and trends.

3. The general price level and rate of inflation.

4. Government control and change in policies.

5. Level of employment, productivity level, capacity utility and national income.

6. Changing technology and capacity to adapt.

7. Consumer's perception.

8. Competition among sellers or producers.

4.0   Conclusion

In conclusion, the outcome of business forecasting may not be 100 percent accurate due to some of the factors highlighted above such as unreliability of available internal data, cumbersome nature of the method applied and in some instances the cost outlay of carrying out forecasting. Furthermore, it may also be factors that are outside the control of the forecasters such as the price level and rate of inflation, the level of political and economic stability etc.

5.0   Summary

This unit discussed on limitations of business forecasting and highlights factors affecting business forecasting that every business forecasters and managers should know.

6.0   Tutor-marked assignments

1. Highlight factors affecting business forecasting

2. Discuss the likely limitation to Forecasting?

7.0   Reference and other sources

Ajonbadi H.A. Applied Business Management Theory, pp.63, 2000

Crosby, John V. *Cycles, Trends, and Turning Points: Practical Marketing and Sales Forecasting Techniques.* NTC Publishing, 2000.

Mentzer, John T., and Carol C. Bienstock. *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process.* Sage, 1998.

UNIT 6: Principles of Forecasting

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1.0   Introduction

This unit attempt to discuss general principles behind forecasting. Business forecasting is a tool that helps managers in decision making about the future and the number market factors likewise the guiding principles on market demand forecasting.

2.0   Objectives

After studying this unit you should be able to:

- ❖ Understand determinants of business forecasting external factors
- ❖ Explain the forecasting demand of new goods and services (products).

3.0   Main Content

3.1   Principles of Forecasting

The principles of forecasting revolved around formulating a problem, obtaining information about it, selecting and applying methods,

evaluating methods, and using forecasts. Each principle is described along with its purpose, the conditions under which it is relevant, and the strength and sources of evidence.

According to J. Scott Armstrong (2001) when managers receive forecasts, they often cannot judge their quality. Instead of focusing on the forecasts, however, they can decide whether the *forecasting process* was reasonable for the situation. By examining forecasting processes and improving them, managers may increase accuracy and reduce costs.

Forecasts have four major characteristics or principles. An understanding of these will allow us to make more effective use of forecasts. They are simple and, to some extent, common sense.

❖ **Forecasts are usually wrong**.

Forecasts attempt to look into the unknown future and, except by sheer luck, will be wrong to some degree. Errors are inevitable and must be expected.

❖ **Every forecast should include an estimate of error**.

Since forecasts are expected to be wrong, the real question is, "By how much?" Every forecast should include an estimate of error often expressed as a percentage (plus and minus) of the forecast or as a range between maximum and minimum values. Estimates of this error can be made statistically by studying the variability of demand about the average demand.

❖ **Forecasts are more accurate for families or groups**.

The behavior of individual items in a group is random even when the group has very stable characteristics. For example, the marks for individual students in a class are more difficult to forecast accurately than the class average. High marks average out with low marks. This means that forecasts are more accurate for large groups of items than for individual items in a group.

For production planning, families or groups are based on the similarity of process and equipment used. For example, a firm forecasting the demand for knit socks as a product group might forecast men's socks as one group and women's as another since the markets are different. However, production of men's and women's ankle socks will be done on the same machines and knee socks on another. For production planning, the forecast should be for (a) men's and women's ankle socks and (b) men's and women's knee socks.

❖   **Forecasts are more accurate for nearer time periods**.

The near future holds less uncertainty than the far future. Most people are more confident in forecasting what they will be doing over the next week than a year from now. As someone once said, tomorrow is expected to be pretty much like today.

In the same way, demand for the near term is easier for a company to forecast than for a time in the distant future. This is extremely important for long lead-time items and especially so if their demand is dynamic. Anything that can be done to reduce lead time will improve forecast accuracy.

As an aid to Managers, Stanton and Burskirk (1978:438) have provided the following guiding principles on which to base market demand forecasting:

3.2   Guiding Principles on Market Demand Forecasting

Minimize the Number of Market Factors

Simplicity is virtuous. The Sales Manager should keep the number of market factors on which the analysis is based as small as possible. This is because the larger the number of these factors, the more difficult it become to identify those which actually affect the demand for a product. Some of the supposed market factors may be mere surface indicators. A drug manufacturer in computing his Market Index may use the number of

drug stores, number of people above age 65, income, number of hospital beds, population, number of physicians, etc. Looking at the above, the actual market factors for the index computation is simply Population and Income.

3.2.1 Use more than one Method

It is wise that the Forecaster use as many of the analysis techniques as possible so as to check one result against another. In market demand forecasting, it is customary to start with the market factor derivation technique and then add the others such as Correlation analysis, Consumer surveys or even Test Markets as may become necessary.

3.2.2 Consider each Product as different

This is necessary for companies which have many products. The market demand forecasts needs to be computed product by product.

3.2.3 Understand Mathematics and Statistics

The determination of Market and Sales potential is definitely for only those that are mathematically and statistically informed. The sales manager should, therefore, be sufficiently knowledgeable and familiar with the statistical techniques so that he can recognize errors in reports/materials presented to him. The definition and explanation of statistical data is very important in all research work. A Sales Manager who has little knowledge of statistical theory will be at the mercy of incompetent statisticians.

3.2.4 Become Familiar with Sources of Information

Forecasters must be familiar with the types of data available from the universities, government agencies, trade associations, private research institutes, etc; and the limitations of their underlying methodologies.

3.2.5 Use Sound Logic

A keen logical mind is essential in order to determine and use market factors. If your logic is faulty, the result of the analysis will also be faulty. To be logical in undertaking market analysis, the Analyst must have a sound background in Economics and Marketing theory. Just being competent statistician will definitely not be sufficient; you can only be as good a Marketing Researcher as you are a good Marketing specialist.

3.2.6 Use the Minimum-Maximum Technique

It is a sound research strategy to prepare estimates under differ scenarios for example under worse and best conditions an even variants in-between. This gives the lowest probable and highest probable Market potentials for the products.

4.0 Conclusion

Attempt was made to discuss general principles behind forecasting. Business forecasting is a tool that helps managers in decision making about the future.

5.0 Summary

In summary, this unit looks at business forecasting as an action taken by managers towards predicting the future business development of their respective organisation. It is used mostly in solving the problems among others inventory control/production planning, investment policy direction of the organisation and as well as economic policy direction.

6.0   Tutor-marked assignments

1.   What are the basic principles of Forecasting?

2.   Errors are inevitable and must be expected in forecasting. Discuss?

7.0   Reference and other sources

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UNIT 7:   ASSUMPTIONS OF FORECASTING

1.0   Introduction

2.0   Objectives

3.0   Main Content

3.0   Assumptions of Forecasting

4.0   Conclusion

5.0   Summary

6.0   Tutor-marked assignments

7.0   Reference and other sources

1.0   Introduction

This unit introduces you to the assumptions of forecasting. It is design basically to enable you have in-depth knowledge of facts behinds every business forecasting.

There are also exercises at the end of the course for you to practice these will enable you to rate your level of reading assimilation.

2.0   Objectives

By the end of this course unit, you should be:

❖   Equipped with the basic tools as well as techniques of forecasting

3.0   Assumptions of Forecasting

Assumption of forecasting are accepted causes and effects relationships, or estimates of the existence of a fact from the known existence of other fact(s). Although generally speaking assumptions are useful in providing basis for action and in creating "what if" scenarios to simulate different realities or possible situations, assumptions are dangerous when accepted as reality without thorough examination.

Business forecasts are conditional in that a company prepares the forecast prior to developing strategic and tactical plans. The forecast of sales potential may cause management to adjust some of its assumptions about production and marketing if the forecast indicates that: 1) current production capacity is inadequate or excessive, and 2) sales and marketing efforts need revisions. Management, therefore, has the opportunity to examine a series of alternate plans that propose changes in resource commitments (such as plant capacity, promotional programs, and market activities), changes in prices and/or changes in production scheduling.

Through forecasting the company determines markets for products, plans corporate strategy, develops sales quotas, determines the number and allocation of salespeople, decides on distribution channels, prices products or services, analyzes products and product potential in different markets, decides on product features, determines profit and sales potential for different products, constructs advertising budgets, determines the potential benefits of sales promotion programs, decides on the use of various elements of the marketing mix, sets production volume and standards, chooses suppliers, defines financing needs, and determines inventory standards.

For the forecasting to be accurate, managers need to consider all of the following factors:

❖ **HISTORICAL PERSPECTIVE.**

As a starting point, management analyzes previous sales experience by product lines, territories, classes of customers, and other relevant details. Management needs to consider a time line long enough to detect trends and patterns in the growth and the decline of dollar sales volume. This period is generally five to ten

years. If the company's experience with a particular product class is shorter, management will include discernible experience of like companies.

The longer the view, the better management is able to detect patterns which follow cycles. Patterns which repeat themselves, no matter how erratically, are considered to be "normal," while variations from these patterns are "deviant." Some of these deviations may have resulted from significant societal developments that carried an impact that filtered all the way down to your business's sales performance. Management may compensate for these abnormalities by adjusting the figures to reflect normal trends under normal conditions.

