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ENTREPRENUERIAL BUSINESS FORECASTING ENT 807:

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UNIT 1: DEFINITION OF BUSINESS FORECASTING

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1.0 Introduction

This unit introduces you to the concept of Business Forecasting. Business forecasting is an act of predicting the future economic conditions on the basis of past and present information. It refers to the technique of taking a prospective view of things likely to shape the turn of things in foreseeable future. As the future is always uncertain, there is a need of organised system of forecasting in a business.

2.0 Objectives

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

- discuss what business is all about.
- analyse in context what can be forecasted
- explain what forecasting is all about
- describe the concept business forecasting

3.0 Main Content

3.1 What is 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 terminate 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 concerned 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 effort 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 continues 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 of Forecasting

Human beings on a daily basis make decisions that have either positive or negative impact on their future. In the business world likewise, managers make decisions that have an impact 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 Meaning of 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.

Business 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.

3.4 What can be Forecasted?

Forecasting is required in many situations: deciding whether to build another power generation plant in the next five years requires forecasts of future demand; scheduling staff in a call centre next week requires forecasts of call volumes; stocking an inventory requires forecasts of stock requirements. Forecasts can be required several years in advance (for the case of capital investments), or only a few minutes beforehand (for telecommunication routing). Whatever the circumstances or time horizons involved, forecasting is an important aid to effective and efficient planning. Some things are easier to forecast than others. The time of the sunrise tomorrow morning can be forecast precisely. On the other hand, tomorrow's lotto numbers cannot be forecast with any accuracy. The predictability of an event or a quantity depends on several factors including:

1. how well we understand the factors that contribute to it;
2. how much data are available;

3. whether the forecasts can affect the thing we are trying to forecast.

For example, forecasts of electricity demand can be highly accurate because all three conditions are usually satisfied. We have a good idea of the contributing factors: electricity demand is driven largely by temperatures, with smaller effects for calendar variation such as holidays, and economic conditions. Provided there is a sufficient history of data on electricity demand and weather conditions, and we have the skills to develop a good model linking electricity demand and the key driver variables, the forecasts can be remarkably accurate.

On the other hand, when forecasting currency exchange rates, only one of the conditions is satisfied: there is plenty of available data. However, we have a limited understanding of the factors that affect exchange rates, and forecasts of the exchange rate have a direct effect on the rates themselves. If there are well publicised forecasts that the exchange rate will increase, then people will immediately adjust the price they are willing to pay and so the forecasts are self-fulfilling. In a sense, the exchange rates become their own forecasts. This is an example of the “efficient market hypothesis”. Consequently, forecasting whether the exchange rate will rise or fall tomorrow is about as predictable as forecasting whether a tossed coin will come down as a head or a tail. In both situations, you will be correct about 50% of the time, whatever you forecast. In situations like this, forecasters need to be aware of their own limitations, and not claim more than is possible.

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 is 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 Bibliography

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

Armstrong, J. S. (2001). *Principles of forecasting: A handbook for researchers and practitioners*.

Fildes, R., & Kourentzes, N. (2017). *Principles of business forecasting* (2nd ed.). Wessex Press Publishing Co. [Amazon]

UNIT 2: DETERMINANT OF BUSINESS FORECASTS

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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 Business forecasting, planning and goals

Business forecasting is a common statistical task in business, where it helps to inform decisions about the scheduling of production, transportation and personnel, and provides a guide to long-term strategic planning. However, business forecasting is often done poorly, and is frequently confused with planning and goals. They are three different things.

Business forecasting

Is about predicting the future as accurately as possible, given all of the information available, including historical data and knowledge of any future events that might impact the forecasts.

Goals

They are what you would like to have happen. Goals should be linked to forecasts and plans, but this does not always occur. Too often, goals are set without any plan for how to achieve them, and no forecasts for whether they are realistic.

Planning

It is a response to forecasts and goals. Planning involves determining the appropriate actions that are required to make your forecasts match your goals.

Forecasting should be an integral part of the decision-making activities of management, as it can play an important role in many areas of a company. Modern organisations require short-term, medium-term and long-term forecasts, depending on the specific application.

Short-term forecasts

They are needed for the scheduling of personnel, production and transportation. As part of the scheduling process, forecasts of demand are often also required.

Medium-term forecasts

They are needed to determine future resource requirements, in order to purchase raw materials, hire personnel, or buy machinery and equipment.

Long-term forecasts

They are used in strategic planning. Such decisions must take account of market opportunities, environmental factors and internal resources.

An organisation needs to develop a forecasting system that involves several approaches to predicting uncertain events. Such forecasting systems require the development of expertise in identifying forecasting problems, applying a range of forecasting methods, selecting appropriate methods for each problem, and evaluating and refining forecasting methods over time. It is also important to have strong organisational support for the use of formal forecasting methods if they are to be used successfully.

3.2 Determining what to be forecast

In the early stages of a forecasting project, decisions need to be made about what should be forecast. For example, if forecasts are required for items in a manufacturing environment, it is necessary to ask whether forecasts are needed for:

1. every product line, or for groups of products?
2. every sales outlet, or for outlets grouped by region, or only for total sales?
3. weekly data, monthly data or annual data?

