Global Journal of Economics and Business (GJEB)

Volume.12, Issue.2, pp: 256-273 Article 8
April (2022)

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Received: 23/3/2022 Revised: 17/4/2022 Accepted: 21/4/2022

DOI: https://doi.org/10.31559/GJEB2022.12.2.8

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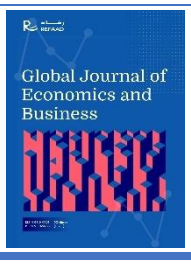
Global Journal of Economics and Business (GJEB)

Journal Homepage: https://www.refaad.com/Journal/Index/2

E-ISSN 2519-9293 | P-ISSN 2519-9285



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Abstract: This study aims at studying the importance of business intelligence systems and decision support systems for Syrian civil society organizations in addition to studying the impact of the dimensions of decision support systems and business intelligence in making strategic decisions. The data was collected through a survey conducted on the participants. 100 correct answers were used to analyze the data. SPSS and SmartPLS 3 software were used to analyze the study data. The results showed support for the seven hypotheses. That decision support systems and business intelligence are well available in Syrian civil society organizations in the city of Gaziantep and at the same time, it was found that there is a strong positive relation between business intelligence and decision support systems with the making strategic decisions.

Keywords: *Decision support system; Business intelligence; Strategic decision-making.*

1. Introduction

The importance of data and information in the business environment has increased because of the rapid development of the world of information technology and the increase in competition under complex and constantly changing environmental conditions. Thus, it can be said that relying on relevant data allows companies to follow their business more effectively and make right decisions that lead to achieving meaningful competition in the labor market (Ritesh, Srimannarayana, 2013). Decision makers must have a large information flow, greater access to data sources, and presentation of accurate and comprehensive information about their products and customers, and therefore they seek to make business decisions that have a greater impact in the long run that will benefit them (Huber, 2008). For managers of companies, institutions and organizations, the abundance of information is the primary resource that determines the manager's ability to rank, analyze and extract useful information from them, thus helping them make successful business decisions. Decision support systems (DSS) can be considered as one of the concepts that were worked on and developed during the eighties (Sauter, 2011), and therefore decision support systems can be considered systems based on the characteristics of flexibility and reactivity, in addition to the characteristic of an adaptive computer information system. In decision models an integrated model with a comprehensive database is used together with the decision-makers' own objectives to solve a problem (Tribathy, Engineering, 2011).

Al-Jazrawi and Al-Janabi (2009) define decision support systems as the systems that support the decision by providing a direct means of support between digital technology and the decision maker in the organization without the need for an information expert in this field. The decision maker also depends on himself to solve problems through the use of this electronic technology. In this respect, this system helps the decision makers in handling unorganized business. Through research and investigation, we found that business intelligence tools help companies significantly and impressively in obtaining data from different and broad sources and thus enabling users to analyze this data using different dimensions and domains (Hoque et al, 2015). Relying on business intelligence, which is the hallmark of successful work, includes the use of tools and the application of techniques

necessary to collect data from different sources, then analyze it and provide us with the necessary knowledge in the decision-making process in various fields (Olaru, Theories, 2014). According to Ritesh and Srimannarayana (2013), business is a set of new technologies such as data warehouses, analytics, and various data mining operations, which aim to process and analyze structured data. Therefore, the main objective of business intelligence tools is to transform data after processing it from several types and sources into useful and valuable information for both companies and decision-makers (Ritesh, Srimannarayana, 2013).

As a result, this research discusses the importance of both business intelligence and decision support systems for organizations and examines their impact on strategic decision-making. Moreover, the study aims at studying the importance of both business intelligence systems and decision support systems for Syrian civil society organizations in addition to the impact of the dimensions of decision support systems and business intelligence in making strategic decisions. The problem of the study revolves around the urgent need to develop decision support systems in Syrian civil society organizations by taking advantage of technical developments in light of the business environment that is characterized by rapid change. Let alone the technological development thanks to the optimal spread of business intelligence applications, which allow workers in civil society organizations to manage various activities related to making strategic decisions, which contributes to the completion of tasks quickly and thus is reflected in the quality of the decisions taken.