❖ **BUSINESS COMPETENCE.**

The ability of a company to respond to the results of a sales forecast depends on its production capacity, marketing methods, financing, and leadership, and its ability to change each of these to maximize its profit potential.

❖ **MARKET POSITION.**

Forecasting also considers the competitive position of the company with respect to its market share; research and development; quality of service, pricing and financing policies; and public image. In addition, forecasters also evaluate the quality and quantity of the customer base to determine brand loyalty, response to promotional efforts, economic viability, and credit worthiness.

❖ **GENERAL ECONOMIC CONDITIONS.**

Although consumer markets are often characterized as being increasingly susceptible to segmentation in recent years, the condition of the overall economy is still a primary determinant of general sales volume, even in many niche markets. Forecasters incorporate relevant data that correlate well or demonstrate a causal relationship with sales volume.

❖ **PRICE INDEX.**

If the prices for products have changed over the years, changes in dollar volume of sales may not correlate well with volume of units. At one point in time when demand is strong, a company raises its prices. At another time, a company may engage in discounting to draw down inventories. Therefore, accountants devise a price index for each year which compensates for price increases. By dividing the dollar volume by the price indexes, a company can track its "true" volume growth. This process is similar to an inflation index, which provides prices in constant dollars. As a result, management is able to compare the price-adjusted dollar sales volumes.

❖ **SECULAR TRENDS.**

The secular trend depicts: 1) general economic performance, or 2) the performance of the specific product for all companies. If a company's trend line rises more rapidly than the secular trend line, a company would be experiencing a more rapid growth in the rate of sales. Conversely, if a company's trend line is below the secular trend line, its performance is below the market's average. Management also uses this type of comparison to evaluate and control annual performance.

❖ **TREND VARIATIONS.**

Although the secular trend represents the average for the industry, it may not be "normal" for a particular company. The comparison of company trends to secular trends may indicate that the company is serving a specialized market, or that the company is not faring well. Forecasters study the underlying assumptions of trend variations to understand the important relationships in determining the volume of sales. Although markets may be strong, the sales force might need to be adjusted.

❖ **"INTRA-COMPANY" TRENDS.**

By analyzing month-to-month trends and seasonal variations over both the long and short terms, small business owners and managers can adjust the sales forecast to anticipate variations that historically repeat themselves during budget periods. Management may then construct a budget reflecting these variations, perhaps increasing volume discounts during traditionally slow periods, exploring new territories, or having sales representatives solicit product and service ideas from current customers.

❖ **PRODUCT TRENDS.**

Forecasters also trend individual products, using indexes to adjust for seasonal fluctuations and price changes. Product trends are important for understanding the life cycle of a product.

4.0 Conclusion

In conclusion an attempt was made to examine the basic assumption of business forecasting. These assumptions helped the business manager to know the direction of its forecasting.

5.0   Summary

In summary, assumption of forecasting establishes the basic foundation upon which business manager based their forecasting techniques as well as the methodologies employed in forecasting.

6.0   Tutor-marked assignments

1. Assumptions are useful in providing basis for action and in creating "what if" scenarios to simulate different realities or possible situations. Discuss

2. Assumptions are dangerous when accepted as reality without thorough examination. Do you agree with this statement? If yes, explain.

7.0   Reference and other sources

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Henry, Porter, and Joseph A. Callanan. *Sales Management and Motivation.* Franklin Watts, 1987.

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Mentzer, John T., and Carol C. Bienstock. *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process.* Sage, 1998.

UNIT 8: STEPS IN FORECASTING

1.0   Introduction

The unit 8 of this course introduces you to the steps in forecasting. It is structured to give you an in-depth understanding of the steps to adopts in forecasting regardless of the approaches or methods applied.

There are also exercises at the end of the course for you to practice with these will enable you to know your level of understanding the course.

2.0   Objectives

At the end of this course unit, student is expected to:

 ❖ Be able to follow the steps in forecasting
 ❖ Be able to initiate, design and implement a forecasting system

3.0   MAIN CONTENT

3.1   Steps in Forecasting

Steps in forecasting ensure that managers present a logical and systematic way of initiating, designing and implementing a forecasting system. Futrell (1998:167) defined the forecasting process as a series of procedures used to forecast this shown pictorially below:

