CUSTOMIZATION AND ACCURACY ANALYSIS OF SALES FORECAST IN ORACLE R12.1.3

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Abstract: Forecasting is the process of making statements about events whose actual outcomes (typically) have not yet been observed. Prediction is a similar, but more general term. Financial and Operations management must deal with the impact of an optimistic forecast. Cash is often tied up in slow moving inventory as well as the opportunity costs associated with the production time for items that don't sell. Conversely, a pessimistic forecast causes Marketing and Sales to have shortfalls in revenue due to limited product availability. Considerable literature has accumulated over the years regarding forecasting. The primary conclusion of this line of research is that forecast accuracy can be substantially improved through customization of forecast forms in Oracle R12.1.3 for the betterment of supply chain and manufacturing units. This paper aims in developing a customized form for updating sales forecast form for different clients in the organization for their ease of use. Its objective is to provide multi-level status and versioning of the forecast to rule over standard functionality of Oracle e-Business Suite which was based on assumptions that resulted in a cumbersome data entry, higher inventories, poor customer delivery performance, longer customer order lead times, and increased overhead costs due to excessive changes to production plans. This in turn created several losses for the clients involved. To obtain a higher quality forecast, now a more customized form is implemented using Oracle Forms. After implementation, testing is done on the accuracy of the form with the data collected. Analysis with the help of forecast error is performed that has obtained unbiased tracking signals and being considered for future usage.

Keywords: Forecast Analysis, Forecast Modeling, Oracle R12 Customization, Sales Forecast.

Introduction: Every day, companies must make decisions about service delivery without knowing what will happen in the future. Forecasts enable them to anticipate the future and plan accordingly. Likewise, the company deals with millions of sales and procurement globally which needs to be estimated well before hand to ensure successful batch creations and final ingredients. Good forecasts are the basis for short, medium, and long-term planning, and are essential input to all types of service production systems. Forecasts have two primary uses: to help managers plan the system, and also to help them plan the use of the system. Planning the system itself is long-range planning: about the kinds of services supplied and the number of each to offer, what facilities and equipment to have, which location optimizes service delivery to the particular patient population, and soon. Planning the use of the system is short-range and medium-range planning for supplies and workforce levels, purchasing and production, budgeting and scheduling. All of the above plans rely on forecasts. Forecasting is not an exact science, however; its results are rarely perfect, and the actual results usually differ. All forecasts have certain common elements regardless of the technique used. The underlying assumption is that past events will continue. It also is a given that errors will occur because of the presence of randomness, and that actual results are more than likely to be different from those predicted. Forecasts of a group of items (aggregate forecasts) tend to be more accurate than those for individual items. For example, forecasts made for a whole hospital would tend to be more accurate than a departmental forecast, because forecasting errors among a group end to cancel each other. Finally, it is generally accepted that forecast accuracy decreases as the time horizon (the period covered) increases. Short-range forecasts face fewer uncertainties than longer-range forecasts do, so they tend to be more accurate. From a top line perspective, accurate sales forecasts allow the company to provide high level of client satisfaction leading to more acquisition of businesses.

Review of Literature: 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. According to **John Gallucci**, in these highly competitive markets, it is more important than ever to improve efficiency and shrink waste to survive and grow. One important area where waste can be reduced is forecasting. Because of rapidly changing

market dynamics, exceptions are now part of doing business. To survive and grow in this market, it is important to leverage exceptions.

"**If you want to make God laugh, tell Him your future plans.**" Of course, there's not a whole lot to laugh about for most business owners these days. They would settle for just a clearer sense of what lies ahead. Planning a budget, managing inventory is never easy, but a dysfunctional economy has now made forecasting all but impossible. Inc. spoke to three business owners about their forecasting struggles and how they are coping with uncertainty. For one of them, it gets down to monitoring sales of paper clips. In the book Demand Forecasting by **Christopher A Dyke**, When many people see forecast output, they think in terms of an exact number of units sold (or produced) during a period of time (500 units in January). The problem with this is that when that exact number isn't reached, natural instinct tells us the forecast should lose credibility and eventually become ignored. Instead of an exact number that may be correct 70% of the time, what if we used a range of output to plan off of (400-600 units in January)? The accuracy of forecasting is one of the crucial factors that accounts for the overall positivity whether the sales made for a particular region is meeting the requirements or not. Just entering the data without having being estimated leads to uncertainty in the production; increase in economy, hence a substantial amount of decrease in confidence.