It is also necessary to consider the forecasting horizon. Will forecasts be required for one month in advance, for 6 months, or for ten years? Different types of models will be necessary, depending on what forecast horizon is most important.

How frequently are forecasts required? Forecasts that need to be produced frequently are better done using an automated system than with methods that require careful manual work. It is worth spending time talking to the people who will use the

forecasts to ensure that you understand their needs, and how the forecasts are to be used, before embarking on extensive work in producing the forecasts.

Once it has been determined what forecasts are required, it is then necessary to find or collect the data on which the forecasts will be based. The data required for forecasting may already exist. These days, a lot of data are recorded, and the forecaster's task is often to identify where and how the required data are stored. The data may include sales records of a company, the historical demand for a product, or the unemployment rate for a geographic region. A large part of a forecaster's time can be spent in locating and collating the available data prior to developing suitable forecasting methods.

3.2.1 Basic factors influencing the demand forecast of goods and services

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 basic 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, be 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.

3.3 Internal factors of business forecasting

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:

Business related factors	Non business-related 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	Aggressive promotional plan

John, (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.

3.4 External factors of business forecasting

Mathematically, it is possible to forecast sales with some precision. 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:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

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

4.0 Conclusion

Most organizations today 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 to know the sales volume for several years past based on the influential 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 Bibliography

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

Henry, A. & Callanan, J. (2016). *Sales Management and Motivation*. Franklin Watts.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*. Sage.

UNIT 3: FORECASTING FOR NEW PRODUCTS

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1.0 Introduction

In this unit we would continue discussion on forecasting demand for new products, the types of demand for new products and factors influencing the customer demand life cycle.

2.0 Objectives

After studying this unit, you should be able to:

- ❖ Explain the forecasting demand of new goods and services (products).
- ❖ Discuss Types of Forecasting Demand for New Products
- ❖ Factors Influencing the Customer Demand Life Cycle

3.0 MAIN CONTENT

3.1 Forecasting Demand for New Products

Demand forecasting is the process of [predicting future sales](#) by using historical sales data to make informed business decisions about everything from inventory planning and warehousing needs to [running flash sales](#) and meeting customer

expectations. Demand forecasting helps the business estimate the total sales and revenue for a future period of time.

Joel Dean suggested a number of possible approaches 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.

3.2 Significance of Demand Forecasting for Business

Without demand, there is no business. And without a thorough understanding of demand, businesses aren't capable of making the right decisions about marketing spend, production, staffing, and more. Demand forecasting will never be 100% accurate, but there are steps you can take to [improve production lead times](#), increase operational efficiencies, save money, launch new products, and provide a better customer experience.

1. Preparing your budget

Demand forecasting helps reduce risks and make efficient financial decisions that impact profit margins, cash flow, allocation of resources, opportunities for expansion, inventory accounting, operating costs, staffing, and overall spend. All strategic and operational plans are formulated around forecasting demand.

2. Planning and scheduling production

Demand forecasting lets you provide the products your customers want, when they want them. Forecasting demand requires that [order fulfilment](#) is synced up with your marketing prior to launching. Nothing kills progress (or your reputation) faster than being sold out for weeks on end. Proper demand forecasting and [inventory control](#) can help ensure a business doesn't buy insufficient or excessive inventory.

3. Storing inventory

Demand forecasting can help you spend less money on both inventory purchase orders and [warehousing](#) as the more inventory you carry, the more expensive it is to store. Good [inventory management](#) involves having enough product on hand but not too much. Closely [tracking inventory levels](#) lets you easily restock and [forecast inventory](#) over time.

4. Developing a pricing strategy

Demand forecasting isn't just about perfecting a business's production schedule to supply demand, but it should also help price products based on the demand. Understanding the market and potential opportunities, businesses can grow, formulate [competitive pricing](#), employ the right marketing strategies, and invest in their growth.

3.3 Types of Forecasting Demand for New Products

There are various ways businesses can forecast demand. All forecasting models leverage data and analytics over specific periods of time.

1. Macro-level

Macro-level demand forecasting looks at general economic conditions, external forces, and other broad things disrupting commerce. These factors keep a business in the know around portfolio expansion opportunities, market research intel, and other shifts in the market.

2. Micro-level

Demand forecasting at the micro-level can be specific to a particular industry, business, or customer segment (e.g., examining demand for natural deodorant for millennial customers in Chicago, IL).

3. Short-term

Short-term demand forecasting is usually done for a time period of less than 12 months. It looks at demand for under a year of sales to inform the day-to-day (e.g., planning production needs for a Black Friday/Cyber Monday promotion).

4. Long-term

Long-term demand forecasting is done for greater than a year. This helps identify and plan for seasonality, annual patterns, production capacity, and expansion over a longer period of time. This drives long-term business strategy (e.g., plans to launch a facility or store internationally and expand into new markets).

3.4 Factors Influencing the Customer Demand Life Cycle

Demand forecasting is where the supply chain side of business meets sales and marketing. Both sides must be in sync to succeed. Learn how different forces affect demand forecasting.

