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A STUDY OF USING SPREADSHEET MODELLING AS IDEAL TOOL FOR SYNERGIES MANAGERIAL KNOWLEDGE WITH UNCERTAIN MARKETING INFORMATION TO SUPPORT PRODUCTION MANAGEMENT CASE STUDY IN AL- AMEEN FOR TRADE IN FOOD COMPANY- BASRAH

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Abstract

Spreadsheet modelling is an tool for synergies managerial knowledge with uncertain marketing information to support,to support the activity of the production department responsible for implementing the production program according to what is determined by the marketing research and Managerial knowledge possessed by the higher management that makes the decision.It is particular spreadsheet models as in the form of tables by using a set of quantitative methods and the aim of this models is to learn how to develop quantitative data and spreadsheet models and use to support analysis and decision making for business problems .In the light of that research aims to explain the role of spreadsheet in analysis and decision making in marketing function to forecast the expected sales volume in the business environment and outline the steps necessary to ensure professional and spreadsheet models that used to prepare the forecast seals volume in Excel system and that the best practise the managers as decision support systems and or management systems.

In light of the results of the research, recommendations can be made, which are solutions and proposals for the research problem:

a. Using statistical methods in the actual sales spreadsheets to conduct the forecasting process, which is the basic tool for work and learning on how to use these applications

and move away from random estimates and work on developing those models and using them appropriately to support the analysis and appropriate decision-making to solve business problems. Among these methods are the following Mentioned in this paper.

b. Choose an efficient employee with educational attainment in order to prepare studies on the volume of sales in the target markets and to identify the volume of competition and competitors' activity in the field of using various promotional means.
c. 3. Adopting strategies to deal with economic market variables and paying attention to activating the role of marketing activity in the serious contribution by preparing the necessary studies to reach an accurate forecast of the expected sales volume that avoids the company's random purchases.

Introduction

Marketing is one of the most complex areas in business decision making , because many input variables , they are qualitative in nature and cannot be accurately measured , an example of this is the change in consumption patterns and forecasting of sales in an uncertain economic environment , so some managers see marketing as a form of art with qualities of experience, good judgment, which is more important with the construction of an analysis model (Analytical model building) , in light of this leads to good estimates , moreover, data modeling is an ideal tool for combining management knowledge with uncertain marketing information , because many marketing decisions depend on a combination of both, in the sense of details , such as past data on sales with quality expectations , a market of volatile demand and places is usually called a semi – structured (Barlow : Second Edition :2005) , so the main problem in the semi-structured market , the decision maker has realistic past data on actual sales used for analysis but must use his own judgment to reach a satisfactory solution. This is beause the past few decades have experienced major changes in management accounting applications (Ali, Abdulaali and ALmashkor). Growing high competition forces companies producing tangible goods and services to radically improve the productivity of their sustainable operations , these objectives can be achieved by using several strategies, some of which are conducive to gradual improvement in productivity, which leads to improving productivity with a great leap. Some of these strategies include the use of intellectual capacity. Through intellectual capital, it's possible for businesses to have successful strategies that cannot be copied easily(Abdulaali, A.R., 2018; M Shariff et al., 2020). In light of the above, the ability to experiment with quantitative data . In order to gain more insight into the semi-structured situation, the decision maker can see the results on certain actions, For example, how can a 5% increase in production costs affect product pricing? To answer this question, many companies have multiple and contradictory goals , often they may seek to maximize sales or possibly maximize profits while minimizing risk .

Thus, the research came with four topics, the first section devoted to the research methodology while the second section was devoted to the

theoretical side, while the third section covered practical and finally the fourth section dealt with the most important conclusions and recommendations .

The first topic : Research Methodology

1. Research Problem

Subjective decisions hinder the adoption of stable and uniform evaluation criteria in the decision-making process , perhaps one of the problems facing business organizations is making decisions without knowing what will happen in the future , also quantities of stock are ordered without knowing what the sales volume will benew equipment is also purchased although the demand for products is uncertain , and making investments without knowing the amount of profits , managers usually try to do the best estimate of what will happen in the future to counter uncertainty Profit is the maximum of economic resources that an individual can consume within a certain period, with his wealth at the end of that period as large as it was at the beginning (Oudah and Almayyahi; Munir et al., 2019; Muhammad et al., 2019). Making good estimates is the primary goal of forecasting .Few business organizations can avoid the prediction process by simply waiting and looking at what happens and then taking their chance.This can be seen in the Al- Ameen Foodstuff Trading Company, The research problem is summarized , The creation of administrative knowledge and uncertain marketing information and linking them to a close relationship has not been systematically tested (Examined systematic) by the company placed research, and based on the above, the basic question of the research is as follows:

"How to use uncertain marketing information and management knowledge in activating the system of demand forecasting in the company under consideration"

2. Research Objectives

The research aims to achieve the following objectives:

A. Developing knowledge and conceptual frameworks for the subject of forecasting through proposals that will lead to integrating the relationship between managerial knowledge and creating capabilities with uncertain marketing information.

B. Using a set of statistical methods to strengthen the knowledge base of marketing decisions.

C. Explain the effect of using the data modeling method in achieving accurate forecasting of expected demand.

D. Reducing the time and money factors that may be exhausted if this method is not used, which reduces all efforts and reduces the costs that would have occurred if a descriptive or simulated approach were used for all the forces and events affecting the problem.

