European Journal of Business and Innovation Research
Vol.3, No.4, pp.46-65, September 2015
Published by European Centre for Research Training and Development UK (www.eajournals.org)

DECISION SUPPORT SYSTEMS: CREATING VALUE FOR MARKETING DECISIONS IN THE PHARMACEUTICAL INDUSTRY

Muhammad Imran

Department of Management Sciences,
The Islamia University of Bahawalpur, Pakistan

Aiman Tanveer

Department of Management Sciences,
The Islamia University of Bahawalpur, Pakistan

ABSTRACT: *Purpose: The purpose of this study is to analyze the impact of decision support systems to creating value for marketing decisions in the pharmaceutical industry. Methodology: This paper was completed with the help of an extensive literature study on decision support/business intelligence and pharmaceutical industry marketing available on the databases and websites. Primary data has been used in this paper to check the impact of information technology market performance. The SPSS software package is used to analyze the employee responses and statistical technique. Regression analysis is used to check the impact of information technology on market performance. Findings: 150 questionnaires were being given to stakeholders in different pharmaceutical companies located in Pakistan. 104 were collected back and 96 questionnaires are considered valid and used are for analysis. After analyzing the data, we find that information technology has significant impact on market performance in pharmaceutical industry. According to the stakeholders, strategic planning, organizational support, knowledge management and technological advancement have significant impact on the success of information technology for decision support. Research limitations / Implications: More research will be required on the theory presented in this thesis "Decision Support Systems: Creating Value for Marketing Decisions in the Pharmaceutical Industry"*

KEYWORDS: Decision Support Systems, Business intelligence, Marketing Performance, Strategic Planning, Organizational Support, Knowledge Management, Technological Innovation, Qualitative and quantitative study.

INTRODUCTION

The beginning of 21st century has seen a strong increase of competition among the businesses. This is due to Globalization technology exploitation (Allen, 2010) and above all increased competition (Qayyum, Sharif, Ahmad, Khan, & Rehman, 2012; Kumpikaite & Sakalas, 2011). Now with innovation at different layers of hardware and software and especially intelligent technologies such as DSS, EIS, knowledge management, GIS, data mining, OLAP, data warehouse, CRM, marketing, visualization, business Intelligence Systems ,human capital management and distribution management system.

Business intelligence systems combine data gathering, data storage, and knowledge management with analytical tools to present complex internal and competitive information to planners and decision makers (Negash, S, 2004). Business intelligence is a broad category of

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. The common part of these two definitions is the collocation "make business decisions" (Airinei & Homocianu, 2009).

DSS supports decision maker to use very large databases, support managers to apply checklists and rules, make extensive usage of mathematical models (Power, 1997). The role of human capital has changed and used the DSS to make strategic decisions (Edvinsson and Malone, 1997). Companies have to become aware of new possibilities that have been produced by the maturation of information and communication technologies in the warehousing and sharing of data. Managers and decision makers needs relevant and topical information about their business and the business environment. Companies are forced to utilized business information more effectively than before and this is not possible without systematic information management. Information management consists of identifying what information is required, how it should be gathered, how it should be formed, where it should be stored, and who in the company should own admittance to it (Tiwana, 2002). The world convert into globalization and business have also gone across the boundaries and known as international business. Evidence of the competitive business environment, companies introduced DSS for better decision making.

Jain (2009) presents factors to marketing performance, *strategic planning*, *organizational support*, *knowledge management* and *technology innovation*. These factors are identifying as input factors towards marketing performance. DSS/BI is moderator variable which effect on the relationships between marketing performance and above mentions factors.

Strategic planning analyzes the competition, market dynamics and environmental shifts Jain (2009).

Organizational support has two dimensions. The first one is organization behavior and the second is organizational management. These two dimensions are separately subdivided into different factors. Organizational behavior divided into organizational culture, organizational commitment and organizational learning. Organizational management is divided into organizational structure, change management, conflict management, and organizational communication.

Knowledge management is a discipline that promotes an integrated approach to identifying capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers.(Duhon, 1998)

Technology innovation increases the competition between companies. Increase of advance technology improves the DSS/BI tools that can support user to make better and more competitive decisions. Technology plays a significant part in managing marketing decision takes accurately. To take market decision accurately, an organization needs to integrate the right technology (Chalmeta, 2006). Decision support systems support users in decision making and problem solving (Duan & Burrell, 1995). Market is place which represents the boundary between the market place and the company, and knowledge of current and emerging happening in market place (Jain, 2009).

This research is conducting about pharmaceutical companies which operates globally and investigate how these companies implement decision support systems in making the marketing

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

decisions. Pharmaceutical industry discovers, develop, and manufacture the drugs and medications for disease treatment.

The use of decision support systems and BI systems can support managers to facilitate strategic decisions. Pharmaceutical marketing face a high competition so a DSS/BI can provide with the advantages to make the better strategies and tactics against competitors. Business intelligence is a highly effective and productive tool for any organization to run the operations of marketing, sales and production (Adidam, Banerjee, & Shukla, 2012). BI is a tool that can scan the competitor's environment and provides the relevant information for making the strategic decisions and tactics against the competitors.

In this research relevant participations from pharmaceutical companies have been selected to answer a questionnaire and participate in qualitative interviews.

Objectives of Research

From the hypothesis for the research study theme shows the following objectives:

1) TO find the impact of decision support system/Business intelligence on the marketing performance.

The subjective of these research is.

- To find the impact knowledge management on the information system success.
- To explore the relation between organizational support and information system success.
- To find the impact of strategic planning on DSS/BI.
- TO find the impact of training on the DSS/BI.

RESEARCH METHODOLOGY

This research uses a factor analytical approach combined with modeling.

1) The first objective of reviewing and analyzing factors for DSS and marketing performance respectively is performed by literature review.
2) The second objective is being conducted to investigate the relationship between DSS/BI and market performance and also check the impact of DSS/BI on marketing decisions by questionnaire and interview..
3) The third objective is to investigate how DSS/BI can be use to provide input to marketing decision and assess the impact of DSS/BI on management decision making.

In this study we have used descriptive approach to investigate the impact of DSS/BI on market performance. . Descriptive research is generally used to explain existing confrontation and current situation. According to Vyhmeister (2009) descriptive research can be define with the help of four steps or it simply a process of four steps: first one is defining the objective, and then designing the approach, after that collecting data and writing the result. The last and most

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

important tools for this type of research are: observation, interview, questionnaire and case study. We use questionnaire and interview as a tool in our study.