1. Seasonality

Seasonality refers to changes in order volume throughout a specific period of time. A [highly seasonal brand](#) may serve a specific time period, event, or season, causing varying demand levels throughout the year including large spikes during their peak season. Seasonal demand often requires a business to reduce inventory on hand

during the quiet months and then ramp up production and their operations workforce during peak season. That's why many cyclical businesses outsource [retail fulfilment](#) to a third-party ([3PL](#)) logistics company, who can store inventory, pick items, pack boxes, and ship orders for them.

2. Competition

Competition affects demand as there are more options for your customers to choose from and more companies vying for their attention. When a competitive force comes into play whether it's a direct competitor or new kind of solution that forces your customer to choose between you or them demand will be skewed. This can take you by surprise, so an agile demand forecasting model can help you respond quickly.

3. Types of goods

Demand forecasting will be very different for different products and services from perishable goods that expire quickly to [subscription boxes](#) that come at the same time each month. It's important to know the lifetime value of your customers (the total purchases they buy from you across channels over time), your [average order value](#) (how much they're spending each time), and the combinations of products ordered to improve demand forecasting.

4. Geography

The geography of where your customers reside and where you manufacture and ship orders from can greatly impact [inventory forecasting](#) and the speed at which you can fulfil customer orders. The geographic locations of your supply chain can be very strategic. Using [fulfilment centres](#) in locations near your customers can help you fulfil customer demand quickly and more affordably, so it ships from the warehouse closest to the customer. This helps you monitor where your customers reside and store certain products in the regions where they are ordered most, so you don't have to [ship to far away destinations](#).

4.0 Conclusion

Demand forecasting helps businesses make informed decisions that affect everything from inventory planning to [supply chain optimization](#). With customer expectations changing faster than ever, businesses need a method to accurately forecast demand.

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 Bibliography

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

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*. Sage.

Michael, L., Paul, G., Marcus, O., & Dilek, Ö. (2016). Judgmental forecasting: A review of progress over the last 25 years. *International Journal of Forecasting* 22 493-518.

Rob, J. H. & George, A. (2018). *Forecasting: principles and practice*. O Texts, second edition.

UNIT 4: Importance of Business forecasting

1.0 Introduction

2.0 Objectives

3.0 Main Content

3.1 Importance of Business Forecasting

3.2 Elements of Business Forecasting

3.3 Criteria of a Good Forecasting Method

3.4 Requisites of a Sound Business Forecasting

4.0 Conclusion

5.0 Summary

6.0 Tutor-marked assignments

7.0 Reference and other sources

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:

1. It is used to allocate resources among the functional areas of the organisation as well as used to control the operations of the entity.
2. It helps the purchasing and supply department towards planning for procurement of raw of materials as well as scheduling their delivery time.
3. It is useful for the finance department towards planning for how to source for funds in order to forestall cash-flow constraint.
4. 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.
5. A manufacturing entity uses business forecasting to schedule its production – when to produce at full capacity and when not to.
6. It is used to fairly determine the expected Return on Investment (ROI). Without this tool, it might be difficult to estimate the performance measurement.
7. Business Forecasting is used to measure the expected earnings of the business which in most cased can be classified as Goodwill.
8. 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.

3.2 Elements of Business Forecasting

The following are the elements of business forecasting:

1. Developing the ground work: The first step in the process of forecasting is its preliminary preparation. It involves collection of basic information relating to the product, market, competition, environment of the industry, social factors, political factors, etc. A proper study of these facts helps in making future estimates.

2. Estimating future trends: The future can be estimated with the help of past experience and present performance. The prospects of the future period can be estimated in consultation with the key personnel and it should be communicated to all employees of the organization. The management has to prepare quantitative estimates of future events with key executives.

3. Collection of results: Relevant records are to be prepared and maintained to collect the actual results. Irrelevant information can be avoided while collecting the results. All relevant facts and figures with regard to actual performance are to be collected and recorded.

4. Comparing actual results with the estimated results: The actual results are compared with estimated results to know the deviations. This comparison provides an opportunity to discuss the deviations, their possible reasons and future trends. The reasons for significant deviations can be investigated. This helps the management to estimate the future realistically.

5. Refining the forecast process: The forecast can be refined in the light of deviations which seem to be more realistic. The management should review the forecasts periodically and revise it according to the experience gained in the immediate past. In this way, the forecast can be refined and improved.

3.3 Criteria of a Good Forecasting Method

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

3.4 Requisites of a Sound Business Forecasting

The economics of business forecasting in true sense of the term refers to the requisites of forecasting. The requisites make the forecasts sound and logical which lead to near perfection stage.

The requisites of a sound business forecasting may be enumerated as under:

1. Forecasting is Not a Guess Work: Forecasting should not be regarded as merely a guess work not it should be taken as such. It should be based on statistical and mathematical methods and on complete, up-to-date and reliable information's. Estimate should be arrived at after due analysis of facts and figures. They should be based on sound judgement and scientific analysis.