According to **Dyke,** The more accurate the model, the better understanding you has of what is impacting the demand (or even to what extent certain variables impact it).This process can impact everything from future inventory levels, response time, delivery time, production variability, and quality control **(Min & Zhou 2002)**. Forecasting is a good practice that helps companies to allocate a budget for an upcoming period of time. This is typically based on demand for the goods and services it offers, compared to the cost of producing them. Investors utilize forecasting to determine if events affecting a company, such as sales expectations, will increase or decrease the price of shares in that company. Forecasting also provides an important benchmark for firms which have a long-term perspective of operations. **Rob J Hyndman** in his book Forecasting-Principles and Practice states that some things are easier to forecast than others. The time of the sunrise tomorrow morning can be forecast very precisely. On the other hand, tomorrow's lotto numbers cannot be forecast with any accuracy.

Often in forecasting, a key step knows when something can be forecasted accurately, and when forecasts will be no better than tossing a coin. Good forecasts capture the genuine patterns and relationships which exist in the historical data, but do not replicate past events that will not occur again. In this book, we will learn how to tell the difference between a random fluctuation in the past data that should be ignored, and a genuine pattern that should be modeled and extrapolated. Many people wrongly assume that forecasts are not possible in a changing environment. Every environment is changing, and a good forecasting model captures the way in which things are changing. Forecasts rarely assume that the environment is unchanging. What is normally assumed is that the way in which the environment is changing will continue into the future. That is, a highly volatile environment will continue to be highly volatile; a business with fluctuating sales will continue to have fluctuating sales; and an economy that has gone through booms and busts will continue to go through booms and busts. A forecasting model is intended to capture the way things move, not just where things are. As Abraham Lincoln said, "If we could first know where we are and whither we are tending, we could better judge what to do and how to do it". Forecasting can never occur without goals and planning. It 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 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 is a response to forecasts and goals. Planning involves determining the appropriate actions that are required to make your forecasts match your goals.

Consider what we have learned about forecasts over the past twenty years. Models have been developed to find 'optimal' forecasts. Both simulation and empirical studies have been done to test the models. Bayesian interpretations have been presented. The results have been virtually unanimous. This has been the result whether the forecasts are judgmental or statistical, econometric or extrapolation. Furthermore, in many cases one can make dramatic performance improvements by determining the accuracy of the forecast.

Need of the Study: The research is carried out in a management organization named Trianz Pvt. Ltd located in Bangalore, India. It was observed that the order to cash cycle and procurement to pay cycle in oracle contains numerous amounts of orders placed and received respectively. The amount of data handled is huge. Due to high production and no specific system to manage the orders, the

manufacturing unit could not provide a perfect estimation of the ingredients and packing material required to fulfill the forecast quantity. This resulted in uneven production with several clients. There was no record maintained towards accuracy of the estimation. The data entered in the previous version did not have any particulars to determine the location wise forecasting. The previous methodology was really complicated as complex system of forecast entry was done. It was hard for the clients to determine the exact quantity of ingredients and products to be sold without any wastage of inventory. The forecasting of the sales will be maintained separately for each route and location. Whenever there is any data that has to be pulled out for a particular date or month, it can be easily pulled out with the help of a button that is introduced known as **load out** for each forecast function. It will load the data based on the information provided. The final objective is to obtain accurate, relevant and credible forecasts and process improvement in efficiency and effectiveness. With the use of the new customized form, the unpredicted and random estimation will not occur. The use of ingredients and the materials will be determined and examined before it reaches the batch production.

Objective of the Paper

- To develop a customized form for forecasting in Oracle R12.1.3 for supply chain and manufacturing unit.
- Analyze the data and develop a mathematical model for the forecasting that needs to be performed.
- Effectively measure the accuracy of the modeling done for further usage.
- Reduction in data error due to manual entry at different stage and reduce the data retrieval time.
- Obtaining a final test on the data and check for any adjustments needed, comparison of actual data done.
- Finally, obtain an unbiased tracking signal and propose improvements.

The research is done and proposed improvements were made for the organization to be carried out. It will be followed by the clients of the organization with their own ease of accessibility. With increase in globalization, clients affiliated to the organization are looking for a global integrated multi-source solution.