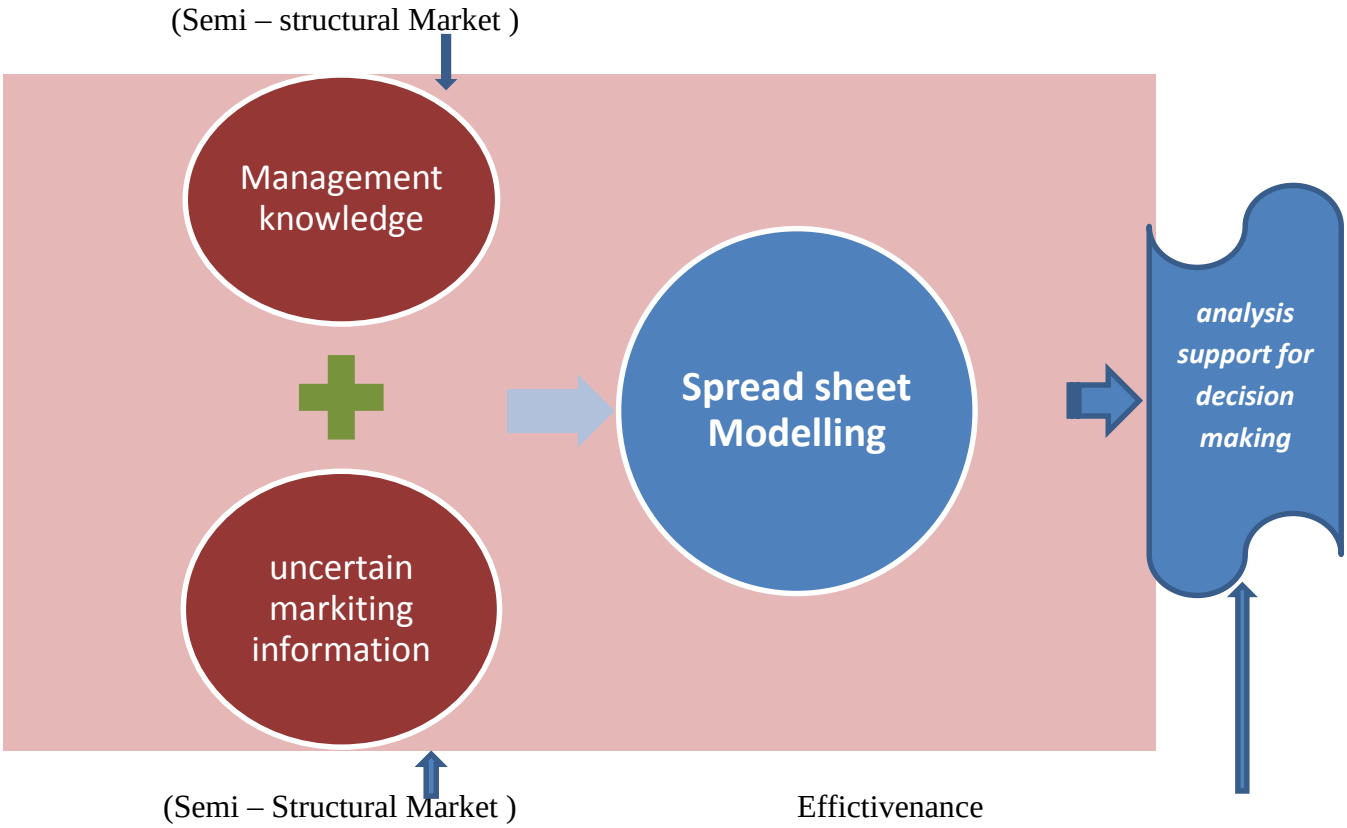
3. Research hypothesis

Based on the research problem, the main research hypothesis has been formulated as proof:

‘’ The use of a modeling approach to combine management knowledge and uncertain marketing information contributes positively to strengthening analysis processes for decision making and increasing effectiveness ‘’

4. Planned hypothetical research

Figure (1) illustrates the relationship between managerial knowledge and uncertain marketing information, from direction, and data modeling and analysis support for decision making,from anther side . The research plan includes four basic variables: management knowledge, unconfirmed marketing information, data modeling and decision support processes. It illustrates the interactive relationships between the components of the model.



Source: Barlow , John F. ‘’Excel Models for Business and operations Management ‘’ Second Edition , Printed and bound in Great Britain by Biddles Ltd , King’s Lynn, 2005

5. Data Collection Method

The case study approach was used to test the research hypothesis, data and information on the research were collected in two ways: First: Information to enhance the theoretical side by relying on books and references related to the topic.Second: Field data were collected through reports, lists, records and personal interviews that were conducted with a group of salesmen and the company director.

6. The Mathematical style used

The forecasting - Exponential Smoothing equation was used for forecasting which involves relying on previous data and is relatively easy to use, and it has been relied upon since there are restrictions on using the Moving - average approach to forecasting, and that the need for this experiment Which depends on a number of months with weighted factors that create serious problems, unlike the exponential Smoothing of a prediction that depends on short periods and can overcome these difficulties through automatic weighting and recent data that are more weighted than the old data, which is the adaptation approach in which the adjustment is made Expectations for a certain period, taking into account the error made in the previous period . To evaluate the accuracy of the forecasting, MAD was used (Mean absolute deviation), as well as the mean squared error (MSE) , as well as Excel's Growth Function , used in cases where there is no clear trend, or if trend appears in an exciting way, upward or downward, and thus the relationship can be exponential, and in this case the growth function is used. (Barlow:2005)

Research limits

A) Objective boundaries: It is the substantive scope of the research and it is imposed by the nature of the research, which focuses on clarifying data modelling and its role in analysing and supporting decision-making processes in various functions, including the function of marketing, finance and operations, as well as discussing the benefits, limitations and risks of data and modelling it in the business environment to create professional development in the field of using computer applications in organizing, analysing and storing data, which replaced paper-based systems tables in all works. These tables and analyses have a standard feature in the form of applications using a set of quantitative methods, including the exponential smoothing function, the mean standard error and the growth function .