2. Use of Statistical Data: Use of complete up-to-date reliable and relevant statistical data and other relevant information's are pre-requisites of a near perfect business forecasting. Nothing should be left to mere guess. As far as possible complete and primary data should be used. The collection of data and other relevant information's should, however, be done on the basis of predetermined objectives.

3. It is a Regular Feature: Any change in business circumstances should be incorporated and forecasts be adjusted accordingly. Forecasts should be kept up-to-date and alive.

4. Division of Forecasting Period:

The period of forecasting should be divided into period of different spans by taking into consideration the nature and purpose of forecasts. Such a division will render the forecast more perfect and may prove more effective so far as the decision taken on the basis of such forecasts are concerned Agriculturists in India may have 'nine months' forecasts while a dress manufacturer may have 'three months' period.

5. Proper Balance in Various Factors be Maintained: While forecasting a proper balance between special skill, technical knowledge, business qualities and general wisdom should be maintained. For reliable business forecasts striking balance

between varying degrees of skill etc., is a necessary. No businessman can match the natural scientist. But a fair amount of accuracy can be ascertained by the businessman also if he strikes a good balance between his available skill, knowledge, quality and wisdom.

6. Forecasts Should be Flexible: Forecasts are not always true. This fact should always be kept in mind by the management by the enterprise. For this reason alone, the management should provide sufficient scope for adjustment in its planning and decisions. Plans and consequent decisions based on forecasts should be flexible so that adjustment may be made whenever there is necessity to do so.

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 involve 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

1. Briefly discuss the criteria for a good business forecasting.

7.0 Bibliography

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

McCarthy, E., William, D., & Perreault, J. (2009). *Basic Marketing: A Managerial Approach*. Irwin.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*. Sage.

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 business forecasting system
 - 3.3 Need for Business Forecasting
 - 3.4 Suggestions for Making Forecasting more Effective
- 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

The following are the limitations of business forecasting:

1. Based on assumptions – Forecasting is made on the basis of certain assumptions and human judgements. Faulty assumptions and human judgements will yield wrong results.

2. Uncertainty of the future – Forecasting helps to know the future. It is a prediction of future events. But there is uncertainty of occurrence of such events. Forecasting cannot eliminate the margin of errors and the possibility of mistakes.

3. Lack of skill of experts – Forecasting is more of an art than a science. Its success largely depends on how skillfully it is put into practice. It requires a high degree of skill. But in practice, very few experts are available for forecasting.

4. Lack of reliable information – Proper forecasting needs adequate and reliable information. It is very difficult to collect reliable data and information. Hence, it is not possible to forecast correctly due to lack of reliable information.

5. Far from absolute truth – Forecasting is not an accurate science. There is no fool-proof method of predicting the future. In reality^ forecasts are seldom recognized as true, due to a high degree of uncertainty of the future.

6. Time and cost factors – Forecasting involves collection of information and conversion of qualitative data into quantitative data. This involves a lot of time and money. Therefore, forecasting is both expensive and time-consuming.

7. Ever-changing business conditions – Business conditions are dynamic and ever-changing. They can never be forecast accurately. Forecasting does not specify any concrete relationship between past and future events.

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.

3.3 Need for Business Forecasting

The need of business forecasting cannot be over emphasised. It provides valuable service to the business world. The business today is competitive which need not only constantly review the current policies, priorities and programmes but it also needs a perfect forecast about the future so that future policies and programmes of the business may be finalised today and action may be taken in the finalised future policies and programmes.

The following are reasons for which business forecasting becomes a necessity:

1. To estimate all business activity,
2. To execute the plans of the business effectively,
3. To determine the managerial activities and help the management in effectively managing the affairs of the enterprise,
4. To estimate and ascertain the nature and span of control,
5. To establish better and effective co-ordination,
6. To help the business growth in desired direction,
7. To help in achieving the objectives of the business enterprise.

3.4 Suggestions for Making Forecasting more Effective

The following are important suggestions for making the process of Business forecasting more effective:

1. Proper collection of required data- Required data must be collected properly and from reliable sources before making the forecasting because the reliable data is the real base of effective forecasting.
2. Detailed analysis of data collected- Data collected must be analysed in detail so that the line of action may be decided and final decision be taken.
3. Forecasting must be a continuous process- Forecasting should be adopted as a continuous process and not as a function. It must be a continuous process.
4. Forecast must be flexible- There must be sense of flexibility in forecasting process. Therefore, forecast must be flexible so that necessary changes may be made in forecasts. Rigid forecasts may fail in the changed circumstances.
5. Forecasts must be for short term- Forecast must be made for short term. Forecast made for long period cannot be successful because the circumstances and the situations may change in the long run.

6. Assumptions be adopted carefully- Assumptions are must for forecasts but the assumptions must be adopted after a careful study of the reliability and feasibility of assumptions.

7. For the success of forecasts, the managerial co-operation is essential- The co-operation of all levels of management especially the managerial co-operation is essential and it must be obtained and the opinions of all persons concerned with the forecasts must be collected.

