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Knowledge Management Strategies, Forecasting Methods and Expert System within Small and Medium-Sized Enterprises: An Applied Study in Fakir Company

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Abstract

The purpose of the current study is to develop an idea for the establishment of a database as an expert system which could support the order decisions of managers of retail shops in the Kurdistan region of Iraq. To understand the theoretical underpinnings of smart systems and the accumulation of knowledge, much of the previous research on the topic has been reviewed. The data were collected from different retail stores that had been selling Fakir Products. To analyze the data, researchers developed basic forecasting methods, which mainly included moving average, weighted moving average, exponential smoothing, and exponential smoothing with trend adjustment. The results showed that methods were successful only in a few cases while the majorities were not. The reasons for the emergence of the current study results are due to firstly; the number of data was very limited with the models failed to develop a path to follow. Secondly, the monthly sales in the investigated area were limited, thereby; the average absolute error rate was significantly affected by a single error.

Keywords: Knowledge management; Expert systems; Forecasting; Al-Fakir Company

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Introduction

For Davenport (1994, p.7) *"knowledge management is the process of capturing, distributing, and effectively using knowledge*." It indicates that how knowledge can be obtained, stored, and utilizes to get benefit for a specific purpose. Currently, owing to the effect of globalization, a new stage of competitions has started amongst firms which are competing based on knowledge. For staying organizations in a competitive advantage manner, it should manage knowledge which has generated from the manufacturer's activities. On the other hand, a firm's competitive advantage depends more than anything on its knowledge: on what it knows- how it uses what it knows – and how fast it can know something new (HR Magazine 2009, p.1.). Knowledge management is a new competitive advantage for organizations that lead management team to be capable enough to acquire information about its position and activity to set a strategically plan for reaching its objectives and profitability because KM directs organizations from using natural resources to intellectual resources to stay in their competitive advantage path that cannot be copied by others. Internal outcome of KM for organizations increases its performance and provide an economic and social advantages for consumers and society. There is a popular saying that knowledge is power. Based on this assertion, it can be said that the management of knowledge is the key to power (Omotayo, 2015). Several systematic reviews on effective management of knowledge have been undertaken. For example, Omotayo (2015) concludes that knowledge management is considered as cornerstones for organisational performance and a significant tool for organisational survival, competitiveness and profitability. Accordingly generating, managing, sharing and using knowledge effectively is indispensable for organisations to take full advantage of the value of knowledge and *"a critical ingredient for organisations seeking to ensure sustainable strategic competitive advantage*"*(* Omotayo, 2015 p.16*)*. Exploring knowledge management assists firms to expand their market share and push for innovation. Knowledge generated in one area is available in .(other areas has powerful appeal (King, Marks, & McCoy, 2002

Economic crises from starting of the twenty first century with large durations opened a new path for innovating in productions. At that time, there were overproductions by factories that could not be sold in the local and global market, so it led organizations to bankrupt. To overcome those crises and bankruptcies, industrial revolution pushes firms for innovation to stay competitive. Overcoming the global crisis requires starting a new wave of innovations. This tendency is supported by intensive progress of a lot of countries in formation of knowledge economy (Popkova & Bogoviz, 2019). Form this point of view, firms started to enter to new high-tech industry to establish advanced manufacturing potentiality with adopted digital technology to be used in their organization to produce better products with more efficiency in time, cost, quality, and environment-friendly. From industry 4.0, which is a new industrial revolution for providing automation system, smart machines, and accurate data and knowledge firms can establish a better associated business ecosystem.

This term has set in Hannover fair in 2011 by Germany organization. Because of importance of it, "The UK subsequently invested 400 million pounds in electric charging infrastructure (Kamal, 2021). There is a strong relationship between knowledge management and industrial revolution 4.0 the knowledge economy. To overcome crises and organizational obstacles, knowledge managements enlighten firms to integrate their machines and the way of managing with technology based acquired knowledge to increase performance. "It is considered that knowledge economy allows modern economic systems to perform a breakthrough in growth .(of efficiency (Nunes, 2016

Information technology provides sufficient capability to generating, storing, and applying knowledge for organization because information technology is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data (Castagna, 2021). On the other hand, as Drucker (1993) contends that knowledge is a key resource, more important than land, capital and labor, in the post-capitalist society. According, to Demir *et al.,* (2021) there is a .(chart to deal with knowledge which has explained in figure (1

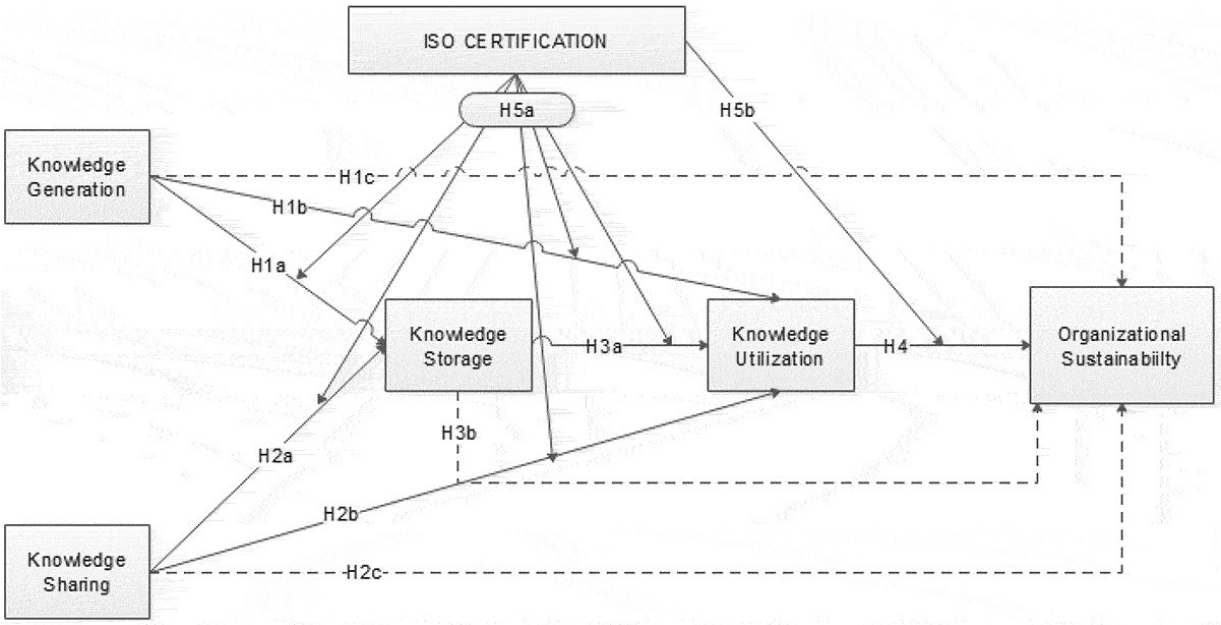

Figure 1 Model of knowledge generation, knowledge sharing and ISO certification on sustainability

(Source: Demir et al., (2021

There are two type of knowledge which comes to any organization. First, knowledge generation which comes from recording or utilizing information technologies to storage communication, coordination, numerical computations… etc. Second, knowledge sharing between members is another source to acquire and collect knowledge in organizations. Then, the knowledge should be stored and kept consistently to utilize them by

organizing and analyzing them to extract new knowledge which will be beneficial for organizational performance. From this process, organizational sustainability can be achieved which consequently leads to keep your .market share and its competitive advantages

In overall, Kurdistan market is developing market which its firms are not advanced in managing its organizations, especially in adopting recent improvement in performance and management like adopting information technology and applying knowledge management in organizations (Ahmed, 2016) . In the best scenario, large firms in Kurdistan only acquire knowledge from its first stage of knowledge management which is recordings their financial transactions. SMEs in this region are very poor in managing their business in a professional way. A large portion of them is working based on their personal experiences without establishing organizational structure. Generally, organizations are far from having accurate prediction for their future developments based on current market and organizational knowledge. On the other hand, generally, there are no smart automation .systems to get knowledge, storage, and analyze in this market

There is a golden opportunity in the Kurdistan region, especially for SMEs to take advantage from informational technology and knowledge management by integrating both into a smart auto machine system to be applied for organizations to increase performance and productivity. Taking advantage from developments in management could be a unique competitive advantage for any firm to establish it for their organizations. The aim of the research is to establish appropriate smart auto machine system for businesses in this region from different sectors and setting a systematic knowledge management to assist firms to generate knowledge automatically from real market data. Then, storing data or information overtime to access huge data and information about the sector is necessary. After a period, the business has mass information about the sector that other firms cannot have, so this step can make the organization to be a market leader in its sector. Finally, the data and information can be transformed to essential knowledge that can identify the business weaknesses, strengths, and opportunities. This cycle of utilizing knowledge brings socio economy knowledge for the firm .that cannot be copied by other firms regardless of their capital and power

2. Literature Review

2.1. Knowledge Management

Knowledge is of fundamental importance and often known as the intellectual capital of a firm. A corporation absorbs knowledge from years of experience in production, engineering, and sales, in addition to its brand name and physical assets. One of the firm's crucial resources is its accumulative experience, which is reinforced .by data, collected from outside sources

In their study, both Badaracco (1991) and Hamel (1991) differentiate between various types of knowledge.

