



The Impact of Business Intelligence and Decision

Support on the Quality of Decision Making

An Empirical Study on Five Stars Hotels in Amman Capital

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Authorization

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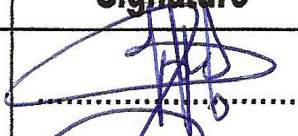
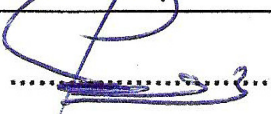
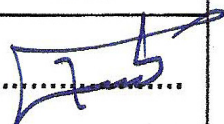
DISCUSSION COMMITTEE DECISION

This dissertation was discussed under title:

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I would like to extend my special thanks to my husband, without whose encouragement and support; I wouldn't have been here completing my degree's final requirements.

Sincerely Yours,

Hadeel A. Mohammad

Dedication

To

My father and mother soul

My husband and sons

And to all my family members

Sincerely Yours,

Hadeel A. Mohammad

Table of Contents

Subject	Page
Authorization	II
Discussion Committee Decision	III
Acknowledgement	IV
Dedication	V
Table of Contents	VI
List of Tables	VIII
Appendices	X
Abstract	XI
Chapter One General Framework	1
(1-1): Introduction	2
(1-2): Study Problem and Questions	4
(1-3): Significance of the Study	6
(1-4): Objectives of the Study	7
(1-5): Study Model and Hypotheses	8
(1-6): Study Limitations	10
(1-7): Study Delimitations	10
(1-8): Terminologies	11
Chapter Two Theoretical Framework and Previous Studies	13
(2-1): Introduction	14
(2-2): Business Intelligence	15
(2-3): Decision Support System	22
(2-4): Quality of Decision Making	29
(2-5): Previous Studies	35
(2-6): Study contribution to Knowledge	48

Table of Contents

Subject	Page
Chapter Three Method and Procedures	49
(3-1): Introduction	50
(3-2): Study Methodology	50
(3-3): Study Population and Sample	51
(3-4): Demographic Variables to Study Sample	52
(3-5): Study Tools and Data Collection	53
(3-6): Statistical Treatment	55
(3-7): Validity and Reliability	56
Chapter Four Analysis of Results & Hypotheses Tests	58
(4-1): Introduction	59
(4-2): Descriptive analysis of study variables	59
(4-3): Study Hypotheses Tests	66
Chapter Five Results, Conclusions and Recommendations	79
(5-1): Results	80
(5-2): Conclusions	82
(5-3): Recommendations	84
References	85
Appendices	99

List of Tables

No.	Subject	Page
(2 – 1)	Business Intelligence Definitions	17
(3 – 1)	The population of the study (Five Stars Hotels in Amman capital)	51
(3 – 2)	Descriptive sample of the demographic variables of the study	52
(3 – 3)	Reliability of Questionnaire Dimensions	57
(4 – 1)	Arithmetic mean, SD, item importance and importance level of Business Intelligence	60
(4 – 2)	Arithmetic mean, SD, item importance and importance level of Information Quality	62
(4 – 3)	Arithmetic mean, SD, item importance and importance level of Content Quality	63
(4 – 4)	Arithmetic mean, SD, item importance and importance level of Quality of Decision Making	65
(4 – 5)	Simple Regression Analysis test results of the impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital	67
(4 – 6)	Simple Regression Analysis test results of the impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital	68
(4 – 7)	Simple Regression Analysis test results of the impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital	69
(4 – 8)	Simple Regression Analysis test results of the impact of information quality on decision making quality in Five Stars Hotels in Amman Capital	70

List of Tables

No.	Subject	Page
(4 – 9)	Simple Regression Analysis test results of the impact of content quality on decision making quality in Five Stars Hotels in Amman Capital	71
(4 – 10)	Path analysis test results of the impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital	73
(4 – 11)	Path analysis test results of the impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital	75
(4 – 12)	Path analysis test results of the impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital	77

Appendices

No.	Subject	Page
1	Names of arbitrators	100
2	Questionnaire	101

*The Impact of Business Intelligence and Decision Support on the Quality
of Decision Making*

An Empirical Study on Five Stars Hotels in Amman Capital

Prepared by

Hadeel A. Mohammad

*Supervisor***Prof. Mohammad AL- Nuiami***Abstract*

The main objective of this study is to explore the impact of Business Intelligence and Decision Support on the Quality of Decision Making in Five Stars Hotels in Amman Capital, through exploring the impact of Business Intelligence on Quality of Decision Making directly and indirectly through Decision Support.

This study was applied on Five Stars Hotels in Amman Capital, and took the samples from the middle and top management. The populations of the study are the Five Stars hotels in Amman capital that is (12) from (23) hotels in Jordan. The researcher chooses a random sample consists of (150) managers will be chosen from the top and middle management in the Five Stars Hotels in Amman capital.

After distributing (150) questionnaires of the study sample, a total of (121) answered questionnaires were retrieved, of which (8) were invalid. Therefore, (113) answered questionnaires were valid for study. In order to achieve the objectives of the study, the researcher designed a questionnaire consisting of (33) paragraphs to gather the primary information from the study sample. The Statistical Package for Social Sciences (SPSS) program was used and Path analysis to analyze and examine the hypothesis.

The study came to show high level of importance for the study variables in Five Stars Hotels, and showed:

1. There is a significant positive direct impact of Business Intelligence on decision making quality, information quality and content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).
2. There is a significant positive direct impact of information quality and content quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).
3. There is a significant positive indirect impact of Business Intelligence on decision making quality under information quality and content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

Finally, the study set the following recommendations:

1. The Five Stars Hotels must build an integrated model to maximize net profit from using Decision support systems. Also it operates the proposed model based on the outcomes of demand forecasting model, the data of actual fact, estimated data for several alternative scenarios, to reach appropriate net profit in light of business processes and Business Intelligence relationships.
2. The Five Stars Hotels must establish cooperative and / or strategic alliances with main customers and suppliers, on the basis of trust and cooperation to maximize the utilization of resources, and sharing of benefits arising among themselves and with beneficiaries of the services provided.

CHAPTER ONE

General Framework

(1-1): Introduction

(1-2): Study Problem and Questions

(1-3): Significance of the Study

(1-4): Objectives of the Study

(1-5): Study Hypotheses

(1-6): Study Limitations

(1-7): Study Delimitations (Difficulties)

(1-8): Terminologies

(1-1): Introduction

Business Intelligence (BI) systems provide a proposal that faces needs of contemporary organizations. Main tasks that are to be faced by the BI systems include intelligent exploration, integration, aggregation and a multidimensional analysis of data originating from various information resources. Systems of a BI standard combine data from internal information systems of an organization and they integrate data coming from the particular environment e.g. statistics, financial and investment portals and miscellaneous databases. Such systems are meant to provide adequate and reliable up-to-date information on different aspects of enterprise activities (Olszak & Ziemba, 2007).

Recent years have witnessed numerous discussions on the Business Intelligence issues including OLAP (On-Line Analytical Processing) techniques, data mining or data warehouses. However, little attention has been paid so far to questions of creating and implementing BI in organizations.

BI systems are assumed to be solutions that are responsible for transcription of data into information and knowledge and they also create some environment for effective decision making, strategic thinking and acting in organizations. Value of BI for business is predominantly expressed in the fact that such systems cast some light on information that may serve as the basis for carrying out fundamental changes in a particular enterprise, i.e. establishing new cooperation, acquiring new customers, creating new markets, offering products to customers (Chaudhary, 2004; Olszak, & Ziemba, 2007; Reinschmidt, & Francoise, 2002).

BI systems are referred to as an integrated set of tools, technologies and programs products that are used to collect, integrate, analyze and make data available (Reinschmidt, & Francoise, 2000). The systems are to support decision-making on all management levels. They differ from traditional Management Information Systems by – first of all – a wider subject range, multivariate analyses of semi-structured data that come from different sources and their multidimensional presentation. The BI systems contribute to optimizing business processes and resources, maximizing profits and improving proactive decision-making. The systems may be utilized while creating various applications within finance, monitoring of competition, accounting, marketing, production, etc.

Decision making process plays an essential role in any organization, and so it should be planned and resolved in a comprehensive, reliable, and transparent manner (Shimizu, et..al., 2006). Managers prepared with information about their relevant organizational cultures, interrelated with the knowledge transfer, can amend their knowledge management strategies to make their organizations more efficient, and to evaluate ICT (Information and Communication Technologies) in effective strategies. Quality of decision making is fundamental in the success of any organization. They necessitate successful implementation of decision support tools to adequately inform the decision process, but also other desirable characteristics such as imagination and creativity (Bresfelean, et..al., 2009).

Decision support system (DSS) is concerned with analyzing information that intended to affect decision-making. The recent analysis on decision support system and the expert systems has shifted from considering these as solely analytical tools for assessing best decision options to seeing them as a more comprehensive environment for supporting efficient information processing based on a superior understanding of the problem context (Gupta, et..al., 2006). Decision support embraces various definitions, but it considers that they are built to assist decision processes and help to identify and resolve problems (Bresfelean, et..al., 2009).

This study will focus at the impact of business intelligence and decision support on the quality of decision-making on Five Stars Hotels in Amman Capital.

(1-2): Study Problem and Questions

Business intelligence becomes a basic issue in the business world, as Business Intelligence is the mixture of the gathering, cleaning and integrating data from various sources, and introducing results in a mode that can enhance business decisions making and decisions support (Karim, 2011).

Thus, nowadays, organizations desire to assess and evaluate their assets into Business Intelligence systems, which involve an accurate evaluation to the business value and distinguish it from other organizations using comparable systems. In addition, in Jordanian organizations, especially the hotel sector there

is a huge amount of data, which should use for different applications; Jordanian hotels' managers are not familiar with BI process. Managers need the right information at the right time and the right place to make a good decision and support it.

Based on the above, the study's problem may be demonstrated via stirring up the questions below:

Question One: Is there a positive direct impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital?

Question Two: Is there a positive direct impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital?

Question Three: Is there a positive direct impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital?

Question Four: Is there a positive direct impact of information quality on decision making quality in Five Stars Hotels in Amman Capital?

Question Five: Is there a positive direct impact of content quality on decision making quality in Five Stars Hotels in Amman Capital?

Question Six: Is there a positive indirect impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital?

Question Seven: Is there a positive indirect impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital?

Question Eight: Is there a positive indirect impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital?

(1-3): Significance of the Study

The significance of the current study arises from the important role of the Five Stars Hotels in Amman Capital.

Also the significance of the current study demonstrated from three dimensions:

First, **Theoretical Knowledge** through lies in the possibility that the reviewed literature will enrich the literature especially business intelligence literature.

Second, **Professional Knowledge** via the results of these study institutions will benefit from the results of the study:

1. Arabic researchers.
2. Jordanian hotels.
3. Researchers in this area.

Third, **Personal Learning** Through this study, the researcher will develop her own knowledge and experience by investigating the role of business intelligence in the Jordanian Five Stars Hotels.

(1-4): Objectives of the Study

This study seeks to achieve the following objectives:

1. Identify the impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital.
2. Identify the impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital.
3. Determine the impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital.
4. Determine the impact of information quality on decision making quality in Five Stars Hotels in Amman Capital.
5. Identify the impact of content quality on decision making quality in Five Stars Hotels in Amman Capital.
6. Identify the indirect impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital.
7. Determine the indirect impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital.
8. Identify the indirect impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital.

(1-5): Study Model and Hypotheses

In measuring Business Intelligence the researcher depends on (Işık, 2010). In the measurement of Decision Support Systems variables (information & content quality) the researcher depends on (Price, et.al, 2008). Finally, in the measurement of Quality of Decision Making the researcher depends on (Swim, 2001).