The Forecasting Process Model

```
┌─────────────┐      ┌──────────────────────┐      ┌─────────────────┐
│  Forecast   │ ───> │ Determine dependent  │ ───> │ Develop forecast│
│ Objectives  │      │ and independent      │      │   procedure     │
│             │      │    variables         │      │                 │
└─────────────┘      └──────────────────────┘      └─────────────────┘
      ▲                                                      │
      │                                                      ▼
┌─────────────┐                                     ┌─────────────────┐
│Evaluate     │                                     │ Select forecast │
│result versus│                                     │ analysis method │
│ forecast    │                                     │                 │
└─────────────┘                                     └─────────────────┘
      ▲                                                      │
      │                                                      ▼
┌─────────────┐   ┌──────────────────────┐   ┌─────────────────┐
│ Make and    │<──│ Present Assumptions  │<──│   Gather and    │
│ finalize    │   │    about Data        │   │  Analyze data   │
│ forecast    │   │                      │   │                 │
└─────────────┘   └──────────────────────┘   └─────────────────┘
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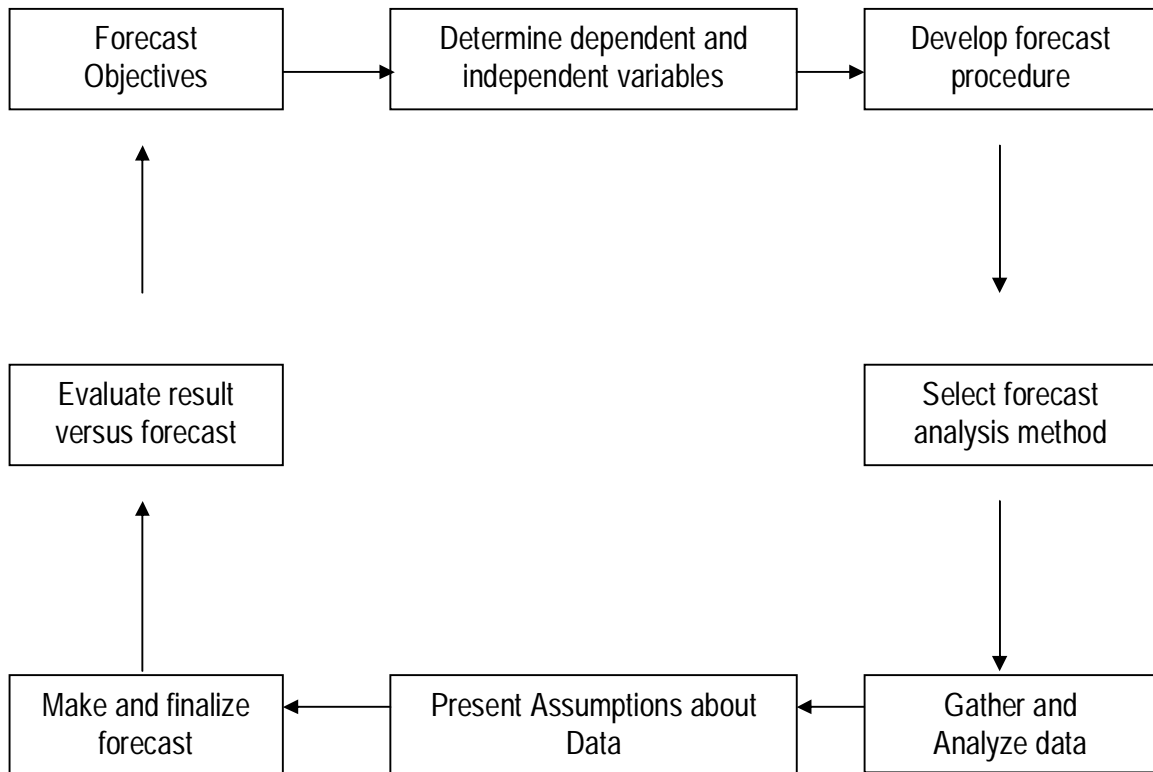
Source: Futrell, C.M. (1988) Sales Management: Team work, leadership, and technology, Orlando: Dryden Press, p 167

Therefore regardless of the approach, technique, or method of forecasting applied, using the model above the following steps are to be followed:

1. Determine the use(s) or objective(s) of the forecast: This is the first stage of forecasting. If the objective or reason for forecasting is not well articulated it could jeopardize the accuracy of forecasting result. Hence, the manager in charge of forecasting must be knowledgeable enough to determine what organisation intends to achieve for the future.

2. Determine the time horizon of the forecasted that is, whether it is short-term, medium-term, or long-term: The next stage is for the forecaster to determine the time range the forecasting will cover

which usually depends upon the objective of the forecast – this can be for a short-term, medium-term or even long-term.

3. Gather the data needed to make the forecast: The fifth stage is to gather together all the data needed to make the forecast; this may include the among others accounting records, financial statements, sales-call reports, after sales services demand from customers, and various periodic reports, etc.

4. Make the forecast

5. Selection of the items that to be forecasted: The second stage is to select all the items to be considered for forecasting. These will include both the dependent variables (which are within the control of the organisation) and the independent variables (which are those items that can be refers to as market factors and most cases outside the control of the organisation).

6. Select the forecasting model(s): After the time frame is determined the next stage is for the forecaster to select the forecasting model to use. This will involve a consideration of many of the available analytical tools for forecasting.

7. Validate and implement the results

The above steps present a logical systematic way of initiating, designing, and implementing a forecasting system. When the system is to be used to generate forecasts regularly over a period of time, data must be routinely selected and the actual compilation used to make the forecast automatically done using computer.

4.0   Conclusion

In conclusion, the major criteria in forecasting steps are that there must be a match between decision time, forecast range and forecasting accuracy.

5.0   Summary

Irrespective of the methods used in forecasting, manager must adhere strictly to forecasting steps in order to minimize forecasting error

6.0   Tutor-marked assignments

1. Briefly describe the steps that used to develop a forecasting system?

7.0   Reference and other sources

Ajonbadi H.A. Applied Business Management Theory, pp.63, 2000

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UNIT 9: CLASSIFICATION AND PURPOSES OF FORECAST

1.0   Introduction

This is course unit 9 and it discuss about the classification of forecasts. During this course, you will understand the varying purposes of business forecasting. Try your read and understand so as to be self-assured that you have mastered the points raised.

2.0   Objectives

Student is expected to understand the following:

❖ Be able to distinguish the major classifications of business forecasting.

❖ Understand varying purposes of business forecasting and apply the approaches.

3.0   Main Content

3.1   Classification of Forecast

Forecasts are classified by the future time horizon they that tend to describe. Three of such categories are:

1. *The Short-Range Forecast* which have a time limit of not more than a year, but is generally less than three months. It is used for planning, purchasing, job scheduling, work force level, job assignments and production level.

2. *Medium-Range Forecast* otherwise refer to as intermediate forecast which spans from three months to three years. It is instrumental in sales planning, production planning and budgeting, cash budgeting and analyzing various operating plans.

3. *Long-Range Forecast* has a minimum of three years as it is used for new products planning, capital expenditure, facility location or business expansion, and research and development programmes.

None of these could be said to be superior to the other. The superiority lays on the nature of assignment at hand, the forecasting tools and the prevailing objective conditions within the environment where such business plans are done.

3.2 PURPOSES OF FORECASTING

The purpose of forecasting differs according to types of forecasting; short term forecasting and long term forecasting:

3.2.1 PURPOSES OF SHORT TERM FORECASTING

(1) Evolving suitable production policy so as to avoid the problem of over-production and the problems of short

supply. For this purpose, production schedules have to be geared to expected sales.

(2) Helping the firm in reducing costs of purchasing raw materials and controlling inventory.

(3) Determining appropriate price policy so as to avoid an increase when the market conditions are expected to be weak and a reduction when the market is going to be strong.

(4) Setting sales targets and establishing controls and incentives. If targets are set too high, they will be discouraged salesmen who fail to achieve them; if set too low, the targets will be achieved easily and hence incentives will prove meaningless.

(5) Forecasting short-term financial requirements: Cash requirements depend on sales level and production operation. Moreover, it takes time to arrange for funds on reasonable terms. Sales forecasts will, therefore enable arrangement of sufficient funds on reasonable terms well in advance.

3.2.2 PURPOSES OF LONG TERM FORECASTING

(1) Planning of a New Unit or Expansion of an Existing Unit

It requires an analysis of the long-term demand potential of the products in question. A multi-product

firm must ascertain not only the local demand situation, knowledge than its rivals of the growth items. If a company has better knowledge than its rivals of the growth trends of the aggregate demand and of the distribution of the demand over various products, its competitive position would be much better.

(2) *Planning long-term financial requirements*

As planned for raising funds requires considerable advanced notice, long-term sales forecasts are quite essential to assess long-term financial requirements.

(3) Planning man-power requirement

Training and personnel development are long-term propositions, taking considerable time to complete. They can be started well in advance only on the basis of estimate of man-power requirements assessed according to long-term sales forecasts.

4.0 Conclusion

It is clear that from the discussion above, various organisation forecast for short term or long term depending on the task at hand with various degree of reasons for opting for either of the classification.

5.0 Summary

In this unit attempt was made to discuss the classification of forecasts as well as the purpose of forecasting either for short term or long term. Try to read and understand so as to be self-assured that you

have mastered the points raised. There are tutor marked exercises that will help you to learn this course faster.

6.0   Tutor-marked assignments

Discuss the classification and purpose of business forecasting?

7.0   Reference and other sources

Ajonbadi, H.A. Applied Business Management Theory pp 60, 2000.

Aston, A. and Weber, J. Jan 16, "The Worst Isn't Over: Smarter science is helping companies and insurers plan for hurricanes. The Bad News: This year could be another doozy." *Business Week, 2006*.

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UNIT 10:   TYPES OF FORECASTS

1.0   Introduction

This is course unit 10 and it discuss about the types of forecasts.

During this course, you will understand the quantitative forecasting methods and qualitative forecasting methods. Please endeavour to go through them and be self-assured that you have mastered the points raised.

2.0   Objectives

Student is expected to understand the following:

❖ Be able to distinguish the major types business forecasting.

❖ Understand both quantitative and qualitative methods which to apply the methods.

3.0   Main Content

3.1   Types of Forecasts

There are two major types or approaches to business forecasting. There is what is called Quantitative approach and Qualitative approach. Both approaches rely in varying degree of judgment. These approaches make

use of different methods of forecasting; these methods shall be discussed later.

3.2   Quantitative Forecasting Approaches

Quantitative forecasting methods are used when historical data on variables of interest are available—these methods are based on an analysis of historical data concerning the time series of the specific variable of interest. There are two quantitative forecasting methods. The first uses the past trend of a particular variable in order to make a future forecast of the variable. In recognition of this method's reliance on time series, it is commonly called the "time series method." The second quantitative forecasting method also uses historical data. This method is often referred to as the causal method because it relies on the use of several variables and their "cause-and-effect" relationships. Examples of variables that may have this cause-and-effect relationship are: 1) interest rate levels and levels of disposable income; 2) winter weather patterns and demand for heating oil; 3) increasing gas prices and a decline in demand for sports utility vehicles (SUVs). By studying the time series data on two or more variables that have a cause-and-effect relationship with the item for which a forecast is needed, effort is made to incorporate as many relevant factors as possible into the forecast.

In practice, most business people use some combination of these methods and techniques in trying to plan for the future and put together accurate forecasts. With each cycle of forecasting, more is learned about what factor to consider and how to weight their importance in projecting future events.

Business forecasting under the quantitative approaches are techniques or varying level of statistical complexity which are based on analyzing past data of the item to be forecast. The underlying assumption is that past patterns will provide guidance to the future events.