B) B) Temporal limits : The sales volume data for the period from 1/1/2018 to 1/7/2019 were relied on to ensure the clarity of the growth function .

C) Spatial Borders : The Middle East Foodstuff Trading Company in Basra .

Literature view

1. Title of the study: Marketing Under Uncertainty : The Logic of Effectual Approach .
   Researcher / Year: Stuart Read / 2017
   Study type: Analytical and Descriptive.
   Domain: Commercial companies.
   Study problem: the effect of unconfirmed marketing information on the activity of commercial companies .
   The aim of the study: To identify the type of strategies that can be directed towards predictability of markets in light of the uncertainty .
   Conclusions: There is a clear weakness in the ability to prepare a clear strategy for markets affected by a set of variables and instability.

Recommendations: It is possible to prepare programs to address the state of uncertainty and direct it towards reducing costs under conditions of uncertainty to reduce the volume of risks associated with the process of forecasting the expected sales volume and to reach a competitive price capable of withstanding in unstable markets .

2. Knowledge Management is the Process of Enabling Knowledge Flow to Enhance Shared Understanding Learning Decision Making .
   Researcher / Year: Auden .K. Morees / 2016
   Study type: Field , Analytical and Descriptive.
   Domain: Group of industrial companies .
   Study problem ; The possibility of knowledge management to encourage participation in the decision-making process .
   The aim of the study ; Creating learning opportunities at the organization level and directing efforts towards improving resource management .
   Conclusions: Knowledge management is a conscious strategy to obtain the right knowledge for the right people at the right time and to use the information in proper ways to improve the level of performance .
   Recommendations : Learning is the basis of organizational culture, and as a result, the organization will gain strength and flexibility, especially when designing and defining the organization for all its components, as well as the organization must seek an implementation approach after it attempts to classify the information well and use it properly .
3. CREATION OF Management Capabilities through Managerial Knowledge Integration : A competence – Based Perspective .
   Researcher / Year: Frans .A. Jvan den / 2017 .
   Study type: Field
   Domain : Group of companies.
   Study problem ; Application of management knowledge and the extent of its impact on administrative decision-making.
   The aim of the study ; Developing managers through special programs for learning and capacity development.
   Conclusions : Capacity development plays a critical role in the processes of creating organizational knowledge .
   Recommendations : Management knowledge should be placed at the forefront of competitive precedence and the conceptual framework developed to analyse integration in management knowledge through its application at the upper and middle administrative levels .
4. MANAGING UNCERTAINTY IN PRODUCT INNOVATION USING STRATEGIES MARKETING
   Researcher / Year: Gláucia Fernandes & Luiz Eduardo Teixeira Brandão / May/Aug 2016 .
   Study type: Field .
   Domain : Group of Brazilian companies .
   Study problem ; To illustrate the concept of 4P's of innovation , apply this model to an IT project in order to determine its value and risks .
   The aim of the study ; projects are characterized by many technical and market uncertainties , this article proposes incorporating marketing strategies into risk management methods for the development of new products and technology projects .

Conclusions : The results indicate that the joint use of marketing and risk management tools proposed add value to the project and reduce the probability of the manager making bad decisions .

Recommendations : it is suggested that in a future work a comparative analysis of the 4P's innovation is made for start-ups and small and large innovative companies, since the impact of the incremental cost of marketing can vary greatly between these companies .

The second topic: the theoretical side

Introduction :

Analytical model building Playing an effective and auxiliary role is expected to lead to maximizing the effectiveness of the decision, as well as shortening the decision-making time, and in light of this there are serious attempts to develop an analytical subsystem for the topics that work within the framework of management, and a model has already been developed to represent the combination of management knowledge and information. Uncertain Marketing this means applying unconventional methods in extracting information to increase effectiveness , It also supports analysis processes for decision-making, that this model is one of the most effective tools for solving problems by defining them, and this work is an attempt to prove the hypothesis that "reducing uncertainty in the decision-making process is possible through developing a model (Data Modeling), which is an ideal tool for combining management knowledge with uncertainty marketing information(Hizer:2017) .The development of this model based on the mixing of quantitative details such as (past sales data) with qualitative forecasts from a volatile market and it is usually called semi-structured, and the main objective of this work is to increase the efficiency and effectiveness of the bodies working in management and thus influence the effectiveness and entity of the administration in a form .

1. **The concept and importance of modeling :**

Modeling can be defined for any economic or administrative problem, it is only the simplified form of this problem, which most often takes the form of equations, inequalities, or dependencies that represent the relationship that can be quantified for the various factors that have a relationship to the problem . In other words, it can be said that modeling is a set of processes and treatments for building models intended to facilitate complex phenomena. (Barlow: 2005; Noorollahi et al., 2019)

Its importance can be explained through the following :

1. A simplified reconstruction of the real situation that reduces the level of complexity in which the planner can understand it sufficiently to overcome the difficulties .
2. The model can identify the limitations and factors that define possible solutions .
3. There is a possibility for the model to evaluate the quantities, their costs and the extent of their impact within the system environment .