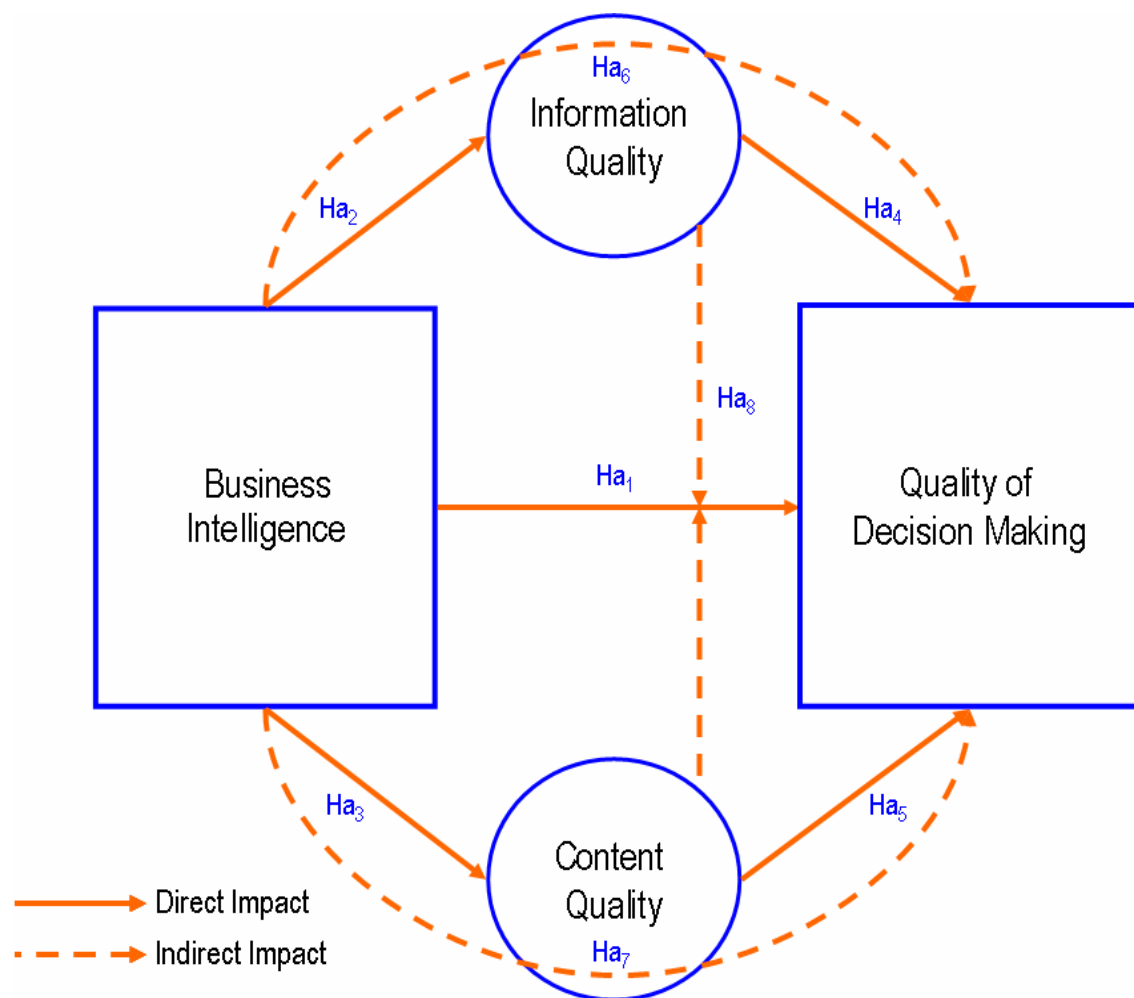


Figure (1 – 1)

Study Model

Prepared by researcher

Based on the study problem and the literature review, the following research hypotheses were examined:

HA₁. There is a significant positive direct impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₂. There is a significant positive direct impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₃. There is a significant positive direct impact of Business Intelligence on content quality in Five Stars Hotels at Amman Capital at level ($\alpha \leq 0.05$).

HA₄. There is a significant positive direct impact of information quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₅. There is a significant positive direct impact of content quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₆. There is a significant positive indirect impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₇. There is a significant positive indirect impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₈. There is a significant positive indirect impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

(1-6): Study Limitations

Human Limitations: the current study includes top management and middle management employees in the Five Stars Hotels in Amman Capital.

Place Limitations: Include the Five Stars Hotels in Amman Capital (Jordan).

Time Limitations: The time needed for study accomplishment is two academic semesters (2011- 2012).

Scientific Limitations: The researcher in measuring Business Intelligence depends on the suggested measurement by (Işık, 2010). In the measurement of Decision Support Systems variable (information & content quality) the researcher depends on (Price, et..al, 2008). Finally, in the measurement of Quality of Decision Making the researcher depends on (Swim, 2001).

(1-7): Study Delimitations (Difficulties)

1. The study concentrates on the Five Stars Hotels chosen using it as a case study.
2. The accuracy of the study depends on the hotel top and middle managers respondents.

(1-8): Study Terminologies

Business: An economic system in which goods and services are exchanged from one another or money, based on their perceived worth. Every business requires some form of investment and a sufficient number of customers to whom its output can be sold at profit on a consistent basis (Daft & Marcic, 2010).

Business Intelligence: is the acquisition, and utilization of fact based knowledge to improve a business's strategic and tactical advantage in the marketplace (Chase, 2001).

Decision Making: is an art, which requires the decision maker to combine experience and education to act (Bohanec, 2003).

Quality of Decision Making: is a target that institutions aim to achieve through different administrative process, and also aim to reach an appropriate decision for the development of the institution or to solve a problem faced by the institution (Maznevski, 2004).

Decision Support: The term Decision Support (DS) is used often and in a variety of contexts related to decision making. It means different things to

different people and in different contexts (Bohanec, 2003). Decision support based on:

Information Quality: is a term to describe the quality of the content of information systems, it is often defined as: The fitness for use of the information provided (Bohanec, 2003).

Content Quality: is a term to describe the quality, improve the usability, search ability and translatability of the content (Bohanec, 2003).

Five Stars Hotels: They are service organizations that offer accommodation, food and beverages, entertainments, and conference to specific market sectors, such as businessmen, executive managers, and important occasions or persons. It is referred to as five stars because it has standards and features that qualify it to have a total of score ranges limited between (600-700) points according to the instructions of Ministry of Tourism and Jordanian Antiquities.

CHAPTER TWO

Theoretical Framework & Previous Studies

(2-1): Introduction

(2-2): Business Intelligence

(2-3): Decision Support System

(2-4): Quality of Decision Making

(2-5): Previous Studies

(2-6): Study contribution to knowledge

(2-1): Introduction

Business intelligence (BI) is the top priority for many organizations and the promises of BI are rapidly attracting many others (Evelson, et.al, 2007). Gartner Group's BI user survey reports suggest that BI is also a top priority for many chief information officers (CIOs) (Sommer, 2008). More than one-quarter of CIOs surveyed estimated that they will spend at least \$1 million on BI and information infrastructure in 2008 (Sommer, 2008). Organizations today collect enormous amounts of data from numerous sources, and using BI to collect, organize, and analyze this data can add great value to a business (Gile, et..al., 2006). BI can also provide executives with real time data and allow them to make informed decisions to put them ahead of their competitors (Gile, et..al., 2006). Although BI matters so much to so many organizations, there are still inconsistencies in research findings about BI and BI success.

This chapter is divided into the following five sections: Business Intelligence; Decision Support System; Quality of Decision Making; previous studies and study contribution to knowledge.

(2-2): Business Intelligence

In the literature we find lots of different approaches to a proper definition of Business Intelligence (BI). Different parties such as IT vendors, press groups and business consultants have their own approach to this subject. Below a few examples are described. Together they should illustrate the main concept of business intelligence.

Business Intelligence as an “active, model-based, and prospective approach to discover and explain hidden, decision-relevant aspects in large amounts of business data to better inform business decision processes”. Business intelligence is the process of gathering high-quality and meaningful information about the subject matter being researched that will help the individual(s) analyzing the information, draws conclusions or make assumptions.” Business intelligence refers to the use of technology to collect and effectively use information to improve business effectiveness. An ideal BI system gives an organization's employees, partners, and supplier's easy

access to the information they need to effectively do their jobs, and the ability to analyze and easily share this information with others (KMBI, 2005).

Miller (2000b: 13) defines Business Intelligence as including the monitoring of developments in the external business environment. Betts (2004) believes that Business Intelligence will mean more people viewing more data in more detail. Betts feels that more companies will be putting Business Intelligence tools into the hands of the typical employee, not just the marketing or financial analyst. Additionally, unstructured data, predictive analytics, and integration will be key trends that will exist in the Business Intelligence domain.

Mendell (1997:115–118) remarks that Business Intelligence has always been an important part of the competing business world, and thus the core activities of Business Intelligence are far from new.

In the 1980s, Ghoshal & Kim (1986: 49) considered Business Intelligence an activity within which information about competitors, customers, markets, new technologies, and broad social trends is gathered and analyzed. Around the same time, Tyson (1986: 9) identified the Business Intelligence concept as an analytical process by which raw data are converted into relevant, usable, and strategic knowledge and intelligence. Collins (1997: 4) recognizes Business Intelligence as a process by which information about competitors, customers, and markets is systematically gathered by legal means and analyzed to support decision-making.

Various definitions of BI have emerged in the academic and practitioner literature. While some broadly define BI as a holistic and sophisticated approach to cross-organizational decision support (Moss and Atre, 2003; Alter, 2004), others approach BI from a more technical point of view (White, 2004; Burton and Hostmann, 2005). Table (2 – 1) provides some of the more prevalent definitions of BI.

Table (2 – 1)
Business Intelligence Definitions

<i>BI Definition</i>	<i>Author(s)</i>	<i>Definition Focus</i>
An umbrella term to describe the set of concepts and methods used to improve business decision-making by using fact based support systems	Dresner (1989)	Technological
A system that takes data and transforms into various information products	Eckerson (2003)	Technological
An architecture and a collection of integrated operational as well as decision support applications and databases that provide the business community easy access to business data	Moss and Atre (2003)	Technological
Organized and systemic processes which are used to acquire, analyze and disseminate information to support the operative and strategic decision making	Hannula & Pirttimaki (2003)	Technological
A set of concepts, methods and processes that aim at not only improving business decisions but also at supporting realization of an enterprise's strategy	Olszak and Ziemba (2003)	Organizational
An umbrella term for decision support	Alter (2004)	Organizational
Results obtained from collecting, analyzing, evaluating and utilizing information in the business domain	Chung et al. (2004)	Organizational
A system that combines data collection, data storage and knowledge management with analytical tools so that decision makers can convert complex information into competitive advantage	Negash (2004)	Technological

A system designed to help individual users manage vast quantities of data and help them make decisions about organizational processes	Watson et al. (2004)	Organizational
An umbrella term that encompasses data warehousing (DW), reporting, analytical processing, performance management and predictive analytics	White (2004)	Technological
The use and analysis of information that enable organizations to achieve efficiency and profit through better decisions, management, measurement and optimization	Burton and Hostmann (2005)	Organizational
A managerial philosophy and tool that helps organizations manage and refine information with the objective of making more effective decisions	Lonnqvist & Pirttimaki (2006)	Organizational

Table (2 – 1)

Business Intelligence Definitions

BI Definition	Author(s)	Definition Focus
Extraction of insights from structured data	Seeley & Davenport (2006)	Technological
A combination of products, technology and methods to organize key information that management needs to improve profit and performance	Williams & Williams (2007)	Organizational
Both a process and a product, that is used to develop useful information to help organizations survive in the global economy and predict the behavior of the general business environment	Jourdan et al. (2008)	Organizational

Gartner Group describes BI as a process of transformation from data to information, and after a voyage of discovery transforming this information to knowledge. Vriens & Philips (1999) found out BI as a process of acquiring and processing of information in order to support an organization's strategy. De Tijd, (2006), defines BI as all applications supporting analyzing and reporting of corporate data in order to improve decision making which leads to better steering of the company. Decision makers need to be provided by reliable information,

filtered from all raw data the company has acquired in the past. The main purpose is to transform these raw data into valuable, actionable information. Common transactional software automates daily based processes such as the creation of invoices and registers them into the system. Unlike this, BI sets a step backwards to provide a holistic view on these transactions. Figures from the past are not reported in a very detailed way, in stead they are aggregated, analyzed and linked to each other with the purpose to forecast future activities. Also David M. Kroenke (2006) mentions business intelligence systems fall into these broad categories, namely reporting, including OLAP, and data mining.