Hamel (1991) contends that one form of knowledge is explicit and discrete in nature. Technical drawings and patents are examples of this. Another sort of knowledge is tacit knowledge, which would be more complex .and methodical

Explicit knowledge can be put into words and numbers, and it can be conveyed in the form of dates, scientific formulas, and specifications, as well as manuals. This sort of information, regardless of cooperative activity, can spread throughout the business world and be accessed by most businesses. It is documented and .maintained in databases so that everyone in the business may quickly access and use it

Notwithstanding the implicitly of this form, since information is mostly implicit, it is hard to see and articulate. Tacit information is quite personal and difficult to formalize, making communication and sharing with others challenging. (Polyany, 1962; Winter, 1987; Hamel, 1991; Nonaka, 1994; Von Hippel, 1994; Stein and .Zwass, 1995). Subjective insights, intuitions and hunches fall under the field of knowledge

Tacit knowledge is based on a person's actions and experiences, as well as beliefs, values, and emotions. Tacit knowledge can be separated into two categories. The first is the technical dimension, which comprises informal personal skills or craft, often known as" know how." The second is the cognitive dimension, which encom- .passes beliefs, ideals, values, schema, and mental models

A dynamic model of knowledge creation was devised by Nonaka and Takeuchi (1995). They expound key hypothesis in this model: that human knowledge is generated and extended through social interaction between tacit and explicit knowledge. This interaction is known as "knowledge conversion. Additionally, they assume that explicit and tacit knowledge are not mutually distinctive. In the creative activities of humans, they interact .with and blend into one another

In their models, Nonaka and Takeuchi (1995) also addressed four alternative mechanisms of knowledge con- :version (see Figure 2). They are as described in the following

1. Tacit knowledge to tacit knowledge which is known as socialization. It is a process of exchanging experienc- .es which uncovers tacit knowledge like shared mental models and technical abilities

2. Tacit knowledge to explicit knowledge, also called externalization. It is a knowledge creation method in .that tacit knowledge becomes evident in the form of metaphors, analogies, concepts, hypotheses or models

3. From explicit knowledge to explicit knowledge or a mixture of the two. It focuses on bringing together var- .ious bodies of explicit information

4. Explicit knowledge to tacit or internalized knowledge. It is a method of converting explicit knowledge into

".tacit knowledge, and it is equivalent to "learning by doing

Figure 1
Four modes of knowledge conversion

From \ To	Tacit Knowledge	Explicit Knowledge
Tacit Knowledge	Socialization	**Externalization**
Explicit Knowledge	**Internalization**	Combination

Source: Nonaka and Takeuchi (1995, p. 62)

Figure 2 Four Modes of Knowledge Conversion

2.2. Industry 4.0

In 2011, a German project entailing with academics and commercial businesses instituted the term "Industry 4.0." It was a key program aimed at improving sophisticated production systems so as to enhance the national industry's productivity and efficiency (Kagermann *et al.,* 2013). By merging a set of developing and convergent technologies that add value to the whole product lifecycle, this notion depicts a brand new industrial stage in production systems (Dalenogare *et al.,* 2018; Wang *et al.,* 2016b).This novel industrial stage requires a socio-technical enhancement of the human function in production systems, in which all value chain value chain working activities are conducted to use smart techniques (Smart Working) (Stock *et al.,* 2018; Longo *et .al.,* 2017) and are based on data

Industry 4.0 is based on the progressive manufacturing, also known as Smart Manufacturing, idea, which is an adaptive system in which adjustable lines alter production processes automatically for a variety of goods and changing conditions (Wang *et al*., 2016a; Schuh *et al*., 2017). This leads to higher quality, efficiency, and flexibility, as well as the production of bespoke items on a large scale and with less waste ((Dalenogare *et al*., .(2018; de Sousa Jabbour *et al*., 2018

Industry 4.0 also ruminates the exchange of information and commixture of the supply chain (called Smart Supply Chain), coinciding production with suppliers to lessen delivery times and information distortions that produce bullwhip effects (Ivanov *et al*., 2014). This integration also permits companies to conjoin resources in collaborative manufacturing (Chien and Kuo, 2013; Lin *et al*., 2012), allowing them to concentrate on their

core competences and share potentialities for product creativity in industry platforms, a collective effort to promote products and complementary assets and services, with more value-added (Gawer and Cusumano, .(2014; Kortmann and Piller, 2016; Chen and Tsai, 2017

The embedded technologies in the final products (Smart Products) are too portion of the broader Industry 4.0 idea (Dalenogare *et al*., 2018). Smart products provide data feedback for modern item advancement (Tao *et al*., 2018b) as well as new services and solutions to customers (Porter and Heppelmann, 2015). Hence, some academics regard the smart products as the second primary objective of Industry 4.0, because they empower new business models such as the product-service systems, which present new options for manufacturers and .(service providers (Zhong *et al*., 2017; Ayala *et al*., 2018

2.3. Automation systems (Expert System)

Expert systems embody human expertise in computer programs to permit these programs to do normal tasks that would ordinarily need a human expert. More formally, an expert system (ES) is described as 'a computing system capable of illustrating and reasoning about some knowledge-rich domain with the goal of solving problems and giving advice' (Marcus, 2013; Jackson 1986) and 'a computer model of expert human reasoning, reaching the same conclusions the expert would reach if faced with a comparable problem' (Marcus, 2013; Weiss and Kulikowski 1984). Examples of evolved and administrated systems are composed of R1/XCON (Bachant and McDermott 1983), which configures VAX computers for Digital, ExperTAX (Shpilberg and Graham 1989), developed by Coopers & Lybrand to offer advice on corporate tax planning, ONCOCIN (Krishnamoorthy and Rajeev, 2018; Langlotz and Shortliffe 1983), which aids doctors determine appropriate treatments for chemotherapy patients, and CLASS (Duchessi et al. 1988), a system that endorses commercial loan decisions in a bank, are instances for evolved systems, and Waterman (1986) and Ernst (1986) provide .(reviews of various systems (1988

Demonstrating that an ES is 'right 'in some way is a challenging task. An ineffective system may lead to making grave blunders or may fail to live up to expectations. In either situation, the choices created by the system may be improper or wrong, and if they are trusted, they can cause significant harm to the user or owner of the system, such as financial loss or human misery. Expert medical diagnostic systems and income tax systems, for .instance, have had difficulty applying owning to concerns over the system's diagnoses' responsibility

It has been stated that due to their declarative form and usage of high-level programming tools, ESs are simple to check and validate. According to Fox (1990), this is only marginally true. A small rule-based program, for example, may be easier to confirm than a large FORTRAN program, but large ESs faced the same verification

.challenges as any large software project, and validation, as will be meticulous, can be much more difficult

Forecasting for Knowledge Management .2.4

According to Granger, technology forecasting arose from the premise that technological development is one of the most influencing determinants of economies on the long term. As a result, it appears that technology forecasting is the most useful when applied to extended time horizons, becoming more significant in strategic innovation management. General strategic business planning decisions, for example, are frequently hinged on .a forecast time horizon of three to twenty years

Aside from extended time horizons, another distinguishing feature of technology forecasting is the scope of the outcomes. "In general, such forecasts are concentrated on the qualities of a technology rather than how these are achieved." This information was incorporated into a definition of technology forecasting by Bright .((Demir *et al.*, 2015