2. Study Model and Hypotheses Development

Based on the studies of (Alwan, 2019; Jones, 2011), the model of the exemplary study illustrated in Figure (1) was prepared. It consists of two independent variables, and a dependent variable, where each of the decision support systems and its components (top management support, computers, software, databases), and business intelligence and its components (data collection and analysis, resilience and risk support) are independent variables. While strategic decision-making in civil society organizations is referred to as a dependent variable. This model will examine the relationship between decision support systems and business intelligence applications and their impact on strategic decision-making in civil society organizations in the city of Gaziantep.

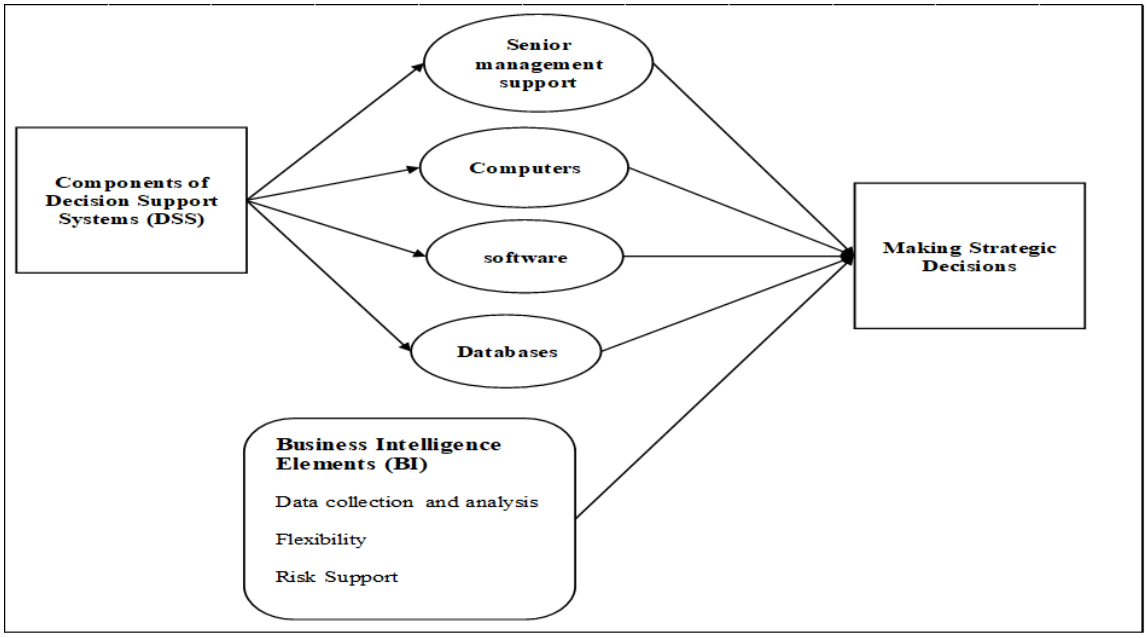

Figure (1): Study model

Senior management support can be defined as the conviction of senior management in organizations of the importance of decision support systems and their work through the development of programs and policies that support the decision-making process in the organization (Ahmad, 2016). Computers can also be defined as the various types of computers and the basic equipment attached to them that are used in the organization to take advantage of receiving data and information from all parties, processing and storing them to take the necessary decisions (Turban, et al., 2017). The software can also be defined as a set of systems that operate devices, equipment, networks, and databases so that the devices can perform the required operations that are commensurate with the decision-making process (Alhazayma, 2011). Databases can also be defined as a set of data, information, and files maintained by organizations and have an interrelationship and stored on computer media and include a description of all operations and activities that are implemented in connection with decision-making. Alter (2012) and Al-atibi (2004) defined decision-making as all the organized decisions taken by leaders, officials, and specialists in organizations to confront a particular problem or situation, provided that there is more than one alternative or solution and then choose the appropriate alternative to achieve the desired goals in the best way. To

reach appropriate and effective decisions that contribute to overcoming the problem or the situations from which it was issued. Accordingly, Mintzberg and Quinn (1996) see that strategic decisions represent decisions that determine the direction and path of the basic organization based on an approach and a perception related to the occurring and expected changes in the work environment of the external organization and its internal movement. Mcleod and Raymond (1998) believe that in the stage of data collection and analysis, business intelligence systems collect data from internal and external sources according to desired objectives and to serve the decision-making process and then analyze it to obtain the necessary information to make various decisions of the organization. Based on what was previously explained in the hypothetical study model, the following hypotheses were formulated:

H1: Decision support systems have a positive, statistically significant effect in making strategic decisions.