Aronson, Liang and Turban (2005) also divide BI tools into reporting, OLAP and data mining. Collins (1997: 19) categorizes the main objectives of Business Intelligence into three groups. First, a company can avoid surprises and identify opportunities and threats. Second, Business Intelligence establishes a baseline for performance evaluation. Third, Business Intelligence provides more time in which to react. One of the goals of BI is to support management activities. Computer based systems that support management activities and provide functionality to summarize and analyze business information are called management support systems (MSS) (Gelderman, 2002; Clark, et..al., 2007; Hartono, et..al., 2007).

Decision support systems (DSS), knowledge management systems (KMS), and executive information systems (EIS) are examples of MSS (Forgionne and Kohli, 2000; Clark, et..al., 2007; Hartono, et.. al., 2007). These systems have

commonalities that make them all MSS (Clark, et.al., 2007). These common properties include providing decision support for managerial activities, (Forgionne and Kohli, 2000; Gelderman, 2002), using and supporting a data repository for decision-making needs (Arnott and Pervan, 2005), and improving individual user performance (Hartono, et..al, 2007).

BI can also be included in the MSS set (Clark, et..al., 2007). First, BI supports decision making for managerial activities (Burton and Hostmann, 2005). Second, BI uses a data repository (usually a data warehouse) to store past and present data and to run data analyses (Anderson Lehman, et.. al., 2004).

BI is also aimed at improving individual user performance through helping individual users manage enormous amounts of data while making decisions (Burton, et..al., 2006). Thus, BI can be classified as an MSS (Baars and Kemper, 2008). Examining BI in the light of research based on other types of MSS may lead to better decision support and a higher quality of BI systems (Clark, et..al., 2007).

The MSS classification of BI may also help research address gaps that result from examining MSS separately, without considering their common properties. Research examines success antecedents of many MSS extensively (Hartono, et..al., 2007), but consistent factors that help organizations achieve a successful BI have not yet emerged. Research suggests that fit between an MSS and the decision environment in which it is used is an MSS success antecedent (Hartono, et..al., 2007). For example, using appropriate information technology

for knowledge management systems provides more successful decision support (Baloh, 2007).

The complexity level of the technology also impacts MSS effectiveness and success (Srinivasan, 1985). However, research has not looked specifically at the role of the decision environment in BI success. It is important to do so because although it is an MSS, BI has requirements that are significantly different from those of other MSS (Wixom and Watson, 2001). BI capabilities include both organizational and technological capabilities (Bharadwaj, et..al., 1999).

BI success is the positive value an organization obtains from its BI investment (Wells, 2003). The organizations that have BI also have a competitive advantage, but how an organization defines BI success depends on what benefits that organization needs from its BI initiative (Miller, 2007). BI success may represent attainment of benefits such as improved profitability (Eckerson, 2003), reduced costs (Pirttimaki, et..al., 2006), and improved efficiency (Wells, 2003).

Most organizations struggle to measure BI success. Some of them want to see tangible benefits, so they use explicit measures such as return on investment (ROI) (Howson, 2006). BI success can also be measured with the improvement in the operational efficiency or profitability of the organization (Vitt, et..al., 2002). If the “costs are reasonable in relation to the benefits accruing” (Pirttimaki, et..al., 2006: 83), then organizations may conclude that their BI is successful. Other companies are interested in measuring intangible benefits; these include whether

users perceive the BI as mission critical, how much stakeholders support BI and the percentage of active users (Howson, 2006). Specific BI success measures differ across organizations and even across BI instances within an organization.

Research, however, does consistently point to at least one high level commonality among successful BI implementations. Organizations that have achieved success with their BI implementations have created a strategic approach to BI to help ensure that their BI is consistent with corporate business objectives (McMurchy, 2008). How Continental Airlines improved its processes and profitability through successful implementation and use of BI is a good example of aligning BI with business needs (Watson, et.. al., 2006).

Research provides valuable insight into how to align BI with business objectives and offers explanations for failures to do so (Eckerson, 2003). Other research provides a solid theoretical foundation for examining BI success, yet provides limited empirical evidence (Gessner and Volonino, 2005). Research that provides a sound theoretical background as well as empirical evidence focuses on specific technologies of BI, such as data warehousing (Nelson, et..al., 2005) or web BI (Chung, et..al., 2004), rather than a more holistic model.

(2-3): Decision Support System

Decision support systems are gaining an increased popularity in various domains, including business, engineering, military, and medicine. They are

especially valuable in situations in which the amount of available information is elusive from decision maker and in which accuracy is importance. Decision support systems can help decision maker by providing various sources of information, providing intelligent access to relevant knowledge, and support the process of structuring decisions. They can also provide well defined alternatives to support decision. Also, they can employ artificial intelligence methods to solve complex problems. Appropriate application of decision making tools increases productivity, efficiency, effectiveness and gives many businesses a competitive advantage over their competitors, allowing them to make optimal choices for technological processes, planning business operations, logistics, or investments (Druzdzal & Flynn, 2002).

(2-3-1): Decision Support System Definition

The massive growth of unstructured information lead to the necessity for developing strategies to improve and enhance individual and organizational decision making by using automated tool in decision systems (Power & Sharda, 2007). Traditional decision support system lacks the capability to encounter dynamics and ill defined data. Current existing decision support tools are focused on quantitative data processing where the systems are specifically analyses factual values. According to Froelich & Ananyan (2008: 609), challenges in decision making requires comprehensive analysis of large volumes of both structured and unstructured data.

Drawing various definitions that have been suggested by (Druzdzal & Flynn, 2002) computer-based interactive systems that help decision makers to use data and models to solve unstructured problems.

Stewart (2003) also said that decision support system is a “computer system which assists decision makers in exploring the consequences of decisions in a structured manner and in developing an understanding of the extent to which each decision alternative or option contributes toward goals”.

However Laudon & Laudon (2007) presented a definition for decision support system by viewing system’s capabilities that “DSS Provide simulation, analytical, and data modeling tools to optimize decision making. This system addresses problems where the procedure for producing the information aids is not fully predefined in advance .Therefore, decision support system has more analytical power than other information systems”.

Based on previous review for decision support system concepts the researcher can develop the following definition. Decision support systems are the interactive systems between the user and computer to support decision-making process for unstructured decisions by using analytical models and databases.

Drawing on various definitions the researcher can list some major capabilities for decision support system suggested by Morana, et.al, (2010):

1. Provides support for decision makers at all management levels, mainly in unstructured situations, by bringing objective information and human judgment.
2. Supports several interconnected decisions.

3. Supports all phases of the decision making process intelligence, design, choice, and implementation.
4. Adaptable by the user to deal with changing conditions.
5. Easy to construct and use in many cases.
6. Usually utilizes quantitative models (standard and/or custom made).
7. Advanced decision support system is equipped with a knowledge management component that allows providing efficient and effective solution of very complex problems.
8. Can be used via the Web.
9. Allows the easy execution of sensitivity analyses.

The foregoing lists refer to capabilities for decision support system Holsapple & Sena,(2005) suggest potential benefits of it including the capacity of this system to enhance a decision maker's ability to process knowledge, handle complex problem, shorten the time associated with making a decision, improves the reliability of decision, encourage discovery by a decision maker, stimulate new approaches to thinking about problems, provide evidence in support of a decision, and create competitive advantage over competing organizations.

Today, decision support systems are developed to generate and evaluate decision alternatives via 'what-if' analysis and 'goal-seeking' analysis in the design and choice stages. Decision support system contains various models such as accounting models to facilitate planning by calculating the consequences of planned actions on estimate of income statements, balance sheets and other

financial statements. Representational models estimate the future consequences of actions, including all simulation models. Optimization models generate the optimal solutions. Suggestion models lead to a specific suggested decision for a fairly structured task. (Eom, 2001).

(2-3-2): Decision Support System Components

A properly designed decision support system is an interactive software based system intended to help decision makers to collect useful information from raw data, documents, personal knowledge, and business models to identify and solve problems and make decisions (Ahmadi & Salami, 2010).

Development of the requirements, characteristics, functionality and contents of the decision support system depend on what we want to use this system for, such as design, operation or construction. All of these areas may need different information, but the type of decision support may be the same.

According to (Druzdzal & Flynn,2002) Basic decision support system (DSS) design consists of Database management system (DBMS), model based management system and Dialog generation management system (DGMS)

1. Database management system (DBMS): serves as a data bank for the DSS. It stores large quantities of data that are related to the class of problems that the DSS has been designed for and provides logical data structures with which the

users interact. It should also be capable to inform the user about the types of data that are available and how to gain access to them.

2. Model base management system (MBMS): the primary function for this system is providing independence between specific models that are used in a DSS from the applications that use them. The purpose of it is to transform data from the DBMS into information that is useful in decision making. It should also be capable of assisting the user in model building.

3. Dialog generation and management system (DGMS): The broader term of the DGMS is user interface. It helps to interact with a DSS, so DSS need to be equipped with easy to use interfaces. These interfaces aid in model building and interaction with these models, such as gaining recommendations from it.

Mardjono (2002: 20) shows that decision support system (DSS) has the following components: databases, database management, knowledge management, a rule base, a reasoning engine and a user interface. Databases are a collection of data stored in a systematic way. Through the operation of the database management data can be called, added, and deleted. DSS also has a rule based component that is a collection of rules to be used in the decision making process, knowledge management used to organize the data transaction, a reasoning engine may be needed in Dss construction which is built as a computer program, an interface is also needed to connect the databases and the main program to help user interact with system.

Shim, et.al.(2002) presented that the web environment is a very important platform for decision support system development, through using a web infrastructure for building decision support system to improve decision making frameworks and promotes more consistent decision making on repetitive tasks. In this way the DSS categories including data warehousing, online analytical process (OLAP), data mining, web-based DSS, collaborative support systems, and optimization based DSS. A web-based DSS refers to a computerized system that delivers information through a web browser to someone who needs it, by passing the user requests to a database server which generates the query result set and sends it back for viewing, where it works consistently with data warehouses and OLAP.

Druzdzal & Flynn (2002) confirmed that the quality and reliability of modeling tools and the internal architectures of decision supports systems are significant, their user interface is the most important aspect, a good user interface to decision support system should support model construction and model analysis, but complex or unclear user interfaces or that require special skills are scarcely useful and accepted in practice. In addition, when the system is based on normative principles, it can play an oversight role; that users will learn the domain model and how to reason with it over time, and improve their own thinking.

Decision support systems use several techniques that Include artificial intelligence. Specially, expert systems as a form of artificial intelligence can be

integrated with more traditional techniques of functionality such as statistics, mapping and/or data restore to form systems that provide more effective decision support in a study domain. Also, it is applying guidelines to encode domain Knowledge, together with inference engines, in order to deduce conclusions from information that the users provide (booty, et...al, 2009).

(2-4): Quality of Decision Making

The uncertainty of the world of business and the ever-changing requirements of organizations require that leaders have the courage, the will, and the ability to make difficult decisions. Decision-making is a part of managing the organization. A good manager is separated from a bad manager by the decisions that are made. The diversity of decisions makes it difficult, if not impossible, to examine and evaluate the ability of a leader to make decisions that will accomplish the organizational mission while ensuring the welfare of the people in it (Nonaka & Takeuchi, 1995).

Decision making can be regarded as the mental processes (cognitive process) resulting in the selection of a course of action among several alternative scenarios. Every decision making process produces a final choice. The output can be an action or an opinion of choice (Abou Aish, 2001).