The direct impact has not been investigated, means that we doesn't find directly the impact of independent variable on marketing performance but we use the other technique we first find the impact of independent variable on DSS/BI and after that its impact on marketing performance. Pharmaceutical companies which are 210 in Pakistan (approx) are chosen as population. Sampling unit are the international pharmaceutical companies. The questionnaires are distributed to those employees who have worked at least one year in pharmaceutical industry.

Interviews have been conducted with pharmaceutical companies. The chosen participants have a marketing role or are responsible for IT in the company. On the basis of frequency of responses then the results have been drawn for proving the study objectives and answering the research questions. Bar charts have been used to elaborate the trends of responses.

Research Methods Used

Descriptive and explanatory methods have adopted to approach the impact of DSS/BI on Market Performance role and to fulfill the other study objectives. Population was the total no of pharmaceutical companies of Pakistan. Survey sampling has been used to collect the relevant data and responses. The sampling techniques used were convenience sampling and referral sampling. Questionnaires were delivered in the various Companies by electronic mail. Sample size was taken by the help of previous researcher(Ahmed & Capretz, 2010) he also consider the pharmaceutical companies and take the same sample size by using the formula. The time considerations and availability of respondents was the major reason behind deciding on the sample size through intuition. SPSS (Statistical Package for Social Sciences) is being used to analyze the responses collected on the questionnaire.

Research Design

Keeping in view the details discussed in the methodology and research methods used sections; it becomes clear that the study being carried out is a combination of both qualitative and quantitative research means that we use both techniques in the form of questionnaire and interview.

Data Collection

For this study as questionnaire survey was used so the data for analysis is primary one. However, most part of the secondary data is being used in literature review section for developing the theoretical and conceptual frameworks.

Data collection is crucial for studies dealing with impacts. If the data collected is unreliable then it is of no use to the researchers. A structured questionnaire and interview questions are used to collect the responses from the targeted sample. So, questionnaire and interviews are the research instrument. Sample size was taken for the questionnaire 150 employees working in different a Pharmaceutical company which operates around the world. Total no of Pharmaceutical companies in the Pakistan are 210 but we take a random sample of only 15 of them and take 150 employees from these companies and also interview of 15 personnel of these companies. Out of 150 employees 104 responded to the questionnaire. So, 104 questionnaires were used for analysis.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Data Analysis & Interpretation

The conceptual model proposed that Strategic Planning OS, KM, IT are being the independent variable (IV), DSS/BI moderator variable and PM is the dependent variable. Hence, what we have to analyze and prove through the model is that DSS/BI on PM, and DSS/BI creating value for marketing decisions.

Ethical Considerations

In this study maintained the confidentiality of respondent. Asked no personnel questions from participant and if have any issue with participant so clear the issue. Personnel information such as name of employee or name of company was optional and is not used in any place of the article for considering the secrecy of respondents, we also doesn't ask personal or secrete information of the company which is not related to our study.

Limitations of the Study

Normally researches are made for the benefit of the concerned area of study and the community is also affected by it or get the benefit through it. But despite of all the efforts done, certain constraints are always there that limit the results of those efforts. The environmental, economic, legal bindings in some confidential cases, and the time & financial constraints are the most common hurdles that are faced by the researchers and study assistants. These restriction factors do not allow the smooth and desired completion of the study. Also these inhibit the achievement of the study objectives. So, keeping in view these constraints this study also has certain objective fulfilment as well as implicative limitations. Following are the major limitations of this study:

The study is carried out in a limited time frame, so the sample size and sampling unit could not be taken very large to ensure the reliability of results.

Due to the companies' confidentiality concerns, the research results of individual employees could not be approached directly. The information provided on part of the employees themselves. so we cannot fully say it that we measure the performance of the company but we only say it as we measure the perception of the people the marketing performance.

The result can be different if we can make the research on the other countries means that we were limited only in one country.

Research Questions

1. Does strategic planning support the market performance with the help of DSS/BI?
2. How does organizational support give the success of market with the used of DSS/BI?
3. What does role of knowledge management provide the market success with the used of DSS/BI?
4. How does information technology give the market performance under the DSS/BI used?

Before answering and interpreting these research questions, some of the demographics related to the respondents such as name, age, income, education were asked.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

LITERATURE REVIEW

For secondary data literature review was used which we gain data from previous researches. In it two type of variables independent variables (SP,OS,KM,TI) and dependent variables(DSS/BI, Marketing Performance) have described. In literature first we define these variables and after that we tell about its importance.

The Adoption of Decision Support/Business intelligence System by Business

Several previous studies in relation to data usage organizations have investigated the adoption of information technology (IT) in various situations in different types of organizations. Caldeira & Ward (2002) investigated the top management perspectives and attitudes towards IS/IT adoption and use play an important role in the development of internal IS/IT competencies and provide an important contribution to the development of a context that enables IS/IT success. In particular, Wöber & Gretzel (2000) investigated decision support applications relating to tourism managers' adoption of marketing decision support systems in the tourism industry, and found that the actual use of a decision support applications (e.g. dss, kms) has a positive perception of benefits and advantages. This implies that tourism organizations should focus on user support, especially more detailed information on system content and functionality. Hung et al. (2005) examined the factors in adopting a Knowledge Management system for the pharmaceutical industry in Taiwan, and found seven factors to be critical: a benchmarking strategy and knowledge structure; the organizational structure; information technology; employee involvement and training; the leadership and commitment of senior management; a learning environment and resource control; and evaluation of professional training and teamwork. Watson et al. (2006) investigated DSS/BI in terms of technology architecture and organizational processes of the airline industry in contemporary real-time business intelligence and found that applications that can leverage real-time DSS/BI by impacting business process to create value to an organization of decision support. It is implied that benefits for IS users had positive perceptions of DSS/BI. Mostly related to DSS/BI, Hwang et al. (2004) examined the various factors playing crucial roles in the adoption of a data warehouse in a banking industry. The results suggest that organizational dimension (top management support, effect of champion, internal needs, and size of organizations) and external characteristic (competitive pressure) affect the adoption of data warehouse technology. Factors investigated in several studies can be separated into four groups: 1) characteristics of IT; 2) characteristics of the organization; 3) characteristics of the environment; 4) characteristics of the individual.