The above implies in general that, quantitative methods use numbers e.g. sales numbers, consumer demand, web traffic numbers, the amount of new accounts or cancellations of existing accounts etc for a specific period depending on the breadth of the forecast being performed. The following are the methods of quantitative approach:

3.2.1 Naïve Method

This is a method that connotes that the demand in the next period will be exactly the same as the demand in the most recent period. In order words, if, for instance, 1000 crates of soft drinks is sold by a depot in July, we can forecast that 1000 crates will be sold in August. This may not be true, but it at least provides a starting point against which the more sophisticated models can be compared. It is very simplistic, cost-effective and an efficient objective forecasting model.

3.2.2 Explanatory Methods

Explanatory forecasting methods use data to attempt to explain trends and to forecast future market direction based on existing data. These consider past performance and marketing trends, such as consumer spending reports and consumer confidence indexes, to attempt to determine the future path for a certain product, web site or company. Explanatory methods involve looking at market activity to explain how and why trends occurred, not just to predict what

will occur. Because the "how" is important here, this method is different than a time-series method which just considers what the future trends will be.

3.2.3 Time-series Methods

Time-series methods are used only with historical data to predict future performance. For example, if ₦6 million in sales were made over the last year, a time-series method might predict that ₦6 million in sales could be achievable this year, with a slight increase allowed for additional business. If a website was hit 340 times on Sunday last week, a time-series method might predict a similar influx on a future Sunday.

3.3   Qualitative Forecasting Approaches

Qualitative forecasting techniques generally employ the judgment of experts to generate forecasts. A key advantage of these procedures is that they can be applied in situations where historical data are simply not available. Even in situations where such data are available, quantitative forecasting methods are a useful addition to successful forecasting.

This technique use human judgment and experience to turn qualitative information into quantitative estimates. It is mostly used for both short and long term purposes, its use becomes of increasing importance as the time scale of the forecast lengthens because as the time scale lengthens, past pattern become less meaningful.

Three important qualitative forecasting methods are: the Delphi method, scenario writing, and the subject approach.

3.3.1 Delphi Method

In the Delphi method, an attempt is made to develop forecasts through "group consensus."

The Delphi Technique relies on the assumption that several experts can arrive at a better forecast than one. Users of this method solicit a panel consensus and reprocess the results through the panel until a very narrow, firm median is agreed upon. By keeping the panel participants isolated, the Delphi excludes many aspects of group behavior, such as social pressure, argumentation, and domination by a few members, from causing undue influence. The expense associated with this method, however, precludes most small business enterprises from pursuing it.

Delphi is attractive to managers because it is easy to understand and supports forecasts with reasons and authority (Green, Armstrong, & Graefe 2007). It is relatively cheap to conduct: panelists do not meet so the costs of assembling a group of highly-paid individuals in one place and the time-wasting of holding meetings are avoided. Moreover it is not necessary to employ expensive consultants to implement the method if a competent administrator can be found in-house.

Green, et al. (2007) identified eight advantage of the Delphi technique over prediction markets. These are:

> (1) Broader applicability
>
> (2) Ease of understanding
>
> (3) Ability to address complex questions
>
> (4) Ability to maintain confidentiality
>
> (5) Avoidance of manipulation
>
> (6) Revelation of new knowledge
>
> (7) Avoidance of cascades

(8) Fewer participants

3.3.2 Scenario Writing Method

Under the scenario writing approach, the forecaster starts with different sets of assumptions. For each set of assumptions, a likely scenario of the business outcome is charted. Thus, the forecaster generates several different future scenarios (corresponding to different sets of assumptions). The decision maker or business person is presented with the different scenarios, and has to decide which scenario is most likely to prevail.

3.3.3 A Subjective Approach Method

The subjective approach allows individuals participating in the forecasting decision to arrive at a forecast based on their feelings, ideas, and personal experiences. Many corporations in the United States have started to increasingly use the subjective approach. Internally, these subjective approaches sometimes take the form of "brainstorming sessions," in which managers, executives, and employees work together to develop new ideas or to solve complex problems. At other times, the subjective approach may take the form of a survey of the company's sales people. This approach, which is known as the sales force composite or grass roots method, is relied on because salespeople interact directly with purchasers and it is assumed therefore that they have a good feel for which products will or will not sell and in what quantities.

The advantage of using the salespeople's forecasts is that salespeople are highly qualified to explain the demand for products, especially in their own territories. The disadvantage is that salespeople may tend to be optimistic in their estimates since optimism is a characteristic often found in good salespeople. Also, those

working in sales may fear that a low sales forecast will lead to layoffs in the sales area. The opinions of salespeople should not be relied on to the exclusion of all else for one additional reason. Salespeople may not be aware of impending changes in other related areas, such as availability of raw materials, national economic developments, or the arrival of a formidable new competitor.

4.0   Conclusion

In conclusion the goal of forecasting is to come as close to possible to an accurate picture of the future. Irrespective of the approaches used forecasters always watch out for the many interactive variables as a change in any one of these may cause the forecasted scenario to change.

5.0   Summary

In summary, despite the fact that forecasting is an imprecise art, a company must do the best it can to plan for the future and an important part of this planning is forecasting using either the quantitative or the qualitative approaches.

6.0   Tutor-marked assignments
1. What do you understand quantitative and qualitative method of forecasting to be?
2. Explain the advantages of Dephi method of forecasting?

7.0   Reference and other sources

Ajonbadi, H.A. Applied Business Management Theory pp 60, 2000.

Aston, A. and Weber, J. Jan 16, "The Worst Isn't Over: Smarter science is helping companies and insurers plan for hurricanes. The Bad News: This year could be another doozy." *Business Week, 2006*.

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UNIT 11:   METHODS OF FORECASTING

1.0   Introduction

This is the unit 11 of the course which is to introduce you the various methods of forecasting. The unit describes common methods of forecasting and its applicability.

2.0   Objectives

At the end of this unit course, you should be able to:

❖   Have knowledge of the various methods of forecasting

❖   Identify which method is best suited for a particular organizational set up as well as a particular situation and environment either for a short-range forecast or long-range forecast.

3.0   Main Content

3.1   Methods of Forecasting

Business forecasting has always been one component of running an enterprise. However, forecasting traditionally was based less on concrete and comprehensive data than on face-to-face meetings and common sense. In recent years, business forecasting has developed into a much more scientific endeavor, with a host of theories, methods, and techniques designed for forecasting certain types of data.

There are a variety of forecasting techniques and methods from which the small business owner may choose. Not all of them are applicable in every situation. To allow for adequate forecasting, a business must choose those methods which best serve their purposes, utilize accurate and relevant data, and formulate honest assumptions appropriate to the market and product.

Forecasting methods can be classified into several different categories; we shall be focus on the following: Moving Average, Trend lines and least square, computer application to business forecasting.

3.2   Time Series Forecasting Method

Before discussing time series methods, it is helpful to understand the behavior of time series in general terms. Time series are comprised of four separate components: trend component, cyclical component, seasonal component, and irregular component. These four components are viewed as providing specific values for the time series when combined.

In a time series, measurements are taken at successive points or over successive periods. The measurements may be taken every hour, day,

week, month, or year, or at any other regular (or irregular) interval. While most time series data generally display some random fluctuations, the time series may still show gradual shifts to relatively higher or lower values over an extended period. The gradual shifting of the time series is often referred to by professional forecasters as the trend in the time series. A trend emerges due to one or more long-term factors, such as changes in population size, changes in the demographic characteristics of population, and changes in tastes and preferences of consumers. For example, manufacturers of automobiles in the United States may see that there are substantial variations in automobile sales from one month to the next. But, in reviewing auto sales over the past 15 to 20 years, the automobile manufacturers may discover a gradual increase in annual sales volume. In this case, the trend for auto sales is increasing over time. In another example, the trend may be decreasing over time. Professional forecasters often describe an increasing trend by an upward sloping straight line and a decreasing trend by a downward sloping straight line. Using a straight line to represent a trend, however, is a mere simplification—in many situations, nonlinear trends may more accurately represent the true trend in the time series.

Although a time series may often exhibit a trend over a long period, it may also display alternating sequences of points that lie above and below the trend line. Any recurring sequence of points above and below the trend line that last more than a year is considered to constitute the cyclical component of the time series—that is, these observations in the time series deviate from the trend due to cyclical fluctuations (fluctuations that repeat at intervals of more than one year). The time series of the aggregate output in the economy (called the real gross domestic product) provides a good example of a time series that displays cyclical behavior.

While the trend line for gross domestic product (GDP) is upward sloping, the output growth displays a cyclical behavior around the trend line. This cyclical behavior of GDP has been dubbed [business cycles](#) by economists.

Generally speaking, as mention earlier observations taken over a period of time (i.e. a time series) often contains the following four components or characteristics.