8. Forecasts must be impartial- Forecasts should not be partial. Every best effort must be made to take it sure that the forecasts are not only the opinions of the persons making forecasts.

9. Scientific approach- Forecasts must be made based on scientific techniques and methods. Only the guess and the estimates cannot be effective forecast.

10. Forecasts must be in accordance with the circumstances- Forecasts must be based on careful study and analysis of the past incident. In addition to this, present situations and circumstances of the business enterprise also should be taken into account very well.

11. Person forecasting must be experienced, efficient and possess perfect knowledge of the subject- Person who has not got knowledge of the situation and is not an experienced man and efficient, he will not be able to make forecasting in perfect and scientific manner.

In the end it can be said that forecasting in business is essential and on the basis of this the producer produces goods. Therefore, success in business entirely depends upon perfect and well-judged forecasting.

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 References and other sources

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

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

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*.

UNIT 6: Principles of Forecasting

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- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Principles of Forecasting
 - 3.2 Guiding Principles on Market Demand Forecasting
 - 3.3 Selection of Suitable Business Forecasting Technique
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked assignments
- 7.0 Reference and other sources

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 forecast.

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

According to 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.

1. 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.

2. 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.

3. 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.

4. 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

1. 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.

2. 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. Consider each Product as different

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

4. 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.

5. 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.

6. 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.

7. Use the Minimum-Maximum Technique

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

3.3 Selection of Suitable Business Forecasting Technique

In choosing a suitable business forecasting technique the forecaster must consider the following factors:

1. Forecast from Desired:

The forecast form can vary between obtaining a point estimate or a prediction interval. The form of the forecast can influence the choice of forecasting method used.

2. Time Pattern: The time frame or time horizon is the total period over which forecasts are required. Is it a week, a year or perhaps ten years? The longer the time period the more difficult the forecasting becomes, and the more useful qualitative methods become.

3. Pattern of Data: The important aspect about the pattern of data is whether a time series or some cyclical pattern exists within the data. This will dictate the forecasting technique to be used.

4. Cost of Forecasting: The cost of forecasting may vary significantly depending on the cost of collecting and storing the data. The costs of forecasting should be compared with the value of having good accurate forecasts.

5. Accuracy Required: Perhaps crude forecasts are sufficient in a particular situation. In a different problem a very accurate forecast is required.

6. Availability of Data: The choice between quantitative and qualitative approaches will depend upon whether suitable data is available or can be collected.

7. Case of Operation and Understanding: The strategist must be able to understand and explain the forecast methodology used. If he does not understand the methodology, he will not have confidence in the results. There is also a danger that he will not foresee, the parameter of the model needs to be changed because of underlying changes in the data.

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 Bibliography

Ajondbadi, H. A. (2000). *Applied Business Management Theory*. pp.63.

Elwood, S. B. (2003). *Modern Production/Operations Management*.

Buffa, E. S. & Plectcher, B. A. (2009). *Understanding Business Today*. Irwin Inc.

Davis, A. A. (2010). *First Course in Business Organisation*. Unwin Ltd.

Article Source: <http://EzineArticles.com/5751637>
<http://mdcegypt.com/Pages/Purchasing/Material%20Management/Forecasting>.

UNIT 7: ASSUMPTIONS OF FORECASTING

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Assumptions of Business Forecasting
 - 3.2 Features of Business 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 Main Content

3.1 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 facts. 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
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:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

7. 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.

8. 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.

3.2 Features of Business Forecasting

1. Concerned with future events – Forecasting is concerned with future events. It is a systematic effort to peep into the future. It is essentially a technique of anticipation.
2. Necessary for planning process – Forecasting is necessary for the planning process. It is the basis for planning. Decisions cannot be taken without the help of forecasting. Therefore, it is an integral part of the planning process.
3. Consideration of relevant facts – Forecasting considers all factors which affect organizational functions. It is a technique to find out the economic, social, and financial factors affecting the business.
4. Inference from known facts – Forecasting is a systematic attempt to probe the future by inference from known facts. It is an analysis of past and present movements so as to arrive at the conclusion about the future pattern.
5. Art of reading the future – Forecasting is not an exact science. It involves looking ahead and projecting the future events. It requires the use of scientific, mathematical, and statistical techniques for reading the future course of events.

6. Elements of guess-work – Forecasting involves elements of guess-work. Personal observations help in guessing future events to a great extent. Estimates for the future are based on the analysis of past and present circumstances.

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 Bibliography

Bolt, G. J. (2008). *Market and Sales Forecasting. The Practice of Marketing Management*. Macmillan Publishing.

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

Henry, P., & Joseph A. C. (2007). *Sales Management and Motivation*. Franklin Watts Publishing.

McCarthy, E. J. & William, D. P. (2009). *Basic Marketing: A Managerial Approach*.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*.

