The impact of the Data-Warehouses and the Online Analytical Processing in the risk management processes on the Jordanian insurance companies

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Abstract *This research aims at studying the effect of data warehouse and OLAP on risk management processes. And the questionnaire as a principal tool in research which was distributed among 182 respondents, through a categorical randomly sample at insurance companies working in Jordan. The data were analyzed by using the Statistical Package for Social Sciences (SPSS), using the multiple, simple regression, model to test the research hypotheses, The research found that data warehouse has a statistically significant impact on risk management processes in the unit under study, where there is a positive impact of OLAP on risk management processes, the study recommended, Develop the user's skills for the data analysis systems and plant the culture of data analysis as an integrated part of the work requirements and making the transforms, The insurance companies should develop and update their data warehouses as they store huge amounts of information, historical data about the activities of the company.*

Keywords*: data warehouse, OLAP, risk management processes, insurance companies working in Jordan.*

I. INTRODUCTION

The new millennium witnesses a scientific revolution and technological rising characterized by rapid rhythm, this revolution caused many local, regional, and global changes that contributed to shaping the business administration field and the activities of the business organizations. These rising and changes were forced on the organizations and pushed them toward adopting new techniques to go with these changes in order to sustain and grow (Alani et. al., 2012).

The quick changes that happened to the organizations like; globalization, removing the borders, organizational change, and the huge competition among the organizations to dominate the markets and clients is considered a challenge for the business organizations and their leaders because they imposed a new reality that they have to deal with in order to avoid the risk and sustain, grow, and achieve targets (Efrain Turban et. al., 2007).

Information systems are considered one product of the knowledge and technology development because information systems depend on the availability of the suitable support to improve the decisions by merging the data, models, and software (Efrain Turban et. al., 2008). With the development of information systems, the concepts of data warehouses and online analytical processing emerged, and they facilitated the interaction between the human element and the information technology, and this interaction aims at providing the required support to rationalize the semi-structured decision-making process, it also provide the managers with information tools (tables, drawings, models, and simulations) to help in solving the semi-structured and non-structured problems (Loshin David, 2013).

Due to the important role of the insurance sector, and the strategic role it has in increasing the economic growth rates, and encouraging the competition by providing services and meeting the needs and desires of the clients, it is obligatory to consider the expected effect of the relation between the business cleverness systems and their role in providing the information that help the organization in managing, determining, and evaluating the risk. Thus, this study aims at studying the impact of data warehouses and the online analytical data processing on the risk management processes in the Jordanian insurance companies.

II. LITERATURE REVIEW

The data warehouse is considered a new technical trend, described as one of the newest concepts in the field of information systems and has a great importance in many business applications, especially in the large organizations with many branches due to its vital role in managing the information resources (Shaker H. Ali El-Sappagh et. al., 2011). The foundation for the data warehouse is the complete integration between the spread odd data and in the different databases, information processing systems, and legacy systems, in addition to the external data resources related to its work, so the organization will have a unified and integrated environment for the current and past information in one warehouse (Scheps Swain, 2008). Data warehouse is an analytical storing system directed toward supporting decisions, works to unify the odd data and store them after deleting

the repeated data and unify its measures in an efficient structure for storing and retrieving the data (Berson Alex, Smith Stephen, 2007).

Turban defined the data warehouse as a group of integrated historical data that help in decision making, because it is designed to store and retrieve data, process them, and present them in a suitable way, it include a huge amount of data collected from different resources, databases, and systems (Efrain Turban et. al., 2008).

Ralph Kimball indicated that a data warehouse is a group of methods and techniques that analyze the data to help workers in the knowledge sector and the managers and analysts in the decision-making process (Matteo Golfarelli, Stefano Rizzi, 2009).

In 1992, William H. Inmon, who is considered the godfather of the data warehouse, provided a definition of it as subject oriented, integrated, non-volatile, time variant, and used in the strategic decision-making processes (Inmon, W. H., 2003)

This definition provides the main characteristics of the data warehouse as follows:

1- **Subject Oriented:** where the data is stored in the warehouse according to the subject (the data is divided into small pieces each of them contains a specific sector in the organization like; sales data, marketing data, products data, and costumers' data), and the data can be organized and employed to support the decisions in the organization and help to give a comprehensive view of all the activities.