Technology forecasting is a quantitative description of the timing, type, or degree of change in technical" parameters and attributes in the design, manufacture, and application of devices, materials, and processes, as determined by an established system of thinking." On the other hand, for example, other writers emphasize that uncertainty about future events can be described using probabilities, which can assist decision-makers in planning for a various number of contingencies and scenarios. We updated Bright's definition to get a more rigorous and specific definition of technology forecasting for this purpose, as well as the fact that technology .(forecasting generally works with long time horizons (Demir, 2014

The precise technology forecasting process might vary, depending on the situation, from a relatively basic process with only a few phases to a process with a complicated structure of stages and sub-processes. The process is broken down into six parts, according to Armstrong: outline the problem, acquire information, determine approaches, implement methods, evaluate approaches, and utilize forecasts. These steps also exist in other .literature often in combination with other stages, in the same or very similar order

Besides this process framework, De Lurgio (2005) states that constant maintenance and confirmation are required to assure the validity and effectiveness of the outcomes. Therefore, it is suggested that reality be tracked and compared to forecasting outcomes in order to correct any possible inconsistencies or errors. He also proposed constant monitoring becomes even more critical in the context of innovation management, because organizations must adapt to developments as rapidly as possible to stay competitive. Furthermore, it is reasonable to suppose that forecasters and decision-makers are not the same people in a huge corporation. Hence, for a comprehensive view of the process, more processes to formulate decisions and make decisions are required. To incorporate these ideas into the process, the last phase must be split and a more thorough

structure must be constructed. (Figure 3) depicts the resulting technology forecasting process for strategic .innovation management

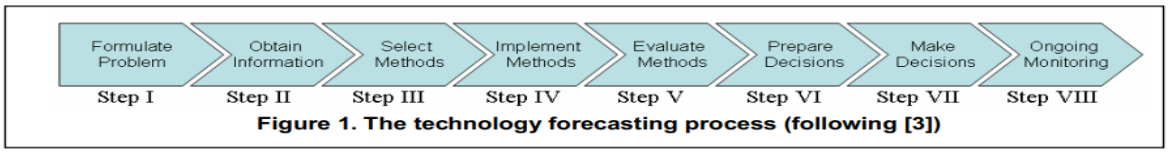

Figure 3 The Technology Forecasting Process

3. Analysis

3.1 Problem

The problem is that with the development of industry 4.0 and Knowledge Management, the world become more global and supply chain became more problematic for the firms because it becomes more complicated to operate based on customers' demand. So, anymore the naive approaches are not sufficient to predict demand for the next period in the future because the competitive environment requires firms to work on their performance and reduce their costs. It is believed that the automation system assists management teams to solve those problems. Yet, there is not specific automation systems in many firms to be utilized and used in their inventories and demand analysis. In the other hand, globalization has helped firms to increase their market share in different locations and geographies. So, obtaining huge amount of data and information from different markets, which are based on different customer behaviors and cultures, is another challenge for firms to deal .and organize them in order to get benefit to identify market gaps and new trend of demands

3.2 Objectives

From problem point of view, it estimated that the automation systems would help management of firms in Iraq to organize inventories of firms and calculate the forecasts of the next period to put the correct and accurate orders with the forecasting systems. In this manner, it is believed that these automation systems will help management teams to make more accurate decisions in their demand analysis. Businesses are going through knowledge management age and smart systems after industry 4.0 became more important to the world. They have reduced inventory and supply chain problem significantly because they give accurate knowledge to the management team to make decisions. For illustration, a supply chain firm, when makes order from factories, should have a proper estimation for its market demand. If the firm orders limited number of a top sold item, the organization would face sales shortage in the future. In contrast, if a normal item is ordered by more

than market demand, it will not liquidate in a regular period to let the firm to get cash to order other items to stay in the market. When firms have many items with different colors, ordering items and controlling its inventories based on market demand to reduce sell shortage and number of non- sold items is one of the most important tasks for management team. Therefore, there are regions that sill industry 4.0 affects are not seen perfectly in the automation systems. From this point of view, in Iraq, we try to develop an automation system by developing forecasting techniques that will forecast the demand of concerning products in every period of the year. Accordingly, it will provide strategies to the firms based on their data and information. Ordering based on forecasting strategies, which has extracted from the firms' data, is very helpful and powerful for firms to estimate which products will be sold, how many of them, and which color are more interesting for its customers. In the other hand, the techniques enlighten management team based on the political and economic situation that face the country to let them know in the best scenario how many any concern items will be sold. .For opposite scenario is as well

3.3 Data Collections

In order to achieve objectives which stated in section 3.2, the researchers have collected data from a firm which is "Fakir – Iraq" firm for home appliances products which operate in major cities in Iraq like Sulaimani, Erbil, Kirkuk, Duhok, Mousl, Baghdad, Basra, Karbala, Najaf… etc. This firm has more than 122 items. There are 11 of them which are top selling products. For this project, the researchers have analyzed only top selling products for the firm. There are the name of products (Excute, Whiper, Culina Chef, Mr.Chef, Darkys, Kaave Mono, Tastea, Tempar, Maxclean, Bouncy, and Mix it easy). The duration for the analysis of the product was .from February 2021 to March 2022

3.4 Data Analysis

The researchers have elaborated the methods that can be applied in the automation systems. There are several methods which are better than the method that have used, but they are not appropriate for the automation systems. We believed that companies could use these introductory automation methods to apply, later they can find other techniques to integrate in the automated systems. In this manner, we have used "Moving Average, Weighted Moving Average, Exponential Smoothing, and Exponential Smoothing with Trend Adjustment Techniques). These forecasting techniques have been applied in the methodology section. The other methods could not be applied because there is lack of data. When the data is increased, the other methods and techniques can be used such as Regression Analysis and Seasonal Index can be integrated in the methodology. This is the only methods used in this study due to its appropriateness of forecasting techniques for the current circumstances. On the other hand, as a knowledge management researcher, the researchers will establish the first phase of knowledge management for this firms to record data and information about the sales and its cus-

tomers from all the aspects to absorb data and information from its markets as much as possible. After a while, .based on the first phase, we can apply advanced methods and techniques to forecast and satisfy its customers

4. Research Findings

4.1. Explaining Calculations

As we mentioned above, we have focused on 11 main products to apply forecasting techniques on it to know how the trend of the sales of these products in the future period is. In overall, we have applied several forecasting techniques for each product based on the data that we got from the firm which extracted from the real market. Generally, we have data for 12 months which started from February 2021 to February 2022 with the .number of sales for each month

The first forecasting technique that we have applied is "Moving Average". This is an explanation of applying this method. We have to exclude the first three month because we need at least 3 months for it. Then, we got average for the last three months. Then, we have found forecasting error by this formula. The original number of sales for the month minus its moving average format in ABS format to get positive results. Finally, we have found Mean Absolute Percentage Error (MAPE) by this formula. The result of forecasting error for each month is divided by the original number of sales. Then, the researcher got average (see table 1) of MAPE from .all the month to get overall result of the product

Second, we have found "Weighted Moving Average" for each month. To find it, it has to multiply the first month by 3, second month by 2, and the third month by 1. Then, divide all of the three months by 6. This is how it can find weighted moving average. Then, we have found forecasting error by this formula. The original number of sales for the month minus its weighted moving average format in ABS format to get positive results. Finally, we have found Mean Absolute Percentage Error (MAPE) by this formula. The result of forecasting error of weighted moving average for each month is divided by the original number of sales. Then, we got aver- .age of MAPE from all the months to get overall result of the product that came from weighted moving average

Third, we have found "Exponential Smoothing" for each month. For the first month, it has to set the original sale number for it. Then, for the upcoming months, it has to add the first month result to multiply Beta or Alpha to the bracket which has original sales number minus to the previous exponential smoothing for the month. Moreover, we have applied 0.9 and 0.1 of Alpha and Beta for each month. This is the formula of exponential smoothing in (figure 4).

$$F_t = F_{t-1} + \alpha(A_{t-1} - F_{t-1})$$

where: F_t = new forecast
F_{t-1} = previous period forecast
A_{t-1} = previous period *actual* demand
α = smoothing (weighting) constant