Decision-making is one of the defining characteristics of leadership. It's core to the job description. Making decisions is what managers and leaders are paid

to do. Yet, there isn't a day that goes by that you don't read something in the news or the business press that makes you wonder, "What were they thinking?" or "Who actually made that decision?" That's probably always been the case, but it seems exponentially more so in the opening decade of the new millennium where everything seems marked with, "too big, too fast, too much, and too soon." (Goll & Rasheed, 1997).

The reality seems to be that most organizations aren't overrun by good decision makers, yet alone great ones. When asked, people don't easily point to what they regard as great decisions. Stories of bad decisions and bad decision-making come much more readily to mind (Harung, 1993).

Some of that is due to our tendency to notice and recall exceptions vs. all the times things go as planned (Papadakis, 1998).

There are several important factors that influence decision making. Significant factors include past experiences, a variety of cognitive biases, an escalation of commitment and sunk outcomes, individual differences, including age and socioeconomic status, and a belief in personal relevance. These things all impact the decision making process and the decisions made (Sabherwal & King, 1995).

Past experiences can impact future decision making. Juliusson, Karlsson, and Garling (2005) indicated past decisions influence the decisions people make in the future. It stands to reason that when something positive results from a decision, people are more likely to decide in a similar way, given a similar

situation. On the other hand, people tend to avoid repeating past mistakes (Sagi, & Friedland, 2007). This is significant to the extent that future decisions made based on past experiences are not necessarily the best decisions. In financial decision making, highly successful people do not make investment decisions based on past sunk outcomes, rather by examining choices with no regard for past experiences; this approach conflicts with what one may expect (Juliusson, et .al., 2005).

In addition to past experiences, there are several cognitive biases that influence decision making. Cognitive biases are thinking patterns based on observations and generalizations that may lead to memory errors, inaccurate judgments, and faulty logic (Evans, Barston, & Pollard, 1983; West, Toplak, & Stanovich, 2008). Cognitive biases include, but are not limited to: belief bias, the over dependence on prior knowledge in arriving at decisions; hindsight bias, people tend to readily explain an event as inevitable, once it has happened; omission bias, generally, people have a propensity to omit information perceived as risky; and confirmation bias, in which people observe what they expect in observations (Marsh, & Hanlon, 2007; Nestler. & von Collani, 2008; Stanovich & West, 2008).

In decision making, cognitive biases influence people by causing them to over rely or lend more credence to expected observations and previous knowledge, while dismissing information or observations that are perceived as uncertain, without looking at the bigger picture. While this influence may lead to

poor decisions sometimes, the cognitive biases enable individuals to make efficient decisions with assistance of heuristics (Shah & Oppenheimer, 2008).

In addition to past experiences and cognitive biases, decision making may be influenced by an escalation of commitment and sunk outcomes, which are unrecoverable costs. Juliusson, Karlsson, and Garling (2005) concluded people make decisions based on an irrational escalation of commitment, that is, individuals invest larger amounts of time, money, and effort into a decision to which they feel committed; further, people will tend to continue to make risky decisions when they feel responsible for the sunk costs, time, money, and effort spent on a project. As a result, decision making may at times be influenced by 'how far in the hole' the individual feels he or she is (Juliusson, et..al., 2005).

A high quality decision comes with a warrant: a guarantee. Not a guarantee of a certain outcome—remember this is the real world we're talking about, and there are certain things that just aren't knowable until after they happen—but a warranty that the process you used to arrive at a choice was a good one.

The quality concept is not new; it is in fact as old as the Medieval Ages. It has been a permanent concern of the universities since their foundation in those ancient times, having always been part of the academic ethos. Van Vught (1995) argues that it was already possible to distinguish two models of quality assessment in the century, the French model of vesting control in an external authority (Cobban, 1988) being the archetype of quality assessment in terms of

accountability, and the English model of a self-governing community of fellows being an example of quality assessment by means of peer review.

According to Massy (2003), they can do this by being better than they actually are, through a continuous and sustained work on the improvement of “decision quality without spending more, dismantling their research enterprise, or undermining their essential values” (Massy, 2003). However this may prove a very difficult task as Trow (1994) emphasises: “Trust cannot be demanded but must be freely given”. According to Vroeijenstijn (1995), the present attention given to quality may lead to think that this is an invention from the late decades and that there was no notion of quality prior to 1985. This is, however of course, not true. Quality decision will always associate to how leaders make decision. It is interconnected to their decision styles hence determine their leadership style.

The shift of decision-making responsibility to producers has had “substantial implications for institutional governance and management” (Dill, 1995). Starting in the 80's, and specially at political level, several voices were raised against the traditional model of governance and management, considered to be inefficient and outdated to face the new challenges confronting these organizations (Rosa, Saraiva & Diz, 2005). In fact, almost everywhere organization has been under pressure to become “more accountable and responsive, efficient and effective and, at the same time, more entrepreneurial and self managing” (Meek, 2003). So, in the last two decades one has been accustomed to the intrusion of the

rhetoric and management practices of the private sector, which has led to important changes in the operation of organizations.

Following Elsass and Graves (1997) who contend that the heart of leadership is decision making, and assuming that the key decisions are increasingly being decentralized to individuals and groups within organizations, it is important to understand how the increasing diversity in the sector relates to Malaysia Colleges' decision making capacity. Decision-making can be considered at three main levels; at the personal level, the individual goes through a generic problem solving cycle to make choices about the personal issues for which they seek solutions. Depending on the complexity of the decision and on the time and other resources available, personal decisions fall within a continuum from highly structured and rational to unstructured and irrational (Foskett & Hemsley-Brown, 2001). At an aggregate or small group level, the tendency is to incorporate more structured approaches which generally, at least in aspiration, involve rational problem solving strategies and relate to operational issues. The third level comprises decisions made on behalf of the organization which tend to be more strategic and generally involve those, such as the senior management team, who carry strategic responsibility for their organization.

(2-5): Previous Studies

Liao & Hsu (2004) under title "***An Intelligent Decision Support System for Supply Chain Integration***", aims to gain a competitive advantage through using an intelligent decision support system for supply chain integration, mainly there are three major issues and related information technologies (IT), including a multi-agent architecture, data cube technique, and an ANN-based system, are investigated to explore the integration of supply chain activities. A multi-agent based architecture is proposed to support the selection and negotiation of purchasing bids and assist the decision making. The concept of data cube is used to investigate the multidimensional data of ordering information and evaluating the decision criteria of purchasing and ordering processes. A system combines supplier selection evaluation and artificial neural network (ANN) technique is designed to evaluate and forecast the supplier's performance. The results indicate

that the proposed structure and related information technologies can support the decision makers for supply chain management and integration.

Negash (2004) under title "**Business Intelligence**" showed that business intelligence systems combine operational data with analytical tools to present complex and competitive information to planners and decision makers. The objective is to improve the timeliness and quality of inputs to the decision process. Business Intelligence is used to understand the capabilities available in the firm; the state of the art, trends, and future directions in the markets, the technologies, and the regulatory environment in which the firm competes; and the actions of competitors and the implications of these actions.

Fries (2006) under title "**The Contribution of Business Intelligence To Strategic Management**" aims to investigate the contribution of BI to strategic management. It showed that BI is not only contributing to the strategic level of an organization, but also to the tactical and even operational level. Moreover, it concluded that producing or providing intelligence for the first category of strategic decisions and issues was relatively easy because internally related data are processed. Data about the company and its main competition and customers is relatively easy to retrieve and to process.

Lee & Cheng (2007) under title "**Development Multi-Enterprise Collaborative Enterprise Intelligent Decision Support System**" presents an intelligent decision support, which includes business intelligence, customer intelligence, supply chain

intelligence and business analysis. The multi-enterprise collaborative conceptual ERP-IDSS framework contains supply chain management and customer relationship management. This framework is an integrative solution for the enterprise resource planning, customer relationship management and supply chain management. This integrates a decision support system with knowledge management, to provide guidance to decision-making during the planning process. This study found that the intelligent decision support system (IDSS) has an ability to capture the knowledge and provide intelligent guidance during the planning process. While the data and model manipulation are done through the DSS, decision makers can focus on the planning issues.

Olszak & Ziemia (2007) under title “**Approach to Building and Implementing Business Intelligence Systems**” aims to describing processes of building Business Intelligence (BI) systems. The considerations are focused on objectives and functional areas of the BI in organizations. Hence, the approach to be used while building and implementing the BI involves two major stages that are of interactive nature, i.e. BI creation and BI consumption. A large part of the article is devoted to presenting objectives and tasks that are realized while building and implementing BI.

Lupu, et.al, (2007) under title “**The Impact Of Organization Changes On Business Intelligence Projects**” aims to present the subject approaches of business intelligence in the context of ERP projects, and the experience of a real

industry project, its development and the problems it faced. It offers an insight into the main three phases of the project and it analyses the impact of technical problems and company changes on the BI project, revealing the strengths and the weaknesses of the proposed solutions. The conclusions of the article can be useful for all of those who are involved in building business intelligence solutions to reveal some of success factors, to prevent or to solve some of the inherent problems related to this type of projects.

Pirttimaki (2007) under title “***Business Intelligence as a managerial tool in large Finnish companies***“ aimed to examine BI as a tool for managing business information in large Finnish Companies. The results presented the role of BI in Finland has expanded since the 1990s. The use of BI increased in the top (50) Finnish companies in the time span under examinations, and BI is likely becoming an integral part of these companies' activities.

Sahay & Ranjan (2008) under title “***Real Time Business Intelligence in Supply Chain Analytics***”. The researchers studied the issues for using the business intelligence (BI) systems in supply chains and tried to identify the need for real time BI in supply chain analytics. In addition, they focused on the necessity to review the traditional BI concept that integrates and consolidates information in an organization in order to support firms that are service targeted and seeking customer loyalty and retention. The researcher concluded from this study that supply chain analytics using real time BI in organizations will lead to better

operational efficiency. An ideal BI system gives an organization's employees, partners, and suppliers easy access to the information they need to effectively do their jobs, and the ability to analyze and easily share this information with others. So business operations find new revenue and saving cost by supplying decision support information.

Rus & Toader (2008) under title "***Business Intelligence for Hotels Management Performance***" aimed to present the advantages of using Business Intelligence Systems in hotel's decision making activities. After a short literature review the researchers analyze the main components of a Business Intelligence System and we will identify the BI solutions for hospitality industry available on the global market and on the Romanian market. It offers important tools for analyzing and presenting data to managers so they can make more informed decisions. Hotels store large quantities of operational data, generated by daily transactions, in operational databases. These databases contain detailed information whereas managers need aggregate, summary information in decision making process. Using Business Intelligence the data from separate source systems is loaded into a data warehouse through a process of extraction, transformation, and loading and data is transformed in useful information and knowledge..

Alnoukari (2009) under title "***Using Business Intelligence Solutions for Achieving Organization's Strategy: Arab International University Case Study***" aimed to explain the role BI which providing organizations with a way to plan and achieve their business strategy. We will experiment this role using a case study in the field of high education, especially helping one of the new private university in Syria (Arab International University)planning and achieving their business strategy.

Tabatabaei (2009) under title "***Evaluation of Business Intelligence maturity level in Iranian banking industry***" aimed to examine the maturity level of Business Intelligence activities as well the outlook concerning Business Intelligence in the Iranian banking. The study showed that BI is a managerial concept which helps managers in the organizations to manage information and make factual decisions. The study conducted that the maturity level of BI as a whole process in Iranian banking industry is at level three of capability.

Ştefan (2009) under title "***Improving the Quality of the Decision Making By Using Business Intelligence Solutions***" aimed to highlight the essential role of Business Intelligence in order to increase the quality of decisions, in the context of using data warehouses, and the main areas where Business Intelligence solutions offered by Microsoft SQL Server 2008 can be applied successfully.