Research Methodology: This module is built using the following software techniques. Both front end and back end design is performed in Oracle Forms and concurrent request reports. The front end design is done with the help of tables. A forecast modeling is done to determine the forecast. It is based on the criteria given by the clients and a model is developed so that the forecast needed is performed accordingly for the items and accuracy of the model is found out based on "**Mean Absolute Deviation and Tracking Signal**" after the creation of the forms**.** The goal of the EAS Team in Trianz is to narrow this range of demand and estimation as much as possible. This paper describes the business process of Sales forecast and the design of the custom solution to meet the requirement of the clients. The finalized forecast will be used by the clients of company who will use the forms to finalize the ingredients. The purpose is also to obtain multidimensional metrics so that sources of errors can be isolated and targeted for improvement.

The form is created to capture weekly sales forecast details (daily location wise form, daily route-wise form). A separate form for updating or providing a consolidated amendment at the regional level is created which provides features of multi-level status and versioning of the forecast. The form enables us to view the forecast based on Route, Location, Region, and Country. It creates move order for daily "Load out" based on the issues made to the Route. The form also creates production batch based on the final published forecast report. This requirement to the production should be given in a consolidated figure. This is done by the manufacturing unit after the forecast is being published. After the customization of forecast form, a forecast modeling is done to determine the ingredients estimation for future creation of final forms. This is done by developing a forecast model for the determination. The initial attempt to develop the model failed due to incompetency with the existing model. The forecast combinations of augmented distributed models provide forecast gains over the existing model. For the model developed by Trianz, according to the relative predictive performances; preference is given to those with relatively low forecast performances. The desire to improve accuracy is a principle factor behind developing a successful model. Second reason is that saving the history in a useful manner sometimes requires retention of the original customer level demand data. With the help of historical data, a more convenient model is being developed by the company for further usage. The variables defined for the forecast determination are:

Ft = (Ma+ Qa + Wa) / 3

Where, **Ma:** Previous Year Same Month Average Sale
Qa: Average of Last Quarter Sale
Wa: Actual Previous Week Sale

The first step in calculating a tracking signal is to find the forecast error. The forecast error is found by simply subtracting the forecasted value from the actual demand value. Forecasts that are below the actual demand values will have a positive forecast error and forecasts that are above the actual demand

values will have a negative forecast error. After finding the forecast errors, express these errors in there absolute values. These values will be used in a later step to calculate the mean absolute deviation (MAD). Calculating MAD is done by dividing the sum of the absolute values found in the second step by the number of periods in the data set. Once the MAD is calculated for each period, you are able to find the tracking signal. A tracking signal is found by dividing the most recent sum of forecast errors by the most recent estimate of MAD.

Business Objectives: Sales forecast is prepared by the sales team and published to production and stores every week. Based on this published forecast, production plans the products to be produced. Stores use this data to plan the dispatch of the products to the respective Locations and Routes. The model is being tested and evaluated to minimize the chance of under-forecasting over-forecasting. The tracking signal of the model tested in calculated. The previous functionality that generated forecast was not credible to forecast users which resulted in high unsuccessful and incomplete orders. The Oracle E-Business Suite architecture is a framework for multi-tiered, distributed computing that supports Oracle E-Business Suite products. In this model, various servers or services are distributed among three levels, or tiers. The first one being the route-wise, second being the location-wise and last one being the region-wise forecast. Al this form service requests is implemented on Oracle Forms. The concurrent processing server supports data-intensive programs in the background.

In the early stages of the research, decisions need to be made about what should be the forecast. It is also necessary to consider the horizon.