❖ **The Trend Component**.

These are the short-term periodic variations in value due to different circumstance. They occur with some degree of regularity. They may be as a result of the natural seasons of the year but do not necessarily occur as a result of these reasons alone.

❖ **The cyclical Component**.

These are medium-term fluctuations caused by factors which apply for a period, then go away, and then return forming a repetitive cycle. They, therefore, form a wavelike fluctuation about the trend. They are of longer-term than the seasonal factors.

❖ **The Seasonal Component**.

The seasonal component is similar to the cyclical component in that they both refer to some regular fluctuations in a time series. There is one key difference, however. While cyclical components of a time series are identified by analyzing multiyear movements in historical data, seasonal components capture the regular pattern of variability in the time series within one-year periods. Many economic variables display seasonal patterns. For example, manufacturers of swimming pools experience low

sales in fall and winter months, but they witness peak sales of swimming pools during spring and summer months. Manufacturers of snow removal equipment, on the other hand, experience the exactly opposite yearly sales pattern. The component of the time series that captures the variability in the data due to seasonal fluctuations is called the seasonal component.

❖ The Irregular, Random or Residual component.

The irregular component of the time series represents the residual left in an observation of the time series once the effects due to trend, cyclical, and seasonal components are extracted. Trend, cyclical, and seasonal components are considered to account for systematic variations in the time series. The irregular component thus accounts for the random variability in the time series. The random variations in the time series are, in turn, caused by short-term, unanticipated and nonrecurring factors that affect the time series. The irregular component of the time series, by nature, cannot be predicted in advance

Of these four component elements, the Trend and Seasonal variations are the most important for the purpose of sales forecasting.

3.2.1 Moving Average

The moving average is a more sophisticated type of trend projection. It assumes the future will be an average of the past performance rather than following a specific linear percentage trend. The moving average minimizes the impact of randomness on individual forecasts since it is an average of several values rather than a simple linear projection.
The moving average equation basically sums up the sales in a number of past periods and divides by the number of periods.

Industry surveys involve surveying the various companies that make up the industry for a particular item. They may include users or manufacturers. The industry survey method that uses a top-down approach of forecasting has some of the same advantages and disadvantages as the executive opinion and sales force composites.

3.2.2 Simple Moving Averages:

The best-known forecasting methods is the moving averages or simply takes a certain number of past periods and add them together; then divide by the number of periods. Simple Moving Averages (MA) is effective and efficient approach provided the time series is stationary in both mean and variance. The following formula is used in finding the moving average of order n, MA(n) for a period t+1,

$$\text{Moving Average} = \frac{\sum \text{Demand in previous "n" periods}}{N}$$

Where "n" is the number of periods used in the calculation.

The forecast for time period $t + 1$ is the forecast for all future time periods. However, this forecast is revised only when new data becomes available.

Moving averages are useful when considering short periods. For example, this technique is useful if you need to forecast demand for a particular product that has a relatively stable demand pattern, such as food staples. If longer periods of time are used, past values are often weighted to put more emphasis on recent history.

3.2.3 Characteristics and drawbacks

It is necessary to note some of the characteristic and shortcomings of Moving Averages as a Forecasting method.

- Different Moving Averages (e.g. 3 –monthly and 4- montly) produce different forecasts.

- The greater the number of observations included in the moving average, the greater the smoothing effect in the forecast.

Among the drawback of Moving Average are:

- It assigns equal weights to each of the observed values used.

- The method does not make full use of all the data available.

- Where there is an underlying seasonal variation, the use of an unadjusted moving average as forecast may be misleading.

- The annual computation of the moving average could be cumbersome where a large number of products or stock items are involved.

An illustrative numerical example: The moving average of order five is calculated in the following table.

Week	Sales (₦1000)	MA (5)
1	105	-
2	100	-
3	105	-
4	95	-
5	100	101
6	95	99
7	105	100
8	120	103
9	115	107
10	125	117
11	120	120
12	120	120

Source: developed by the authors

4.0   Conclusion

From the above it can be concluded that Business forecasting require scientific approach to make accurate prediction of the future for a business entity using diverse techniques.

5.0   Summary

In this unit, we examined an aspect of techniques employed in business forecasting under the time series; Moving average. This method assumed the future performance of a business can be predicted from the present performance. We also attempted to illustrate this with some working examples.

6.0   Tutor-marked assignment

1.   What is Moving Average Method?

2.   Consider the following example: the demand for a product for 6 months is shown below - calculate the three month moving average for each month and forecast the demand for month 7.

Month	Demand	Moving Average
January	4200	
February	4100	
March	4300	
April	3800	
May	3500	
June	3700	
July		

3. Calculate the forecast sales for four months and six months using the moving average method with the data below.

Past Sales		Forecasts Produced Using	
Month	Actual Sales Volume (Units)	4-monthly Moving Average	6-monthly Moving Average
January	800		
February	760		
March	880		
April	860		
May	840		
June	860		
July	880		
August	900		
September	920		
October	960		
November	920		
December	980		
January	1000		

7.0 Reference and other sources

1. Armstrong, J.S., Brodie, R. and McLntyre, S. Forecasting Methods for marketing, International Journal of Forecasting, 3, pp 355 76.(1987)

2. Churchill, Jr., Ford, N.M., Walker, Jr., O.C., Johnston, M.W., and Tanner, Jr., J.F. Sales Force Management, 6th ed., Boston: Irwin McGraw-Hill, (2000)

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5. Crosby, John V. *Cycles, Trends, and Turning Points: Practical Marketing and Sales Forecasting Techniques.* NTC Publishing, 2000.

6. Mentzer, John T., and Carol C. Bienstock. *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process.* Sage, 1988.

7. Norman N. Barish., Economic Analysis McCrew-Hill Book Company Inc., 1982, p. 781

UNIT 12   Methods of Forecasting-Exponential Smoothing / Weighted Moving Average

1.0   Introduction

This is the unit 12 of the course which is to continue introducing you to the various methods of forecasting. The unit describes others methods of forecasting and its applicability.

2.0   Objectives

At the end of this unit course, you should be able to:

❖ Have knowledge of the various methods of forecasting

❖ Identify which method is best suited for a particular organizational set up as well as a particular situation and environment either for a short-range forecast or long-range forecast.

3.0 Main Content

3.1 Exponential Smoothing / Weighted Moving Average:

This is a weighted Moving Average of all past data. It involves an automatic weighting of past date with assigned weights decreasing exponentially with passage of time. This implies the most recent observations (i.e. Values) are given the greatest weighting and the older values receive decreasing weights. In using the method, a smoothing constant is arbitrarily selected and denoted α (alpha). The value of α (alpha) can be between 0 and 1 but is usually kept between 0.1 and 0.5. The higher the value of the α (alpha) the more sensitive to the current conditions will the forecast be. The lower the value, the more stable the forecast will be. The underlying principle and computational formula are as below (Lucey, 2002: 174)

The principle that states that:

New forecast = old forecast + a proportion of the forecast error.

The formula in simple form:

New forecast = Old forecast + α (alpha) (latest observation old forecast)

Where α (alpha) = smoothing constant

Look at the example below:

Month	Actual Sales (Units)	Exponential Forecast Value 0.1
January	500	
February	460	500
March	480	504
April	460	501.6
May	440	497.4

Notes

March Forecast   = Feb. Forecast + 0.1 Feb. Sales – Feb. Forecast

                    = 500 + 0.1 (460-500)

                    = 504 Units

April Forecast   = Mar. Forecast + 0.1 Mar. Sales – Mar. Forecast

                    = 504 + 0.1 (480-504)

                    = 501.6 Units

It is always assumed that the first forecast is the actual sales of the previous period.

3.2   Trend Lines

In its simplest form, trend projection analysis involves the examination of what has happened in the past. Analysts develop a specific linear percentage trend with the expectation that the trend will continue. The problem with the simple trend projection is the fact of randomness—that is, the random event or element that has a major impact on the forecast.

Straight or curved line in a <u>trend chart</u> that indicates the <u>general</u> <u>pattern</u> or direction of a <u>time series data</u> (<u>information</u> in sequence over time). It may be drawn visually by connecting the actual <u>data</u> <u>points</u> or (more frequently) by <u>using</u> statistical <u>techniques</u> such as '<u>exponential smoothing</u>' or '<u>moving averages</u>.'

3.3   Least-squares method

Least-square method of forecasting seeks to calculate the line of best fit mathematically. A line is calculated to minimize the total of the squared deviations of the actual observed data from the calculated line (Lucey, 2002:133). The method gives equal importance to all the items in the time series – whether most recent or old. The method is only useful for short to

medium term forecasting. Again, the methods share the joint disadvantage of basing prediction on sales, and taking 'Time' as an independent variable which predicts sales. Time is definitely not the factor which determines the movements in sales. It is the dynamics of the external environment (e.g. competitors' activities, government policies, etc) and of the internal environment (e.g. the firm's marketing programmes, sales force size, promotional activities, etc) which influences sales.

Looking at the example below:

Year	Sales (in '000)
1	14
2	17
3	15
4	23
5	18
6	22
7	27

Sales in '000

Years

Using the above data to forecast for the eighth (8) year using the least-square method. Least squares assumes that the best-fit curve of a given

type is the curve that has the minimal sum of the deviations squared (*least square error*) from a given set of data.

The solution is set out like this:

Year (x)	Sales (y)	xy	x^2
1	14	14	1
2	17	34	4
3	15	45	9
4	23	92	16
5	18	90	25
6	22	132	36
7	27	189	49
$\sum x = 28$	$\sum y = 136$	$\sum xy = 596$	$\sum x^2 = 140$

Source: Lucey, T (2002). Quantitative Techniques, 6[th] edition, London: Continuum BookPoweer/ELST, P.187.