Kursan & Mirela (2010) under title "***Business Intelligence: the Role of the Internet in Marketing Research and business Decision – Making***" aims to point out the determinants of the business intelligence discipline, as applied in marketing practice. The paper examines the role of the Internet in marketing research and its implications on the business decision-making processes. The paper aimed to stress the importance of Web opportunities in conducting the Web segmentation and collecting customer data. Due to the existence of different perceptions concerning the role of the Internet, this paper tries to emphasize its effort of an interactive channel that serves the function of not only an informational nature, but as a powerful research tool as well. Several data collection and analysis methods techniques are discussed that would help companies to take advantage of a Web as a significant corporate resource.

Ahmad & Shiratuddin (2010) under title "***Business Intelligence for Sustainable Competitive Advantage: Field Study of Telecommunications Industry***" attempts to highlight these issues in the context of Telecommunication Industry. A qualitative field study in Malaysia is undertaken in this research, where all of four telecommunication services providers, at various levels of BI deployments, are studied. The study is conducted via interviews with key personnel, who are involved in decision-making tasks in their organizations. Contents analysis is then performed to extract the factors and variables and a comprehensive model of BI for Sustainable Competitive Advantage is developed. The results of the interviews

identify nine major variables affecting successful BI deployment such as; Quality Information, Quality Users, Quality Systems, BI Governance, Business Strategy, Use of BI Tools, and Organization Culture. BI is believed to be the main source for acquiring knowledge in sustaining competitive advantage.

Popovic & Jaklic (2010) under title “**Benefits of business intelligence system implementation: an empirical analysis of the impact of business intelligence system maturity on information quality**” aims to empirically confirm the contribution of business intelligence systems in providing quality information, and to analyze in detail how much does implementation of these systems actually contribute to solving the major issues regarding information quality. The results of the analysis showed that business intelligence systems actually have a positive impact on information quality. The results showed that the quality of information content is important for making better business decisions and providing higher value of business intelligence systems. The results thus suggest there is still a gap between available information quality and knowledge workers’ needs.

Ozceylan (2010) under title “**A Decision Support System to Compare the Transportation Modes in Logistics**” used an AHP-based model (analytical hierarchy process) to select an optimal Transportation mode which was evaluated for logistic activities. To solve this problem, the best transportation mode is determined and discussed by developed decision support system. The AHP models are using a

hierarchical relationship among decision levels. It is capable of handling multiple criteria and enables to incorporate seven different criteria factors, when assessing the transportation modes. The author concluded that seaway is the best transportation mode with an overall.

Beheshti, H (2010) under title “**A Decision Support System for Improving Performance of Inventory Management in a Supply Chain Network**” seeks to present a decision support model for improving supply chain performance. The model aims to provide a holistic view of the supply chain as an integrated system by analyzing inventory options to facilitate the decision making process by business partners in the system. The results for the study show that the model can be used as a powerful Spreadsheet base which can be expanded to answer a variety of supply chain Structures cost saving tools, and negotiation questions.

Garza, et..al, (2010) under title “**Managerial Cultural Intelligence and Small Business in Canada**” studies (122) executives of Canadian small businesses examined the extent to which managerial cultural intelligence was a contributing factor to the organizational effectiveness of small businesses. We found that the cultural intelligence of small business managers engaged in international business was higher than that of small business managers in domestic firms. After controlling for firm entrepreneurial orientation, the researcher found that managerial cultural intelligence was positively related to corporate reputation and employee commitment, but not to the financial performance of small businesses.

Further, these relationships were similar for small businesses that conducted international business and those that were domestic-only. For internationalized small businesses, managerial cultural intelligence was not influenced by the international scope of business activities. One implication is that cultural intelligence is a managerial competency that is not restricted to international business contexts. Directions for future research on cultural intelligence are identified

Karim (2011) under the title "***The value of Competitive Business Intelligence System (CBIS) to Stimulate Competitiveness in Global Market***" aims to describe and measures the fact that competitive advantage can be gained through Business Intelligence. It evaluates the impact of key factors of typical BIS on improving business performance to survive in competitive market. In addition, the study showed that Business Intelligence is the mixture of the gathering, cleaning and integrating data from various sources, and introducing results in a mode that can enhance business decisions making. BIS provide sufficient fundamentals for comparison process.

Riabacke, et..al, (2011) under the title "***Business Intelligence as Decision Support in Business Processes: An Empirical Investigation***" aims to investigate the role of business intelligence systems and the perceived business value of implemented systems and their contribution to facilitate the fulfillment of

organizational goals. The study builds upon a survey answered by 43 respondents from different large companies in Scandinavia. The survey used questions on how visions, objectives and strategies are supported by BI systems, on how business values are derived from such systems, and on how design and implementation issues affect the solutions. The overall conclusion of the study is that there are markedly different levels of problems in the areas. Most problems being found were in integration of BI information and decision processes, and that there is room for large improvements and further work within everything from implementation to requirements engineering for business intelligence decision support systems.

Isik, et.al, (2011) under the title "***Business Intelligence Success and the role of Business Intelligence Capabilities***" aims to suggest that one of the reasons for failure is the lack of an understanding of the critical factors that define the success of BI applications, and that BI capabilities are among those critical factors. We present findings from a survey of 116 BI professionals that provides a snapshot of user satisfaction with various BI capabilities and the relationship between these capabilities and user satisfaction with BI. Findings suggested that users are generally satisfied with BI overall and with BI capabilities. However, the BI capabilities with which they are most satisfied are not necessarily the ones that are the most strongly related to BI success. Of the five capabilities that were the most highly correlated with overall satisfaction with BI, only one was specifically related to data. Another interesting finding implies that, although users are not highly

satisfied with the level of interaction of BI with other systems, this capability is highly correlated with BI success.

Ramakrishnan, et..al (2012) under the title “**Factors influencing business intelligence (BI) data collection strategies: An empirical investigation**” examines external pressures that influence the relationship between an organization's business intelligence (BI) data collection strategy and the purpose for which BI is implemented. A model is proposed and tested that is grounded in institutional theory, research about competitive pressure, and research about the purpose of BI. Two data collection strategies (comprehensive and problem driven) and three BI purposes (insight, consistency, and transformation) are examined. Findings provide a theoretical lens to better understand the motivators and the success factors related to collecting the huge amounts of data required for BI. This study also provides managers with a mental model on which to base decisions about the data required to accomplish their goals for BI.

Woodside (2012) under the title “**Business intelligence and learning, drivers of quality and competitive performance**” seeks to model the relationships between BIS, learning, quality organization and competitive performance, as well as measure the influence that BIS has on end-user perceptions of quality and competitive performance from a learning point of view. Qualitative and quantitative methods including survey, interview, and case study instruments to measure the

link between BIS, learning models of mental-model building and mental-model maintenance, quality organization, and competitive performance. Individual, organizational, system, information, and service characteristics are explored to measure the relationship between variables. A proposed model is introduced to improve the explanatory power of the prior model, and extend theoretical, practical, and policy contributions within a healthcare setting. Results demonstrate a significant relationship between learning, quality and competitive performance when utilizing BIS. Information and system quality characteristics also influence the level of learning. The model increases the explanatory power over the prior information support systems and learning models and adds important contributions to healthcare research and practice.

(2-6): Study Contribution to knowledge

After reading and through examining previous studies related to the subject of this study, the researcher found that the most important characteristics that distinguish this study from the other previous studies and can be stated as follows:

- The other previous studies were business intelligence, strategic management and organization changes. However, this study is to measure the impact of Business Intelligence and decision support on the quality of decision-making process in the Five Stars Hotels in Amman Capital.
- This study consists of three variables :
 1. Independent variable: business intelligence.
 2. Mediator variable: decision support (information quality and content quality).
 3. Dependent variable: Quality of decision making.

CHAPTER THREE

Method and Procedures

(3-1): Introduction

(3-2): Study Methodology

(3-3): Study Population and Sample

(3-4): Demographic Variables to Study Sample

(3-5): Study Tools and Data Collection

(3-6): Statistical Treatment

(3-7): Validity and Reliability

(3-1): Introduction

In this chapter the researcher will describe in detail the methodology used in this study, and the study population and its sample. Next, the researcher will design the study model and explain the study tools and the way of data collections. After that, the researcher will discuss the statistical treatment that is used in the analysis of the collected data. In the final section the validation of the questionnaire and the reliability analysis that is applied will be clearly stated.

(3-2): Study Methodology

Descriptive research involves collecting data in order to test hypotheses or to answer questions concerned with the current status of the subject of the study. Typical descriptive studies are concerned with the assessment of attitudes, opinions, demographic information, conditions, and procedures. The research design chosen for the study is the survey research. The survey is an attempt to collect data from members of a population in order to determine the current status

of that population with respect to one or more variables .The survey research of knowledge at its best can provide very valuable data. It involves a careful design and execution of each of the components of the research process.

The researcher designed a survey instrument that could be administrated to selected subjects. The purpose of the survey instrument was to collect data about the respondents on Business Intelligence process.

(3-3): Study Population and Sample

To increase credibility, it is important to choose the sample that will represent the population under investigation. The populations of the study are the Five Stars hotels in Amman capital that is (12) from (23) hotels in Jordan. Table (3-1) shows the name of Five Stars Hotels in Amman capital. On the other hand, the researcher chooses a random sample which consists of (150) managers will be chosen from the top and middle management in the Five Stars Hotels in Amman.

Table (3-1)

The population of the study (Five Stars Hotels in Amman capital)

No.	Hotel name	Opening year	No. of rooms	No. of beds	No. of employees
1	Jordan Hotel (InterContinental)	1962	440	640	402
2	The Regency Palace Hotel	1980	300	455	245
3	Marriott	1982	293	400	302
4	Crowne Plaza	1984	278	441	341
5	Meridien	1978	414	864	344
6	Grand Hyatt	1999	366	940	357
7	Holiday Inn	1999	218	310	193
8	Sheraton Amman	2001	267	536	279
9	Le Royal	2002	348	564	688
10	Four Seasons	2003	193	357	367

11	Kempinski	2004	283	400	300
12	Landmark	2010	260	520	240
Total					4058

Source: Ministry of Tourism, 2010

After distributing (150) questionnaires of the study sample, a total of (121) answered questionnaires were retrieved, of which (8) were invalid, Therefore, (113) answered questionnaires were valid for study.

(3-4): Demographic Variables to Study Sample

Table (3-2) shows the demographic variables of the study sample (Age; Gender; Educational level; Experience; Years of Service in Hotels and Job Title).

Table (3-2) Descriptive sample of the demographic variables of the study

No.	Variables	Categorization	Frequency	Percent
1	Age	30 years or less	46	40.7
		From 31 – 40 Years	33	29.2
		From 41 – 50 years	22	19.5
		51 Years More	12	10.6
<i>Total</i>			113	100%
2	Gender	Male	74	65.5
		Female	39	34.5
<i>Total</i>			113	100%
3	Educational Level	BS	71	62.8
		High Diploma	22	19.5
		Master	14	12.4
		PhD	6	5.3
<i>Total</i>			113	100%
4	Experience	5 Years or Less	36	31.9
		From 6 – 10 Years	27	23.9
		From 11 – 15 years	27	23.9
		16 Years More	23	20.4

<i>Total</i>		113	100%	
5	<i>Years of Service in Hotels</i>	5 Years or Less	44	38.9
		From 6 – 10 Years	23	20.4
		From 11 – 15 years	29	25.7
		16 Years More	17	15
<i>Total</i>		113	100%	
6	<i>Job Title</i>	Top Management	53	46.9
		Middle Management	60	53.1
<i>Total</i>		113	100%	

Table (3-2) the results of descriptive analysis of demographic variables of responding members of the study sample. The table shows that the (69.9%) of the sample ranged below (41) years. This indicates that the focus will be on the element of youth and new blood. On the other hand, the (65.5%) of the study sample is male and (34.5%) is female. The educational level; all members of the study sample have a scientific qualification which is a good sign in adopting the high educational qualifications to accomplish the work in the hotel Sector.