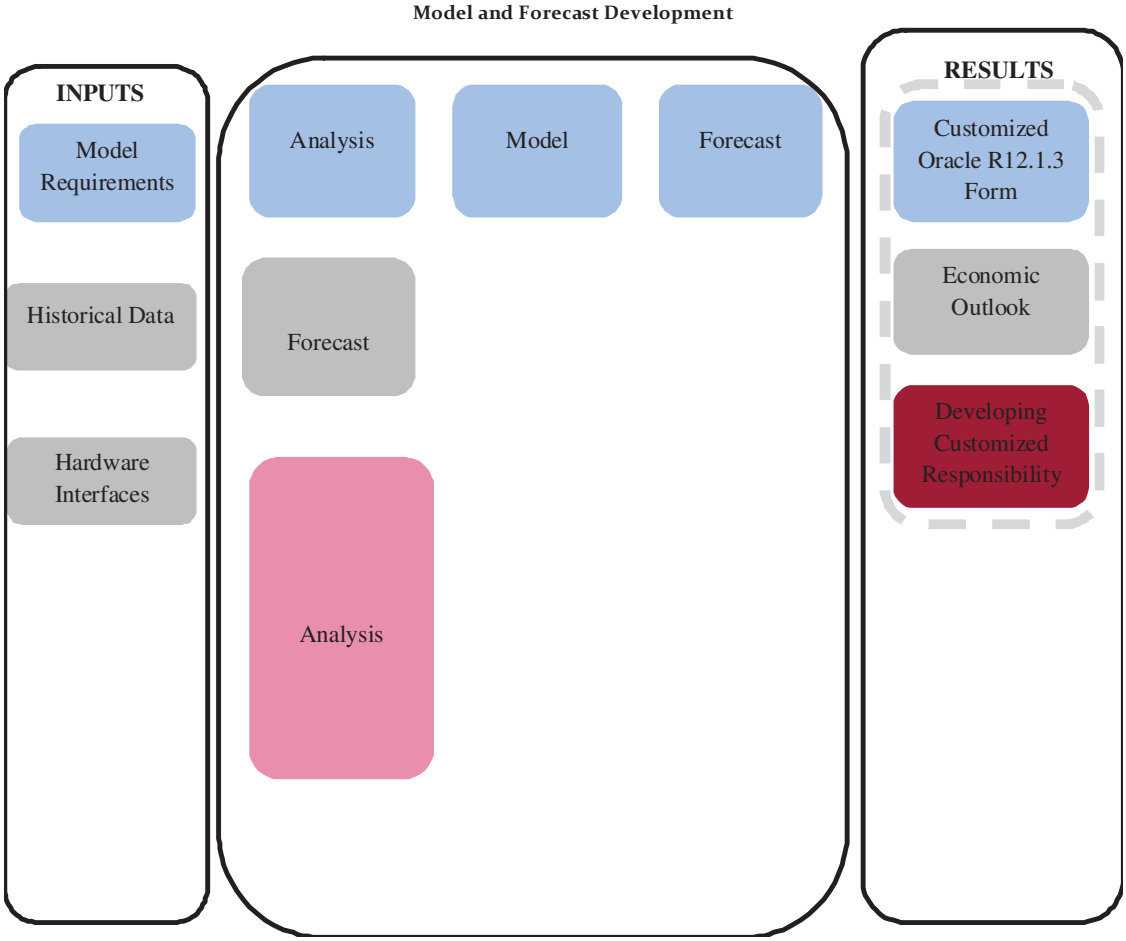


Figure 1: Modelling and Development

The seven keys here provide an end to end methodology of how to carry out forecasting in any scenario. It is the management decision or commitment as to what the company will do to make orders at ease. There are a lot of inter functional collaboration between units to meet the requirements. To identify all these problems, a forecast infrastructure is created and tested so that it reduces the losses of the system to a considerable amount.

The seven steps taken for the forecasting are as follows:

Keys	*Issues and Symptoms*	*Actions*	*Results*
Understand what forecasting is and is not.	• Computer system as focus, rather than management processes and controls • Blurring of the distinction between forecasts, plans, and goals	• Establish forecasting group • Implement management control systems before selecting forecasting software • Derive plans from forecasts • Distinguish between forecasts and goals	• An environment in which forecasting is acknowledged as a critical business function • Accuracy emphasized and game-playing minimized
Forecast demand, plan supply.	• Shipment history as the basis for forecasting demand • "Too accurate" forecasts	• Identify sources of information • Build systems to capture key demand data	• Improved capital planning and customer service
Communicate, cooperate, collaborate.	• Duplication of forecasting effort • Mistrust of the "official" forecast • Little understanding of the impact throughout the firm	• Establish cross-functional approach to forecasting • Establish independent forecast group that sponsors cross-functional collaboration	• All relevant information used to generate forecasts • Forecasts trusted by users • Islands of analysis eliminated • More accurate and relevant forecasts
Eliminate islands of analysis.	• Mistrust and inadequate information leading different users to create their own forecasts	• Build a single "forecasting infrastructure" • Provide training for both users and developers of forecasts	• More accurate, relevant, and credible forecasts • Optimized investments in information/communication systems.
Use tools wisely.	• Relying solely on qualitative or quantitative methods • Cost/benefit of additional information	• Integrate quantitative and qualitative methods • Identify sources of improved accuracy and increased error • Provide instruction	• Process improvement in efficiency and effectiveness
Make it important.	• No accountability for poor forecasts • Developers not understanding how forecasts are used	• Training developers to understand implications of poor forecasts • Include forecast performance in individual performance plans and reward systems	• Developers taking forecasts seriously • A striving for accuracy • More accuracy and credibility
Measure, measure, measure.	• Not knowing if the firm is getting better • Accuracy not measured at relevant levels of aggregation • Inability to isolate sources of forecast error	• Establish multidimensional metrics • Incorporate multilevel measures • Measure accuracy whenever and wherever forecasts are adjusted	• Forecast performance can be included in individual performance plans • Sources of errors can be isolated and targeted for improvement • Greater confidence in forecast process