UNIT 8: STEPS IN FORECASTING

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
- 3.1 Steps in Forecasting
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked assignments
- 7.0 Reference and other sources

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 adopt 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:

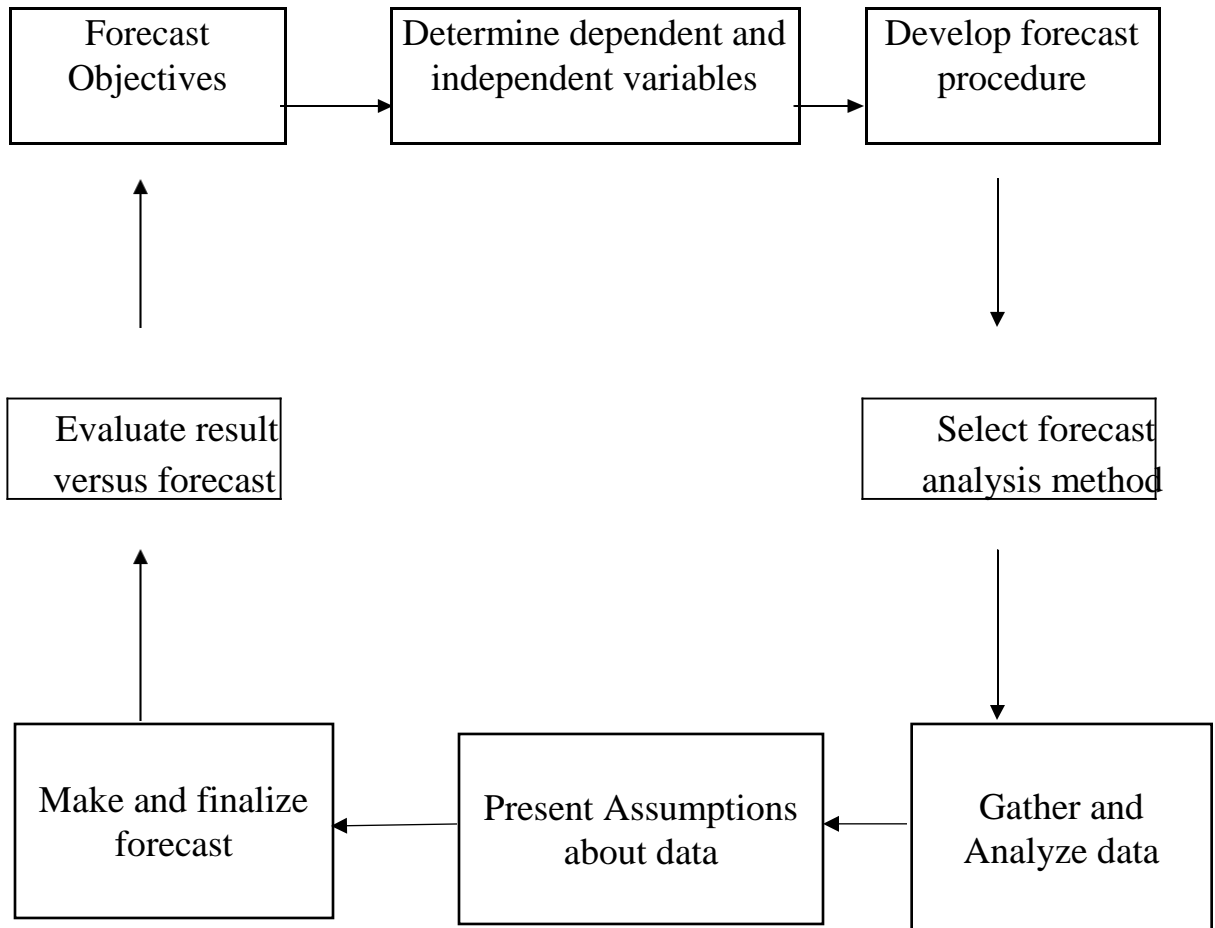
- ❖ Be able to follow the steps in forecasting
- ❖ Be able to initiate, design and implement a forecasting system

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.

The Forecasting Model



Futrell, (2008)

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 Bibliography

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

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

Futrell, C.M. (2008). *Sales Management: Team work, leadership, and technology*, Orlando: Dryden Press, p 167

Henry, P., & Joseph, A. C. (2007). *Sales Management and Motivation*. Franklin Watts.

McCarthy, E. J., & William, D. P. (2009). *Basic Marketing: A Managerial Approach*.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*, Sage Publishing.

UNIT 9: CLASSIFICATION AND PURPOSES OF FORECAST

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Classification of Forecast
 - 3.2 Purposes of Forecasting
 - 3.2.1 Purpose of Short-term Forecasting
 - 3.2.2 Purpose of Long-term Forecasting
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked assignments
- 7.0 Reference and other sources

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 is 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 Bibliography

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

Aston, A. & Weber, J. (2006). "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*.

Chase, C. W. (2000). "Composite Forecasting: Combining Forecasts for Improved Accuracy." *Journal of Business Forecasting*.

Engerman, S. (2005). "On the Accuracy of Some Past and Present Forecasts." *International Monetary Fund Staff Papers*.

Evans, M. (2002). *Practical Business Forecasting*. Blackwell Publishing.

Gaber, T. J, Goldenberg, B.L., & Eitan M. (2004). "From Density to Destiny: Using spatial dimension of sales data for early prediction of new product success." *Marketing Science*, 2004.