Descriptive analysis for the Years of experience of the member's respondent from the study sample. The table shows that the experience of 5 years or less (31.9%), and the experience from 6 -10 years (23.9%), from 11-15 years (23.9%), finally above 16 more (20.4%). At the same time years of Service in Hotels of the respondent members from the study sample Indicates that the 5 years or less (38.9%), and the experience from 6 -10 years (20.4%), from 11-15 years (25.7%), finally 16 years more (15%). Finally, the analysis of the job title represents that the

(46.9%) from the sample of the study are top management and (53.1%) from middle management.

(3-5): Study Tools and Data Collection

The current study is of two folds, theoretical and practical. In the theoretical aspect, the researcher relied on the scientific studies that are related to the current study. Whereas in the practical aspect, the researcher relied on descriptive and analytical methods using the practical manner to collect, analyze data and test hypotheses.

The data collection, manners of analysis and programs used in the current study are based on two sources:

1. Secondary sources: books, journals, and theses to write the theoretical framework of the study.
2. Primary source: a questionnaire that was designed to reflect the study objectives and questions.

In this study, both primary and secondary data were used. The data collected for the model were through questionnaire. After conducting a thorough review of the literature pertaining to business Intelligence, Decision Support and Quality of Decision Making, the researcher formulated the questionnaire instrument for this study.

The questionnaire instrumental sections are as follows:

Section One: **Demographic variables**. The demographic information was collected with closed-ended questions, through (6) factors (Age; Gender; Education level; Experience; Years of Service in Hotels and Job Title)

Section Two: **business Intelligence**. This section was measured the business Intelligence through (10) items on a Likert-type scale as follows:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1

Section Three: **Decision Support Systems**. This section measured through (2) dimensions (Information Quality & Content Quality) to measure the Decision Support Systems through (13) items (7) for Information Quality, (6) for Content Quality on a Likert-type scale as follows:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1

Section Four: **Quality of decision making**. This section measured the Quality of decision making through (10) items on a Likert-type scale as follows:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1

(3-6): Statistical Treatment

The data collected from the responses of the study questionnaire were used through *Statistical Package for Social Sciences (SPSS)* & Amos for analysis and conclusions. Finally, the researcher used the suitable statistical methods that consist of:

- *Percentage and Frequency.*
- *Cronbach Alpha reliability (α)* to measure strength of the correlation and coherence between questionnaire items.
- *Arithmetic Mean* to identify the level of response of study sample individuals to the study variables.
- *Standard Deviation* to Measure the responses spacing degree about Arithmetic Mean.
- Simple Regression analysis to Measure the impact of study variables on testing the direct effects.
- Path Analysis to testing the indirect effects
- Relative importance, assigned due to:

$$\text{Class Interval} = \frac{\text{Maximum Class} - \text{Minimum Class}}{\text{Number of Level}}$$

$$\text{Class Interval} = \frac{5 - 1}{3} = \frac{4}{3} = 1.33$$

The Low degree from 1- less than 2.33

The Medium degree from 2.33 – 3.66

The High degree from 3.67 and above.

(3-7): Validity and Reliability

(3-7-1): Validation

To test the questionnaire for clarity and to provide a coherent research questionnaire, a macro review that covers all the research constructs was thoroughly performed by academic reviewers from Middle East University specialized in faculty and practitioners Business Administration, Marketing, and information system. Some items were added, while others were dropped based on their valuable recommendations. Some others were reformulated to become more accurate to enhance the research instrument. The academic reviewers are (5) and the overall percentage of respond is (100%), (see appendix “2”).

(3-7-2): Study Tool Reliability

The reliability analysis applied to the level of Cronbach Alpha (α) is the criteria of internal consistency which was at a minimum acceptable level (Alpha \geq 0.60) suggested by (Sekaran, 2003). The overall Cronbach Alpha (α) = (0.933). Whereas the High level of Cronbach Alpha (α) is to Decision Support Systems = (0.864). The lowest level of Cronbach Alpha (α) is to Information Quality = (0.797).

These results are the acceptable levels as suggested by (Sekaran, 2003). The results were shown in Table (3-3).

Table (3-3)

Reliability of Questionnaire Dimensions

No.	Dimensions	Alpha Value (α)
1	Business Intelligence	0.850

2	Decision Support Systems	0.864
2 – 1	Information Quality	0.797
2 – 2	Content Quality	0.799
3	Quality of Decision Making	0.859
<i>Total</i>		0.933

CHAPTER FOUR

Analysis Results & Hypotheses Test

(4-1): Introduction

(4-2): Descriptive analysis of study variables

(4-3): Study Hypotheses Test

(4-1): Introduction

According to the purpose of the research and the research framework presented in the previous chapter, this chapter describes the results of the statistical analysis for the data collected according to the research questions and research hypotheses. The data analysis includes a description of the Means and Standard Deviations for the questions of the study; Simple Linear and Regression analysis and path analysis used.

(4-2): Descriptive analysis of study variables

(4-2-1): *Business Intelligence*

The researcher used the arithmetic mean, standard deviation, item importance and importance level as shown in Table (4-1).

Table (4-1)

Arithmetic mean, SD, item importance and importance level of Business Intelligence

No.	Business Intelligence	Mean	St.D	t- value Calculate	Sig	Item importance	Importance level
1	Our hotel management Enjoy foresight, utilize expertise and flexibility	4.18	0.86	14.947	0.000	1	High
2	Our hotel have the ability to adapt with complex environment	4.09	0.77	14.581	0.000	2	High
3	The hotel management characterized insight and brightness related to knowledge	4.06	0.90	12.554	0.000	3	High
4	Hotel managers have prior knowledge of environmental changes and the basis for any decision from decisions and carry out the activities	4.05	0.88	12.652	0.000	4	High
5	Hotel managers Intelligence includes a short-term tactical level	3.84	1.02	8.983	0.000	8	High
6	Intelligence in our hotel is a tool to provide comprehensive information on the external environment in right time to support the strategy development process	3.81	0.95	8.739	0.000	9	High
7	Hotel managers Intelligence can improve decision-making processes	3.98	0.86	12.206	0.000	5	High
8	Intelligence is coordinator activity to find the information for decision-making then analyzing and dissemination	3.90	0.99	9.685	0.000	7	High
9	Hotel managers interested in the process of gathering information about competitors, markets and customers to support business decisions	3.94	0.94	10.629	0.000	6	High
10	Hotel managers interested in creating the necessary information to formulation business strategy	3.80	1.12	7.711	0.000	10	High
General Arithmetic mean and standard deviation		3.97	0.93				

t- Value Tabulate at level ($\alpha \leq 0.05$) (1.658)

t- Value Tabulate was calculated based on Assumption mean to item that (3)

Table (4-1) Clarifies the importance level of Business Intelligence, where the arithmetic means range between (3.80 - 4.18) compared with General Arithmetic mean amount of (3.97). We observe that the highest mean for the item "***Our hotel management Enjoy foresight utilize expertise and flexibility***" with arithmetic mean (4.18), Standard deviation (0.86). The lowest arithmetic mean was for the item "***Hotel managers interested in creating the necessary information to formulation business strategy***" With Average (3.80) and Standard deviation (1.12). In general, it appears that the Importance level of Business Intelligence in Five Stars Hotels in Amman capital under study from the study sample viewpoint was high.

(4-2-2): Decision Support Systems (Information Quality)

The researcher used the arithmetic mean, standard deviation, item importance and importance level as shown in Table (4-2).

Table (4-2)

Arithmetic mean, SD, item importance and importance level of Information Quality

No.	Information Quality	Mean	St.D	t- value Calculate	Sig	Item importance	Importance level
11	The currency date of information is suitable for hotel needs	4.18	0.86	13.557	0.000	1	High
12	It is easy to interpret what this current information means.	4.09	0.77	12.486	0.000	2	High
13	Information in hotel showed an appropriate format.	4.06	0.90	12.298	0.000	3	High
14	Information in hotel can easily be collated	4.05	0.88	10.700	0.000	4	High
15	Information in hotel presented at appropriate level of detail and precision	3.84	1.02	9.534	0.000	6	High
16	presented of information in hotel is suitable for hotel needs	3.81	0.95	7.457	0.000	7	High
17	Information provided in hotel is characterized by comprehensive	3.98	0.86	10.187	0.000	5	High
General Arithmetic mean and standard deviation		4.00	0.89				

t- Value Tabulate at level ($\alpha \leq 0.05$) (1.658)

t- Value Tabulate was calculated based on Assumption mean to item that (3)

Table (4-2) Clarifies the importance level of Information Quality, where the arithmetic means range between (3.81 - 4.18) compared with General Arithmetic mean amount of (4.00). We observe that the highest mean for the item "**The currency date of information is suitable for hotel needs**" with arithmetic mean

(4.18), Standard deviation (0.86). The lowest arithmetic mean was for the item "**presented of information in hotel is suitable for hotel needs**" With Average (3.81) and Standard deviation (0.95). In general, it appears that the Importance level of Information Quality in Five Stars Hotels in Amman capital under study from the study sample viewpoint was high.

(4-2-3): *Decision Support Systems (Content Quality)*

The researcher used the arithmetic mean, standard deviation, item importance and importance level as shown in Table (4-3).

Table (4-3)

Arithmetic mean, SD, item importance and importance level of Content Quality

No.	Content Quality	Mean	St.D	t- value Calculate	Sig	Item importance	Importance level
18	The units of measurement used in hotel for retrieved information can be easily changed as needed	3.90	0.99	12.327	0.000	5	High
19	The level of detail or precision for information can be modified to suit hotel needs	3.94	0.94	12.999	0.000	3	High
20	The hotel has an ability to change the content of information easily as needed	3.81	1.12	11.866	0.000	6	High
21	The units of measurement used to ,measure information Content Quality allocated according to the hotel needs	4.14	0.90	14.544	0.000	1	High
22	In the hotel, they manage easily to get explanations of terms, abbreviations and symbols used in presenting information in hotel	3.93	0.92	12.545	0.000	4	High
23	The hotel has an ability to customize the expulsion information as needed	3.97	0.83	13.585	0.000	2	High
General Arithmetic mean and standard deviation		3.95	0.95				

t- Value Tabulate at level ($\alpha \leq 0.05$) (1.658)

t- Value Tabulate was calculated based on Assumption mean to item that (3)

Table (4-3) Clarifies the importance level of Content Quality, where the arithmetic means range between (3.81 - 4.14) compared with General Arithmetic mean amount of (3.95). We observe that the highest mean for the item "***The units of measurement used to measure information Content Quality allocated according to the hotel needs***" with arithmetic mean (4.14), Standard deviation (0.90). The lowest arithmetic mean was for the item "***The hotels have an ability to change the content of information easily as needed***" With Average (3.81) and Standard deviation (1.12). In general, it appears that the Importance level of Content Quality in Five Stars Hotels in Amman capital under study from the study sample viewpoint was high.

(4-2-4): Quality of Decision Making

The researcher used the arithmetic mean, standard deviation, item importance and importance level as shown in Table (4-4).