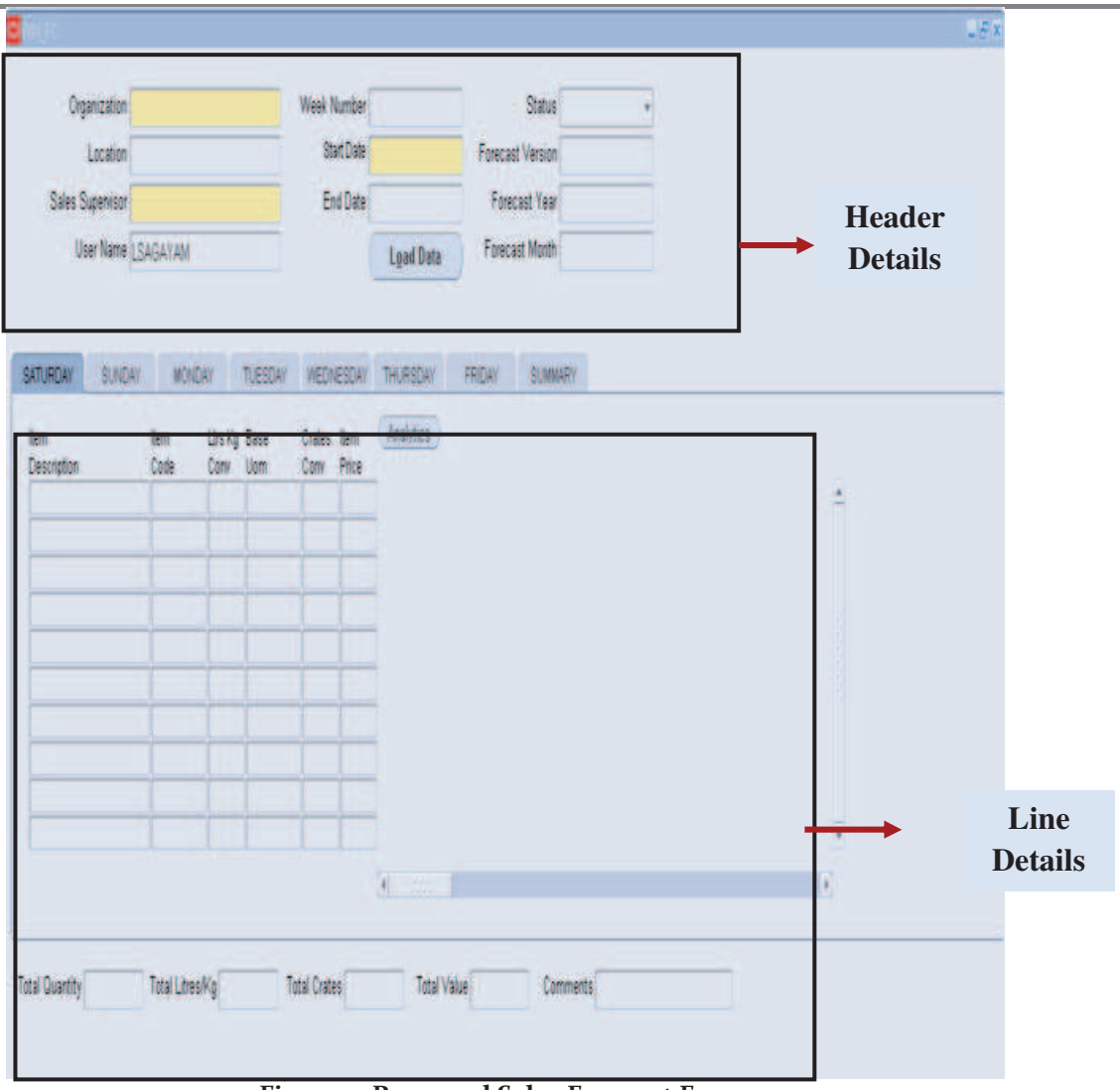


Figure 3: Proposed Sales Forecast Form

Navigation Details:

ERP Login Page → Home Page →Sales Forecast →Forecast Entry

BI Publisher Templates: All of the following Templates are XML Format. . These templates are created by the Technical Developer and will be associated to the respective concurrent program and "Request Group".Constraints: Assumptions: All variable field data will be available in Oracle e-Business Suite. A request set can be created that will include the concurrent program to create the batch directly triggering from the form. User can access this form from the respective responsibility of their functional operations**.**

User Access Restrictions: Sales supervisor, area sales manager (ASM) and senior sales and marketing manager (SSMM) will have access to enter, modify and publish. Stores, Production and other departments will have view access to the published Forecast.

Frequency of Usage: This form will be used 24X7, to enter the sales forecast details of each location, route and item.

Organization: Display Inventory organization that are used for Dairy Sales. Inventory Organization DFF Attribute6 is "Y" (Yes)

Location: Display the Sales Location associated with the sales supervisor which is defined in the Inventory Organization DFF Attribute7

Status: The forecast has multiple statuses like "Draft", "For Review", "Approved", and "Published". The status flow is **Draft -> For Review -> Approved ->Published (Version)**

Start Date: Start Date should be the date which falls on Saturday.

End Date: End Date should be displayed automatically, which will be +7 days of the start date,

it should end on Friday.

Week Number: Week number of that year should be displayed. As Week numbers are calculated based on Sunday. Saturday which is day before Sunday should also fall under the same week number as Sunday, hence either Sunday week number is assigned to Saturday or arrive the week number for Saturday and add one.

Month: Month of the date to be displayed

Year: Year of the date to be displayed.

Load Data Button: When the user click on this button, the line details tab will be loaded with data arrived based on the last week same day sales. For e.g. last week Saturday sale for the respective item of the assigned route.

Line Details: Totally eight tabs will be created for the Line Details. Seven Tabs for the date starting from Saturday till End Date i.e. Friday. Eighth Tab will be the Summary Tab which will display the summary quantity of the complete week.

Tab 1 to Tab 7 (I.E. Saturday to Friday)

