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Analysis of Sales Forecasting Process and Sales Forecasting System

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***Abstract*— Historically sales forecasting has been considered as a side activity by most of the companies. Sales forecasting has not been considered as an important function of marketing and finance. Very few companies have seen sales forecasting by a scientific management point of view. Less research has been reported in sales forecasting in comparison to other managerial functions. Planning based on sales forecasting; may be part of a selected strategy for growth and profitability. These facts have attracted us to study sales forecasting as a managerial function. The purpose of this study is to describe and analyze the sales forecasting process.**

***Index Terms*— Supply chain management, Bullwhip Effect, Inventory, forecasting, Demand and Supply.**

I. INTRODUCTION

Forecasts are nothing but predictions about future. May be forecasts of sunrise and sunset can be predictable without any mistake but it is not the scenario in business. Business equations changes as time goes and hence prediction may give error. One should not confuse the planning process and forecasting process. The aim of right forecast is to predict demand perfectly. Hence forecasting is necessary to be focused towards maximum accuracy. Whereas planning is needed to be aimed towards efficacy and efficiency of all managerial functions to meet forecasting. In business each project starts with planning. But to plan, the prediction about future is needed so that one could prepare plan well in advance. Here the forecast comes in the picture. Forecasts have been used in all kind of companies, service sectors, and government organizations.

The characteristics of sales forecast as follows:

1) Forecasts are always wrong and hence one should always expect evaluation of errors in it.

2) Long term forecast are normally less accurate than short time forecasts. This is because larger
standard deviation of error relative to mean than short term forecasts.

3) Aggregate forecasts are normally more accurate than disaggregate forecasts. Aggregate forecast contains smaller standard deviation of error than disaggregate forecasts.

4) The Greater the distortions of information in supply chain the higher are the errors in sales forecast.

II. SALES FORECASTING PERFORMANCE MEASUREMENT

'What gets measured gets rewarded and what gets rewarded gets done.' Since our purpose is to study the forecasting process and as it is needed to measure the accuracy of any managerial process, we tried to analyze the sales forecasting performance measurement process of company. It seems that the companies not use any statistical data or graphical report to measure its forecast accuracy. We also identified that there is only one common criterion to measure its performance which is the total annual sale of the company. We found out that the company has market in international level and hence they prepare the forecast for different regions and country wise. While measuring the accuracy of the forecast, the management does not bother much about performance from one particular region or country. Instead, they bother about total sale from all the markets and countries. They match this data with the data which they have predicted and projected in the starting of the period. It is possible that companies may have bad selling figures in one particular region, but at the same time they may have better selling figure in other market during the same year. This situation brings accurate data close to the forecasted data and gives them overall satisfaction.

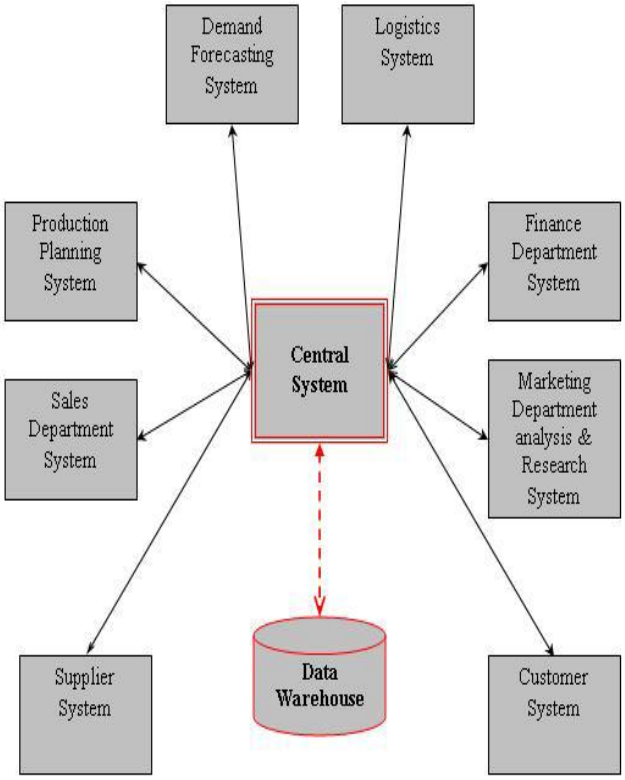

Fig.01: Open System Server Architecture

III. ANALYSIS OF SALES FORECASTING SYSTEM

The sales forecasting system needs to be an integrating entity which should integrate the process of forecasting, the method of forecasting and the computer system.