Figure 4 Exponential Smoothing

After that, we have found forecasting error and MAPE of the exponential smoothing for each month. Finally, we got average for all the result of MAPE in exponential smoothing for each month to get overall result of the .product

Fourth, we have applied "Exponential Smoothing with Trend Adjustment" for each product and month by 5 different times because we have examined 5 different Alpha and Beta to find in which case, we can get the minimum forecasting error to apply this method for future decision making by the management team of the Fakir Company. The 5 different Alpha and Beta are (0.9; 0.1), (0.5;0.5), (0.1;0.9), (0.9;0.9), and (0.1;0.1). This is how the exponential smoothing with trend adjustment formula has applied to the data. First, we have to set the original sale number to the first month. Second, for the upcoming months, in the first bracket, it has to multiply Alpha by the original sale number. Then, add this bracket by 1 minus Alpha then multiply by another bracket in which contains the previous exponential smoothing with trend adjustment result plus previous trend result. The Trend is found by the same steps but in here, instead of using Alpha, it has to use Beta. To find "FIT" it has to add trend with exponential smoothing trend adjustment results together. Next, it has to find forecasting error and MAPE for each month. Finally, it has to average of MAPE results of exponential smoothing with trend adjustment for each month to get .(overall result that can be used for predicting the future sales of the product. Its formula has explained in (figure 5

$$F_{t+1} = A_t + T_t$$

where $A_t = \alpha D_t + (1 - \alpha)(A_{t-1} + T_{t-1})$

$$T_t = \beta(A_t - A_{t-1}) + (1 - \beta)T_{t-1}$$

A_t = exponentially smoothed average of the series in period t
T_t = exponentially smoothed average of the trend in period t
α = smoothing parameter for the average
β = smoothing parameter for the trend
D_t = demand for period t
F_{t+1} = forecast for period $t + 1$

Figure 5 Exponential Smoothing with Trend Adjustment

4.2. Main Founding per product

There are all 11 products which were selected to apply those forecasting methods to it. We have arranged the .result on a table to be easy to be analyzed for readers

The actual sales for this product are (1,6,1,0,4,2,3,3,7,7,9,3,2) for each month which has illustrated in the table. The result of MAPE for moving average is 60%. The result of MAPE for Weighted moving average is 57%. The result of MAPE for exponential smoothing (0,1) is 46%. The result of MAPE for exponential smoothing (0,9) is 85%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 90%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 87%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 62%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 142%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 49%. The best method that can be used to forecast for this product is "Exponential Smoothing (0,1)" because it has the lowest MAPE in comparing to other results which is 46%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 46% which is more than 40%. Generally, this is not accepted. It occurred because the data is not sufficient and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole market as well. (These two factors can be a cause for having an MAPE which is more than 40%. (see Table 1

The actual sales for this product are (1,1,0,1,0,0,1,4,5,4,1,1,1) for each month which has illustrated in the table. The result of MAPE for moving average is 94%. The result of MAPE for Weighted moving average is 82%. The result of MAPE for exponential smoothing (0,1) is 35%. The result of MAPE for exponential smoothing (0,9) is 51%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 55%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 84%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 75%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 82%. The result of MAPE for exponential smoothing (0,1;0,1) is 39%. The best method that can be used to forecast for this product is "Exponential Smoothing (0,1)" because it has the lowest MAPE in comparing to other results which is 35%. In the standard, the accepted MAPE should be lower than 40%. Therefore, this forecasting techniques can provide appropriate result to the management team to relay on. (see .(Table 2

The actual sales for this product are (1,2,1,0,2,1,1,0,2,6,4,2,4) for each month which has illustrated in the table. The result of MAPE for moving average is 33%. The result of MAPE for Weighted moving average is 38%. The result of MAPE for exponential smoothing (0,1) is 29.1%. The result of MAPE for exponential smoothing (0,9) is 46%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 49%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 48%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 31%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 85%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 28.9%. The best method that can be used to forecast for this product is "Exponential Smoothing with trend adjustment (0,1;0,1)" because it has the lowest MAPE in comparing to other results which is 28.8%. In the standard, the accepted MAPE should be lower than 40%. Therefore, this .(forecasting techniques can provide appropriate result to the management team to relay on. (see Table 3

The actual sales for this product are (10,3,2,2,3,2,3,10,5,5,4,2,2) for each month which has illustrated in the table. The result of MAPE for moving average is 57%. The result of MAPE for Weighted moving average is 49%. The result of MAPE for exponential smoothing (0,1) is 159%. The result of MAPE for exponential smoothing (0,9) is 54%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 56%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 94%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 107%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 92%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 132%. The best method that can be used to forecast for this product is "Weighted Moving Average" because it has the lowest MAPE in comparing to other results which is 49%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 49% which is more than 40%. Generally, this is not accepted. It occurred because there is not enough and more data, and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole market as well. These two factors can be a cause for having an MAPE .(which is more than 40%. (see Table 4

The actual sales for this product are (6,3,1,2,1,0,2,2,3,1,2,3,1) for each month which has illustrated in the table. The result of MAPE for moving average is 58.9%. The result of MAPE for Weighted moving average is 59.2%. The result of MAPE for exponential smoothing (0,1) is 146%. The result of MAPE for exponential smoothing (0,9) is 81%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 82%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 93%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 144%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 101%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 119%. The best method that can be used to forecast for this product is "Moving Average" because it has the lowest MAPE in comparing to other results which is 58.9%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 58.9% which is more than 40%. Generally, this is not accepted. It occurred because there is not enough and more data, and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole market as well. These two factors can be a cause for having an MAPE which is more than 40%. (see .(Table 5

The actual sales for this product are (9,3,2,3,1,2,4,2,1,4,3,1,1) for each month which has illustrated in the table. The result of MAPE for moving average is 85%. The result of MAPE for Weighted moving average is 84%. The result of MAPE for exponential smoothing (0,1) is 236%. The result of MAPE for exponential smoothing (0,9) is 86%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 80%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 154%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 167%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 127%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 182%. The best method that can be used to forecast for this product is "Exponential Smoothing with Trend Adjustment (0,9;0,1)" because it has the lowest MAPE in comparing to other results which is 80%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 80% which is more than 40%. Generally, this is not accepted. It occurred because there is not enough and more data, and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole market as well. These two factors can be a cause for having an .(MAPE which is more than 40. (see Table 6

The actual sales for this product are (25,10,19,11,12,15,13,21,17,12,15,9,8) for each month which has illustrated in the table. The result of MAPE for moving average is 29%. The result of MAPE for Weighted moving average is 27%. The result of MAPE for exponential smoothing (0,1) is 61%. The result of MAPE for exponential smoothing (0,9) is 38%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 54%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 39%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 40%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 55%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 40%. The best method that can be used to forecast for this product is "Weighted Moving Average" because it has the lowest MAPE in comparing to other results which is 27%. In the standard, the accepted MAPE should be lower than 40%. Therefore, this forecasting techniques can provide appropriate result to the .(management team to relay on. (see Table 7

The actual sales for this product are (1,3,7,7,3,7,12,8,7,16,9,12,5) for each month which has illustrated in the table. The result of MAPE for moving average is 46%. The result of MAPE for Weighted moving average is 49%. The result of MAPE for exponential smoothing (0,1) is 52%. The result of MAPE for exponential smoothing (0,9) is 54%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 57%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 56%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 52%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 74%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 49%. The best method that can be used to forecast for this product is "Moving Average" because it has the lowest MAPE in comparing to other results which is 46%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 46% which is more than 40%. Generally, this is not accepted. It occurred because there is not enough and more data, and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole .(market as well. These two factors can be a cause for having an MAPE which is more than 40%. (see Table 8

The actual sales for this product are (0,1,0,1,1,2,1,2,2,2,3,4,2,2) for each month which has illustrated in the table. The result of MAPE for moving average is 44%. The result of MAPE for Weighted moving average is 44%. The result of MAPE for exponential smoothing (0,1) is 60%. The result of MAPE for exponential smoothing (0,9) is 43%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 43%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 42%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 43%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 63%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 53%. The best method that can be used to forecast for this product is "Exponential Smoothing with Trend Adjustment (0,5;0,5)" because it has the lowest MAPE in comparing to other results which is 42%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 42% which is more than 40%. Generally, this is not accepted. It occurred because there is not enough and more data, and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole market as well. These two factors can be a cause for having an MAPE .(which is more than 40%. (see Table 9