H1.1: There is a statistically significant influence relationship for the variable of senior management support in making strategic decisions.

H1.2: There is a statistically significant influence relationship for the variable of computers in making strategic decisions.

H1.3: There is a statistically significant influence relationship for the variable of software in making strategic decisions.

H1.4: There is a statistically significant influence relationship for the variable of databases in making strategic decisions.

H2: There is a positive, statistically significant effect of business intelligence and its elements in making strategic decisions.

H2.1: There is a statistically significant influence relationship for the variable of data collection and analysis in making strategic decisions.

H2.2: There is a statistically significant influence relationship for the variable of flexibility in making strategic decisions.

H2.3: There is a statistically significant influence relationship for the variable of risk in making strategic decisions.

3. Literature Review

One of the studies that focused on the importance of decision support systems and business intelligence, as well as the investigation of organizational factors that affect the effective use of business intelligence systems or decision support systems in a particular organization, is the study of (Salameh & Alasiri, 2020). The two researchers used "University Library" data by investigating and collecting information about the emergence of decision support systems technologies, business intelligence, understanding concepts, applications and interests in different industries, especially retail trade. The study concluded that business intelligence can have a positive impact on the decision-making process and thus reach a sound decision, as it adds a positive value that is inevitable benefit to the business owner and the beneficiaries.

Among the results of the study of Malkawi (2015) on the relationship of decision support systems and business intelligence, that decision support systems and business intelligence systems in King Abdullah University Hospital founder are highly efficient. Also, it was found that the level of the hospital's decision-making process is high. In the same context, the researcher found that there is a positive and statistically significant relationship between decision support systems, business intelligence systems, and decision-making.

Ahmed (2016) concluded that decision support systems contribute significantly to the resource planning process through the data used by decision makers, at the same time human resource planning needs effective systems to support management with the necessary information such as human resource information systems.

Ngwenya (2013) concluded that decision support systems are to a large extent effective in helping to make decisions in organizations, and the responses from management focused on the higher positive side, and it was found that most elements of human resources were improved through the use of decision support systems.

Bhandari, et al. (2004) aimed to know the importance of decision support systems in helping investors face challenges. This is done by applying the study tool to a group of management members at the medium and high levels in some US corporate departments. The results of the study showed that there is a strong role for decision support systems in providing knowledge to decision makers. There is also an effective role for these systems in reducing the negative effects of decisions.

In the same context, Petkov, et al. (2007) aimed to provide a summary of the researcher's experience with many decision-making criteria and methods used to support decision-making in solving complex problems. In this regard, the study showed the important role of each of the integration of information, software and communications in supporting the different stages of the decision support process.

4. Theoretical Background

4.1. Decision Support Systems

Information systems are defined as information systems that rely on computers in their work. Thus, the main task of information systems is to facilitate the process of communication between the human element and

information technology, with the aim of facilitating the delivery of information to the end-user (Yasin, 2009). Interactive information systems provide managers with information, models, and tools for data processing that will assist in decision-making. especially in circumstances that do not know what the decision is to be taken (Al-Kurdi, Al-Abd, 2003). Al-Omari and Al-Sameri (2008) defined it as a system capable of supporting data analysis, providing models for specific topics, and this targeting strategic planning, information technology, methodology, and progressivity. Accordingly, it can be said that the decision support system is a computerized information system that helps organizations to make effective decisions, whether they are business or organizational decisions (Huber, 2008; Power, Heavin, 2017). These systems provide important information for unstructured and semi-structured decision making by middle management.

4.1.1. Types of decision support systems

4.1.1.1. data-driven decision support systems

This system relies on old technologies, as well as new technologies such as decision support systems, data warehouses, and OLAP (Power 2008b; Bhargava et al., 2007). Thus, it can be expressed as a computer-based program as well as features between expert management systems, artificial intelligence technology and data search (Power, 2001).