Table (4-4)

Arithmetic mean, SD, item importance and importance level of Quality of Decision

Making

No.	Quality of Decision Making	Mean	St.D	t- value Calculate	Sig	Item importance	Importance level
24	Hotel Interested in developing strategies for new services that it intends to submit in the coming years	3.72	1.02	8.697	0.000	10	High
25	Hotel keen to diversify the new services to meet the needs of customers	3.80	0.89	10.547	0.000	9	High
26	Hotel keen to employ the technology to bring about developments in the provision of services	3.96	0.83	11.218	0.000	7	High
27	Decisions that are taken consistent at the hotel with the policy pursued by the hotel	3.88	0.92	10.838	0.000	8	High
28	Decisions are taken at the hotel consistent with their strategic objectives	4.03	0.84	12.798	0.000	3	High
29	Decisions taken by hotel Characterized by easily follow up their results in the long term	4.02	0.74	11.831	0.000	4	High
30	Decisions taken at the hotel are measurable	3.99	0.84	11.528	0.000	5	High
31	Decisions taken at the hotel contribute to achieving the hotel vision	3.97	0.84	11.364	0.000	6	High
32	Decisions taken at the hotel are achievable	4.04	0.82	13.165	0.000	2	High
33	Decisions taken at the hotel contribute to achieving the hotel mission	4.05	0.94	13.796	0.000	1	High
General Arithmetic mean and standard deviation		3.95	0.87				

t- Value Tabulate at level ($\alpha \leq 0.05$) (1.658)

t- Value Tabulate was calculated based on Assumption mean to item that (3)

Table (4-4) Clarifies the importance level of Quality of Decision Making, where the arithmetic means range between (3.72 - 4.05) compared with General Arithmetic mean amount of (3.95). We observe that the highest mean was for the item "**Decisions taken at the hotel contribute to achieving the hotel mission**" with arithmetic mean (4.05), Standard deviation (0.94). The lowest arithmetic mean was for the item "**Hotel Interested in developing strategies for new services that it intends to submit in the coming years**" With Average (3.72) and Standard deviation (1.02). In general, it appears that the Importance level of Quality of Decision Making in Five Stars Hotels in Amman capital under study from the study sample viewpoint was high.

(4-3): Study Hypotheses Test

The researcher in this part tested the main hypotheses, through Simple Linear Regression analysis with (F) test using ANOVA table and path analysis as follows:

HA₁. There is a significant positive direct impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the simple regression analysis to ensure the impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital. As shown in Table (4-5).

Table (4-5) Simple Regression Analysis test results of the impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital

	(R)	(R ²)	F Calculated	DF	Sig*	β	T Calculated	Sig*
decision making quality	0.612	0.374	66.404	1	0.000	0.603	8.149	0.000
				111				
				112				

* the impact is significant at level ($\alpha \leq 0.05$)

From table (4-5) the researcher observes that there is a significant impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital. The R was (0.612) at level ($\alpha \leq 0.05$); whereas the R^2 was (0.374). This means the (0.374) of decision making quality in Five Stars Hotels changeability's results from the changeability in Business Intelligence. As β was (0.603) this means the increase of one unit in Business Intelligence will increase decision making quality in Five Stars Hotels value (0.603). Confirms significant impact F Calculate was (66.404) and it's significance at level ($\alpha \leq 0.05$), and that confirms the validation of the first hypotheses, and thus ,accept the hypothesis:

There is a significant positive direct impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₂. There is a significant positive direct impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher used the simple regression analysis to ensure the impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital, as shown in Table (4-6).

Table (4-6) Simple Regression Analysis test results of the impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital

	(R)	(R ²)	F Calculate	DF	Sig*	β	T Calculate	Sig*
Information quality	0.625	0.391	71.249	1 111 112	0.000	0.620	8.441	0.000

* the impact is significant at level ($\alpha \leq 0.05$)

From table (4-6) the researcher observes that there is a significant impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital. The **R** was (0.625) at level ($\alpha \leq 0.05$); whereas the **R²** was (0.391). This means the (0.391) of information quality in Five Stars Hotels changeability's results from the changeability in Business Intelligence. As **β** was (0.620) this means that the increase of one unit in Business Intelligence will increase information quality in five stars Hotels value by (0.620). Confirms significant

impact F Calculate was (71.249) and its significance at level ($\alpha \leq 0.05$), and that confirms valid Second hypotheses, and accepted hypothesis:

There is a significant positive direct impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₃. There is a significant positive direct impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the simple regression analysis to ensure the impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital. As shown in Table (4-7).

Table (4-7) Simple Regression Analysis test results of the impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital

	(R)	(R ²)	F Calculate	DF	Sig*	β	T Calculate	Sig*
content quality	0.641	0.441	77.319	1	0.000	0.623	8.793	0.000
				111				
				112				

* the impact is significant at level ($\alpha \leq 0.05$)

From table (4-7) the researcher observes that there is a significant impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital. The *R* was (0.641) at level ($\alpha \leq 0.05$) whereas the *R²* was (0.441). This means the (0.441) of content quality in Five Stars Hotels changeability's results from the

changeability in Business Intelligence. As β was (0.623) this means the increase of one unit in Business Intelligence will increase content quality in Five Stars Hotels value (0.623). Confirms significant impact F Calculate was (77.319) and its significance at level ($\alpha \leq 0.05$), and that confirms valid third hypotheses, and accepted hypothesis:

There is a significant positive direct impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₄. There is a significant positive direct impact of information quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the simple regression analysis to ensure the impact of information quality on decision making quality in Five Stars Hotels in Amman Capital. As shown in Table (4-8).

Table (4-8) Simple Regression Analysis test results of the impact of information quality on decision making quality in Five Stars Hotels in Amman Capital

	(R)	(R ²)	F Calculate	DF	Sig*	β	T Calculate	Sig*
decision making quality	0.641	0.410	77.237	1	0.000	0.634	8.788	0.000
				111				
				112				

* the impact is significant at level ($\alpha \leq 0.05$)

From table (4-8) the researcher observes that there is a significant impact of information quality on decision making quality in Five Stars Hotels in Amman

Capital. The R was (0.641) at level ($\alpha \leq 0.05$) whereas the R^2 was (0.410). This means the (0.410) of decision making quality in Five Stars Hotels changeability's results from the changeability in information quality. As β was (0.634) this means the increase of one unit in information quality will increase decision making quality in Five Stars Hotels value (0.634). Confirms significant impact F Calculate was (77.237) and it's significance at level ($\alpha \leq 0.05$), and that confirms valid fourth hypotheses, and accepted hypothesis:

There is a significant positive direct impact of information quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₅. There is a significant positive direct impact of content quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the simple regression analysis to ensure the impact of content quality on decision making quality in Five Stars Hotels in Amman Capital. As shown in Table (4-9).

Table (4-9) Simple Regression Analysis test results of the impact of content quality on decision making quality in Five Stars Hotels in Amman Capital

	(R)	(R ²)	F Calculate	DF	Sig*	β	T Calculate	Sig*
Decision making quality	0.540	0.291	45.572	1	0.000	0.546	6.751	0.000
				111				
				112				

* the impact is significant at level ($\alpha \leq 0.05$)

From table (4-9) the researcher observes that there is a significant impact of content quality on decision making quality in Five Stars Hotels in Amman Capital. The R was (0.540) at level ($\alpha \leq 0.05$) whereas the R^2 was (0.291). This means the (0.291) of decision making quality in Five Stars Hotels changeability's results from the changeability in content quality. As β was (0.546) this means the increase of one unit in content quality will increase decision making quality in Five Stars Hotels value (0.546). Confirms significant impact F Calculate was (45.572) and its significance at level ($\alpha \leq 0.05$), and that confirms valid fifth hypotheses, and accepted hypothesis:

There is a significant positive direct impact of content quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₆. There is a significant positive indirect impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the path analysis (Amos Programming) to ensure the impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital. As shown in Table (4-10).

Table (4-10) Path analysis test results of the impact of Business Intelligence on decision making quality under information quality in
Five Stars Hotels in Amman Capital

	Chi ² Calculate	Chi ² Tabled	GFI	CFI	RMSEA	Direct Effect		Indirect Effect	Sig.*
Business Intelligence on decision making quality through information quality	14.867	3.841	0.923	0.890	0.035	Business Intelligence on information quality	0.625	0.400	0.000
						information quality on decision making quality	0.641		

RMSEA: Root Mean Square Error of Approximation must Proximity to Zero

GFI: Goodness of Fit Index must Proximity to One

CFI: Comparative Fit Index must Proximity to One

From table (4-10) we observe that there is a significant impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital. The χ^2 was (14.867) at level ($\alpha \leq 0.05$), whereas the GFI was (0.923) approaching to one. On the same side the CFI was (0.890) approaching to one, while the RMSEA was (0.035) approaching to zero, as Direct Effect was (0.625) between Business Intelligence and information quality, (0.641) between information quality and decision making quality. Also the Indirect Effect was (0.400) between Business Intelligence on decision making quality through information quality in Five Stars Hotels in Amman Capital. Thus, we accept the hypothesis that states:

There is a significant positive indirect impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₇: There is a significant positive indirect impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the path analysis (Amos Programming) to ensure the impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital. As shown in Table (4-11).

Table (4-11) Path analysis test results of the impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital

	Chi ² Calculate	Chi ² Tabled	GFI	CFI	RMSEA	Direct Effect		Indirect Effect	Sig.*
Business Intelligence on decision making quality through content quality	20.798	3.841	0.898	0.829	0.042	Business Intelligence on content quality	0.641	0.346	0.000
						content quality on decision making quality	0.540		

RMSEA: Root Mean Square Error of Approximation must Proximity to Zero

GFI: Goodness of Fit Index must Proximity to One

CFI: Comparative Fit Index must Proximity to One

From table (4-11) we observe that there is a significant impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital. The χ^2 was (20.798) at level ($\alpha \leq 0.05$), whereas the GFI was (0.898) approaching to one. On the same side the CFI was (0.829) approaching to one, while the RMSEA was (0.042) approaching to zero, like Direct Effect was (0.641) between Business Intelligence and content quality, (0.540) between content quality and decision making quality. Also the Indirect Effect was (0.346) between Business Intelligence on decision making quality through content quality in Five Stars Hotels in Amman Capital. Thus, we accept the hypothesis that states:

There is a significant positive indirect impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

HA₈. There is a significant positive indirect impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

To test this hypothesis, the researcher uses the path analysis (Amos Programming) to ensure the impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital. As shown in Table (4-12).

Table (4-12) Path analysis test results of the impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital

	Chi ² Calculate	Chi ² Tabled	GFI	CFI	RMSEA	Direct Effect		Indirect Effect	Sig.*
Business Intelligence on decision making quality through information & content quality	8.693	3.841	0.953	0.948	0.026	Business Intelligence on information & content quality	0.704	0.466	0.003
						information & content quality on decision making quality	0.662		

RMSEA: Root Mean Square Error of Approximation must Proximity to Zero

GFI: Goodness of Fit Index must Proximity to One

CFI: Comparative Fit Index must Proximity to One

From table (4-12) we observe that there is a significant impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital. The Chi² was (8.693) at level ($\alpha \leq 0.05$), whereas the GFI was (0.953) approaching to one. On the same side the CFI was (0.948) approaching to one, while the RMSEA was (0.026) approaching to zero, as Direct Effect was (0.704) between Business Intelligence and information, content quality, (0.662) between information, content quality and decision making quality. As well as, the Indirect Effect was (0.466) between Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital. That assures Eighth hypothesis:

There is a significant positive indirect impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

CHAPTER FIVE

Results, Conclusions and Recommendations

(5 -1): Results

(5-2): Conclusions

(5-3): Recommendations

(5 -1): Results

1. The Importance level of Business Intelligence in Five Stars Hotels in Amman Capital under study from the study sample viewpoint was high.
2. The Importance level of Information Quality in Five Stars Hotels in Amman Capital under study from the study sample viewpoint was high.
3. The Importance level of Content Quality in Five Stars Hotels in Amman capital under study from the study sample viewpoint was high.
4. The Importance level of Quality of Decision Making in Five Stars Hotels in Amman capital under study from the study sample viewpoint was high.
5. There is a significant positive direct impact of Business Intelligence on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).
6. There is a significant positive direct impact of Business Intelligence on information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).
7. There is a significant positive direct impact of Business Intelligence on content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).
8. There is a significant positive direct impact of information quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).
9. There is a significant positive direct impact of content quality on decision making quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

10. There is a significant positive indirect impact of Business Intelligence on decision making quality under information quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

11. There is a significant positive indirect impact of Business Intelligence on decision making quality under content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

12. There is a significant positive indirect impact of Business Intelligence on decision making quality under information & content quality in Five Stars Hotels in Amman Capital at level ($\alpha \leq 0.05$).