The actual sales for this product are (4,0,2,2,2,1,2,1,3,4,4,0,1) for each month which has illustrated in the table. The result of MAPE for moving average is 39%. The result of MAPE for Weighted moving average is 33%. The

result of MAPE for exponential smoothing (0,1) is 42%. The result of MAPE for exponential smoothing (0,9) is 23%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 26%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 38%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 46%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 86%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 61%. The best method that can be used to forecast for this product is "Exponential Smoothing (0,9)" because it has the lowest MAPE in comparing to other results which is 23%. In the standard, the accepted MAPE should be lower than 40%. Therefore, this forecasting techniques can provide appropriate result to the management .(team to relay on. (see Table 10

The actual sales for this product are (4,3,0,1,1,2,4,2,2,1,2,1,3) for each month which has illustrated in the table. The result of MAPE for moving average is 68%. The result of MAPE for Weighted moving average is 54%. The result of MAPE for exponential smoothing (0,1) is 83%. The result of MAPE for exponential smoothing (0,9) is 47%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,1) is 53%. The result of MAPE for exponential smoothing with trend adjustment (0,5;0,5) is 62%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,9) is 80%. The result of MAPE for exponential smoothing with trend adjustment (0,9;0,9) is 80%. The result of MAPE for exponential smoothing with trend adjustment (0,1;0,1) is 70%. The best method that can be used to forecast for this product is "Exponential Smoothing (0,9)" because it has the lowest MAPE in comparing to other results which is 47%. In the standard, the accepted MAPE should be lower than 40%. For this product the lowest MAPE is 47% which is more than 40%. Generally, this is not accepted. It occurred because there is not enough and more data, and the sales retheme is not proper because the firm has not a specific marketing plan to sale this product, and the coronavirus has affected the whole (market as well. These two factors can be a cause for having an MAPE which is more than 40%. (see Table 11

Table 1 :- Execute - Men Bread Trimmer

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	6					5.00	0.83	5.00	0.83	5.00	0.83	5.00	0.83	5.00	0.83	5.00	0.83	5.00	0.83
4/21	1					0.50	0.50	4.50	4.50	4.95	4.95	3.75	3.75	0.95	0.95	8.55	8.55	0.55	0.55
5/21	0	2.67	0.00	2.67	0	1.45	0.00	1.45	0.00	1.50	0.00	3.19	0.00	2.22	0.00	1.02	0.00	1.54	0.00
06/21	4	2.33	0.42	1.33	0.67	2.70	0.67	3.86	0.96	3.98	1.00	2.89	0.72	1.84	0.46	6.15	1.54	2.59	0.65
07/21	2	1.67	0.17	2.17	0.08	0.43	0.21	1.61	0.81	1.83	0.91	0.79	0.40	0.68	0.34	4.32	2.16	0.27	0.14
08/21	3	2.00	0.33	2.33	0.22	1.38	0.46	0.84	0.28	0.75	0.25	0.56	0.19	0.12	0.04	1.13	0.38	1.19	0.40
09/21	3	3.00	0.00	2.83	0.06	1.24	0.41	0.08	0.03	0.06	0.02	0.10	0.03	0.17	0.06	0.24	0.08	1.00	0.33
10/21	7	2.67	0.62	2.83	0.6	5.12	0.73	4.01	0.57	3.87	0.55	3.84	0.55	3.58	0.51	3.82	0.55	4.82	0.69
11/21	7	4.33	0.38	5.00	0.29	4.61	0.66	0.40	0.06	0.09	0.01	0.75	0.11	2.64	0.38	2.87	0.41	4.21	0.60
12/21	9	5.67	0.37	6.33	0.3	6.15	0.68	2.04	0.23	1.52	0.17	1.02	0.11	3.55	0.39	0.79	0.09	5.62	0.62
01/22	3	7.67	1.56	8.00	1.67	0.47	0.16	5.80	1.93	6.45	2.15	7.10	2.37	3.95	1.32	7.49	2.50	1.17	0.39
02/22	2	6.33	2.17	5.67	1.83	1.42	0.71	1.58	0.79	1.67	0.83	4.39	2.19	5.34	2.67	2.75	1.38	2.27	1.13
			60%		57%		46%		85%		90%		87%		62%		142%		49%

Table 2:- Culina Chef - Stand Mixer

	Actual	Moving Average	Weighted Moving Average	Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)			
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4/21	0					1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
5/21	1	0.33	0.33	0.50	0.50	0.10	0.10	0.90	0.90	0.99	0.99	0.75	0.75	0.19	0.19	1.71	1.71	0.11	0.11
06/21	0	0.67	0.00	0.67	0.00	0.91	0.00	0.91	0.00	0.90	0.00	0.56	0.00	0.76	0.00	1.40	0.00	0.90	0.00
07/21	0	0.33	0.00	0.33	0.00	0.82	0.00	0.09	0.00	0.01	0.00	0.08	0.00	0.54	0.00	0.42	0.00	0.79	0.00
08/21	1	0.67	0.67	0.83	0.83	0.26	0.26	0.99	0.99	1.08	1.08	1.18	1.18	0.70	0.70	1.26	1.26	0.32	0.32
09/21	4	3.67	0.92	3.50	0.88	3.24	0.81	3.10	0.77	3.09	0.77	3.52	0.88	3.76	0.94	2.32	0.58	3.31	0.83
10/21	5	3.33	0.67	2.67	0.53	3.91	0.78	1.31	0.26	1.02	0.20	1.81	0.36	4.17	0.83	1.45	0.29	3.97	0.79
11/21	4	0.67	0.17	0.00	0.00	2.52	0.63	0.87	0.22	1.28	0.32	1.50	0.38	2.17	0.54	2.65	0.66	2.52	0.63
12/21	1	3.33	3.33	3.33	3.33	0.73	0.73	3.09	3.09	3.40	3.40	4.78	4.78	1.83	1.83	2.62	2.62	0.81	0.81
01/22	1	2.33	2.33	1.67	1.67	0.66	0.66	0.31	0.31	0.30	0.30	2.22	2.22	2.27	2.27	2.50	2.50	0.79	0.79
02/22	1	1.00	1.00	0.50	0.50	0.59	0.59	0.03	0.03	0.03	0.03	0.39	0.39	2.45	2.45	0.99	0.99	0.77	0.77
			94%		82%		35%		51%		55%		84%		75%		82%		39%

Table 3:- Darkys - Handheld Vacuum Cleaner

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	2					1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50
4/21	1					0.10	0.10	0.90	0.90	0.99	0.99	0.75	0.75	0.19	0.19	1.71	1.71	0.11	0.11
5/21	0	1.33	0.00	1.33	0.00	1.09	0.00	1.09	0.00	1.10	0.00	1.44	0.00	1.24	0.00	0.60	0.00	1.11	0.00
06/21	2	1.00	0.50	1.33	0.67	1.02	0.51	1.89	0.95	1.99	0.99	1.58	0.79	0.92	0.46	3.00	1.50	1.01	0.50
07/21	1	0.00	0.00	0.17	0.00	0.08	0.00	0.81	0.00	0.88	0.00	0.31	0.31	0.22	0.22	2.07	2.07	0.10	0.10
08/21	1	0.00	0.00	0.17	0.17	0.07	0.07	0.08	0.08	0.09	0.09	0.17	0.17	0.22	0.22	0.10	0.10	0.10	0.10
09/21	0	1.33	0.00	1.17	0.00	1.07	0.00	1.01	0.00	1.00	0.00	1.06	0.00	1.20	0.00	0.76	0.00	1.10	0.00
10/21	2	1.33	0.67	1.50	0.75	1.04	0.52	1.90	0.95	2.00	1.00	1.76	0.88	1.02	0.51	2.77	1.38	1.02	0.51
11/21	6	5.00	0.83	4.83	0.81	4.94	0.82	4.19	0.70	4.12	0.69	4.73	0.79	4.93	0.82	2.88	0.48	4.91	0.82
12/21	4	1.33	0.33	0.33	0.08	2.44	0.61	1.58	0.40	2.04	0.51	0.97	0.24	2.01	0.50	5.44	1.36	2.37	0.59
01/22	2	2.00	1.00	2.33	1.17	0.20	0.10	2.16	1.08	2.47	1.24	3.57	1.79	0.81	0.40	1.87	0.93	0.05	0.03
02/22	4	0.00	0.00	0.67	0.17	2.18	0.54	1.78	0.45	1.71	0.43	0.02	0.00	0.73	0.18	4.00	1.00	1.97	0.49
			33%		38%		29%		46%		49%		48%		31%		85%		28.8%