2- **Integrated:** the concept of integration is approaching the subject, where the warehouses put the data after collecting them from different resources and make them in a constant shape. It also means collecting the odd data from different resources and transform them into a presentable form that is easy to access (Balacanu Daniel, 2007).

3- **Non volatile:** which means that after the data arrives at the warehouse, it can't be amended or changed (no adding and deleting), in the contrary of the databases. This means that the data is read-only, and the analysis can be extracted, and they can be updated periodically (Marakas M George, 2003).

4- **Time-variant:** the warehouse keeps the historical data which helps the organization to predict the future and know the current situation (Balacanu Daniel, 2007).

The importance of data warehouses

The business require the ability to reach and merge data from the different storing sources, and make the complicated analysis on them to make multi-dimensional tables, in addition to the fact that the needs of the decision makers are increasing and require the integration of all the data sources to show in a way that helps in choosing the best choice for the organization among the available alternatives. In the past, this used to require a long time to be accomplished and the need for it will end or the circumstances change before having them, thus, the need for the data warehouses arose and considered one of the best developments of databases (Sheng-Hui Lin et. al., 2010).

The data warehouse is considered the technical base that works on the quick and flexible response to the activities, and to the needs of the users inside and outside of the organization, because of the integrated structure of the data warehouse and the internal and external data sources it depend on (Güz_n türkmen, 2007).

Dan Power indicated that the data warehouses provide three main advantages by the data integration due to the multiple resources, it also give the added value in the data analysis process in a way that facilitates understanding them and this will help in the decision-making process, in addition to that, it reduces the cost of reaching the historical data (Reddy Satyanarana, 2010). Mark I. Hwang thinks that the data warehouses became of the most important modern techniques that support decisions. Although the cost of building data warehouses is high, the companies are still trying to build them due to the benefits they provide to the organization like ease of access to information, rapid retrieve of information, provide more data and information about the internal and external environment of the organization, high quality information, improve the decision making process (Hwang Mark I. and Hongjiang Xu, 2007).

Online Analytical Processing (OLAP)

The online analytical processing arose due to the difficulties in data analysis in the databases that were updated in the information processing systems, and due to the inefficiency of the traditional analysis tools in producing the information after analyzing the data (Berson Alex and Smith Stephen, 2007).

The first use of the OLAP concept was by Codd and Asocates, who defined the Multi-Dimensional Cognitive Model (a way to make the user able to communicate with the data warehouse either by the end user front or the Internet front, and is the ability to analyze a huge amount of data and produce them in multiple forms including the graphical form (AlSamerrai and AlAkedi, 2012).

The OLAP has many capabilities in data analysis in many ways, it help providing quick responses to complicated enquiries according to the needs of the higher administration even the middle administration in the organization, and it is considered effective in the data retrieving and analysis to ease the reporting for the management when needed (Liangzhong Shen, 2012). OLAP also organizes the data according to the level of

details, one data warehouse may contain fields for country, region, or city for each kind of sales in a way to organize this information in the details level (Berson Alex and Smith Stephen, 2007).

The OLAP concept

The data warehouses became the main element in building information systems in the organizations and is playing a vital role in supporting decisions by collecting the data from different internal and external resources, this huge amount of data needs a high-quality techniques to be processed, analyzed, and transformed into valuable information, that's why the OLAP became a necessity (Hamd M . Murtadaha, Hassan Waleed,2010). OLAP is a tool that provides an advanced analysis structure for the data and supports the decision making and business modeling. It also can be defined as a process of formulating and executing the enquiries, where it responds to the enquiries of the users (if the organization wanted to know about the sales in a specific period of time, OLAP will provide a multi-dimensional information to read the past, present, and future of the organization) (Cios Krzsstof J et. al., 2007). It also can be explained as an advanced way of structured inquiries that provide collected data in a group of dimensions.

Importance of OLAP

- Considered one of the most important techniques used in supporting decisions because it shows the link between the data and it makes an advanced presentation of the data (three-dimensional shapes, three-dimensional cubes, data rotation) (Berson Alex and Smith Stephen, 2007).
- Provides a rapid mechanism of complicated analytical inquiries, allowing searching, retrieving, and presenting the business data. OLAP can deal with hundreds of complicated inquiries and is considered a transitional stage between the data storing environment and the data and reports presenting techniques (Cios Krzstof J. et. al., 2007).