2.Classification of intellectual models

Models can be divided into three types, namely (Ragsdale: 2004; Noreen et al., 2019; Shabbir et al., 2019)

- Descriptive models :

These models are in line with the inductive method, meaning that they use logic to describe and analyse the relationships between the variables affecting the problem.

- Predictive models :

  They are the models that are used to predict what the system will look like over a future period of time.

- Planning models or normative :

  It extends predictive models aimed at verifying the correctness of a system by matching the results with the reality for which statistics are recorded .

3.Forecasting-Time series and Exponential smoothing

Organizations of all kinds and their productive or service activities cannot effectively achieve their goals set within the plan without having forecasting for their products and services, so forecasting is a process to protect the future and on the other hand, planning is the process for determining progress , it could be and how could it be . Forecasting provides the planning process with information on the available inputs. In practice, all administrative decisions depend on forecasting, whether in a quantitative or qualitative manner, and forecasting can be in the short term and may extend for one year. The most important Statistical Quantitative Techniques are (Moving Average), Rend Extrapolation and Exponential Smoothing are the best for predicting the short term, either qualitative or judgemental predictions are mostly dependent on human judgment, intuition and experience. These methods are most appropriate for long-term prediction when seasonal trends and studies are unclear, so building reliable mathematical models. (Telsang:2005; Normalini et al., 2019) .

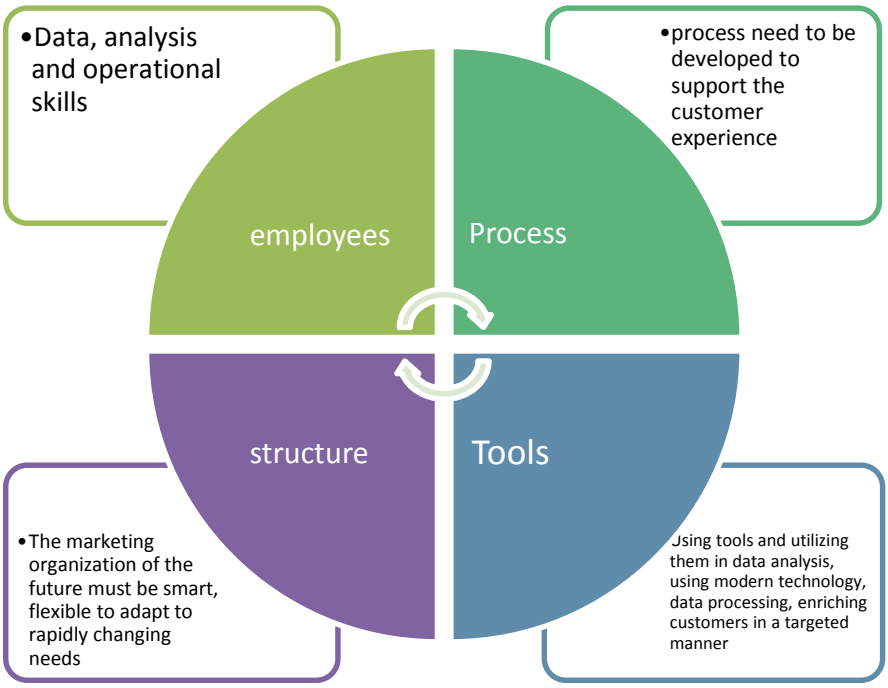
4. knowledge management

The emergence of the term "knowledge management" is a fairly recent phenomenon. Operationally, he appeared only in the mid-1990s. The earliest printed reference appears to have been used first in the context of library and information work(Claire R.Mcinerney:2011:3).

Knowledge management is one of the most important topics in today's world, both in the world of industry and in the world of searching for information, and in our daily life we deal with vast amounts of data and information . There is no agreed definition of knowledge management, just as there is no agreement on what knowledge is in the first place, and the following definition was chosen for its simplicity and it is consistent with the general context of the research .There are many definitions of knowledge management andKnowledge management can be defined as a process of creation and participation, using and managing knowledge and information in any organization, and it refers to a multidisciplinary approach to achieving organizational goals through the optimal use of knowledge.Knowledge management focuses on the processes of creating and exchanging knowledge and the technical foundations that support these processes. Perhaps knowledge management can be identified through its role in influencing the organization’s individuals in increasing their capabilities in influencing others .Knowledge management has a role in providing appropriate knowledge and making

it available to the right people, and for the purpose of ensuring that the organization can learn when it is able to retrieve and use knowledge assets in current practices and applications whenever needed ,And in the words of (Peter Druker) that knowledge management "is the coordination and exploitation of organizational knowledge resources (in order to create benefit and competitive advantage)(Nair:2004) .Figure (2) illustrates the basic components of knowledge management and the process of interaction between those components.

Figure (2) illustrates the relationship between the basic components of knowledge management and marketing information



Source: Shree , Dandekar . '' Customer Analytics & Intelligence '' 2th Edition , McGraw-Hill-New Delhi , 2014.

From the previous figure (2) it becomes clear that a state of interaction must be created between the basic components and this interaction comes through a mixture of management knowledge and marketing information using tools (and utilization of it in analyzing big data and using modern technology in processing that data and enriching customers in a targeted way, Personal and more efficient, on the other hand, in terms of construction .The marketing organization of the future needs to be smart and flexible to adapt to rapidly changing needs. As for the processes, the processes need to be continuously developed in response to the desires of customers and technological developments in order to support those desires and the need for customer experience in this field, and finally with regard to workers, the organization needs skills Operational and other capable of collecting and analyzing data .