(All calculations to two decimal places) $\quad$ $136 = 7a + 28b$

$596 = 28a + 140b$

Which reduces to $\qquad\qquad$ $52 = 28b$

$b = 1.86$

and substituting in one of the equations we obtain

$$a = 12$$

Therefore, regression line = y = 12 + 1.86x (Where x = no. of years).

Forecasting for the 8[th] year sales $\quad$ = 12+1.86 (8)

= **26.88** or **26,888 units**

4.0 Conclusion

It can be concluded that there are various method available to professional forecasters to choose from depending on what their projection is intended to achieve for their organisation. Methods that are good for short term forecasting should not be use for middle term or long term project if accuracy of forecasting is the objectivity.

5.0 Summary

In summary, we have examined another set of techniques/methods that is at the disposal of the forecasters in forecasting for their organisation such as Exponential Smoothing / Weighted Moving Average, Trend Lines and Least square methods. We also experimented with some examples to give us vivid understanding of the subject matters.

6.0 Tutor-marked assignments

1. Calculate the Exponential/weighted moving average forecast for the data below.

Month	Actual Sales (Units)	Exponential Forecast Value 0.1
January	500	
February	460	500
March	480	504
April	460	501.6
May	440	497.4
June	460	
July	480	
August	500	
September	520	
October	560	
November	520	
December	580	
January	600	

2. List Six and discuss any three techniques of forecasting the future sales of a product?

3.   Explain the Least Square method of forecasting?

7.0   Reference and other sources

Armstrong, J.S., Brodie, R. and McLntyre, S. Forecasting Methods for marketing, International Journal of Forecasting, 3, pp 355 76.(1987)

Churchill, Jr., Ford, N.M., Walker, Jr., O.C., Johnston, M.W., and Tanner, Jr., J.F.   Sales Force Management, 6th ed., Boston: Irwin McGraw-Hill, (2000)

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UNIT 13: Computer applications to Business Forecasting

1.0   Introduction

2.0   Objectives

3.0   Main Content

3.1   Computer applications to Business Forecasting

3.2   The needs and uses of forecast

4.0   Conclusion

5.0   Summary

6.0   Tutor-marked assignment

7.0   Reference and other sources

1.0   Introduction

This is the unit 13 of the course which is to introduce you to the computer application to business of forecasting. The unit describes computer methods of forecasting and its applicability.

2.0   Objectives

At the end of this unit course, you should be able to:

❖   Have knowledge of the computer applicability for business forecasting

❖   Understanding the needs and uses of forecast.

3.0   Main content

3.1   Computer applications to Business Forecasting

Many organizations nowadays are so complex that it is practically impossible to forecast the future without the aid of computer application to assist in analyzing the numerous data available, hence many

organisation running complex system now result into buying some business forecasting software.

Computer-aided forecasting has revolutionized this process. Advances in computer technology, information highways, and statistical and mathematical models provide almost every business with the ability to execute complex data analyses, thus reducing the risks and pitfalls prevalent in the past. These advances have made the process and costs of forecasting practical and affordable for small- and mid-sized businesses.

But what's the point of forecasting software, if you can just use a spreadsheet? The whole point of forecasting software is to save you the trouble of needing to do all the calculation yourself. Not every businessman is also an accountant or math guru, and if you want to keep track of a lot of different data and functions, you may need some help to get you through it. If you've got a particularly complicated pool of data, forecasting software can help you to sort through it more easily.

If you have a business, you need to get your hands on some good business forecasting tools. If you purchase some business forecasting software it can save you a lot of time deciding your future finances.

Excel is an accounting spreadsheet program that enables users to organize sales history data for forecasting. Customer lists, sales personnel lists, products, and sales history by year and month are organized in Excel in to display sales figures, analyze trends and project future sales to prepare inventory, staffing and delivery methods. Excel has many features important to sales forecasting, such as pivot tables, averaging tools and graphing

3.3 NEED AND USES OF FORECAST

(a) It is a useful tool in decision making.

(b) It minimizes error and inaccuracy.

(c) It enables the prediction of future sales volume and profits.

(d) It is a requirement for meaningful feasibility study.

(e) It provides needed input, to implement routine planning and control of inventories and raw materials

Indeed, forecast is a prerequisite for the success of any business, be it manufacturing or servicing sector.

4.0 Conclusion

In conclusion, the complexity of many organisations today has given birth to the use of computer applications to forecast their performance due to the numerous data being generated from the company activities that may be too tedious to analysis manually. This has helped in no small measures to reduce the task of the professional forecasters, increases their level of accuracy and objectivity as well as reduces the time expended on forecasting for future.

5.0 Summary

In summary, this unit examines the introduction of computer aided application to the subject of business forecasting and how it revolutionized the task of forecasting. We also enumerate some of the advantages of using computer aided applications in business forecasting.

6.0 Tutor-marked assignment

Briefly enumerate the advantages of computer application in Business Forecasting?

7.0   Reference and other sources

1. Armstrong, J.S., Brodie, R. and McLntyre, S. Forecasting Methods for marketing, International Journal of Forecasting, 3, pp 355 76.(1987)

2. Churchill, Jr., Ford, N.M., Walker, Jr., O.C., Johnston, M.W., and Tanner, Jr., J.F. Sales Force Management, 6th ed., Boston: Irwin McGraw-Hill, (2000)

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UNIT 14:   MONITORING AND CONTROLLING FORECAST

1.0   Introduction

2.0   Objectives

3.0   Main Content

3.1   Monitoring and Controlling Forecast

4.0   Conclusion

5.0   Summary

6.0   Tutor-marked assignment

7.0   Reference and other sources

1.0   Introduction

This is the unit 14 of the course which is to introduce you the monitoring and controlling of forecasting. The unit describes monitoring and controlling of forecasting and its applicability.

2.0   Objectives

At the end of this unit course, you should be able to:

❖   Have knowledge of the monitoring and controlling for business forecasting

❖   Understanding the tracking signal of forecast.

3.0 Main content

3.1 Monitoring and Controlling Forecast

A forecast is not left merely after its completion, it must be monitored. Everyone who is involved in forecast will find it disgusting to be reminded when his or her forecast is horribly inaccurate, but a firm needs to determine why the actual demand (or any variable under consideration) is different from what is projected.
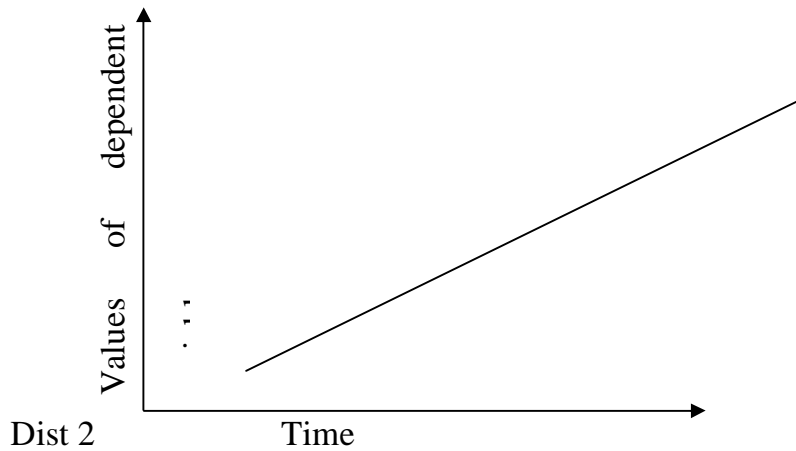
Tracking signal

This is one way that is identified to be capable of monitoring forecasts. It measures how well the forecast is predicting actual values. As forecasts are updated weekly, monthly, or quarterly, the newly available demand data are compared to the forecast values.

Tracking signal is compared as the Running sum of the forecasting error (RSFE) divided by the Mean Absolute Deviation (MAD)

$$\text{Tracking Signal} = \frac{\text{RSFE}}{\text{MAD}}$$

$$= \frac{\Sigma \text{ (Actual demand in Period 1} - \text{Forecast demand in Period 1)}}{\text{MAD}}$$

$$\text{where MAD} = \frac{|\Sigma| \text{ Forecast errors } |}{n}$$

Dist 2

Positive tracking signals indicate that demand is great than the forecast whereas negative signals means that demand is less than forecast. A good tracking signal, that is, one with low RSFE has about as much positive error as it has negative error. Hence, little variation are tenable, but

positive and negative signals should balance one another so the tracking signals are centered closely around zero.

Once tracking signals are calculated, they are compared to predetermined control limits. When a tracking signal exceeds an upper or lower limit, a flag is tripped. This means there is a problem with the method of forecasting and management may want to reappraise the demand forecast adopted. The graph shows a tracking signal that is exceeding the range of acceptable variation. If the model used is for instance, exponential smoothing perhaps the smoothing constant needs to readjusted.

Another monitoring and controlling instrument is the ***adaptive smoothing method***. It refers to complete monitoring of tracking signals and self adjustment if a signal passes its present limit. In exponential smoothing, the ∞ and β co-efficient are first selected based on values that minimum error forecasts, and then adjusted accordingly whenever the computer notes an errant tracking signal.

4.0   Conclusion

In conclusion, any forecasting without proper monitoring and control will amount to an exercise in futility, a waste of company resources and time. Therefore, there must be strong monitoring procedure in place as well putting in place control measure in order to achieve targeted level.

5.0   Summary

In this unit, we looked into the aspect of monitoring and control measures in business forecasting as well as the instruments that are available to management to monitor and control their forecasting. The Tracking signal as an instrument was examined as well as adaptive smoothing method the

methods helps the management to keep tracks of their forecasting and quickly adjust where there is need.

6.0 Tutor-marked assignment

1. Do **forecasts** actually manage to predict future behavior? Discuss

2. Explain the term Tracking Signal as an instrument of Monitoring and Controlling Forecasting?

3. Discuss the term Adaptive Smoothing Method?

7.0 Reference and other sources

1. Armstrong, J.S., Brodie, R. and McLntyre, S. Forecasting Methods for marketing, International Journal of Forecasting, 3, pp 355 76.(1987)

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UNIT 15: PROFIT FORECASTING

1.0   Introduction

This is the unit 15 of the course which is to introduce you to the profit forecasting. The unit describes profit forecasting and its applicability has pointed out by Joel Daen.

2.0   Objectives

At the end of this unit course, you should be able to:

❖   Have knowledge of the profit forecasting

❖   Understanding the three approaches of profit forecast.

3.0   Main content

3.1   Profit Forecasting

Every Management is required to make profit forecasting. Its needs depend upon the extent of the competition prevailing among the firms. It has not as much significant under the condition of monopoly as under monopolistic competitor. It is so because the monopolist has full control

over the price than under competition, the very existence of the firm depends on such efforts as yield profit in the long run.

3.1.1 Meaning of Profit Forecasting

Profit Forecasting means the projection of further earnings. Profit Forecasting involves analysis of actual and expected behaviour of sales of the firm, prices of the commodity, fixed and variable cost strategies and competing firms etc. It is through profit forecasting the plan relating to improvement in profit can be chalked.

Relationship between profit forecasting and profit improvement can explained as follows:

S/N	Profit Forecasting	Profit Improvement
1	Sales Forecasting	Change in Sales
2	Cost Budget: i. Production Cost ii. Sales and distribution costs iii. Administrative Costs iv. Research and Development costs	Change in Sales-mix
3	Capital Expenditures Budget	Development of National Capital Expenditures Policy
4	Planned Profit Level	Exchanging Returns in Investment

With a view to enhancing profit, a firm has to analysis the following facts:

a. Having analyzed competitive conditions and elasticity of demand of the product the firm, first of all makes an effort to increase the sales and get suitable price of the product.

b. Having analyzed the cost of its different activities like production, sales, distribution, administrative, Research and Development, the firm decides how to reduce these costs.

c. The firm decides its capital investment program in such a manner as to reduce the high rate of interest, depreciation, risk of obsolescence, cost of maintenance etc.

d. The firm also makes and assessment of many other factors like:

i. Most profitable rate of return.

ii. Assessment of alternative scheme of investment to increase profit.

iii. Monitoring the implementation of selected alternative suggestion of investment.

In short, the main objective of profit forecasting is to enhance the quantum of profit.

3.2 Method of Profit Forecasting

Joel Dean has pointed out three approaches to profit forecasting these are; *Spot Projection, Break-Even Analysis and Environmental Analysis*

1. Spot Projection

Projecting the entire profit and loss statement for a specified future period by forecasting each important element separately; forecasts are made about sales volume and prices and costs of producing the anticipated sales. Since profits are residuals resulting from the forces that shape demand for the company's products and govern the behaviours of its costs, their prediction is subject to wide margins or error, from cumulating of errors in forecasting revenue and costs from the inter-relation of the various components of the income statement.

2. Break-Even Analysis

Identifying functional relations of both revenue and costs to output rate, with profit related to output as a residual; or alternatively, relating profits to output directly by the usual data used in break-even analysis.

3. Environmental Analysis

Relating the company's profits to key variables in its economic environment, such as the general business activity and the genera; price level. These variables are external tot h company.

In fact, factors that control profits have a tendency to more in regular and related patterns; rate of output, prices, wages, materials costs and efficiency and all inter-related by their interactions in the aggregate business activity. Theories of business cycles are based on the hypothesis that the value of production, employment, wages and prices show systematic patterns of behaviours is in business activity fluctuates. Although it is not always clear what the patterns is in detailed analysis, this hypothesis has some justification for broad averages.

These patterns of confluence raise the possibility that the profits of a company can be forecast directly by findings a relation to key variables in the economy that either control or combine the movement of a number of direct forces that can reflected in the profit and loss statement. The problem is to find a direct functional relation between company profits and national activity that shows statistical significance.

In practice, these three approaches need not be mutually exclusive, but can be used jointly for maximum information. In projecting the profit and loss statement, use can be made of the functional relations of cost to

output and to its other determinants. Similarly, direct measurement of the impact of outside economic forces upon the company's profit can facilitate good spot guesses, and can also enhance the accuracy of break-even analysis.

4.0   Conclusion

As mentioned earlier, Profit Forecasting is art of projecting what the future earning of an organisation will be either on a short run or a long run basis taken into consideration all the prevailing factors that may in one way or the other influenced the profit of the business entity.

5.0   Summary

In summary, we have attempted to examine what Profit Forecasting is all about and its effects on the organisation. We also examined the three major approaches to Profit Forecasting as postulated by Joel Dean. We concluded that Profit Forecasting enables the Management to know if the organisation is doing well as projected or not and where the forecasters needs to focus their attention.

6.0   Tutor-marked assignment

1.   Explain term spot projection?
2.   What do you understand Break-even analysis to mean in relation to Profit Forecasting?
3.   Profit Forecasting is useless depending upon the extent of the competition prevailing among the firms. Discuss?

7.0 Reference and other sources

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UNIT 16:   MATERIAL FORECASTING

1.0 Introduction

2.0   Objectives

3.0   Main Content

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3.2   Approaches to Material Forecasting

    3.2.1 Non-Statistical Approach

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3.3   Advantages of Material Forecasting

3.4   Disadvantages of Material Forecasting

4.0   Conclusion

5.0   Summary

6.0   Tutor-marked assignment

7.0   Reference and other sources

1.0   Introduction

This is the unit 16 of the course which is to introduce you to Material forecasting. The unit describes Material Forecasting and its applicability.

2.0   Objectives

At the end of this unit course, you should be able to:

❖   Have knowledge of the material forecasting

❖   Understanding the methodology of material forecasting.

❖   Define the key advantages and disadvantages of material forecasting

3.0   Main content

3.1   Material Forecasting Methodology of Forecasting

Forecasting has long been associated with processes that impacts on stock. Such process includes production, procurement and sales. Irrespective of the industry type, whether "make to sell" or "buy to sell", elements of forecasting springs up. This is because the driving phenomenon of "demand" is inevitable.

In a "make to sell" industry, the producer can't wait for orders to be received before the production process is initiated. In like manner, the "buy to sell" entrepreneur can't wait for customers to request for an item before he procures the item. However, these behaviors might be practicable for special order.

From the foregoing, it is evident that some level of inventory must exist at any point in time. It can be raw materials for production and/or finished goods. The crux of the matter then becomes, what should be the relative inventory level at a particular point in time. In objectively answering this question, some form of forecasting must be made.

Inventory forecasting in my opinion is a proactive and futuristic strategy aimed at providing estimated stock level to meet demand at a particular point in time. Proactiveness can be interpreted as a step taken, prelude to a known event. Forecasting involves estimating what will be needed based on certain assumptions. It can also be viewed as projections of some sort.

A number of factors can determine the turn of demand for a particular product. They include but not limited to price, availability of close substitutes, market trends, season and advertising strategy. My concern in this posting is not to emphasize demand as a concept but the perception of inventory forecasting as a tool that can either make or mar an entrepreneur.

3.2   MATERIAL FORECASTING

In the modern supply chain, forecasting is necessary for companies that manufacture items for inventory and that are not made to order. Manufacturers will use material forecasting to ensure that they produce the level of material that satisfies their customers without producing an overcapacity situation where too much inventory is produced and remains on the shelf. Equally, the forecast must not fall short and the manufacturer finds them without inventory to fulfill customer's orders. The cost of failing to maintain an accurate forecast can be financially catastrophic.

Forecasts are developed for a company's finished goods, components and service parts. The forecast is used by the production team to develop production or purchase order triggers, quantities and safety stock levels. The forecast is not static and should be reviewed by management on a regular basis. This is to ensure that information on future trends, the internal or external environment is incorporated into the forecast to give a more accurate calculation.

Forecasting is an important aspect of the planning process of stock control. Such forecasts usually reveal the expected material requirements of an estimated production level. Forecasting can be relatively simple in some cases while in other cases relatively complex. Complex forecasting

usually require the application of sophisticated mathematical or statistical models or even the use of computers.

When we wish to forecast for the material requirement it is necessary to put in mind the importance of a close co-operation between the production planning and control department and the inventory needed for planning production but also the material requirements to meet a production level.

The forecast the inventory control department is mostly concerned with is either the short term or the medium term forecast. Forecast for the daily, weekly or monthly demand of raw materials parts or bought out products.

Forecast for the material can be relatively simple when a company knows precisely the quantity of products required per annum. This is not usually possibly though, in companies quite a large range of products. Forecasting in this type of companies can be relatively difficult to the extent of applying the most sophisticated mathematical, statistical models or even the use of a computer.

However, in order to be able to forecast accurately we shall examine the use of some techniques. These include:

3.2.1. Non-Statistical Forecasting

Non-statistical forecasting is found in supply chain management software where demand is forecasted based on quantities determined by the production planners. This occurs when the planner enters in a subjective quantity that they believe the demand will be without any reference to historical demand. The other non-statistical forecasting that occurs is when demand for an item is based

on the results of materials requirements planning (MRP) runs. This takes the demand for the finished good and explodes the bill of materials so that a demand is calculated for the component parts. The component demand can then be amended by the planner based on their assessment and knowledge of the current environment. The resulting forecast is based on current demand and will not incorporate any demand from previous periods. Many companies will use a combination of non-statistical and statistical forecasting across their product line.

Statistical forecasting is based on complex calculations and the future demand can be determined based on the demand from historical periods. The forecast gives the planner a guide to future demand, but no forecast is totally accurate and the planners experience and knowledge of the current and future environment is important in determining the future demand for a company's products.

3.2.3 Statistical Forecasting