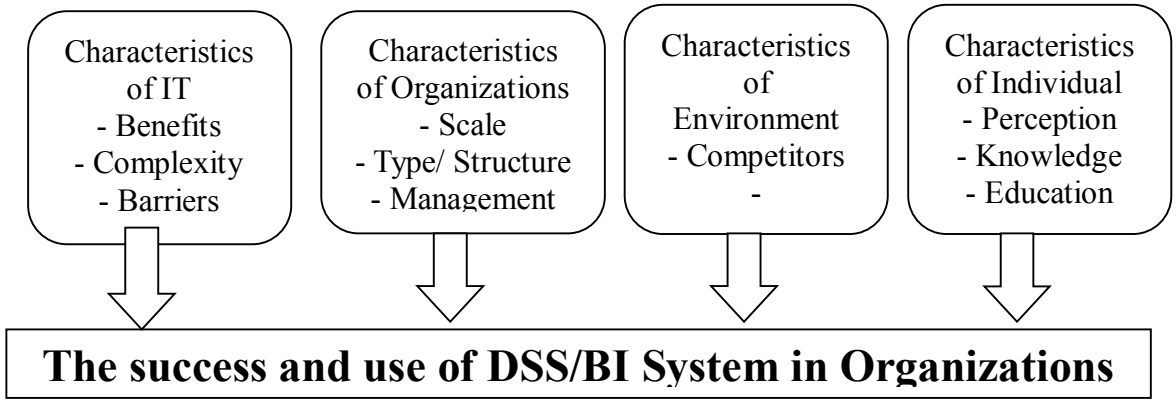

Figure (5) provides a summary of these factors affecting adoption of DSS/BI literature.
Sources: Adapted from Sen & Sinha (2008).

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Strategic Planning and decision support system

Strategic planning analyzes the competition, market dynamics and environmental shifts (Jain,2009). In the context of strategic planning; five organizational levels can be distinguished. They are: corporate level, strategic business unit (SBU) level, functional level, operational level and mixed levels (Li, Guohui, & Eppler, 2008). Higgins (2005) says that about four types of strategies: corporate, business, functional and process. Process strategies, the last type, normally cut across functions and are aimed at integrating organizational processes across the organization in order to make them more effective and more efficient. Companies with the same interests are now concentrating on the strategic planning with the aim of developing long-term programs and alterations in their organization and in turn to improve their competitiveness. Planning for strategies require top management involvement taking into account both external and internal factors to an arrangement. Strategic planning of DSS/BI should support the long-term objectives and goals of marketing performance both in terms of flexibility and responsiveness to shifting marketplace demands (Gunasekaran & Ngai, 2004). Fletcher and Wright (1996) report a study into the relationship between strategic use of business intelligence in financial service systems and the strategic context within which such function is established. Strategic planning involves decisions that move the long-term functioning of an establishment. Since the market characteristics have changed, it would be hard to live in a global market without business intelligence. DSS/BI help to improve collaboration supported work using different automation that includes computer-aided design/computer assisted manufacturing computer automatic designing/computer automatic manufacturing (Gunasekaran & Ngai, 2004).These days, while implementing a business intelligence system is an advanced step for any organizations wanted to be lived in the market competition, there is nevertheless a high need to strategically plan for gathering accurate information about competitors, analyze it, share it using innovative tools, and accessed by managers who are professional enough to attain the correct decisions at the correct time (Karim, 2011).

The four phases of the Deming cycle are known as the plan, do, check, and act stages. In stage one would identify the system characteristics to be improved, possible methods for improvement, and measurement instruments and acceptance criteria for testing success. Do, this is a second stage of Deming cycle which consist performing the experiment or implementing changes for the purpose of measuring the effects of the change on the quality of the system which you implement. Check in this stage measuring the results of the experiment and determining whether the resulting changes in quality were sufficient to justify large scale implementation of the change. The most common problem in this phase is obtaining inconclusive results. Act in this stage consists of the large-scale compress of the change or the decision to maintain status-quo and try other experiments. (Jalkio & Weimerskirch, 2008).

Organizational support and decision support system

Organizational support having two dimensions one is organization behavior and second is organizational management (Turakaman, Mohammad Reza Najaf; Ebrahim moradi, Dhaifiallah Obaid almutairi). These two dimensions are subdivided into seven organizational factors. The organizational behavior dimension includes the factors of organizational culture, organizational commitment, and organizational learning. On the other hand, organizational management focuses on such issues as organizational structure, change management, conflict management, and organizational communication. Organizational support focuses on to reduce the cost, improvements in product quality and a decrease in product development time (Ahmed

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

& Capretz, 2010). Top management can demonstrate its support could be by providing the necessary resources and leadership, by setting goals and policies for DSS and showing interest by participating in DSS design and development. Internal support including the availability of experienced DSS staff, training opportunities and a network of supportive colleagues. Due to insufficient internal technical expertise, especially in developing countries, the availability and quality of external support may be an important determinant of DSS effectiveness in strategic decision making (Elbeltagi, McBride, & Hardaker).

Top management support has been identified as a key predictor in the adoption and implementation of IT (Fink 1998). Several previous studies have shown that top management support is a significant predictor of technology adoption and leads to more successful IT use in many organizations (Caldeira & Ward 2002). It is important to create a supportive climate and adequate resources for the adoption of new technology (Premkumar & Roberts 1999). Top management would be able to identify business opportunities for the exploitation of IT and their active involvement and support would provide appropriate strategic vision and direction for the adoption of new innovations (Thong & Yap 1995). The size of business increases, so will the likelihood of information technology being present within the organization (ABS 2000). A study by Gibson & Arnott (2003) reports that business scale is as one of the factors that have an effect on the adoption of DSS/BI in small businesses. It has been considered to be an adoption factor facilitator (Damanpour 1992) and has been used in IT adoption since researchers believe larger firms tends to have abundant resources, be more capable of bearing risks, and possess more power to urge trading partners to adopt IT (Zhu, Xu & Dedrick 2003). Top management should encourage the empowered implementation team to reduce across the operational barriers and provide with necessary technical and fiscal documentation to DSS/BI system (Gunasekaran & Ngai, 2004).Senior management support the project managers and project stakeholders' familiarity with information technology in organization's criteria for procedure integration (Shahraki, Shahraki, & Dejkam, 2013).