5. Uncertainty Marketing Information

When the marketing information is uncertain in an unknown situation, or the nature of things is unknown due to the availability of unforeseen circumstances and events, the forecasts may lose their credibility and lead to the results of a high probability of not occurring . Many of the uncertainties are undesirable and unreliable to make decisions and the possibility to control them may not be available, in other words that the probability distributions of the variables are unknown and it is difficult to predict them .It is not possible to prepare an accurate description and determine the current state when knowledge is limited, as it is not possible to describe the situation exactly and therefore the result cannot be expected in the future, and making decisions using such uncertain data or what is called uncertainty may have significant future effects or it may cause a big loss to the company .Therefore, a strategy must be used in light of uncertainty, and some managers may seek to form a vision for the future under high-risk conditions and in the light of which it is decided whether the investment is feasible or not, and what is the volume of investment required and some of the managers may wait for the entry of new competitors , in light of this, they decide (Giraed:2015).The development of a vision for future events must be accurate through carrying out the process of analysis and the goal or main purpose of it is to find the most likely outcome and create a strategy commensurate with the prevailing circumstances . What serves the competing companies well is working in relatively stable environments, but when there are more uncertainties about the future, things are expected in the worst case to be dangerous, and therefore the adoption of traditional methods of strategic planning under these circumstances pose a threat to the future of the company in other wordsManagers who believe that they are working in uncertain environments, the degree of confidence in their decisions is weak and thus the majority of them avoid making important strategic decisions about their products and target markets, which may lead them to develop technologies that focus instead on programs that contribute to reducing internal costs and the approved restructuring and quality management, although the value of these programs is not sufficient, it is not a substitute for strategic planning and decision-makingsound strategy in light of uncertainty requires a different approach, and it is rare to see managers who know absolutely nothing about the importance of strategic planning, even in the most complex environments . In fact, there is usually a definition of a set of potential results or even a set of scenarios, and accordingly, this vision is very strong despite its simplicity to determine the best strategies under those circumstances and how to use and develop them, and this in result depends on the level of uncertainty facing the company and even more work environmentsuncertainty There is a lot of relevant information and in light of which certain trends can be identified, for example the demographics of target marketswhich can help in determining the potential demand for products or services in the future and based on the analysis process can identify the factors that directly affect the company's activityincluding the elasticity of demand for a

group of products and the demand for them may be stable, but the thing that takes into consideration is the ability of competitors to expand, which is often unknown, but not completely unknown. (Frans:2013).

The third topic: the practical side

The Middle East Company is considered one of the largest companies working in the field of marketing food products, cosmetics and detergents in Basra Governorate, and thus it deals with more than 150 types of these materials, and some of its materials, especially food, are often subjected to obsolescence and damage due to improper storage conditions as well as wrong sales estimates that are often based on the personal estimates and intuition of the company's sales representatives .In order to achieve a convergence between management knowledge based on digital data of its previous sales and uncertain marketing information, the Spreadsheet modelling will be used . And coming up with predictive results close to reality, which avoids the financial loss of the company, by relying on weighted or weighted data, which is the degree of confidence that can be relied upon for actual salesbased on experience and extensive knowledge of the nature of the market and the strength of competitors and the weighting process depends on the decision-making process, and to obtain more accurate forecasts when there is a special assignment of weights to reflect the age of the data depending onExponential smoothing function ,it is more accurate than relying solely on Moving Average, In fact, it does not offer more flexibilityIt also sometimes leads to complex solutions (Slack:2004) . Therefore, the main problem is how the manager estimates the good weight of a particular item of data . The use of exponential smoothing which is a prediction method for short periods, and some forecasting difficulties can be overcome by weighted data, which are the last data, which are more weighted than the old data,It is an adaptive approach in which expectations are modified for a certain period, taking into account the error achieved in previous periods, and this process is repeated until the errors are reduced, and in light of this, there is great importance for the weighted data.

The general rule for exponential smoothing is: (Stevenson : 2005)

The new forecast = the old forecast + a (last observation - the old forecast)
Since the value of alpha (a) represents the smoothing constant, this equation can be written mathematically according to the following formula :
$Yt\text{-}1 = yt + a (y0 – yt)$