(5-2): Conclusions

1. Organizations today collect enormous amounts of data from numerous sources. The use of BI to collect, organize, and analyze this data can add great value to a business.
2. Business Intelligence has always been an important part of the competing business world, and thus the core activities of Business Intelligence are far from new.
3. There are two perspectives of Business Intelligence: Technological & Organizational. Technological means a system that takes data and transforms it into various information products, while Organizational means an umbrella term for decision support.
4. Decision support systems can help closing human knowledge gap by providing various sources of information, providing intelligent access to relevant knowledge, and aiding the process of structuring decisions.
5. Decision support systems are the interactive system between the user and computer to support decision making process for unstructured decisions by using analytical models and databases.
6. Decision support systems can help the manager to take a good decision about the quality of services and also, improve electronic registration organization management.
7. Making decisions is what managers and leaders are paid to do.

8. There are several important factors that influence decision making. Significant factors include past experiences, a variety of cognitive biases, an escalation of commitment and sunk outcomes, individual differences, including age and socioeconomic status, and a belief in personal relevance.

9. Decision-making can be considered at three main levels; at the personal level, the individual goes through a generic problem solving cycle to make choices about the personal issues for which they seek solutions.

(5-3): Recommendations

Based on the study results and research conclusions, the researcher suggests the following recommendations to meet the study objectives:

1. The Five Stars Hotel must build an integrated model to maximize net profit from using Decision support systems, Also it operates the proposed model based on the outcomes of demand forecasting model, the data of actual fact, estimated data for several alternative scenarios, to reach appropriate net profit in light of business processes and Business Intelligence relationships.
2. The Five Stars Hotel must establish cooperative and / or strategic alliances with main customers and suppliers, on the basis of trust and cooperation to maximize the utilization of resources, and sharing of benefits arising among themselves and with beneficiaries of the services provided.
3. The Five Stars Hotel must apply the Business Intelligence process, including: instructions for planning, forecasting and cooperation.
4. The researcher recommends conducting case studies, each of them building a model to maximize the benefit of Decision support systems for the Five Stars Hotel.
5. The researcher recommends conducting research about the impact of Business Intelligence Capabilities in achieving competitive performance.

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Appendices

Appendix (1)

Names of arbitrators

No.	Name	Specialization	University
1	Prof.Dr. Kamel AL-Moghrabi	Business Administration	MEU
2	Dr. Laith AL-Rubaie	Marketing	MEU
3	Hamza khraim	Marketing	MEU
4	Hamid Shaibi	Business Administration	MEU
5	Amjad Twaqat	Business Administration	MEU

Appendix (2)

Questionnaire

Mr/Mrs Greeting

The researcher purposed to explore the impact of “*Business Intelligence and Decision Support on the Quality of Decision Making: An Empirical Study on Five Stars Hotels in Amman Capital*”

This Questionnaire is designed to collect information about your organization. I would be very grateful if you could answer ALL questions as completely and accurately as possible.

Thanks for answer all the items in the Questionnaire

Hadeel A. Mohammad

First Section: Demographics Information

الجزء الأول: الخصائص الديمغرافية

(1) Age:				(1) العمر			
30 years or less	<input type="checkbox"/>	From 31– 40 Years	<input type="checkbox"/>	<input type="checkbox"/>	من 31 - 40 سنة	<input type="checkbox"/>	30 سنة فأقل
From 41– 50 Years	<input type="checkbox"/>	51 Years More	<input type="checkbox"/>	<input type="checkbox"/>	51 سنة فأكثر	<input type="checkbox"/>	من 41 - 50 سنة
(2) Gender:				(2) الجنس			
Male	<input type="checkbox"/>	Female	<input type="checkbox"/>	<input type="checkbox"/>	أنثى	<input type="checkbox"/>	ذكر
(3) Educate Level:				(3) المستوى التعليمي			
BSc	<input type="checkbox"/>	High Diploma	<input type="checkbox"/>	<input type="checkbox"/>	دبلوم عالٍ	<input type="checkbox"/>	بكالوريوس
Master	<input type="checkbox"/>	PhD	<input type="checkbox"/>	<input type="checkbox"/>	دكتوراه	<input type="checkbox"/>	ماجستير
(4) Experience:				(4) الخبرة العملية			
5 years or less	<input type="checkbox"/>	- 10 Years From 6	<input type="checkbox"/>	<input type="checkbox"/>	من 6 - 10 سنة	<input type="checkbox"/>	5 سنوات فأقل
From 11 – 15 Years	<input type="checkbox"/>	16 Years More	<input type="checkbox"/>	<input type="checkbox"/>	16 سنة فأكثر	<input type="checkbox"/>	من 11 - 15 سنة
(5) Years of Service in Hotels:				(5) عدد سنوات الخدمة في الفنادق			
5 years or less	<input type="checkbox"/>	- 10 Years From 6	<input type="checkbox"/>	<input type="checkbox"/>	من 6 - 10 سنة	<input type="checkbox"/>	5 سنوات فأقل
From 11 – 15 Years	<input type="checkbox"/>	16 Years More	<input type="checkbox"/>	<input type="checkbox"/>	16 سنة فأكثر	<input type="checkbox"/>	من 11 - 15 سنة
(6) Job Title:				(6) المنصب الوظيفي			
Top Management	<input type="checkbox"/>	Middle Management	<input type="checkbox"/>	<input type="checkbox"/>	إدارة وسطى	<input type="checkbox"/>	إدارة عليا

Second Section: Business Intelligence

الجزء الثاني: نكاء الأعمال

No	Item	بدائل الإجابة Answer alternatives					الفقرة	ت
		لا أتفق إطلاقاً Strongly disagree	لا أتفق Disagree	محايد Neutral	أتفق Agree	أتفق كلياً Strongly Agree		
1	Our hotel management Enjoy foresight, utilize expertise and flexibility						تتمتع الإدارة في فندقنا بالتبصر والانتفاع بالخبرة والمرونة	1
2	Our hotel have the ability to adapt with complex environment						لدى فندقنا القدرة على التكيف مع البيئة المعقدة	2
3	The hotel management characterized insight and brightness related to knowledge						تتميز إدارة الفندق بالفتنة والنباهة المتصلة بالمعرفة والملازمة لها	3
4	Hotel managers have prior knowledge of environmental changes and the basis for any decision from decisions and carry out the activities						يتمتع مديري الفندق بالمعرفة المسبقة بالتغيرات البيئية والأساس لاتخاذ أي قرار من القرارات والقيام بالأنشطة	4
5	Hotel managers Intelligence includes a short-term tactical level						الذكاء لدى مديري الفندق يشمل المستوى التكتيكي القصير الأمد	5
6	Intelligence in our hotel is a tool to provide comprehensive information on the external environment in right time to support the strategy development process						الذكاء في فندقنا يمثل أداة لتوفير معلومات شاملة عن البيئة الخارجية في الوقت المناسب لدعم عملية تطوير الاستراتيجية	6
7	Hotel managers Intelligence can improve decision-making processes						الذكاء لدى مديري الفندق يمكن من تحسين عمليات صناعة القرار	7
8	Intelligence is coordinator activity to find the information for decision-making then analyzing and dissemination						يعتبر الذكاء نشاط منسق للبحث عن المعلومات اللازمة لاتخاذ القرارات ثم تحليلها وتوزيعها	8
9	Hotel managers interested in the process of gathering information about competitors, markets and customers to support business decisions						يهتم مديري الفندق بعملية جمع المعلومات عن المنافسين والأسواق والزبائن لدعم قرارات الأعمال	9
10	Hotel managers interested in creating the necessary information to formulation business strategy						يهتم مديري الفندق في تهيئة المعلومات اللازمة لصياغة استراتيجية الأعمال	10

Third Section: Decision Support Systems

الجزء الثالث: نظم دعم القرار

No	Item	بدائل الإجابة Answer alternatives					الفقرة	ت
		لا أتفق إطلاقاً Strongly disagree	لا أتفق Disagree	محايد Neutral	أتفق Agree	أتفق كلياً Strongly Agree		
Information Quality							جودة المعلومات	
11	The currency date of information is suitable for hotel needs						التاريخ الحالي للمعلومات هو مناسب لاحتياجات الفندق	11
12	It is easy to interpret what this current information means.						من السهل تفسير ما تعني المعلومات الحالية للفندق	12
13	Information in hotel showed an appropriate format.						المعلومات في الفندق معروضة بشكل مناسب	13
14	Information in hotel can easily be collated						المعلومات في الفندق يتم جمعها بسهولة	14
15	Information in hotel presented at appropriate level of detail and precision						يتم تقديم المعلومات في الفندق بمستوى مناسب من التفصيل والدقة	15
16	presented of information in hotel is suitable for hotel needs						عرض المعلومات في الفندق مناسب لاحتياجات الفندق	16
17	Information provided in hotel is characterized by comprehensive						المعلومات المقدمة في الفندق تتصف بالشمولية	17
Content Quality							جودة المحتوى	
18	The units of measurement used in hotel for retrieved information can be easily changed as needed						وحدات القياس المستخدمة في الفندق للحصول على المعلومات يمكن تغييرها بسهولة حسب الحاجة	18
19	The level of detail or precision for information can be modified to suit hotel needs						يمكن تعديل مستوى التفصيل أو الدقة للحصول على المعلومات المناسبة لاحتياجات الفندق	19
20	The hotel have an ability to change the content of information easily as needed						لدي الفندق القدرة على تغيير محتوى المعلومات بسهولة وحسب الحاجة	20
21	The units of measurement used to measure information Content Quality allocated according to the hotel needs						وحدات القياس المستخدمة لقياس جودة محتوى المعلومة يتم تخصيصها تبعاً لاحتياجات الفندق	21
22	In the hotel, they easily to get explanations of terms, abbreviations and symbols used in presenting information in hotel						من السهل الحصول على تفسيرات للمصطلحات والاختصارات والرموز المستخدمة في عرض المعلومات داخل الفندق	22
23	The hotel have an ability to customize the expulsion information as needed						لدي الفندق القدرة على تخصيص إخراج المعلومات بما يتناسب واحتياجاته	23

Fourth Section: Quality of Decision Making

الجزء الرابع: جودة اتخاذ القرارات

No	Item	بدائل الإجابة Answer alternatives					الفقرة	ت
		لا أتفق إطلاقاً Strongly disagree	لا أتفق Disagree	محايد Neutral	أتفق Agree	أتفق كلياً Strongly Agree		
24	Hotel Interested in developing strategies for new services that it intends to submit in the coming years						يهتم الفندق بتطوير استراتيجيات للخدمات الجديدة التي ينوي تقديمها خلال السنوات القادمة	24
25	Hotel keen to diversify the new services to meet the needs of customers						يحرص الفندق على تنوع الخدمات الجديدة لتلبية حاجات الزبائن	25
26	Hotel keen to employ the technology to bring about developments in the provision of services						يحرص الفندق على توظيف التكنولوجيا لإحداث تطورات في عملية تقديم الخدمات	26
27	Decisions that taken consistent at the hotel with the policy pursued by the hotel						تنسجم القرارات المتخذة في الفندق مع السياسة العامة التي ينتهجها الفندق	27
28	Decisions taken at the hotel consistent with their strategic objectives						القرارات المتخذة في الفندق تنسجم وأهدافه الاستراتيجية	28
29	Decisions taken by hotel Characterized by easily follow up their results in the long term						تتسم القرارات التي يتخذها الفندق بسهولة متابعه نتائجها على المدى البعيد	29
30	Decisions taken at the hotel are measurable						القرارات التي يتم إتخاذها بالفندق قابلة للقياس	30
31	Decisions taken at the hotel contribute to achieving the hotel vision						تساهم القرارات المتخذة في الفندق بتحقيق رؤية الفندق	31
32	Decisions taken at the hotel are achievable						القرارات التي يتم إتخاذها بالفندق قابلة للتحقق	32
33	Decisions taken at the hotel contribute to achieving the hotel mission						تساهم القرارات المتخذة في الفندق بتحقيق رسالة الفندق	33