Knowledge Management and Decision support system

Knowledge management is a justified personal belief that increases an individual's capacity to take effective action. Action in this context requires physical skills and competencies. The ability to integrate and apply specialized knowledge of organizational members is fundamental to a firm's ability to create and sustain competitive advantage (Alavi & Leidner, 1999). Absorptive capacity is the ability of key organizational members to utilize available or pre-existing knowledge (Griffith, Redding & Reenen 2003). It facilitates a sort of reaction process of the knowledge with their mind (Alavi & Leidner 2001). This absorptive capacity of organizations indicates an ability to recognize the value of external and internal information, and to assimilate and apply it effectively to realize economic benefits. Sambamurthy & Zmud (1999) have suggested a need to be critical to organizations' innovativeness. Applied to the IT area, organization's absorptive capacity reflects the capacity to absorb information relating to appropriate IT innovations through employees' individual knowledge repositories, cognitive structures, and processes for supporting operational or strategic activities, and to enhance firm performance (Boynton, Zmud & Jacobs 1994). Knowledge management is concerned with knowing and managing all of organization intellectual assets to fulfill its business aims. Organizations are redesigning their internal construction and their external relationships, creating knowledge networks to facilitate improved communication of data, information, and knowledge, while improving coordination, decision making, and planning (Warkentin et al., 2001). Managers are starting to leverage their information system assets to react to market

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

needs more efficiently. Knowledge management has become one of the strategic uses of DSS/BI system in today's business environments. Many companies are considering building a KM system for organizational learning. There are different ways to manage the knowledge. These include strategic alignment with partnering firms, collaboration with local universities and training and education in IT. Knowledge about the market place and customer expectations can be acquired with web-based data organizations. This opens up the whole world of information. However, it is unlikely that companies can let their employees to spend unlimited amount of time in searching through voluminous information. Consequently, information mining and data storage techniques will serve to improve the velocity of information processing and hence make available the right information for getting timely and more accurate decisions (Gunasekaran & Ngai, 2004). The main aspects of knowledge management include knowledge, instruction, knowledge generation, knowledge diffusion, and response to knowledge (Sin et al., 2005). Knowledge about key customers are essential for customer relationship management (Stefanou et al., 2003) and can also be utilized to build up training programs about how to effectively reach customers (Zahay& Griffin, 2004). The need for clarification of information and the organizational processes that ensue in the data processing (Shahraki, Shahraki, & Dejkam, 2013). Users of DSS must have a detailed knowledge of the task environments, and they need other information sources to help them notice environmental changes and to generate reasonable scenarios. They must see both the possibilities and restrictions of the modeling format, and they must compare model assumptions and outcomes with empirical information to determine whether the theoretical account is a valid representation of their task environments (Fuglseth & Grønhaug, 2003). Knowledge management is enhancing the dynamic capabilities (Peter & Lee, 2004).

Technological innovation and decision support system

Technological advancement is increased the competition between companies, so advance technology improved the DSS/BI process as well and make the decision better than older user of technology. Technology plays a significant part in managing marketing decision takes accurately. To take market decision accurately, organization must integrate the right technology (Chalmeta, 2006). Rogers (1983) found that relative advantage or perceived benefits had a positive relationship to the adoption of technology. Wixom & Watson (2001) indicates that DSS/BI can offer several benefits to an organization that include enabling effective decision support and business applications (e.g. CRM, SCM), facilitating data analytics, ensuring data integrity, accuracy, security, and availability; easing the setting and enforcing of standards, facilitating data sharing, and delivering the right information to the right person during the right time. Positive perception of benefits of IS organizations should provide an incentive for the pharmaceutical companies to develop the use of their DSS/BI. Therefore, it is expected that DSS/BI's perceived benefit is positively related to adoption of DSS/BI (Chaveesuk, 2010). Complexity is defined as the degree to which an innovation is perceived as relatively difficult to understand and use (Rogers 1983). Complexity of an innovation can function as an inhibitor to adoption and further diffusion of the innovation as the organization may not be able to integrate it with the rest of its procedures. The complexity of the technology (e.g. DSS/BI) also creates greater uncertainty for successful implementation and therefore increases the risk of the adoption process. The innovation is compatible with existing work practices, environments, and the firm's objectives; the firm will be more likely to adopt it. It is expected that the greater the perceived compatibility of the DSS/BI with an organization's beliefs, values, and IT infrastructure, the more likely it will be adopted by the pharmaceutical organizations (Chaveesuk, 2010).

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Market performance and DSS/BI

Firm performance and level of DSS/BI activities historically, analysts and researchers agree that better DSS/BI will improve firm's overall performance in the marketplace (Glueck and Jauch, 1994). Several prior studies have identified a positive relationship between DSS/BI and firm performance (Daft et al., 1988; Gordon, 1989; Teo and Choo, 2001). In their study of 85 US firms, Subramanian and Ishak (1998) found that firms having advanced systems to monitor market trends exhibited great profitability. The positive relationship between DSS/BI and firm performance is empirically tested in the Western developed markets context (Chaveesuk, 2010). However, Tao and Prescott (2000) suggest the need for testing the link in emerging markets due to the high level of uncertainty involved and differing cultural contexts.

Conceptual Model

We have many factors that affect the DSS/BI and marketing performance of the organization but we select only a few of them for conceptual model or for using this study. Such as we have environmental factor, organizational commitment, organizational support KM, Technology, organization culture and many other factors were available out of which we select only four independent variable.