III.   RISK MANAGEMENT

The risk is considered imminent for the human life, with multiple forms, the human feels the fear and anxiety and that may cause hesitation on some decisions what leads into missing the opportunities of profit and success (Alshaqiri et. al., 2012). But, in light of some changes that the organizations face, the managers will be required to make some general decisions, some of these changes are that the managers don't know what will happen in the future and not knowing the results of their decisions prior to making them (Alshaqiri et. al., 2012). Risk management is defined as a group of scientific methods should be taken into consideration when making decisions to face any risk in order to minimize the possible loss and reduce the uncertainty (Hamad, 2003). While Hamad thinks that the risk management is a scientific approach to deal with the risks by predicting the possible losses and design and execute procedures to minimize the losses and their impact (Alshaqiri et. al. 2012). Artimah thinks that risk management is controlling the risk by defining the causes and calculating the probability of its occurrence, and the amount of expected loss then apply the best procedures to face these risks and reduce the impacts, then monitor the suitability of these procedures (Artimah and Alakour, 2012). Alshaqiri indicated that risk management is complete system aiming at facing the possible risk in the best way and least cost, and it depends on some scientific procedures that should be considered when deciding to face any risk in order to minimize the losses and reduces the uncertainty (Salam and Alshaqiri, 2007). Salamah Abdullah provided a more comprehensive definition where he defined risk management as "reaching for specific tools to control the risk and reduce its occurrence and minimize the losses in the least cost possible", it contained the word reaching which means searching and exploring, and the word "specific tools" mans the policies that can be followed or used in risk management (Salamah, 1986). According to all of the above, the researcher thinks that risk management is a process to determine the possible risk before it occurs and the expected results of it, and measure the loss that could happen to the individuals and the organization and find the tools or techniques needed to prevent or reduce these risks, (a process to avoid the risk before it occurs or minimize its effects if it occurred).

Importance and goals of risk management

When the insurance management is limited to managing the insurance programs, the risk management concept is wider and includes the economical activities of the individual and the organization, this process starts with identifying the risks and analyzing them to know their nature, causes, and the relation to other risks and phenomena. Within the risk management comes measuring the risk and the probability of the losses and biggest loss possible, make the required comparisons for each risk alone, and prioritizing the risk on the scientific basis and this is called the quantitative risk analysis (Salamah, 1986). The goal of risk management is to reduce its effects that threaten the projects and individuals because of their fear of losing their capitals or incomes or both. It also aims mainly at developing a perfect policy with specific goals to face the expected losses are reduce them

with the least possible cost in light of the circumstances, abilities, and the expected results related to the risk and the risk manager (Abdali Latifah, 2012) (Salamah, 1986).

How to manage the risk (risk management processes)
 The risk management aims mainly at choosing the right way that leads to reduce or eliminate the expected losses, and that is usually in the relation between the cost of the policy and the return on the organization and its financial position, thus, to reach for the goals, risk management should go through the following stages (processes of risk management) which will be discussed in this research.

1- Identify risk (discovery).
 That is accomplished by having a department within the organization (Risk management department) that study all the activities of the organization like; production, storing, buying, selling, funding, and choosing and training the employees in order to discover the risks on the organization either they are eligible or not for insurance, and this can be achieved by having strong relations between the risk management department and Insurance and other departments in the organization (Salam and Alshaqiri, 2007).

2- Risk assessment
 The risk management and insurance should evaluate the discovered risk, which means to measure the possibility of the loss, and this evaluation requires to prioritize the risk and give the priority to the risk with the biggest effect on the organization (Batshoon Ryad, 2004). The risks are disseminated into groups of; high risks with a big effect on the organization, medium risk with an effect on some parts or investments in the organization, and low risks with the indirect effect on the organization (AbuBaker Eid Ahmad, 2011).