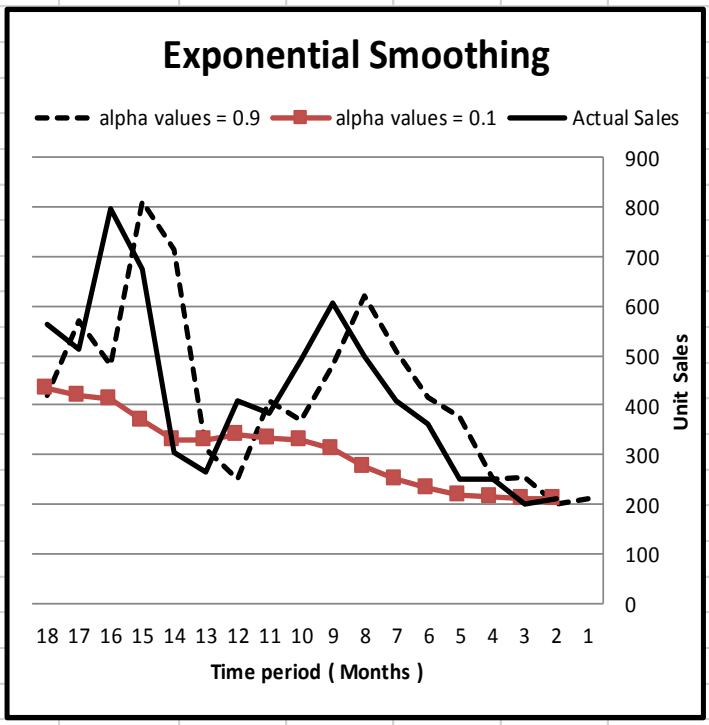
The constant weighting of the value of alpha, which is usually chosen by the forecasting operator, which is a value greater than or equal to zero and less than or equal to one and more responsive to expectations is the last observations. On the other hand, if the value of (a) alpha is zero, the forecasting becomes more sensitive and it will It did not reflect the truth of recent data regarding actual sales(Giraed : 2015) If we use the actual

sales data for the last (18) months from 1/7/2015 until 31/12/2016 for a 5 kg rice product, the main purpose of adopting this relatively long period is to set the general trend line for the actual sales movement and arrive at a forecasting closer to reality for the next time period . To study this case, the fixed-weight alpha value was adopted (two extreme values are 0.1 and 0.9).Figure (3) shows how to implement a model(Excel Exponential Smoothing) . In extremes when using outliers is constant weighting of alpha value and using the function Damping Factor which is equal to (1-a), and the reasonable value of alpha is between 0.2 and 0.3 .

An ExponentialSmoothing Model for Sales Data

N.B. Damping factor = 1 - alpha

The results below show that the value of alpha = 0.9 follows the actual sales pattern , but lags one month (time-period) behind .The value alpha = 0.1 produces an insensitive graph - very similar to the moving-average .



alpha values =0.9	alpha values =0.1	Actual	Time Perio
#N/A	#N/A	210	1
210.00	210.00	200	2
201.00	209.00	255	3
249.60	213.60	250	4
249.96	217.24	375	5
362.50	233.02	415	6
409.75	251.21	510	7
499.97	277.09	620	8
608.00	311.38	480	9
492.80	328.25	370	10
382.28	332.42	410	11
407.23	340.18	250	12
265.72	331.16	310	13
305.57	329.04	715	14
674.06	367.64	810	15
796.41	411.88	480	16
511.64	418.69	570	17
564.16	433.82	420	18

From Figure (3) we notice that the forecast data in alpha value columns were produced using exponential smoothing function . It is a highly weighted value score that tracks the actual sales value to some extent, but lags behind it by one month in the 18th month and this is what the graph shows , whereas when using the value of alpha (a) 0.1, we notice that the

forecast values are not close to the actual data for previous sales, and this can be seen from the graph.

Also, they are insensitive values, as they are very similar to when using the moving average method and here the matter is available to the manager in adopting the value of the smoothing constant, which is the value of alpha (a) according to the degree of confidence that can be adopted on the basis of experience And the know-how and studies that the company can conduct on the market situation in terms of the strength of competition, looking at the quality of its products, the methods of promotion followed, and the ability of sales representatives to promote this product if it has a high quality level in addition to the competitive price, all this information can result in an appropriate estimate For alpha until acceptable estimates and predictions are made for a future time period. (Frans:2013).

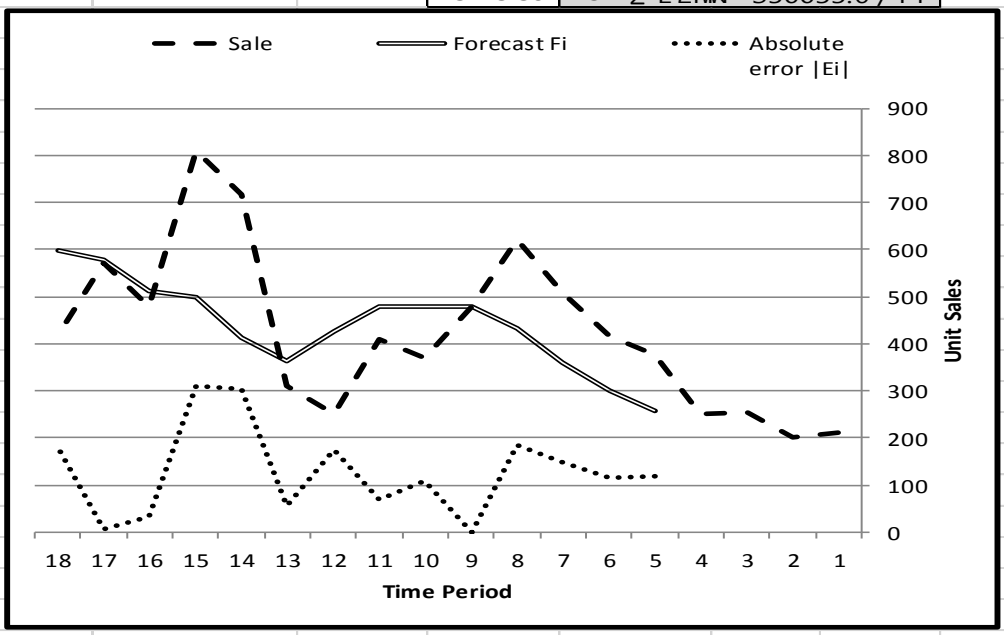
From the foregoing, we note that this stage of the analysis in which the company's sales were forecast, which is the expected sales of the product in light of the prevailing economic conditions, competition conditions and the level of marketing effort exerted. The estimated sales number was obtained by estimating the total size of the market and then it follows that evaluating a forecast accuracyby using MSE and MAD to come up with a better forecasting method that is close to company data .The evaluation case can actually be done accurately for each forecasting and there are several reliable methods available to model data for a Time series data ,there are many attempts by using a set of methods and applying them to the previous data and comparing the different results that are reached to find out the accuracy of the forecasting by using an appropriate approach to time series analysis, and to answer this, there are two more popular methods of measuring forecasting accuracy, they areMean Absolute Deviation (MAD), which gives equal weights to each error, and the other method is , Mean Squared Error (MSE), Comparing the two methods, we note that (MSE) is more accurate in practice than (MAD) because it places emphasis on the major errors that occur as a result of the forecasting process, and it can be seen by observing Figure (4) .