Gray, A. (2005). "How Forecasting Can Help the Bottom Line." *Fairfield County Business Journal*.

Green, K. C., Armstrong, J. S., & Graefe, A. Methods to Elicit Forecasts from Groups: Delphi and Prediction Markets Compared. *Foresight*, 8, 17-20, 2007.

Jones, V.D., Stuart, B. & Wilpen, L. G. (2007). "Organization Pressures on Forecast Evaluation: Managerial, Political, and Procedural Influences." *Journal of Forecasting*.

Mentzer, J. T. & Mark, A. M. (2004). *Sales Forecasting Management*. Sage Publications, Inc.

UNIT 10: TYPES OF FORECASTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Types of Forecasts
 - 3.1 Quantitative Forecasting Methods
 - 3.2 Qualitative Forecasting Approaches
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked assignments
- 7.0 Reference and other sources

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 other words, if, for instance, 1000 crates of soft drinks are 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 uses 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 patterns 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 by quantitative and qualitative method of forecasting?
2. Explain the advantages of Delphi method of forecasting.

7.0 Bibliography

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

Aston, A. & Weber, J. (2006). "*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*.

Chase, C. W. (2000). "Composite Forecasting: Combining Forecasts for Improved Accuracy." *Journal of Business Forecasting*.

Engerman, S. (2005). "On the Accuracy of Some Past and Present Forecasts." *International Monetary Fund Staff Papers*.

Evans, M. (2002). *Practical Business Forecasting*. Blackwell Publishing.

Gaber, T. J, Goldenberg, B.L., & Eitan M. (2004). "From Density to Destiny: Using spatial dimension of sales data for early prediction of new product success." *Marketing Science*, 2004.

Gray, A. (2005). "How Forecasting Can Help the Bottom Line." *Fairfield County Business Journal*.

Green, K. C., Armstrong, J. S., & Graefe, A. Methods to Elicit Forecasts from Groups: Delphi and Prediction Markets Compared. *Foresight*, 8, 17-20, 2007.

Jones, V.D., Stuart, B. & Wilpen, L. G. (2007). "Organization Pressures on Forecast Evaluation: Managerial, Political, and Procedural Influences." *Journal of Forecasting*.

Mentzer, J. T. & Mark, A. M. (2004). *Sales Forecasting Management*. Sage Publications, Inc.

UNIT 11: METHODS OF FORECASTING

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Methods of Forecasting
 - 3.2 Time Series Forecasting Method
 - 3.2.1 Moving Average Method
 - 3.2.2 Simple Moving Average Method
 - 3.2.3 Characteristics and Drawbacks
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked Assignment
- 7.0 Reference and other sources

1.0 Introduction

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

2.0 Objectives

At the end of this unit, 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.

1. 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.

2. 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.

3. 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.

4. 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:

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

2. The method does not make full use of all the data available.
3. Where there is an underlying seasonal variation, the use of an unadjusted moving average as forecast may be misleading.
4. 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 Bibliography

Armstrong, J. S., Brodie, R. & McLntyre, S. (2007). Forecasting Methods for marketing, *International Journal of Forecasting*, 3, pp 355 76.

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

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

Hughes, M. C. (2001). Forecasting Practice: Organizational Issues, *The Journal of the Operational Research Society*, Vol. 52, No. 2, pp 143 – 149.

Lucey, T, (2002). *Quantitative Techniques*, 6th edition, London: Continuum Book Power/ELST, P.187.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*, Sage Publishing.

Norman N. B. (1982). *Economic Analysis*. McCraw-Hill Book Company Inc., p. 781

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

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Exponential Smoothing / Weighted Moving Average
 - 3.2 Trend Lines
 - 3.3 Least-squares method
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-marked assignment
- 7.0 Reference and other sources

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 m 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

$$\begin{aligned}\text{March Forecast} &= \text{Feb. Forecast} + 0.1 \text{ Feb. Sales} - \text{Feb. Forecast} \\ &= 500 + 0.1 (460-500) \\ &= 504 \text{ Units}\end{aligned}$$

$$\begin{aligned}\text{April Forecast} &= \text{Mar. Forecast} + 0.1 \text{ Mar. Sales} - \text{Mar. Forecast} \\ &= 504 + 0.1 (480-504) \\ &= 501.6 \text{ Units}\end{aligned}$$

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

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

Using the above data to forecast for the eighth (8) year using the least-square method. Least squares assume 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
$\Sigma x=28$	$\Sigma y=136$	$\Sigma xy=596$	$\Sigma x^2=140$

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

(All calculations to two decimal places)

$$\begin{aligned}
 136 &= 7a + 28b \\
 &= 28a + \\
 596 &= 140b
 \end{aligned}$$

Which reduces to

$$\begin{aligned}
 52 &= 28b \\
 b &= 1.86
 \end{aligned}$$

and substituting in one of the equations we

obtain $a = 12$

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

$$\begin{aligned}\text{Forecasting for the 8}^{\text{th}} \text{ year sales} &= 12+1.86 (8) \\ &= \mathbf{26.88} \text{ or } \mathbf{26,888} \text{ units}\end{aligned}$$

4.0 Conclusion

It can be concluded that there are various methods 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 used 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 Bibliography

Armstrong, J. S., Brodie, R. & McLntyre, S. (2007). Forecasting Methods for marketing, *International Journal of Forecasting*, 3, pp 355 76.