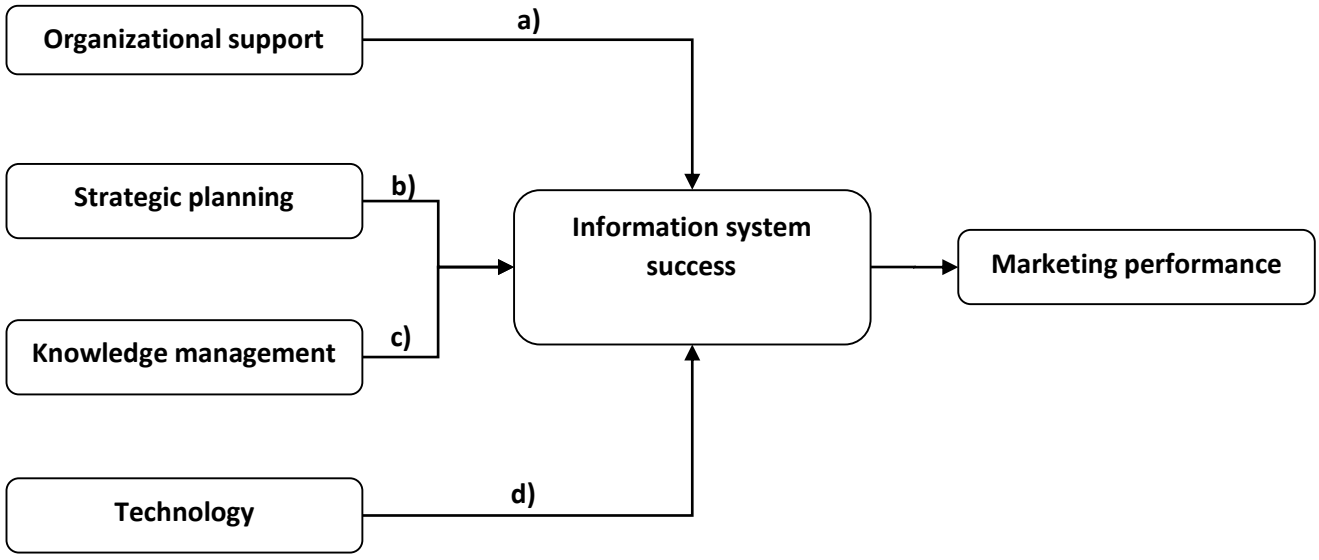

Figure 6: Model based on four variables:

1) Strategic Planning and decision support system. 2) Organizational support and decision support system. 3) Knowledge Management and Decision support system. 4) Technology and Decision support system:

In our conceptual model first four factors OS, KM, T, SP are used as a independent variable and on the other hand information system is used as a dependent variable. Our conceptual model also shows another relationship in this relationship we showed Information system success as an independent variable and the marketing performance is dependent variable. Means that we want to check out the impact of information system success on the marketing performance.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Hypothesis

H1: There is significant relationship between Strategic planning and DSS/BI

H2:.There is significant relationship between Organizational support and DSS/BI

H3: There is significant relationship between Knowledge management and DSS/BI

H4: There is significant relationship between Technology and DSS/BI

H5: There is significant relationship between DSS/BI and Market Performance are to mention here so that the trends in responses can be elaborated.

RESULTS AND DISCUSSION

150 questionnaires were being given in different pharmaceutical companies. 104 were collected back and 96 questionnaires are considered valid and used are for analysis. Results from SPSS test are analyzed with hypothesis and are compared with research questions

Reliability Check and Demographical Analysis

The ***Chronbach's Alpha*** for the instrument (questionnaire) was calculated to be ***.912*** on all 34 items. 91.2 % reliability is being resulted. This shows that the instrument was reliable enough for analysis. The reliability statistics for the instrument were as under:

Reliability Statistics	
Chronbach's Alpha	**No. of Items**
0.912	**34**

Frequency tables & Charts for Gender

Gender of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	47	49.0	49.0	49.0
	Female	39	40.6	40.6	89.6
	3	5	5.2	5.2	94.8
	5	5	5.2	5.2	100.0
	Total	96	100.0	100.0	

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Correlation

	S.planning	O.support	K.Management	T.Inovation	DSS/BI	M.Performance
S.planning	1	.980**	.954**	.959**	.963**	.954**
O.support	.980**	1	.946**	.987**	.967**	.985**
K.Management	.954**	.946**	1	.952**	.969**	.953**
T.Inovation	.963**	.967**	.969**	.955**	1	.945**
DSS/BI	.963**	.967**	.969**	.955**	1	.945**
M.Performance	.954**	.985**	.953**	.987**	.945**	1

Correlation Table

We use Pearson Correlation for finding the relation between the variables.All the variables are significant so we does not shows their significant value because it was less then .05 of all the variables.The result of the correlation shows the strong positive relation between all the variables.The most strong relation here is between DSS/BI and T.innovation with a correlation value of .987, and after that other variables also have strong positive relation.Table also shows that all the variables are positively correlated with each other.

Research Questions

Research Question#1

Has the strategic planning impact on information system (DSS/BI) success?

	Coefficient (B)	Standard Error	T-Ratio	P value	Adjusted R Square
Constant Value	-.213	.056	-3.812	.000	.927
Technological innovation	1.026	.029	34.871	.000	

Independent Variable=Strategic planning , Dependent variable= DSS/BI

Above table shows there is a significance relationship between strategic planning and DSS/BI system. P value shows that Relationship is highly strong between these two variables. Coefficient value indicate that one unit increase in strategic planning, it will increase 1.026 points of DSS/BI system. Its adjusted R Square value is 0.927 which indicates that a 92.7 percent change comes in Decision support system /Business intelligence of the organization.

Hypothesis:

Ho (a): There is no significant relationship between Strategic planning and DSS/BI

H1 (a): There is significant relationship between Strategic planning and DSS/BI

Regarding above analysis accept the H1

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Research Question # 2

Has the organizational support impact on information system (DSS/BI) succession?

	Coefficient (B)	Standard Error	T-Ratio	P value	Adjusted R Square
Constant Value	.357	.038	9.310	.000	.934
Technological innovation	.706	.019	36.691	.000	

Independent Variable= Organizational support , Dependent variable=DSS/BI

Above table shows there is a significance relationship between organizational support and DSS/BI system. P value shows that Relationship is highly strong between these two variables. Coefficient value indicate that one unit increase in organizational support, it will increase .706 points of DSS/BI system. Its adjusted R Square value is 0.934 which indicates that a 93.4 percent change comes in Decision support system /Business intelligence of the organization.

Hypothesis:

Ho (b): There is no significant relationship between Organizational support and DSS/BI

H1 (b):.There is significant relationship between Organizational support and DSS/BI

Regarding above analysis accept the H1 (B).

Research Question # 3

Has the knowledge management impact on information system (DSS/BI) success?

	Coefficient (B)	Standard Error	T-Ratio	P value	Adjusted R Square
Constant Value	.291	.039	7.544	.000	.939
Technological innovation	.684	.018	38.154	.000	

Independent Variable= Knowledge management , Dependent variable= DSS/BI

Above table shows there is a significance relationship between Knowledge management and DSS/BI system. P value shows that Relationship is highly strong between these two variables. Coefficient value indicate that one unit increase in Knowledge management, it will increase .684 points of DSS/BI system. Its adjusted R Square value is 0.939 which indicates that a 93.9 percent change comes in Decision support system /Business intelligence of the organization.

Hypothesis:

Ho(c): There is no significant relationship between Knowledge management and DSS/BI

H1(c): There is significant relationship between Knowledge management and DSS/BI

Regarding above analysis accept the H1 (C).

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Research Question # 4

Has the technological advancement impact on information system success?