Evaluting Forecast's Accuracy Using MAD & MSE

Five-Month Moving Averge Forecast

Squared error e^2 i	Absolute error |Ei|	Error Ei=Xi-Fi	Forecast F*i*	Sale	Period
			#N/A	210	1
			#N/A	200	2
			#N/A	255	3
			#N/A	250	4
13689.0	117.0	117.0	258	375	5
13456.0	116.0	116.0	299	415	6
22201.0	149.0	149.0	361	510	7
34596.0	186.0	186.0	434	620	8
0.0	0.0	0.0	480	480	9
11881.0	109.0	-109.0	479	370	10
4624.0	68.0	-68.0	478	410	11
30976.0	176.0	-176.0	426	250	12
2916.0	54.0	-54.0	364	310	13
92416.0	304.0	304.0	411	715	14
96721.0	311.0	311.0	499	810	15
1089.0	33.0	-33.0	513	480	16
49.0	7.0	-7.0	577	570	17
32041.0	179.0	-179.0	599	420	18
Σ 356655.0	1809.0				

129.21	MAD=∑ E i/N =1809.0 / 14
25475.36	MSE=∑ E 2i/N =356655.0 / 14



Using moving average forecasting for five months with an excel system, results can be extracted more quickly and also help in finding the optimal weights for alpha , by reducing the values of MAD and MSE when applied to the moving average method of extracting forecast values , and the number of weights (the weight) depends on the amount of the time

interval used, which has been adopted here to be five months, which are five weighted factors , this period can be modified for more than one experiment until the appropriate number of time intervals is reached that leads us to the least deviation in Mean absolute deviation (MAD) and mean squared error (MAD) .From figure (4) it is possible to notice the value of MAD (as it reached 129.21) while the value of (MSE) (25475.36). We also note that the actual sales path with expected sales is somewhat inconsistent, and that the value of MAD was large, but it takes almost related with the actual sales through the graph of the actual sales movement with the expected.

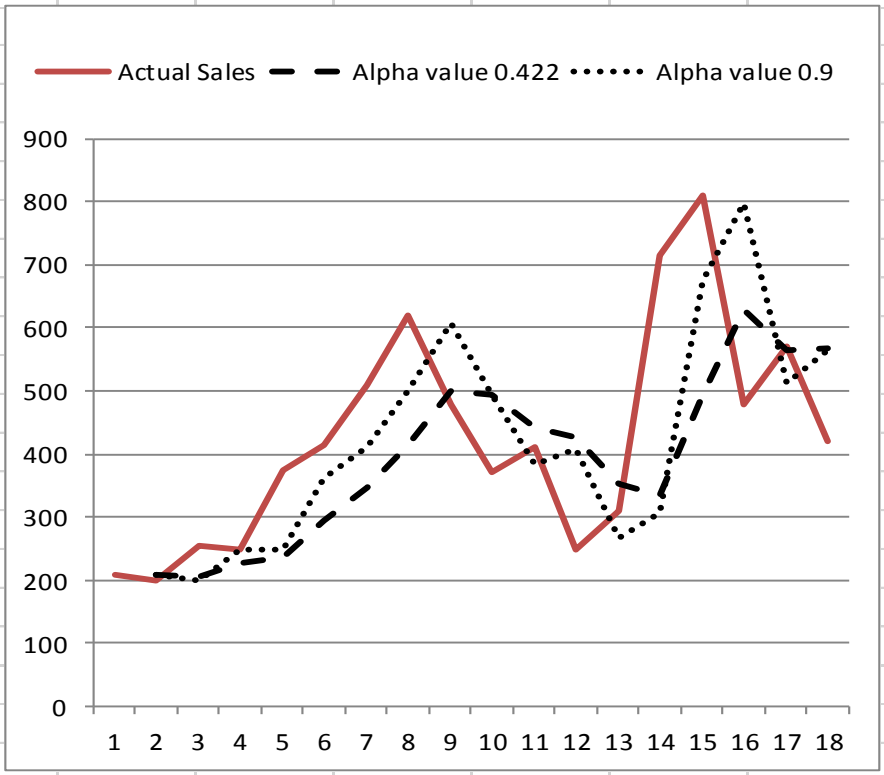
And because the (exponential smoothing method) has one weight factor, which is the constant value of alpha, so the company has to decide with regard to finding the optimal value for (alpha) as shown in Figure (5), and a suitable solution can be found for this by using (Excel's Solver) to build the solution model shown in Figure (5) .The company will be able to find the value of alpha, which reduces the mean standard error (MSE) after the company knows the amount of error in the forecast,and trying to find the alpha weighting value closer to the accuracy and by modifying the value of alpha to (0.422) instead of 0.1, the problem here is nonlinear (nonlinear) because the mean standard error represents a non-linear objective function and that the use of the nonlinear programming model (NLP) to find the optimal value of alpha can be determined by the value (0.422) and here The damping factor will be 1 - 0.422 = 0.578 and the standard mathematical formula for exponential smoothing is: (Shree:2014).