3- Identify alternatives
 After determining and measuring the risks, comes the stage of choosing the right way to face each risk alone, and there are two main approaches to deal with the risks in the organization, and this stage is considered as a trouble for decision making, where the risk manager should decide on the best way to deal with each risk alone sometimes (Aboodi, 2006), and sometimes there might be a predesigned plan to deal with the possible risks or a scale to choose the right way in dealing with each risk, and in this case the risk manager is responsible for the risk management program more than being a decision maker (Alshaqiri et. al., 2012).

4- The implementation of decisions
 Choosing the best way to prevent the risk among the available alternatives that could give the best results, if the decision was to refer the risk to another party like insurance companies, we should choose the best insurer and negotiate with him then sign the agreement (Oraiqat, Juma 2008). But, if the decision was to prevent the loss or the risk, we must find the way to do so. For example, to prevent the work injuries for the workers, they must be trained on the work site safety first (AbuBaker Eid Ahmad, 2011).

5- Evaluation and feedback
 The evaluation and review process is important because the risk management operates in a changing environment and changing work circumstances, and the risk may change also from what was discovered in the first process. It also helps in treating the risks before being high and big (Alshaqiri et. al., 2012).

IV.   METHODOLOGY OF THE STUDY
 This section provides the methodology applied in the current study. It consists of the research model, research hypotheses, in addition to data collection tool and research population and sample.

Research Model
 The major elements of this research are established based on preceding literature, either theoretically or empirically. Figure (1) represents a model for the study that shows the independent variables within the construct of data warehouse and OLAP, and the dependent variable Risk management process, and the proposed relationship between them.
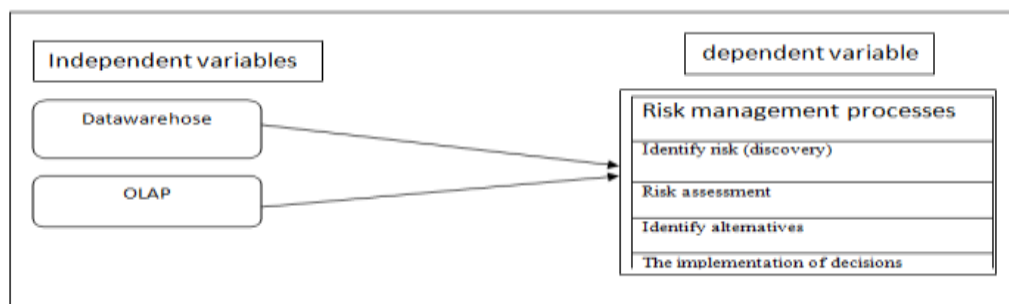
Research Model

The hypotheses of the study were developed, based on the diagram shown hereinabove, to achieve the objectives of the study:

H0: there is no impact of statistical significance of Data Warehouse and OLAP on risk management process in the Jordanian insurance companies.

Tow subsidiary hypotheses were developed out of this study.

H0:1, there is no impact of statistical significance for data warehouse on risk management processes for the insurance companies in Jordan

H0:2 there is no impact of statistical significance for OLAP on risk management process for the insurance companies in Jordan

Population of the study

The population of the study consists of the insurance companies working in Jordan, 9 companies were studies, the preview, and analysis unit consisted of managers and experts in these companies (CEOs, Assistant Directors, Division Managers, Insurance Experts in these companies, IT managers). The researcher distributed 210 questionnaires to the population, out of which 191 questionnaires were returned, 9 questionnaires were excluded because they were not valid for statistical analysis, what makes the valid questionnaires 182 (88% of the distributed questionnaires)

Reliability and Validity

The questionnaire was arbitrated by a group of 6 experienced arbitrators specialized in business administration and computer science in Irbid National University, their notes and suggestions regarding the paragraphs of the questionnaire were taken into consideration, the questionnaire was amended according to them to get the final questionnaire. The researcher checked the stability of the study by doing an internal consistency for the paragraphs using the Cronbach's Alpha test in order to measure the link between the paragraphs and check the reliability of the data collection tool used in testing the variable in the study.