All companies in study should use software which will fit in present system and help to solve problems. When company

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tries to fit the culture in the chosen software, it goes away from its routine working style which may affect planning and strategy. Furthermore when changes occur as need of time, these softwares if not capable of adjustment affects by means of capital loss and accuracy of forecasting/planning. Some companies have their forecasting system on mainframe and personal computer based on LAN. Due to such system, the users of forecasting system like functional managers of marketing, finance and sales cannot access it electronically while planning their activities. Manual data entering may cause errors in planning and give rise to possibility of preparing individual forecasts. The things reported are affecting effectiveness in forecasting and may cause inefficient planning. It seems like all forecast developers interviewed knew a little about system and principles of functioning. But it seems that all of them have well understood how to use it towards developing forecast using personal experience and learning historical trends within industry. Final fruit of the forecasting system is an accurate forecast which every system is capable of deriving. All forecasters seem to have good experience of forecasting. We hence conclude that, personal experience used together with forecasting system adds accuracy. Knowledge of forecasting methods adds advantage in this process.

When considered the system architecture, all companies has been reported to have a closed system architecture which is not ideal. This helps to plan inventory with respect to the purchasing and replenishment electronically with correlation to the forecast. One may skip manual entries by this and may reduce errors in process. *'System disconnects'* and *'islands of analysis'* could be reduced by electronic integration. No observed forecasting system is integrated with retailer's or customer's information system. POS data has not been used for the forecasting. Where as orders from distributors, sales company estimates has been considered as the base of forecast. One can not see the real time demand which is a very important entity towards forecast. When invisibility of information occurs throughout a supply chain, each level prepare forecast based on orders from preceding member and hence buffers increases at each level. This causes bullwhip effect. Extra inventory causes the capital investment and an ineffective planning. These companies may integrate retailer's information system with EDI to company's central database in an open server structure to increase visibility. Use of POS information will help to increase the accuracy of forecasting. Forecasting using POS data helped them while preparing the replenishment strategy and hence the planning. integration of the information system and databases of suppliers with MIS and company database electronically with EDI may be used towards information visibility. Two way information data sharing can be useful from both sides. Suppliers can see forecast of manufacturer and prepare their forecast for their suppliers to achieve timed deliveries and scheduling production for future. This can be reduced by sharing forecasting, orders and production plan with suppliers. Suppliers can plan their production with this data to satisfy demand at any occasion. Lack of transparency in information plays an important role in the change of demand towards maintaining buffers. Isolation of different layers causes non coordination. Information sharing will help to decrease uncertainty and will help to optimize different variables like planning cost.

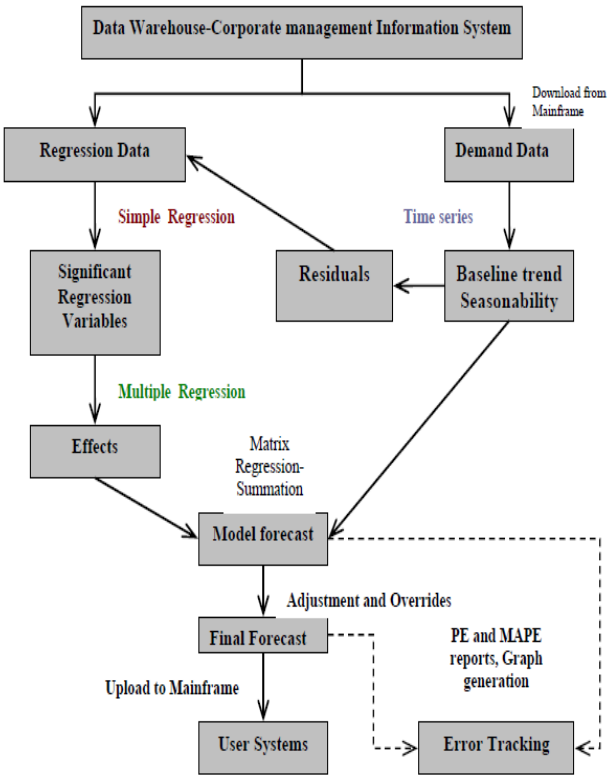

Fig. 02: MFS system flow

IV. Analysis of Sales Forecasting Method or Technique

This flow of information is matched with the historical data present with company. The reason to use this method is that those companies have lots of data from past sale. This observation could be matched with suggestion by Ballou (2004) who says 'when a reasonable amount of data is available, projecting this data into the future is best way for forecasting'. The time horizon for companies to make its forecast is one year. When it comes to preparing this forecast. Basically a historical method is the most appropriate when demand is stable but our study shows that demand is not always stable for the companies. Seasonality and trend is affecting the companies demand.