	Coefficient (B)	Standard Error	T-Ratio	P value	Adjusted R Square
Constant Value	.305	.047	6.508	.000	.910
Technological innovation	.810	.026	31.034	.000	

Independent Variable= Technological innovation , Dependent Variable=DSS/BI

Above table shows there is a significance relationship between Technological innovation and DSS/BI system. P value shows that Relationship is highly strong between these two variables. Coefficient value indicate that one unit increase in technological innovation, it will increase .810 points of DSS/BI system. Its adjusted R Square value is 0.910 which indicates that a 91 percent change comes in Decision support system /Business intelligence of the organization.

Hypothesis:

Ho (d): There is no significant relationship between Technology advancement and DSS/BI

H1 (d): There is significant relationship between Technology advancement and DSS/BI

Regarding above analysis accept the H1 (d).

Research Question#5

Has the information system (DSS/BI) increased or decreased the market performance?

	Coefficient (B)	Standard Error	T-Ratio	P value	Adjusted R Square
Constant Value	-.556	.086	-6.434	.000	.893
Technological innovation	1.388	.049	28.151	.000	

Independent Variable= Information system (DSS/BI)

Dependent variable= Marketing performance

Above table shows there is a significance relationship between Information system (DSS/BI) and market performance. P value shows that Relationship is highly strong between these two variables. Coefficient value indicate that one unit increase in Information system (DsSS/BI), it will increase 1.388 points in marketing performance. Its adjusted R Square value is 0.893 which indicates that impact of information system on the marketing performance is 89.3% means that according to respondents perception 89.3% changes in marketing performance are occurred due to DSS/BI and the remaining may be due to any other factors.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Hypothesis:

Ho (e): There is no significant relationship between DSS/BI and Market Performance

H1 (e): There is significant relationship between DSS/BI and Market Performance

Regarding above result accepts the H1 (e).

Qualitative interview

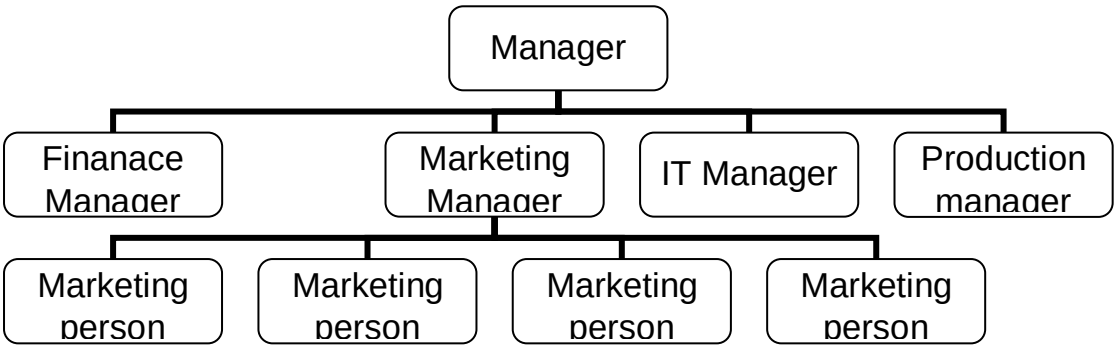

Figure 4. Functional decomposition

Functional decompositions of companies in developing countries are approaching from top management to employer. Owner of the company rely on his general manager to make decision in order to get better performances. Mangers of all departments work under general manager and provide him relevant information for effective decision making. Managers follow the instructions from general manager to make the decisions and policies for company's interest. Marketing people get the information about marketing policies for implementations.

After considering this information we make interview of top management of the companies. For interview purpose we select 15 different companies and then take interview of the 15 different managers of these companies we take interview from regional managers, product manager or national sale manager of the companies.

Telephone interviews are being conducted with different departments of pharmaceutical companies. People from marketing and IT departments were selected for qualitative interviews.

Interviews with IT Department

Different pharmaceutical companies are using different modules of Decision Support Systems (DSS) i.e. Supply Chain Management (SCM), Human Capital Management (HCM), Distribution Management System (DMS-01). Strategic planning, organizational support, knowledge management and technological advancement have impact or any influence with DSS/BI system implementation or success of DSS/BI system in organization. So regarding interview from IT department employees says that without strategic planning, organizational support, employee knowledge and new technology DSS is not helpful for any organization specially to take strategic decisions in different fields of the corporation. Pharmaceutical companies believe that the referred information provided by Decision Support Systems (DSS) under the facts of strategic planning, organizational support, knowledge management and technological advancement is praiseworthy for any organization to obtain material benefits and provide environment for accurate decision making for adding value in the growth of an

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

organization and it is also helpful to compete with competitors in sales and marketing departments.

In future business intelligence is a highly effective and productive tools for any organization to run the operations (marketing, sales and production).With the help of business intelligence (BI), new products can be developed for new therapeutic areas and it is very helpful in making right decision for right product. Business Intelligence (BI) does not play any role in pricing, because pricing is controlled by Drug Regulatory Authority of Pakistan (DRAP).

DRAP is an autonomous body under the administrative control of the Federal Government with its headquarters at Islamabad.DRAP is an Authority that is composed of a Chief Executive Officer and thirteen Directors, and a Policy Board that oversees the working of DRAP and gives Policy Guidelines. Presently DRAP is attached to the Ministry of National Regulations and Services.

Interviews with Marketing Department

The major crucial aspect of data is precision and completeness. It gives you accurate information to take decision. Paper based system is used to transfer information in marketing department which causes such problems:

- Information Loss
- Inaccessible information
- Incomplete and outdated information
- Geographical problems
- Hard to achieve targets
- Monopoly of multinational companies
- Late night meetings with doctors to introduce product

Marketing employees in pharmaceutical industry believe that Information System (IS) is very helpful to compete with competitors in sales and marketing. Marketing staff have theoretical knowledge about DSS/BI but need to have practical access with information system.

CONCLUSION AND RECOMMENDATIONS:

The study shows that information system (DSS/BI) influenced by marketing performance. Basically, four main variables strategic planning, organizational support, knowledge management and technological innovation are taken as independent variables to check the information system (DSS/BI) succession. In first stage, strategic planning, organizational support, knowledge management and technological innovation are taken as independent variables and information system succession is taken as dependent variable. It has been observed that strategic planning; organizational support, knowledge management and technological innovation have significant impact on information system succession. In second stage information system (DSS/BI) is taken as an independent variable and market performance

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

is taken as dependent variable. It has been observed that information system has significant impact on market performance. In other words, information system (DSS/BI) provides the precise and accurate information for market decision making. For finding this result we use descriptive research method means that questionnaire and interview and both the method shows the same result. Our result shows that our independent variables have significant impact on the dependent variable and all of our hypotheses are accepted. Means that for increasing marketing performance of the organization the companies should improve its Decision support system and business intelligence. It is recommended that KM, OS, T and OS have a significant impact on the DSS/BI. For increasing marketing performance we recommend the managers to improve its DSS/BI. The other researcher can also make the same research by using different variables such as organization culture, organizational commitment etc.