Item Code: Item code display the Item Codes which are Finished Goods of Dairy. These are identified based on Inventory Item Category.

Item Description: Description of the selected item code is to be displayed here.

Base UOM: Display the Primary UOM of the Item.

Liters: Display the Liter Conversion Factor defined for this Item in Inventory UOM Conversion.

Crates: Display the Crates Conversion Factor defined for this Item in Inventory UOM Conversion.

Routes: Each Route are defined as "Sub Inventory" and identified as "Route" based on Sub inventory. By Default, Routes 1 to 40 are predefined in this form as R1, R2... R40. Each Route name which is defined by default will be replaced with the actual name as per the logic defined below.

The line details consist of item codes and description of its quantity. The forecast is weekly basis hence there are seven columns provided for each day where each day's sales forecast can be seen separately by clicking each tab in the form shown.

Developing a forecast model is the most crucial job for any organization. They have to cross-validate the model using which a client must forecast its actual demand. Clients will choose different predictor values and observe the predicted seasonal inflow and associated uncertainties. Upon completion of the task, the organization that develops the model for the client will have a better understanding of both the forecast model that can be built with the given predictor and predicted values and how to interpret the model's results. Modeling of forecasting is an evolving process. As well as the choice of model type, there are elements of trade-off and judgment in assessing alternative model estimations. A number of possible contradictory measures may be employed to gauge how well a model fits the data and the likely accuracy and bias of the forecast. This modeling of forecast developed by the clients describes a general approach to modeling their sales estimation which may not perfectly reflect the particular process that was followed in the initial standard functionality of Oracle. This is partly due to the particular nature of the data for each region and partly due to the time constraint. The company's objective in defining demand is to isolate the underlying use of the bulk of end-use consumers, so it can be modeled and forecast. The point is to track accuracy at the level where you make the important business decisions. Additionally, you should consider tracking accuracy across like items. If you use one service-level calculation for fast-moving, continuous-demand items, and a second standard for slower- and intermittent-demand items, you should calculate separate error measures for the distinct groups.