$Yt+1 = yt + a\ (y0 + yt\ )$

It is used to find the optimal values and this can be seen in the alpha values columns (as in Figure 5), which are two values (0.9 and 0.422) with actual sales, whose paths appear in the chart as they are estimated values somewhat close to the actual sales this is when the main objective was to reduce the MSE value .

The optimal value for alpha (α)

This is a nonlinear (NLP) Problem become Mse represnts a nonolinear objective function

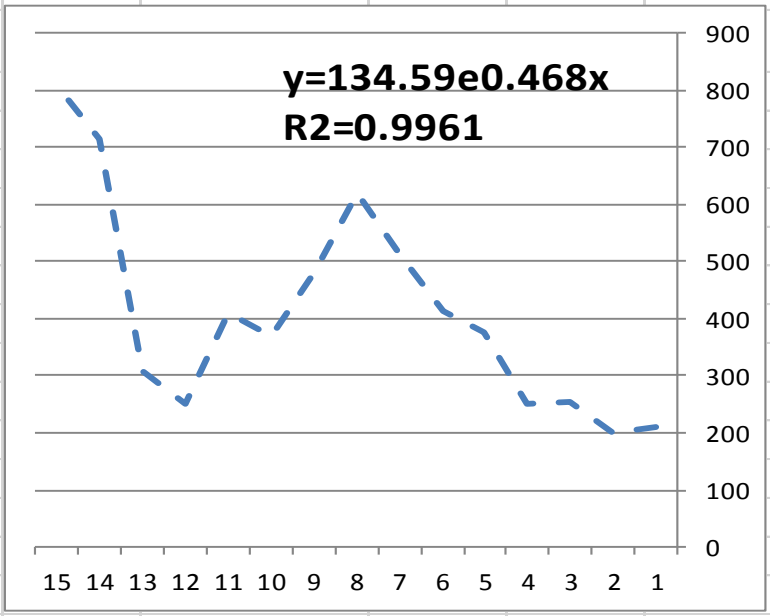


alpha values		Actual	Time
0.9	0.422	Sales	Perio
#N/A	#N/A	210	1
210.00	210.00	200	2
201.00	205.78	255	3
249.60	226.55	250	4
249.96	236.45	375	5
362.50	294.92	415	6
409.75	345.59	510	7
499.97	414.97	620	8
608.00	501.49	480	9
492.80	492.42	370	10
382.28	440.76	410	11
407.23	427.78	250	12
265.72	352.76	310	13
305.57	334.71	715	14
674.06	495.19	810	15
796.41	628.04	480	16
511.64	565.57	570	17
564.16	567.44	420	18
	442981	$(Ci-Di)^2$	

0.422	Alpha	
0.578	Damping	
objective : Minimise MSE Values		26058

And using Excel's Growth Function () which is the best method that can be used to relate the trend of growth with historical data on actual sales and its horizontal axis that represents timeby examining Figure (6), it can be determined if this growth is stable or volatile, or if it is characterized by a period that consists of periodical and seasonalfluctuations .

Sales Forcasts Using the Growth Function



Sales	Month
210	1
200	2
255	3
250	4
375	5
415	6
510	7
620	8
480	9
370	10
410	11
250	12
310	13
715	14
810	15
630	16
672	17
717	18

242761.1	Using the graph's
387873	exponential
619726.2	equation

using
Growth
Function

The use of exponential smoothing is in cases where there is no clear trend, so if the data shows a large trend of increase or decrease in this case, the relationship is exponential and thus can be used Exponential Growth Function, and when the growth rate is a mathematical function, and it is one of the most important analyzes in mathematics and its application areas in general, and When the company wants to plan to purchase 5 kg class rice in order to meet future demand, it should use the growth function to help obtain sales estimates for the next three months, and it must verify the results shown in Figure (6) by observing the graph, which shows the composition of the exponential trend line through points, and the exponential equation resulting from it is a fixed set of expected numbers, which is a high probability that there is an increase in the expected sales volume for the next three months.

The fourth topic: Conclusions and Recommendations

1: Conclusions:

In light of the research problem, the theoretical side, and the previous analysis, the most important conclusions based on logical and mental considerations that have been identified from the context of the research

can be identified from general judgments to special partial judgments, the most important of which are:

a. The company does not have a great interest in studying the market due to its lack of a clear future vision, especially in the field of activity of its marketing units, and therefore we did not notice any survey study of competitive and alternative commodities.
b. 2. The company does not depend in determining the volume of its purchases of materials to meet the expected demand on the use of quantitative methods for the numbers of predictive estimates. Therefore, the marketing department represented by its manager and sales representatives does not have any indicators that indicate interest in statistical methods in forecasting the expected sales volume.
c. 3. The company's lack of detailed studies of the current market, which paves the way for it to identify the absorptive capacities, which is one of the missing links in the entirety of its marketing activity to solve the problems it faces on a daily basis.

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