In supply chain management software, the forecast is a calculation that is fed data from real time transactions and is based on a set of variables that are configured for a number of statistical forecast situations. Planning professionals are required to use the software to provide the best forecast situation possible and often this is left unchecked without any review for long periods. To best use the forecasting techniques in the supply chain software, planners should review their decisions with respect to the internal and external environment. They should adjust the calculation to provide a more accurate forecast based on the current information they have.

Statistical forecasts are best estimates of what will occur in the future based on the demand that has occurred in the past. Historical demand data can be used to

produce a forecast using simple linear regression. This gives equal weighting to the demand of the historical periods and projects the demand into the future. However, forecasts today give greater emphasis on the more recent demand data than the older data. This is called smoothing and is produced by giving more weight to the recent data. Exponential smoothing refers to ever-greater weighting given to the more recent historical periods. Therefore a period two months ago has a greater weighting than a period six months ago. The weighting is called the Alpha Factor and the higher the weighting, or Alpha factor the fewer historical periods are used to create the forecast. For example, a high Alpha factor gives high weighting to recent periods and demand from periods for a year or two years ago are weighted so lightly that they have no bearing on the overall forecast. A low Alpha factor means historical data is more relevant to the forecast.

Historical periods generally contain demand data from a fixed month, i.e. June or July. However, this introduces error into the calculation as some months have more days than other months and the number of workdays can vary. Some companies use daily demand to alleviate this error, although if the forecaster understands the error, monthly historical periods can be used along with a tracking indicator to identify when the forecast deviates significantly from the actual demand. The level at which the tracking signal flags the deviation is determined by the forecaster or software and vary between industries, companies and products. A small deviation may require intervention when the product being forecasted is high-value, whereas a low-value item may not require the forecast be scrutinized to such a high level.

3.3   Role of Materials Forecasting in Various Organizational Functional Activities

Materials Forecasting helps management to make decisions in areas such as decision on making material or buying it and the following are critically examined:

- ❖ Supplies are not adequately obtained successfully in the past·
- ❖ The quality of supplied goods is not of standard
- ❖ The volume requirement of sales is exceeding the possible manufacturing capacity
- ❖ The material fails in the cost analysis

The materials management needs to forecast the requirements. Some of the questions that need to consider for it are:

Materials Management: An Overview	❖ Is this material being needed for longtime? ❖ Will there be any requirement after 10years for this material? Will the supplier exist after 10 years ❖ Are there any changes or technological break- though for this material? ❖ Are the prices going to rise in the future?
Materials Planning and Budgeting	Materials planning are of the major control activity that an organization needs to put in place. It is feasible because of materials management.
Selection of Potential information sources	This will include selection of suppliers, and other market research information such as price trends, corporate environment etc. The materials management data may help this task.
Purchasing with a difference	Purchasing commits a lot of capital of an organization. Materials management information allows very creative purchasing by organization as it sees most of the trends. It also helps while purchasing in uncertain situation.
Forecasting of Price	This is most essential function thus, has been kept separately also. A good price forecasting system based on material management and market research information may bring an organization into a win-win situation.

Store Management and Inventory Control with a difference	Store Management and inventory materials management helps in the store control with a difference functions such as: control of material being received, proper storage, minimization of obsolescence, highlighting of unused stocks, ensuring good house keeping, verification of stock, timely delivery of goods, proper storage and presentation of materials, dealing with scrap materials etc.

3.4   Advantages and Disadvantages of Material Forecasting

Good forecast of material, labor and other resources for operation are essentially needed by the managers. If good projection of future demand is available, the management may take suitable action regarding inventory. Similarly, if production activities are accurately forecasted, then balanced work-load may be planned. Good labor relations may be maintained, as there would be lesser hiring and firing activities by the management with better manpower planning. Also, there may be some accruable disadvantages in projecting for expected increase in materials usage this shall be examined below:

3.4.1 Advantages of Material Forecasting:

1. Effective handling of uncertainty
2. Better labor relations
3. Balanced work-load
4. Minimization in the fluctuations of production
5. Better use of production facilities
6. Better material management
7. Better customer service
8. Better utilization of capital and resources
9. Better design of facilities and production system.

3.4.2 Disadvantages of Material Forecasting

1. Costs of storage – rent and insurance
2. Money tied up in stocks not being used elsewhere in the business
3. Large stocks subject to deterioration and theft

4.0 Conclusion

In conclusion, Forecasting is seen to be an important aspect of the planning process of stock control. Such forecasts usually reveal the expected material requirements of an estimated production level and it helps organizations to stay afloat all the time to meet its customer's request.

5.0 Summary

This unit provides a brief account of what material forecasting is all about as well as its roles in an organization. The unit first explains the basic objects of materials management in an organization along with the advantages and disadvantages of materials management.

6.0 Tutor-marked assignment

1. What is Material Forecasting?
2. Describe the role of Material Forecasting in organizational management?
3. Mention the advantages and disadvantages of Material Forecasting?

7.0   Reference and other sources

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COURSE GUIDE

ENT 330:   BUSINESS FORECASTING

BUSINESS FORECASTING ENT:330

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ENT 330: Businees Forecasting   **Course guide**

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INTRODUCTION

The Business Forecasting comprises of two approaches to the problem of business forecasting or **Techniques**   One is to obtain information about the survey methods such as Survey Methods Expert Opinion, Consumer's Interview Method, Complete Enumeration Survey Method, Sample Survey Method and End-Use Method, while the second is the **Statistical Methods** involves Trend Method, Regression Method, Leading Indicator Method and Simultaneous Equation Method through collecting experts' opinion or by conducting interviews. The principal advantage of this method is that it provides use-wise or sector-wise demand forecast. In the process of obtaining the forecast of aggregate demand, the forecaster obtains separately the demand by the individual consuming industries, by final consumer categories, and by export and import sector.

Finally,managers needs to understand the concept, principles of business forecasting and its applications in take decisions bothering on running business management successfully.

COURSE AIMS

    The overall aim of the course can be summarized as introducing students to the with meaning, concept of business forecasting growth and development provide analytical expression and tools for comparison basic concepts, lay down principles, scope and approaches of business forecasting management. This will be achieved by:

        Introducing you to the ………………

COURSE OBJECTIVES

To achieve the broad aims set out about, the course objective below

each of the separate units of the course also has its objectives at the

beginning of the unit to help you focus better.

Once you have successfully completed the course, it is expected that

you focus better.

STRUCTURE OF THE COURSE

This is a two-credit unit course made up of sixteen study units covering
the following.

The specific study units are as follows:

1. **MODULE ONE: INTRODUCTION**

UNIT 1: DEFINITION OF FORECASTING

UNIT 2: DETERMINANT OF BUSINESS FORECASTS

UNIT 3: DETERMINANTS OF FORECAST (EXTERNAL FACTORS)

UNIT 4: IMPORTANCE OF BUSINESS FORECASTING

UNIT 5: LIMITATIONS TO BUSINESS FORECASTING

2   MODULE TWO:

UNIT 6: PRINCIPLES OF FORECASTING

UNIT 7: ASSUMPTIONS OF FORECASTING

UNIT 8: STEPS IN FORECASTING

UNIT 9: CLASSIFICATION AND PURPOSES OF FORECAST

3 MODULE THREE:

UNIT 10: **TYPES OF FORECASTS**

UNIT 11: **METHODS OF FORECASTING**

UNIT 12 **METHODS OF FORECASTING-EXPONENTIAL SMOOTHING / WEIGHTED MOVING AVERAGE**
2. **UNIT 13: Computer applications to Business Forecasting**

4 MODULE FOUR:

UNIT 14: **MONITORING AND CONTROLLING FORECAST**

UNIT 15: **PROFIT FORECASTING**

UNIT 16: **MATERIAL FORECASTING**

ASSESSMENT
There will be two aspects to the assessment of the course:
1. Continuous assessment-tutor marked assessments.
2. Written examination of three (3) hours duration.

TUTOR MARKED ASSESSMENT (T M A)
In attempting the assignments, you are expected to utilize the

information gathered during the course. Each assignment, which you will find

at the end of each unit should be submitted to your assigned tutor at a date to

be decided by the National Open Nigeria Authority, on a separate file. The

assignment will count for 50% of the total course mark.

You are strongly advised to attempt and submit all assignments. Each

assignment counts towards your total course mark. When you have

completed each assignment, send it, together with a TMA form, to your

tutor. Make sure that each assignment you turn in reaches your tutor on or

before the deadline given

EXAMINATION

The final examination for the course will be of two hours duration and account for 50% of the total course grade. Typically all areas of the course will be assessed during the examination.

SUMMARY

Managers of any societies need to be provided information and understand the concepts and lay down principle of business forecasting learn from different countries and international business associations and organization the contributing factors to their failure and success. Thus ENT 330 BUSINESS FORECASTING is designed in such a way to make learners in providing relevant information and knowledge that will help them in business organizations and management.

Final Advice

Organize how to manage your time. Do everything to stick to it. The major reason many students fail is that they take things for granted and delay in taking decisions, only to be rushing unnecessarily towards exam period. If you get into difficulties with your schedule, do not waste time to let your tutor know before it is too late to help you. When you are confident and

satisfied that you have achieved a unit's objectives, you can then move on to the next unit. Proceed, unit by unit, through the course, pacing your studies and making the whole exercise easy for yourself.

Wishing you a happy and enjoyable reading time.