Results And Discussions: Many companies consider the most important decisions about forecasting. Many revolve around the selection or development of computer software for preparing the forecasts. They have adopted the overly simplistic belief that "If we've got good software, we'll have good forecasting." Our research team, however, has observed numerous instances of sophisticated computer systems put into place, costing enormous amounts of time and money that have failed to deliver accurate forecasts. This is because system implementation has not been accompanied by effective management to monitor and control the forecasting process. With the proposed new forecasting sequence, the route, location and region wise data produced tracking signals well within the limit. The item SE2501 showed a significant value of -4 which is the borderline value. After implementing the new form, the data has been divided into many routes which are helping the clients to obtain an organized data for each ingredient. The unadjusted statistical forecasts have been measured and analyzed with the help of accuracy tracking system.

Once the model has been selected and its parameters estimated, the model is used to determine the forecasted value. The performance of the model can only be properly evaluated after the data for the forecast period have become available. A number of methods have been developed to help in assessing the accuracy of forecasts. This will help us to know whether the forecasting model selected by customizing the previous model is accurate or not. For this, we use standard error calculation methods called Tracking signal, Mean Absolute Deviation and Mean Squared Error. After developing the forecast forms and the modeling, it is necessary to check the

feasibility of the model that will be used by the clients. Without pre-testing and evaluation plan, it will be hard to determine the anticipated working of the same. Comparing actual numbers with previously established benchmarks will reveal if the forms does what it is intended to do. In order to test for data accuracy, a full week of real sales data is taken into consideration to validate output. A forecast is never completely accurate; forecasts will always deviate from the actual demand. Although forecast error is inevitable, the objective of forecasting is that it be as slight as possible. A large degree of error may indicate that either the forecasting technique is the wrong one or it needs to be adjusted by changing its parameters. The accuracy determination is completed with the help of Mean Absolute Deviation and Tracking Signal. The formula used is:

Mean Absolute Deviation:

$$MAD = \frac{\sum |Dt - Ft|}{n}$$

Where t = the period number
Dt = demand in period t
Ft = the forecast for period t
n = the total number of periods
| | = absolute value

Tracking Signal:

$$TD = \frac{\sum (Dt - Ft)}{MAD}$$

Existing Model: The forecast values taken for the previous table are the sales from the last month. The results obtained were:

Table 6
Tracking Signal
-6
-6.167
-4.7744
-11.543
-8.0445
-6.2061

As seen from the table, the Mean Absolute Deviation (MAD) and Tracking signal (TS) values obtained are exceptionally high which means the forecasting format used is not performing up to the mark and it should be modified. Hence, the company has implemented a customized forecast form as the standard form is designated out of control. The proposed improvement will be followed for all future forecast done.

An important component of a tracking signal is a continuous sum of the differences between forecasted and actual values, so as to measure whether a forecast is consistently too high or too low. If a forecast is consistently producing values that are too high or too low, a tracking signal will designate the forecasting method to be out of control, similar to the function of quality control charts. A tracking signal is also very versatile in that it can be used with a variety of forecasting methods. There are companies that haven't settled on a forecast-accuracy metric. While this may seem to be a simple task, the choice of metric depends on the nature of the demand data. Finally, some companies don't have processes in place that factor forecast-accuracy metrics into business decisions. So they lack the impetus to track accuracy.