Table (1) represents the results of Cranach's alpha for the independent and dependent variables, data warehouses and OLAP and risk management processes

	Dimension	Alpha value
1	**Data warehouses**	**0.747**
2	**OLAP**	**0.823**
3	Identify risk (discovery)	**0.820**
4	Risk assessment	**0.848**
5	Identify alternatives	**0.777**
6	The implementation of decisions	**0.699**
7	Evaluation and feedback	**0.754**

The Cronbach's alpha coefficients values in for the paragraphs of all the variables between (0.699 – 0.848), thus, all the values are higher than (0.60) which means that the paragraphs are consistent, and the tools are reliable for the statistical analysis.

Description of the variables

This part describes the variables in the study, where the mean and standard deviations were calculated for each dimension of the dependent and independent variables, the results were:

Table (2) Overall mean and standard deviation of the study's variables

Number	Paragraph	mean	Standard deviation	Order	Level
	Data warehouses	**3.89**	**.57**	**2**	**high**
	OLAP	**4.02**	**0.55**	**1**	**High**
1	Risk identification	**3.95**	**0.73**	**1**	**High**
2	Risk evaluation	**3.93**	**0.77**	**2**	**High**
3	Alternative identification and choosing the right way to face the risk	**3.90**	**0.67**	**3**	**High**
4	Decision execution	**3.79**	**0.45**	**4**	**High**
5	Evaluation and review	**3.75**	**0.66**	**5**	**High**
6	Risk management	**3.87**	**0.55**		**High**

Table (2) indicates that the importance measure for the data warehouses was high, the averages were between 3.20 – 4.32 (with a general average of 3.89 and a standard deviation of 0.57), the researcher thinks that the convergence of answers reflects that the higher administration in the insurance companies is aware of the importance of getting the data and information and store them in the warehouses that are considered one of the

important assets, and that the warehouses provide the data needed to achieve the strategic vision on the long run. In addition to that, using data warehouses gives the insurance companies a chance to keep historical data, in a perfect storing mechanism that allows them to retrieve the data quickly and accurately within the timeframe.

Table (2) indicates that the general scale for OLAP was relatively high, the answers were between (3.82- 4.16) with an average of (4.02) and a standard deviation of (0.57), and the researcher thinks that the convergence in the answers on the paragraphs about the OLAP variable dues to its importance, because it provides comprehensive control on the organization's performance, and provides comparisons on the performance in different periods and presents the data in an easy way and gives a clear view of the achievements of the organization.

The results in a table (2) indicate that the relative importance of the risk management is high, the average of this variable was (3.87) and the standard deviation was (0.55). the table showed that **risk identification** came in the first place of importance with an average of (3.95) and standard deviation of (0.73) and high relative importance. While the **evaluation and review** came last with an average of (3.75) and standard deviation (0.66) with a high relative importance also.

Testing the study hypotheses

The current research is mainly seeking to investigate the impact of Data warehouse and OLAP on Risk management process in Jordanian insurance companies, Consequently, in order to test the hypotheses developed for this study, multiple regression and simple regression technique was used

H0: there is no impact of statistical significance of Data Warehouse and OLAP in risk management process in the Jordanian insurance companies.

Table No (3) the results of multiple regression analysis indicate that the Data Warehouse and OLAP affects risk management process

Dependent variable	(R)	(R²)	F	Sig F*	Regression coefficient				
					Item	β	Standard deviation	T	Sig*
Risk management	0.793	0.629	153.333	0.000	Data Warehouses	0.411	0.053	7.808	0.000
					OLAP	0.002	0.059	0.027	0.000

*The effect is statistically significant at the level of ($\alpha \leq 0.05$).

The results from the table show that the impact of (data warehouses and OLAP) on the dependent variable (risk management) is statistically significant, where the calculated F was (153.333), and (Sig F = 0.000) which is less than 0.05, while the correlation coefficient was (R=0.793) indicating the positive relation between the data warehouses and OLAP and risk management. In addition, the coefficient of determination was ($R2 = 0.629$) indicating that 62.9% of the variation in risk management can be explained by the variation in data warehouses and OLAP.

The regression coefficient for the variable data warehouses β= 0.411 indicating the direct impact of the data warehouses on risk management and it is significant effect, where the T value was (7.808) at (Sig=0.000), and the regression coefficient for having OLAP was (β= 0.002) indicating the direct impact of OLAP on the risk management which not significant effect and its T value was (0.027) at Sig= 0.978 which is more than 0.05.