REFERENCES

Allen, M. (2010). Corporate universities 2010: globalization and greater sophistication. The Journal of International Management Studies, 5(1), 48-50.

Adidam, P. T., Banerjee, M., & Shukla, P. (2012). Competitive intelligence and firm's performance in emerging markets: an exploratory study in India. Journal of Business & Industrial Marketing , 27 (3), 242–254.

Akçura, M. T., & Ozdemir, Z. D. (2014). Drug prescription behavior and decision support systems. Decision Support Systems , 395-405.

Ang, C.L., Davies, M., Finlay, P.N., 2000. Measures to assess the impact of information technology on quality management. International Journal of Quality & Reliability Management 17 (1), 42–65.

Attaran, M., 2001. The coming age of online procurement. Industrial Management & Data Systems 101 (1), 177–180.

Ahmed, F., & Capretz, L. F. (2010). An organizational maturity model of software product line engineering. Software Qual J , 18, 195-225.

Airinei, D., & Homocianu, D. (2009). Dss vs. Business Intelligence. Revista Economic .

Blomqvist, E. (2012). The Use of Semantic Web Technologies for Decision Support - A Survey. IOS Press , 1-24.

Badr, A. & Madden, E. (2006). The New Business intelligence in the development and implementation of strategy in the Pharmaceutical Industry.Presentation at SCIP,s 2006 international Annual conference Exhibition. Orlando, Florida, April 26-29.

Chalmeta, R. (2006). Methodology for customer relationship management. The Journal of Systems and Software, 79, 1015–1024.

Cheng, E.W.L., Li, H., Love, P.E.D., Irani, Z., 2001. An ebusiness model to support supply chain activities in construction. Logistics Information Management 14 (1/2), 68–77.

Chaveesuk, S. (2010). The Determinants of the Adoption and Application of Business Intelligence: An ERP Perspective. School of Management and Information Systems .

Duan, Y., & Burrell, P. (1995). A hybrid system for strategic marketing planning. Marketing intelligence & planning , 13 (11), 5-12.

Davenport, TH & Beck, JC 2001, The attention economy: understanding the new currency of business, Harvard Business School Press, Boston, M.A.

Davis, J. G., & Sundaram, D. (1995). PETAPS • A prototype decision support system for consumer product marketing and promotion. European Journal of Operational Research , 247-256.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

D.J.Power, A Brief History Of Decision Support Systems,see version 4.1 in spanish translated by Maria Ramos and 2.8

Duhon, Bryant (1998), It's All in our Heads. Inform, September, 12 (8).

Druzdzel, M. J., & Flynn, R. R. (2002). Decision Support Systems. Encyclopedia of Library and Information Science, .

Dulcica, Z., Pavlicb, D., & Silicc, I. (2012). Evaluating the intended use of Decision Support System (DSS) by applying Technology Acceptance Model (TAM) in business organizations in Croatia. Procedia - Social and Behavioral Sciences , 1565 – 1575.

Dous, M., Kolbe, L., Salomann, H., & Brenner, W. (2005). KM capabilities in CRM: Making knowledge for, from and about customers work. In Proceedings of the eleventh Americas conference on information systems Omaha, NE, USA, 167–178.

Edvinsson, L. & Malone,M.S. (1997). Intellectual Capital : Realizing your company,s True value by Finding its Hidden Brainpower: Harper Business, New York.

EFPIA. (2013). The Pharmaceutical Industry in Figures. Brussels: European Federation of Pharmaceutica Industries and Association.

Elbashir, M. Z., Collier, P. A., & Davern, M. J. (2008). Measuring the effects of business intelligence systems: The relationship between business process and organizational performance. International Journal of Accounting Information Systems , 135–153.

Fink, D 1998, 'Guidelines for successful adoption of information technology in small and medium enterprises', International Journal of Information Management, 18, 4, 243-53.

Fleisher, C.S. & Blenk horn, D.L. (2005). Management of Global competitive intelligence, 271-284.

Fuglseth, A. M., & Grønhaug, K. (2003). Can computerised market models improve strategic decision-making? An exploratory study. Journal of Socio-Economics , 32, 503–520.

Fletcher, K., Wright, G., 1996. The strategic context for information systems use: An empirical study of the financial services industry. International Journal of Information Management 16 (2), 119–131.

Forbes. (2013). Global 2000: World's Biggest Drug Companies 2013. Retrieved Janaury 20, 2014, from http://www.forbes.com/pictures/mkg45klhm/pfizer.

Ganesh, U., Miree, C.E., & Prescott,J.E. (2003). Competitive intelligence field research: Moving the field forwarded by setting a Research Agenda. Journal of competitive intelligence and management,1(1), 1-12.

Ghazanfari, M., Jafari, M., & Rouhani, S. (2011). A tool to evaluate the business intelligence of enterprise systems. Scientia Iranica , 18 (6), 1579–1590.

Gunasekaran, A., & Ngai, E. (2004). Information systems in supply chain integration and management. European Journal of Operational Research , 159, 269-295.

Hawking, P, Foster, S & Stein, A 2008, 'The adoption and use of business intelligence solutions in Australia', International Journal of Intelligent Systems Technologies and Application, 4, 3-4, 327-40.

Hou, C.-K. (2012). Examining the effect of user satisfaction on system usage and individual performance with business intelligence systems: An empirical study of Taiwan's electronics industry. International Journal of Information Management , 32, 560–573.

Henderson, J.C., Venkataraman, N., 1993. Strategic alignment: Leveraging information technology for transforming organizations. IBM Systems Journal 32 (1), 4–16.

Hicks, D., 1997. The managers_ guide to supply chain and logistics problem-solving tools and techniques. IIE Solutions 29 (10), 24–29.

Isik, O., Jones, M. C., & Sidorova, A. (2013). Business intelligence success: The roles of BI capabilities and decision environments. Information & Management , 50, 13-23.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Janakiraman, V., & Sarukesi, K. (2008). Decision Support System. Delhi: Prentice-Hall of India.