Sample Calculation: Route-wise: Item code: CA100, Period: 02/05/14-08/05/14

Table 1				
Item No	**Route 1 (At)**	**Route 2 (At)**	**Route 3 (At)**	**Total**
CA100	883	857	825	2569

Table 2			
Ma	**Qa**	**Wa**	**Ft**
538	1623.6	410.5	857.367

Table 3				
Et-1	**Et-2**	**Et-3**	**Absolute Value-1**	**Absolute Value-2**
25.6333	-0.3	-32	25.6333	0.36667

Table 4			
Absolute Value-3	**Squared Error-1**	**Squared Error-2**	**Squared Error-3**
32.3667	657.068	0.13444	1047.6

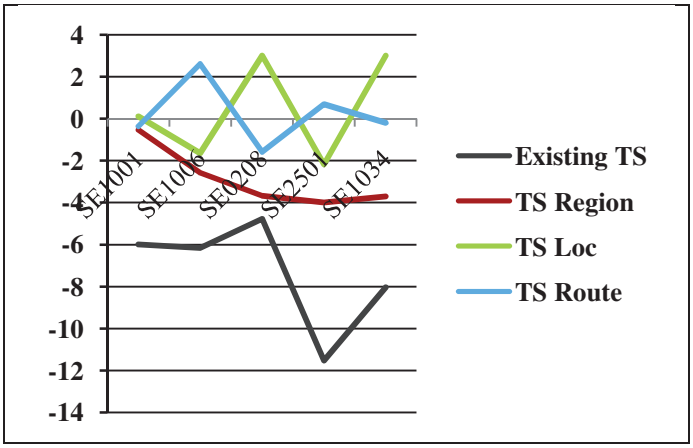
Table 5	
Mean Absolute Deviation	**Tracking Signal**
19.4556	-0.3649

From the results, we can see that the tracking signal stays well within the limits of -4 and +4 which indicate that the forecasting method used by the company is following demand patterns closely enough for the time being. The Tracking signal was not employed by the clients initially while actual data was being calculated.

New Results:

After implementing the new form, the data has been divided into many routes which are helping the clients to obtain an organized data for each ingredient. It is clearly understood that the previous form followed was not up to the mark, hence changed to the proposed form. After the implementation of the proposed responsibility separately for forecasting, the tracking signal reduced to a drastic level of range between -4 to 4 from -11. The results below reflects the considerable improvement

Table 7	
Tracking Signal Route-Wise	0.230775
Tracking Signal Location-Wise	0.455246
Tracking Signal Region-wise	-2.89896



Graph 1: Old and New Tracking Signal

The graph represents the results of tracking signal for both existing and newly collected data.

There is a considerable amount of difference present between the old modeling and the new modeling provided for route, locations and regions.

Conclusion: The problem of the previous functionality is successfully addressed with the customized form and new forecast modeling. The error components like mean absolute deviation and tracking signal are used to arrive at the root cause for the problem. The organization should access forecasting accuracy in terms of its impact on business performance. The root cause for the problem is found to be no limited version of modeling used in the existing form.

- The major factor causing high tracking signal was no particular division of data and making random demand patterns.
- There was no way to separately load out the data automatically for any day.
- While manufacturing finished goods, the raw materials were taken randomly which resulted in

unfinished goods.

- Hence feasibility of the model is obtained.

With the above findings, following recommendations are proposed:

- The issue of new sales forecast form which would capture all regions and locations data separately.
- Ingredients, item quantities will be calculated based on the forecast model which is required to produce the finished goods. The forecasting done for the particular period showed a considerable amount of biased modelling and the tracking signal value reduced to the designed limit.

Limitations: In this work type of forecast modelling is done only for weekly basis data. The monthly and yearly data modelling has to be carried out further.

Due to lack of time duration, the proposed improvements are applied for only one month's sale orders and shown improved results.

The reliability of the solution cannot be judged unless the long term implementation i.e. at least for six months of production and sale with the proposed method. This way the vulnerability of the form to a prolonged forecasting can be understood.

Future Scope:

- The monthly and yearly modeling has to be carried out for the long term benefit solution.
- Control charts can also be used for the monitoring of forecasts.
- The method of customization and development of forms can also be used for other objectives like managing the finished goods after the manufacturing and this can be extended to other modules and units of Oracle to improve the productivity.

Further adjustments can be done by other clients based on the knowledge of market conditions and feedback can be taken for further improvements. Finally, companies should assess forecasting accuracy in terms of its impact on business performance. Accurate forecasts should not be an end in themselves, but rather a means to achieving the end, which is business success. Improvements in accuracy require expenditures of resources, both human and financial, and should be approached in a return-on-investment framework. With this recognition comes a willingness to commit the necessary resources to improving this critical process.

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