Thus, we reject the first hypothesis and accept the alternative hypothesis that says: there is an impact of statistical significance at level ($\alpha \leq 0.05$) of Data Warehouse and OLAP on risk management process in the Jordanian insurance companies. The sub-hypotheses were checked with simple linear regression model as follows:

H0:1 hypothesis

There is no statistically significant impact at level ($\alpha \leq 0.05$) for having data warehouses on risk management (identification, evaluation, alternatives, decision execution, review) in the Jordanian insurance companies.

Table No (4) the results of simple linear regression analysis indicate that the Data Warehouse affects risk management process

Dependent variable	R	R^2	F	Sig F*	Regression coefficient				
					Item	β	Standard error	T	Sig*
Data warehouses	0.729	0.531	309.2	0.000	Risk management	0.703	0.040	17.583	**0.000**

*The effect is statistically significant at the level of (α ≤ 0.05).

The results from the previous table indicate that the impact of the independent variable (data warehouses) on the dependent variable (risk management) is statistically significant, where the calculated F was (309.2) at level (Sig F= 0.000) and it is less than 0.05), while the correlation factor (R=0.729) indicate the positive relation between the two variables, in addition, the determination coefficient (R^2= 0.531) indicate that 53.1% of the variation in risk management can be explained by the variation in the data warehouses when the other variables are stable. The regression coefficient (β = 0.703) indicates the direct impact of the data ware houses on the risk management which is significant, where the T value was (17.583) at (Sig= 0.000), and thus we reject the first sub-hypothesis and accept the alternative hypothesis that says

There is an impact of statistical significance at level ($\alpha \leq$ 0.05) for data warehouse on risk management processes for the insurance companies in Jordan

H0:2 hypotheses
There is no impact of statistical significance at level (α ≤ 0.05) for OLAP on risk management process for the insurance companies in Jordan.

Table No (5) The Results Of Simple Linear Regression Analysis Indicate That The OLAP Affects Risk Management Process

Dependent variable	R	R^2	F	Sig F*	Regression coefficient				
					Item	β	Standard error	T	Sig*
OLAP	0.626	0.392	176.2	0.000	Risk management	0.609	0.046	13.275	**0.000**

*The effect is statistically significant at the level of (α ≤ 0.05).

The results from the previous table show that the impact of the independent variable (OLAP) on the dependent variable (risk management) is statistically significant, where the calculated F was (176.2) at level (Sig=0.000) which is less than 0.05, the regression coefficient was (R=0.626) indicating the positive relation between the two variables, and the determination coefficient was (R^2= 0.392) indicating that 39.2% of the variation in risk management can be explained by the variation of having OLAP when all other variables are stable. The regression coefficient (β=0.609) indicates that the direct impact of OLAP on risk management is significant, the T value was (13.275) at (Sig= 0.000), thus, we reject the third sub-hypothesis and accept the alternative that says:
There is an impact of statistical significance at level ($\alpha \leq$ 0.05) for having OLAP tools on risk management process for the insurance companies in Jordan.

Discussing study results

1- The results related to the descriptive analysis of the study variables

2- The study results indicated that the importance of having data warehouses and OLAP in the Jordanian insurance companies was high from the point of view of the sample embers, with an average of (3.93) and the averages of the data warehouses and OLAP were between (3.87- 4.02), the OLAP came first followed by the data warehouses.

This indicate that the insurance companies adopt building data warehouses and OLAP, but the use is developing and the experts and managers are aware of the importance of keeping up with the developments in the information technology due to its vital role in the performance and achievements of the organizations, because it helps in collecting the information from different resources, store it perfectly, and analyze it in a way that is easy to understand and explore the patterns and hidden relations which help in speeding up service providing.

3- The results showed that the importance of having data warehouses in the Jordanian insurance companies from the sample members' point of view was high, the averages of the answers were between (3.20 – 4.32) with a total average of (3.89) and standard deviation of (0.57), with a high relative importance due to its ability to store huge amounts of information collected from the internal and external environment and with high quality, and easy to access, where it provides complete and comprehensive data for the decision makers to help in quick decision making.