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

Hughes, M. C. (2001). Forecasting Practice: Organizational Issues, *The Journal of the Operational Research Society*, Vol. 52, No. 2, pp 143 – 149.

Lucey, T. (2002). Quantitative Techniques, 6th edition, London: Continuum Book Power/ELST, P.187.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*, Sage Publishing.

Norman, N. B. (1982). *Economic Analysis*. McCrew-Hill Book Company Inc., p. 781

Walker, O. C., Johnston, M. W., & Tanner, J. F. (2000). *Sales Force Management*, 6th ed., Boston: Irwin McGraw-Hill.

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.

3.2 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

1. Briefly enumerate the advantages of computer application in business forecasting.

7.0 Bibliography

Armstrong, J. S., Brodie, R. & McLntyre, S. (2007). Forecasting Methods for marketing, *International Journal of Forecasting*, 3, pp 355 76.

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

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

Hughes, M. C. (2001). Forecasting Practice: Organizational Issues, *The Journal of the Operational Research Society*, Vol. 52, No. 2, pp 143 – 149.

Lucey, T, (2002). *Quantitative Techniques*, 6th edition, London: Continuum Book Power/ELST, P.187.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*, Sage Publishing.

Norman N. B. (1982). *Economic Analysis*. McCraw-Hill Book Company Inc., p. 781

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)

$$\begin{aligned} \text{Tracking Signal} &= \frac{\text{RSFE}}{\text{MAD}} \\ &= \frac{(\text{Actual demand in Period 1} - \text{Forecast demand in Period 1})}{\text{MAD}} \end{aligned}$$

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

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 is tenable, but positive and negative signals should balance one another so the tracking signals are centred 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 are 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 α and β coefficient 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
3. Monitoring and Controlling Forecasting?
4. Discuss the term Adaptive Smoothing Method?

7.0 Bibliography

Armstrong, J. S., Brodie, R. & McLntyre, S. (2007). Forecasting Methods for marketing, *International Journal of Forecasting*, 3, pp 355 76.

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

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

Hughes, M. C. (2001). Forecasting Practice: Organizational Issues, *The Journal of the Operational Research Society*, Vol. 52, No. 2, pp 143 – 149.

Lucey, T, (2002). *Quantitative Techniques*, 6th edition, London: Continuum Book Power/ELST, P.187.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*, Sage Publishing.

Norman N. B. (1982). *Economic Analysis*. McCrew-Hill Book Company Inc., p. 781

UNIT 15: PROFIT FORECASTING

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Profit Forecasting
 - 3.1.1 Meaning of Profit Forecasting
 - 3.2 Method of Profit 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 15 of the course which is to introduce you to the profit forecasting. The unit describes profit forecasting and its applicability as 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 an 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 Methods of Profit Forecasting

Joel Dean pointed out three approaches to profit forecasting which 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 general price level. These variables are external to the company.

In fact, factors that control profits have a tendency to move 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 behaviour as business activity fluctuates. Although it is not always clear what the patterns are 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 finding a relation to key variables in the economy that either control or combine the movement of a number of direct forces that can be 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 the term spot projection?
2. What do you understand by Break-even analysis and its relationship to Profit Forecasting?
3. Profit Forecasting is useless depending upon the extent of the competition prevailing among the firms. Discuss

7.0 Bibliography

Armstrong, J. S., Brodie, R. & McLntyre, S. (2007). Forecasting Methods for marketing, *International Journal of Forecasting*, 3, pp 355 76.

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

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

Hughes, M. C. (2001). Forecasting Practice: Organizational Issues, *The Journal of the Operational Research Society*, Vol. 52, No. 2, pp 143 – 149.

Lucey, T, (2002). *Quantitative Techniques*, 6th edition, London: Continuum Book Power/ELST, P.187.

Mentzer, J. T., & Carol, C. B. (2008). *Sales Forecasting Management: Understanding the Techniques, Systems, and Management of the Sales Forecasting Process*, Sage Publishing.

Norman N. B. (1982). *Economic Analysis*. McCrew-Hill Book Company Inc., p. 781

UNIT 16: MATERIAL FORECASTING

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Material Forecasting
 - 3.2 Approaches to Material Forecasting
 - 3.2.1 Non-Statistical Approach
 - 3.2.2 Statistical Approach
 - 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 requires 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 possible 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 long-time? 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.
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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 Bibliography

Dutta, A. K. (1998). *Materials Management: Procedures, Text and Cases*, Prentice all of India Pvt ltd, New Delhi

Gopalakrishnan, P. & Sundaresan, M. (1998), *Materials Management: An Integrated Approach*, Prentice all of India Pvt ltd, New Delhi.