Table 4:- Kaave Mono - Turkish Coffee Machine

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	10					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	3					7.00	2.33	7.00	2.33	7.00	2.33	7.00	2.33	7.00	2.33	7.00	2.33	7.00	2.33
4/21	2					7.30	3.65	1.70	0.85	1.07	0.54	2.75	1.38	6.67	3.34	3.97	1.99	7.23	3.62
5/21	2	3.00	1.50	1.67	0.83	6.57	3.29	0.17	0.09	0.62	0.31	1.06	0.53	4.77	2.39	2.85	1.43	6.36	3.18
06/21	3	0.67	0.22	0.83	0.28	4.91	1.64	0.98	0.33	1.73	0.58	3.70	1.23	1.64	0.55	1.43	0.48	4.52	1.51
07/21	2	0.33	0.00	0.50	0.00	5.42	2.71	0.90	0.00	0.31	0.00	2.10	1.05	0.66	0.33	1.87	0.94	4.82	2.41
08/21	3	0.67	0.22	0.67	0.22	3.88	1.29	0.91	0.30	1.51	0.50	2.77	0.92	2.27	0.76	1.31	0.44	3.04	1.01
09/21	10	7.33	0.73	7.33	0.73	3.51	0.35	7.09	0.71	7.56	0.76	8.41	0.84	10.70	1.07	6.57	0.66	4.60	0.46
10/21	5	0.00	0.00	1.33	0.27	1.84	0.37	4.29	0.86	4.52	0.90	2.87	0.57	5.33	1.07	10.23	2.05	0.58	0.12
11/21	5	1.00	0.20	1.33	0.27	1.66	0.33	0.43	0.09	0.32	0.06	2.79	0.56	5.02	1.00	1.38	0.28	0.23	0.05
12/21	4	2.67	0.67	1.83	0.46	2.49	0.62	1.04	0.26	0.87	0.22	3.06	0.76	3.28	0.82	0.42	0.11	0.92	0.23
01/22	2	2.67	1.33	2.50	1.25	4.24	2.12	2.10	1.05	1.85	0.92	3.42	1.71	0.43	0.21	1.02	0.51	2.52	1.26
02/22	2	1.67	0.83	1.17	0.58	3.82	1.91	0.21	0.11	0.22	0.11	0.75	0.38	0.18	0.09	1.66	0.83	1.95	0.97
			57%		49%		159%		54%		56%		94%		107%		92%		132%

Table 5:- Tastea - Tea Maker

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	6					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	3					3.00	1.00	3.00	1.00	3.00	1.00	3.00	1.00	3.00	1.00	3.00	1.00	3.00	1.00
4/21	1					4.70	4.70	2.30	2.30	2.03	2.03	2.75	2.75	4.43	4.43	0.13	0.13	4.67	4.67
5/21	2	1.33	0.67	0.50	0.25	3.23	1.62	0.77	0.39	1.25	0.62	1.06	0.53	2.32	1.16	3.34	1.67	3.13	1.56
06/21	1	1.00	1.00	0.83	0.83	3.91	3.91	0.92	0.92	0.53	0.53	0.70	0.70	2.21	2.21	1.05	1.05	3.71	3.71
07/21	0	1.33	0.00	1.33	0.00	4.52	0.00	1.09	0.00	0.67	0.00	0.35	0.00	1.91	0.00	0.64	0.00	4.19	0.00
08/21	2	1.00	0.50	1.33	0.67	2.06	1.03	1.89	0.95	2.38	1.19	3.08	1.54	1.53	0.76	2.92	1.46	1.58	0.79
09/21	2	1.00	0.50	0.83	0.42	1.86	0.93	0.19	0.09	0.47	0.24	1.68	0.84	2.49	1.24	1.09	0.54	1.22	0.61
10/21	3	1.67	0.56	1.33	0.44	0.67	0.22	1.02	0.34	1.24	0.41	1.56	0.52	4.12	1.37	0.39	0.13	0.11	0.04
11/21	1	1.33	1.33	1.50	1.50	2.61	2.61	1.90	1.90	1.80	1.80	1.89	1.89	2.23	2.23	2.78	2.78	1.68	1.68
12/21	2	0.00	0.00	0.17	0.08	1.34	0.67	0.81	0.41	1.06	0.53	0.14	0.07	3.32	1.66	2.16	1.08	0.28	0.14
01/22	3	1.00	0.33	1.17	0.39	0.21	0.07	1.08	0.36	1.25	0.42	0.77	0.26	4.00	1.33	0.90	0.30	0.98	0.33
02/22	1	1.00	1.00	1.33	1.33	2.19	2.19	1.89	1.89	1.84	1.84	1.97	1.97	1.26	1.26	2.95	2.95	0.90	0.90
			59%		59%		146%		81%		82%		93%		144%		101%		119%

Table 6:- Temper - Tea Maker

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	9					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	3					6.00	2.00	6.00	2.00	6.00	2.00	6.00	2.00	6.00	2.00	6.00	2.00	6.00	2.00
4/21	2					6.40	3.20	1.60	0.80	1.06	0.53	2.50	1.25	5.86	2.93	3.26	1.63	6.34	3.17
5/21	3	1.67	0.56	0.50	0.17	4.76	1.59	0.84	0.28	1.53	0.51	1.88	0.63	3.21	1.07	3.55	1.18	4.58	1.53
06/21	1	1.67	1.67	1.67	1.67	6.28	6.28	1.92	1.92	1.35	1.35	0.59	0.59	3.53	3.53	2.30	2.30	5.96	5.96
07/21	2	0.00	0.00	0.17	0.08	4.66	2.33	0.81	0.40	1.48	0.74	7.46	3.73	0.50	0.25	1.98	0.99	4.13	2.07
08/21	4	2.00	0.50	2.17	0.54	2.19	0.55	2.08	0.52	2.63	0.66	6.40	1.60	3.27	0.82	1.80	0.45	1.45	0.36
09/21	2	0.33	0.17	0.83	0.42	3.97	1.99	1.79	0.90	1.49	0.74	3.83	1.91	2.36	1.18	3.67	1.84	3.02	1.51
10/21	1	1.67	1.67	1.67	1.67	4.57	4.57	1.18	1.18	0.77	0.77	3.29	3.29	2.34	2.34	0.25	0.25	3.40	3.40
11/21	4	1.67	0.42	2.17	0.54	1.12	0.28	2.88	0.72	3.37	0.84	3.59	0.90	6.11	1.53	4.30	1.07	0.29	0.07
12/21	3	0.67	0.22	0.33	0.11	2.00	0.67	0.71	0.24	0.51	0.17	1.73	0.58	4.95	1.65	2.73	0.91	0.40	0.13
01/22	1	1.67	1.67	2.00	2.00	3.80	3.80	2.07	2.07	1.86	1.86	1.23	1.23	2.46	2.46	2.22	2.22	2.01	2.01
02/22	1	1.67	1.67	1.17	1.17	3.42	3.42	0.21	0.21	0.18	0.18	2.34	2.34	2.00	2.00	1.63	1.63	1.44	1.44
			85%		84%		236%		86%		80%		154%		167%		127%		182%