4- It was obvious in the study that the importance of having OLAP tools in the Jordanian insurance companies was high. The averages of the answers were (3.82- 4.16) with a total average of (4.02) and a standard deviation of (0.57). the paragraph of (having the data analysis systems for reports on the organization's performance in different time periods) came in the first place with a high relative importance also, the insurance companies make sure to use OLAP.

5- The results showed that the level of importance for the risk management in the Jordanian insurance companies was high, with an average of (3.87), and the averages of the answers were between (3.75- 3.950, risk identification came in the first place, followed by risk evaluation, while the review and evaluation came last.

6- It turned out that the importance level of risk identification in the studied Jordanian insurance companies from the point of view of the sample members was high, with an average of (3.95) and a standard deviation of (0.74). the paragraph (the management of the company evaluates the external environment the affect its man activities0 came in the first place with an average of (4.02) and high relative importance. While the paragraph (the company has a trained and qualified employee to determine the risk) came last with an average of (3.86) and high relative importance also. These results indicate the low number of workshops held by the company to build the capacities of the employees to make them capable of determining the risk.

7- The results clarified that the level of importance of Evaluating the risk in the studies Jordanian insurance companies was high according to the sample members, with an average of (3.93) and a standard deviation of (0.77). the paragraph (the management does a periodical review for the plans of potential risk evaluation) came first with an average of (4.03) and high relative importance, while the paragraph (the company has an experienced team to classify the risk) came last with an average of (3.86) and high relative importance also. The result that says that there is no specialized team to classify the risk can be justified by the lack of a specialized risk management department in the insurance companies.

8- The importance of determining the alternative in the studied Jordanian insurance companies according to the sample members was medium. The paragraph (the company keeps the data and information about the previous risks) came first with an average of (3.89)and high relative importance, while the paragraph (the information technology available in the company contribute to preparing scenarios for facing the risk) came last with an average of (3.84) and high relative importance also.

9- The study found that the importance level of executing the decision in the studied Jordanian insurance companies was high according to the sample members, with an average of (3.79) and a standard deviation of (0.49). the paragraph (information technology used help in the efficiency and effectiveness of executing the decision) came first with an average of (4.06) and high relative importance, while the paragraph (the decision in the company is executed depending on the experiences of the managers only) came last with an average of (3.45) with medium relative importance. This result indicates that the information technology provides reports for decision makers to help them in making decisions.

10- The study found that the importance of evaluation and review in the studied Jordanian insurance companies according to the sample members was high, with an average of (3.75) and standard deviation of (0.66). the paragraph (the company documents all the procedure of facing risks to make future use of them) came first with an average of (3.84) and high relative importance, while the paragraph (the company benefits from the risk management ways in other insurance companies) came last with an average of (3.66) and medium relative importance.

Recommendations

In light of the study results, we provide a group of recommendations and suggestion that we hope will help to adopt and to apply the data warehouses and OLAP, due to their vital role in the risk management processes in the Jordanian insurance companies.

1. The insurance companies should provide advanced computers with the accessories in all divisions.
2. Develop the user's skills for the data analysis systems and plant the culture of data analysis as an integrated part of the work requirements and making the transforms.
3. Recruit human resources experienced with knowledge management and data warehouse an OLAP with high skills in using software and hardware, and train them and keep them to invest better. They should be evaluated periodically as the main element of the efficiency and effectiveness of the companies, and because they help in the integration of the information technology and the different activities of the company.
4. The insurance companies should develop and update their data warehouses as they store huge amounts of information (historical data about the activities of the company).
5. Build data warehouses in the companies by specialized teams that include information about the various environmental variables especially clients, suppliers, and competitors.
6. Improve the special equipment attached to the data warehouses to be able to collect data and store it in an accessible way.
7. Store the information and data used in risk management in a special warehouse, and update them periodically and make them accessible for the related specialists. They should be reached quickly, to answer the questions and respond to inquiries about the procedures when needed and in the future risks.
8. The companies should pay attention to OLAP as a tool that provides an advanced data analysis structure and supports the decision-making process.
9. Develop departments and divisions specialized in business intelligence and link them to the higher management according to the hierarchy, and they should include individuals experienced in information technology, and design and execute work strategies in coordination with the risk management department and research and development department.

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