The question is now what is the best method or technique for those companies according to their demand and product categories. They could continuously use the historical method but with this technique they should also acquire an adoptive historical method. It means that companies need to update its forecasted data in regular interval to get accurate forecast.

It is clear that sales people are always looking forward and want to sell more in his area. They provide the sales data after collecting data from its distributor or dealer which became the base of the total forecast data to their chief. Sales people are often expecting that they are going to sell more and it may happen that the information they have provided is not accurate enough at the end of the day. Not meeting sales goal may be the result of an environmental factor.

Use of combination of methods and techniques could be the other option. Generally in short term, (less then one year) combining forecast methods has shown good result in other research. The method we have discussed in the theoretical part fits to the companies who make its forecast for one year or more than a year. Sophisticated system has not been taken

place and that is why they need information updating regularly. If they acquire one sophisticated system, it will be easier for them to prepare the forecast. They can also save the administrative time to make its forecast and also use different methods for different products according to its demand and behavior. But how those companies are measuring its forecast that is another question of our research. Here below we are going to analyze the measurement process.

V. Empirical Findings

The company environment decides the forecasting process flow. The data of each company have been presented and divided into six major parts with sequence as shown below. They are:

i) Process of forecasting and administration of forecasting - it gives an overall idea of how forecasting process is done in general.

ii) Forecasting system - this part is in connection with the software system and integration of information with other channel partners. Analysis of this data in conjunction with the literature review is done in order to solving the research problem.

iii) Forecasting methods and techniques used - this part highlights the present method of forecasting

iv) Forecasting performance accuracy and satisfaction - this part deals with different methods (if used) to measure performance of present forecasting system and to find out whether or not managerial staff is satisfied with the present approach.

v) Problems - this part gives us insight towards the necessary steps in order to propose possible
improvement options in existing forecasting system considering data presented in earlier parts.

vi) Planning of supplier - this part talks about how immediate the suppliers of a company plan their production based on the company's production plan and forecasting. This gives insight about system integration and collaborative demand-supply planning and whether they are needed in the improvement process.

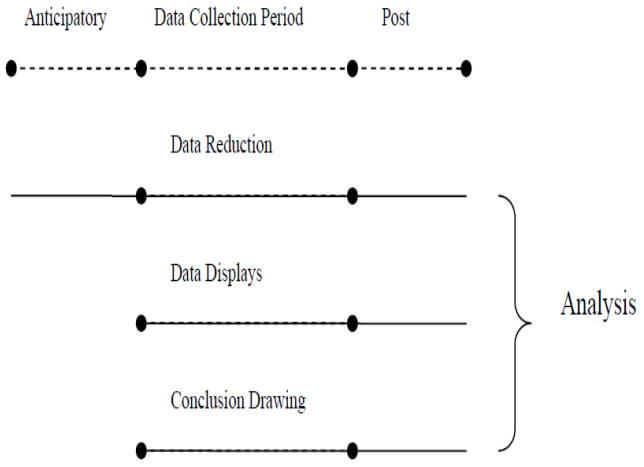

Fig.03: Components of Data Analysis

VI. Conclusions about 'Sales Forecasting Methods and Techniques'

To analyze method / technique used in forecasting is one of the purposes of this study. While analyzing methods/techniques used by the companies in the study we have came across some drawbacks. The use of only historical methods, use of only single method irrespective to product type is a few of them. Considering drawbacks of present sales forecasting methods/techniques, we have drawn the conclusions mentioned below:

The forecasting methods are available from simple to complex level. Historical method, Delphi method, casual method, surveys, correlation methods and market research are some common methods or techniques. The methods are selected by the managers of an organization, based on what experience and expectation they have. We conclude that the organization may select the methods which are the best fit for them and easiest to adopt according to need. All selected companies for this research are using only historical method which is based on trends, cycles, seasonal sales and random factors. These factors are all affecting the accuracy of the forecast. It is natural that the question is arising in the author's mind that, why these company adopting only one method and not several? We conclude that when demand is stable over the time, a historical method may be considered as a method of interest for forecasting. Availability of historical data together with stable demand may give better accuracy in historical methods. We conclude that there is no difference in choosing the methods of forecasting despite company size. The only difference between large and small companies is time factors during this process of forecasting. Big companies may have a long and complex process where the smaller companies have a simple process. Companies may select product specific forecasting methods through multi forecasting with at least three methods may be a better option available do not indicate when one can use the sales forecasting process approach. The surveys available indicate only which approach is preferred by the mass of companies. We tried to answer this question by considering company management size and power imbalance in managerial departments. We couldn't find industry specific research in the sales forecasting. Hence study in industry specific sales forecasting is our area of further research

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