Table 7:- Whisper - Vacuum Cleaner

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	25					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	10					15.00	1.50	15.00	1.50	13.50	1.35	15.00	1.50	15.00	1.50	15.00	1.50	15.00	1.50
4/21	19					4.50	0.24	7.50	0.39	12.92	0.68	5.25	0.28	3.15	0.17	19.65	1.03	3.15	0.17
5/21	11	7.00	0.64	6.00	0.55	12.05	1.10	7.25	0.66	14.60	1.33	2.94	0.27	9.20	0.84	9.80	0.89	9.20	0.84
06/21	12	1.33	0.11	1.50	0.13	9.85	0.82	0.28	0.02	3.47	0.29	2.70	0.23	4.82	0.40	4.19	0.35	4.82	0.40
07/21	15	1.00	0.07	2.17	0.14	5.86	0.39	3.03	0.20	4.47	0.30	6.85	0.46	1.56	0.10	4.20	0.28	1.56	0.10
08/21	13	0.33	0.03	0.33	0.03	7.27	0.56	1.70	0.13	4.05	0.31	2.21	0.17	2.16	0.17	4.20	0.32	2.16	0.17
09/21	21	7.67	0.37	7.50	0.36	1.45	0.07	7.83	0.37	8.38	0.40	9.34	0.44	12.50	0.60	8.36	0.40	12.50	0.60
10/21	17	0.67	0.04	0.33	0.02	2.69	0.16	3.22	0.19	9.17	0.54	1.43	0.08	8.69	0.51	9.15	0.54	8.69	0.51
11/21	12	5.00	0.42	5.67	0.47	7.42	0.62	5.32	0.44	4.50	0.37	7.46	0.62	3.47	0.29	4.49	0.37	3.47	0.29
12/21	15	1.67	0.11	0.17	0.01	3.68	0.25	2.47	0.16	7.61	0.51	0.61	0.04	6.47	0.43	7.61	0.51	6.47	0.43
01/22	9	5.67	0.63	5.33	0.59	9.31	1.03	5.75	0.64	6.34	0.70	6.03	0.67	0.42	0.05	6.34	0.70	0.42	0.05
02/22	8	4.00	0.50	3.50	0.44	9.38	1.17	1.58	0.20	2.40	0.30	2.23	0.28	1.58	0.20	2.40	0.30	1.58	0.20

Table 8:- Max Clean - Steam Vacuum Cleaner

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	3					2.00	0.67	2.00	0.67	2.00	0.67	2.00	0.67	2.00	0.67	2.00	0.67	2.00	0.67
4/21	7					5.80	0.83	4.20	0.60	4.02	0.57	4.50	0.64	5.62	0.80	2.58	0.37	5.78	0.83
5/21	7	3.33	0.48	2.33	0.33	5.22	0.75	0.42	0.06	0.14	0.02	0.63	0.09	4.37	0.62	3.45	0.49	5.12	0.73
06/21	3	2.67	0.89	3.33	1.11	0.70	0.23	3.96	1.32	4.54	1.51	5.47	1.82	1.14	0.38	5.26	1.75	0.48	0.16
07/21	7	1.33	0.19	2.00	0.29	4.63	0.66	3.60	0.51	3.43	0.49	0.85	0.12	1.99	0.28	6.82	0.97	4.30	0.61
08/21	12	6.33	0.53	6.33	0.53	9.17	0.76	5.36	0.45	4.91	0.41	4.80	0.40	5.64	0.47	3.50	0.29	8.69	0.72
09/21	8	0.67	0.08	0.83	0.10	4.25	0.53	3.46	0.43	4.38	0.55	3.43	0.43	0.59	0.07	8.67	1.08	3.56	0.45
10/21	7	2.00	0.29	2.17	0.31	2.82	0.40	1.35	0.19	1.91	0.27	3.68	0.53	3.14	0.45	0.14	0.02	1.91	0.27
11/21	16	7.00	0.44	7.83	0.49	11.54	0.72	8.87	0.55	8.50	0.53	7.11	0.44	4.85	0.30	10.91	0.68	10.40	0.65
12/21	9	1.33	0.15	2.67	0.30	3.39	0.38	6.11	0.68	7.22	0.80	5.27	0.59	4.40	0.49	12.85	1.43	1.93	0.21
01/22	12	1.33	0.11	1.00	0.08	6.05	0.50	2.39	0.20	1.86	0.15	0.14	0.01	2.33	0.19	5.18	0.43	4.30	0.36
02/22	5	7.33	1.47	6.67	1.33	1.56	0.31	6.76	1.35	7.40	1.48	7.54	1.51	10.25	2.05	7.21	1.44	3.62	0.72
			46%		49%		52%		54%		57%		56%		52%		74%		49%

Table 9:- Mr.Chef Quadro - Blender Set

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	1					1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4/21	0					0.10	0.00	0.90	0.00	0.99	0.00	0.75	0.00	0.19	0.00	1.71	0.00	0.11	0.00
5/21	1	0.67	0.67	0.67	0.67	0.91	0.91	0.91	0.91	0.90	0.90	0.56	0.56	0.76	0.76	1.40	1.40	0.89	0.89
06/21	1	0.33	0.33	0.33	0.33	0.82	0.82	0.09	0.09	0.01	0.01	0.08	0.08	0.54	0.54	0.42	0.42	0.79	0.79
07/21	2	1.33	0.67	1.17	0.58	1.74	0.87	1.01	0.50	0.92	0.46	0.82	0.41	1.30	0.65	0.74	0.37	1.68	0.84
08/21	1	0.33	0.33	0.50	0.50	0.56	0.56	0.90	0.90	1.07	1.07	1.02	1.02	0.14	0.14	1.74	1.74	0.47	0.47
09/21	2	0.67	0.33	0.67	0.33	1.51	0.75	0.91	0.46	0.82	0.41	0.32	0.16	0.58	0.29	1.42	0.71	1.38	0.69
10/21	2	0.33	0.17	0.33	0.17	1.36	0.68	0.09	0.05	0.06	0.03	0.09	0.05	0.18	0.09	0.41	0.21	1.18	0.59
11/21	3	1.33	0.44	1.17	0.39	2.22	0.74	1.01	0.34	0.86	0.29	0.73	0.24	0.80	0.27	0.74	0.25	1.99	0.66
12/21	4	1.67	0.42	1.50	0.38	3.00	0.75	1.10	0.28	0.87	0.22	0.95	0.24	1.28	0.32	0.26	0.06	2.70	0.67
01/22	2	1.00	0.50	1.33	0.67	0.70	0.35	1.89	0.94	2.21	1.10	2.17	1.09	1.39	0.70	3.00	1.50	0.31	0.15
02/22	2	1.00	0.50	0.83	0.42	0.63	0.31	0.19	0.09	0.31	0.16	1.19	0.60	1.68	0.84	1.10	0.55	0.15	0.08
			44%		44%		60%		43%		43%		42%		43%		63%		53%

Table 10:- Bouncy - Waffle Maker

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	4					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	0					4.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00
4/21	2					1.60	0.00	1.60	0.00	1.96	0.00	1.00	0.50	1.24	0.62	4.84	2.42	1.56	0.78
5/21	2	0.00	0.00	0.33	0.17	1.44	0.72	0.16	0.08	0.38	0.19	1.25	0.63	0.64	0.32	0.20	0.10	1.35	0.67
06/21	2	0.67	0.00	0.33	0.00	1.30	0.00	0.02	0.00	0.19	0.00	1.06	0.53	0.05	0.03	0.54	0.27	1.14	0.57
07/21	1	1.00	0.00	1.00	0.00	2.17	0.00	1.00	0.00	0.85	0.00	0.30	0.30	0.51	0.51	1.14	1.14	1.95	1.95
08/21	2	0.33	0.17	0.50	0.25	0.95	0.47	0.90	0.45	1.12	0.56	1.10	0.55	1.12	0.56	1.72	0.86	0.65	0.33
09/21	1	0.67	0.67	0.67	0.67	1.85	1.85	0.91	0.91	0.78	0.78	0.48	0.48	0.49	0.49	1.39	1.39	1.48	1.48
10/21	3	1.67	0.56	1.67	0.56	0.33	0.11	1.91	0.64	2.10	0.70	1.85	0.62	2.87	0.96	2.43	0.81	0.79	0.26
11/21	4	2.00	0.50	1.83	0.46	1.30	0.32	1.19	0.30	1.20	0.30	1.55	0.39	3.76	0.94	0.16	0.04	1.82	0.46
12/21	4	1.33	0.33	0.83	0.21	1.17	0.29	0.12	0.03	0.00	0.00	0.02	0.00	3.23	0.81	1.29	0.32	1.74	0.43
01/22	0	3.67	0.00	3.83	0.00	2.95	0.00	3.99	0.00	4.12	0.00	4.76	0.00	1.55	0.00	4.36	0.00	2.36	0.00
02/22	1	1.67	1.67	1.00	1.00	1.65	1.65	0.60	0.60	0.84	0.84	0.95	0.95	0.71	0.71	3.87	3.87	1.02	1.02
			39%		33%		42%		23%		26%		38%		46%		86%		61%