Karim, A. J. (2011). The value of Competitive Business Intelligence System (CBIS) to Stimulate Competitiveness in Global Market. International Journal of Business and Social Science , 2 (19).

Jain, S. C. (n.d.). Marketing Planning & Strategy. South-Western college Publishing .

Khan, A. S., & Anwar, F. (2012). An Exploratory study of Appraisal Techniques from Pakistan Telecommunication Company Limited (PTCL). Arabian Journal of Business and Management Review , 1, (7).

Kumpikaite, V., & Sakalas, A. (2011). The model of human resource development system's evaluation. International Conference on E-business, Management and Economics, 46-50. Singapore: IACSIT Press.

Karim, A. J. (2011). The value of Competitive Business Intelligence System (CBIS) to Stimulate Competitiveness in Global Market. International Journal of Business and Social Science , 2 (19).

Miller,J.P. (2000). The intelligence process-What it is, Its benefits, and current status, 9-30.

Moller, C 2005, 'ERP II: a conceptual framework for next-generation enterprise systems?' Journal of Enterprise Information Management, 18, 4,483-97.

M.C.ER. (1988). Decision support system: A summary problems and future trends. Decision support systems , 4, 355-363.

Mariadoss, B. J., Milewicz, C., Lee, S., & Sahaym, A. (2014). Salesperson competitive intelligence and performance: The role of product knowledge and sales force automation usage. Industrial Marketing Management , 136-145.

Motwani, J., Madan, M., Gunasekaran, A., 2000. Information technology in managing supply chains. Logistics Information Management 13 (5), 320–327.

Negash,S. (2004). Business Intelligence. Communications of the Association for Information Systems. 13, 177-195.

Neelankavil, J. P. (2007). International business research (1st Edition ed.). New York: M.E Sharp Inc.

Niu, L., Lu, J., Zhang, G., & Wu, D. (2013). FACETS:Acognitive business intelligence system. Information Systems , 38, 835-862.

Nofal, M. I., & Yusof, Z. M. (2013). Integration of Business Intelligence and Enterprise Resource Planning within Organizations. Procedia Technology , 11, 658 – 665.

Noe, R. A. (2008). Employee training & development. New York: MacGraw-Hill, Inc.

Porter, M. E. (1996, november–december). What Is Strategy? Harvard Business Review .

Peter, J., & Lee, V. C. (2004). Information technology as a facilitator for enhancing dynamic capabilities through knowledge management. Information & Management , 41 (8), 933-945.

Petrini, M. and Pozzebon, M. (2008). ''What role is business intelligence playing in developing countries? A picture of Brazilian companies'', In Data Mining Applications for Empowering Knowledge Societies, 237–257.

Popovič, A., Hackney, R., Coelho, P. S., & Jaklič, J. (2012). Towards business intelligence systems success: Effects of maturity and culture on analytical decision making. Decision Support Systems , 54, 729–739.

Perry, M., Sohal, A.S., 2000. Quick response practices and technologies in developing supply chains. International Journal of Physical Distribution Management and Logistics 30 (7), 627–639.

Prescott, J.E. (2001). Introduction: Competitive intellegence-Lesson from the trenshes, 1-20.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Qayyum, A., Sharif, M. T., Ahmad, A., Khan, M. S., & Rehman, K. -u. (2012). Training & development practices in National Bank of Pakistan. Information Management and Business Review , 8-17.

Rajasekar, S., Philominathan, P., & Chinnathambi, V. (2006, January 25). Research Methodology. Retrieved January 20, 2014, from http://arxiv.org/pdf/physics/0601009.pdf

Ramakrishnan, T., Jones, M. C., & Sidorova, A. (2012). Factors influencing business intelligence (BI) data collection strategies: An empirical investigation. Decision Support Systems , 52, 486–496.

Rogerson, S., Fidler, C., 1994. Strategic information systems planning: Its adoption and use. Information Management & Computer Security 2 (1), 12–17.

Rubin, E., & Rubin, A. (2013). The impact of Business Intelligence systems on stock return volatility. Information & Management , 50, 67–75.

Shahraki, A. R., Shahraki, M. R., & Dejkam, R. (2013). Evaluation the Effect of Implementing Business Intelligence on Customer Relationship Management Success. International Journal of Advanced Studies in Humanities and Social Science , 1 (9), 1346-1358.

Sitra(1998). The Finnish National Fund for researchana development.

Salmeron, J. L., Luna, P., & Martinez, F. J. (2001). Executive information systems in major companies: Spanish case study. Computer Standards & Interfaces , 23, 195-207.

Sharma, S., Gupta, J.N.D., 2002. Application service providers: Issues and challenges. Logistics Information Management 15 (3), 160–169.

Sin, L. Y., Tse, A. C., & Yim, F. H. (2005). CRM: conceptualization and scale development. European Journal of Marketing, 39(11/12), 1264-1290.

Stefanou, C., Sarmaniotis, C. and Stafyla, A. (2003), "CRM and customer-centric knowledge management: an empirical research", Business Process Management Journal, 9 (5), 617-34.

Scheps, S. (2013). Business Intelligence Defined. In Business Intelligence For Dummies (pp. 11-12). Hoboken, NJ: Wiley Publishing, Inc.

Tiwana, A.(2002). The knowledge management toolkit: 2nd Edition. Prentice Hall, upper saddle river, NJ.

Tutuneaa, M. F., & Rusa, R. V. (2012). Business intelligance solution in SME,s. Procedia Economics and Finance , 3, 865 – 870.

Warkentin, M., Bapna, R., Sugumaran, V., 2000. The role of mass customization in enhancing supply chain relationship in B2C e-commerce markets. Journal of Electronic Commerce Research 1 (2), 1–17.

Warkentin, M., Sugumaran, V., Bapna, R., 2001. E-knowledge networks for inter-organizational collaborative e-business. Logistics Information Management 14 (1/2), 149–162.

Xu, M., & Walton, j. (2005). Gaining customer knowledge through analytical CRM. Industrial Management Data Systems, 105(7), 955-972.

Turakaman, Mohammad Reza Najaf; Ebrahim moradi, Dhaifiallah Obaid almutairi. project managers ethical behaviour within modern organizations. *Aferican journal of business management , 5*, 29.

Yamaya, E., Wendy, C., Seltsikas, P., 2002. Delivering enterprise resource planning systems through application service providers. Logistics Information Management 15 (3), 192–203.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)