Table 11:- Mix It Easy - Juice maker

	Actual	Moving Average		Weighted Moving Average		Ex. Smooth. (0,1)		Ex. Smooth. (0,9)		Ex. Smooth. Tr. (0,9;0,1)		Ex. Smooth. Tr. (0,5;0,5)		Ex. Smooth. Tr. (0,1;0,9)		Ex. Smooth. Tr. (0,9;0,9)		Ex. Smooth. Tr. (0,1;0,1)	
		Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
02/21	4					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03/21	3					1.00	0.33	1.00	0.33	1.00	0.33	1.00	0.33	1.00	0.33	1.00	0.33	1.00	0.33
4/21	0					3.90	0.00	3.10	0.00	3.01	0.00	3.25	0.00	2.29	0.00	2.29	0.00	3.89	0.00
5/21	1	1.33	1.33	0.67	0.67	2.51	2.51	0.69	0.69	1.06	1.06	0.44	0.44	3.44	3.44	3.44	3.44	2.45	2.45
06/21	1	0.33	0.33	0.00	0.00	2.26	2.26	0.07	0.07	0.37	0.37	1.17	1.17	0.23	0.23	0.23	0.23	2.13	2.13
07/21	2	1.33	0.67	1.17	0.58	1.03	0.52	1.01	0.50	1.27	0.63	2.25	1.12	0.72	0.36	0.72	0.36	0.83	0.41
08/21	4	2.67	0.67	2.50	0.63	1.07	0.27	2.10	0.53	2.24	0.56	3.22	0.81	1.19	0.30	1.19	0.30	1.36	0.34
09/21	2	0.33	0.17	0.83	0.42	1.04	0.52	1.79	0.89	1.86	0.93	1.10	0.55	3.73	1.86	3.73	1.86	0.69	0.34
10/21	2	0.67	0.33	0.67	0.33	0.93	0.47	0.18	0.09	0.10	0.05	0.98	0.49	0.80	0.40	0.80	0.40	0.52	0.26
11/21	1	1.67	1.67	1.33	1.33	1.84	1.84	1.02	1.02	0.92	0.92	1.68	1.68	0.40	0.40	0.40	0.40	1.37	1.37
12/21	2	0.33	0.17	0.50	0.25	0.66	0.33	0.90	0.45	1.08	0.54	0.39	0.20	1.81	0.90	1.81	0.90	0.12	0.06
01/22	1	0.67	0.67	0.67	0.67	1.59	1.59	0.91	0.91	0.81	0.81	0.67	0.67	1.44	1.44	1.44	1.44	0.99	0.99
02/22	3	1.67	0.56	1.67	0.56	0.57	0.19	1.91	0.64	2.07	0.69	1.97	0.66	2.40	0.80	2.40	0.80	1.24	0.41
			66%		54%		83%		47%		53%		62%		80%		80%		70%

5. Conclusion

The purpose of the current study was to develop an idea to for establishment of a database as an expert system which could support order decisions of managers of retail shops in the Kurdistan region of Iraq. To that end and to understand it deeper, the researchers reviewed and investigated previous studies that became the theoretical underpinnings of smart systems and accumulation of knowledge. Then, relevant data from retail shops, which were selling products of Fakir Company in the region, were collected from people who were in managerial positions. Next, basic forecasting methods were developed. This is in order to apply on the data that were collected. The methods were mainly; moving average, weighted moving average, exponential smoothing, .and exponential smoothing with trend adjustment

The results shown that methods were successful only for some cases but not very successful in many of the cases. This is due to , first, the number of data was very limited and the models failed to develop a path to follow and second, numbers of sales monthly were limited and mean absolute percentage error was affected .from a single error significantly

Practical implication of the current research is that once the new data are entered in the system, it can methods which used in the study are able to automatically calculate the new forecasting results and for every period the forecast results are ready to be used. Secondly, by this automation technique, life spans of the products might be predicted as well. For example, when a product's forecasts are reducing for several periods, it can be .estimated that the product is in the decline period and so on

The generalizability of these results is subject to certain limitations. For instance, as it was investigated, the monthly sales records were not well well-kept by managers. Therefore, the study was limited by the absence of a proper and adequate data. Moreover, the nature of case study is often problematic as it focuses on one or few cases. Thus, the outcome is not always robust and reliable. Accordingly, the researchers believe that more information on that topic would help researchers to establish a greater degree of accuracy on this matter. It is suggested to study different models than it was implemented in this paper and gaining access to a greater data .and more cases might decrease error levels

الملخص

الغرض من الدراسة الحالية هو تطوير فكرة لإنشاء قاعدة بيانات كنظام خبير يمكن أن يدعم قرارات الطلبات الصادرة عن مديري متاجر البيع بالتجزئة في إقليم كردستان العراق. للقيام بذلك، تمت مراجعة الأدبيات الواسعة لفهم الأسس النظرية للأنظمة الذكية وتراكم المعرفة. وقد جمع الباحثون البيانات ذات الصلة من متاجر التجزئة المختلفة التي كانت تبيع منتجات فكير في المنطقة التي شملها المسح لمدة عام تقريبًا. لتحليل هذه البيانات، طور الباحثون طرق التنبؤ الأساسية، والتي تضمنت بشكل أساسي المتوسط المتحرك، المتوسط المتحرك المرجح، التسوية الأسية والتسوية الأسية مع تعديل الاتجاه. وأظهرت النتائج الى أن الأساليب كانت ناجحة فقط في بعض الحالات ولكنها لم تكن ناجحة جدًا في كثير من الحالات. وتعود أسباب ظهور نتائج الدراسة الحالية إلى عدة أمور، أهمها: أولاً، كان عدد البيانات محدودًا للغاية مع فشل النماذج في تطوير مسار لاتباعه. ثانيًا، كانت المبيعات الشهرية في منطقة التحقيق محدودة، وبالتالي تأثر متوسط ،معدل الخطأ المطلق بشكل كبير بخطأ واحد.

پوختە

مەبەست لەم لێکۆڵینەوە، بریتیە لە گەشەپێدان لە دامەزراندی بنکەی زانیاریی، وەک سیستەمێکی شارەزا کە پاڵپشتبێت بۆ ڕێکخستنی بڕیاری بەڕێوەبەرەکان لە کۆمپانیاکانی بواری وردە فرۆشکان لە هەرێمی کوردستانی عیراق، بۆ شارەزابوونی زیاتر لە بنەما تیۆرییەکانی بابەتەکە، کە بنەڕەتە بۆ سیستەمێکی زیرەک و کەڵەکەبوونی مەعریفە. پێداداچونەوە و وردبوونەوەی زۆر کراوە لە لێکۆلینەوە پێشووەکان. زانیارییەکان لەو بازرگانە وردە فرۆشان وەرگیراوە کە بەرهەمەکانی فاخر دەفرۆشن لە هەرێمی کوردستان. لێکۆڵەرەوانەکان گەشەیاندا بە ڕێبازی پێشبینیی سەرەتایی، پاشان جێبەجێیان کرد لە سەر ئەو داتایانەی کە لە بەڕێوەبەرەکان وەرگیران. ڕێبازەکە بە زۆریی جەختی لەسەر ناوەندی جووڵە، ناوەندی کێشی جوڵە، (التنعيم الأسي والتجانس الأسي) لەگەڵ گۆڕینی ئاراستەکە. دەرئەنجامی لێکۆڵینەوەکە ئەوە پیشاندەدات، کە ڕێبازکان تەنها لە هەندێ حاڵەتدا سەرکەوتوون. هۆکارەکانیش دەگەڕێتەوە بۆ: یەکەم، ژمارەی داتاکان سنورداربوون و، ڕێبازەکە سەرکەوتوو نەبوو لە دۆزینەوەی دەرەچەیەک. دووەم، ژمارەی فرۆش سنووردار بوو و، ڕێژەی هەڵە لە ناوەندی ڕەها سەرچاوەی گرتووە، لە هەڵەی یەکی بەشێوەیەکی فراوان.

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