4.1.1.2. Group decision support systems and communication-driven decision support systems:

Group decision support systems are defined as a group of advanced hardware and software that stimulate teamwork by supporting communications and meetings such as video calls. The DSS Group and the DSS Group are communication-based systems associated with decision makers to create connections and exchange data between decision makers (Power, Bhargava, 2001).

4.1.1.3. Document-driven DSS

A system that relies on categorizing vast amounts of unstructured information such as document management systems and system information management. In this regard, the document space is used to provide information relevant to decision-making (Power, 2002; Zarate, Dargam, 2015).

4.1.1.4. Model-driven DSS:

According to Power and Sharda (2007), it is a system based on precise programming models that can be used to support the decision-making process through different models and language interfaces that are easy to handle in the information in these models. Another definition uses the analytic analysis and analysis tools for decision making, optimization, simulation, statistics, sampling, and the use of formal representation of decision models (Srinivasan et al., 2011).

4.2. Business intelligence

By observing the theoretical literature, the first to use the term business intelligence was Gartner. Analyst Howard Drezner describes it as the process of transforming data into information and then into knowledge. Business intelligence applications are described as a set of concepts and methods used to improve business decision-making through the use of fact-based support systems. In his definition of business intelligence, Gartner referred to all the ways in which a company can explore, access, and analyze information in its data warehouse in order to reach successful decisions. Business intelligence tools can also include ad hoc query and report writing, decision support systems, executive information systems, and technologies such as statistical analysis and online analytical processing (OLAP). Business intelligence is one of the concepts that has gained wide interest and popularity among companies and administrators in the past years because it enables companies to store, retrieve and analyze a large amount of information in addition to making successful strategic decisions to reach a competitive advantage (Hoque et al., 2015). A set of tools and techniques that collect, analyze, and integrate data in a way that improves decision-making and workflow in an organization (Ritesh, Srimannarayana, 2013). According to Watson and Wixom (2007), BI has important functions that help organizations improve their business performance and enable them to adapt with changes (Howson, 2013). Business technologies are among the systems that deal with a large amount of raw data and through which it is possible to provide classified databases that can be used to improve companies. The work of business intelligence aims to provide large amounts of interpreted data. Therefore, the goal of business intelligence is to simplify the process of collecting and analyzing information, thus enabling decision makers to access, analyze and understand comprehensive information at any time and from anywhere (Power, Heavin, 2017). This enables organizations and individuals to collect, store, analyze and provide access to data and help users make the right decision at the right time (Day, 2011).

4.2.1. Basic functions of business intelligence systems

Figure 2. shows the main tasks of business intelligence applications

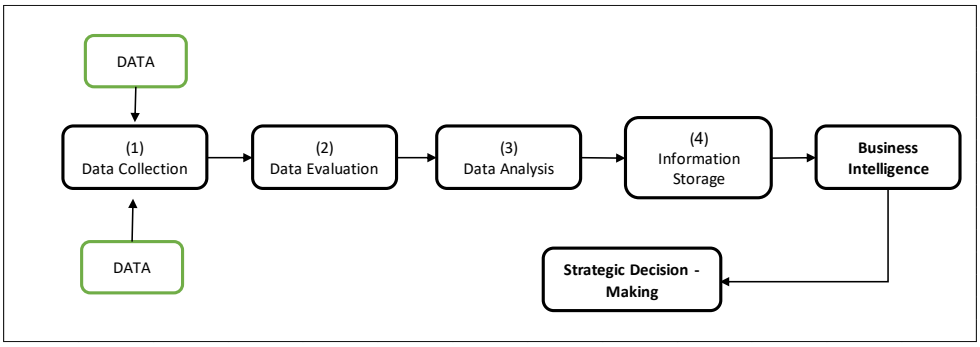

Figure (2): functions of business intelligence systems
Resource: Mcleod, Raymond (1998) management information systems, 7 Edition, Prentice-Hall international, Inc. pp59

- Data collection: Business intelligence systems at this stage collect data from several internal and external sources, according to the requirements of decision-making and decision-making.
- Data evaluation: This step describes the method of evaluating the data, with the aim of determining the data that can be used in the decision-making process and excluding data that contains errors or cannot be used.
- Data analysis: This step mainly relies on analyzing the data to obtain the information required to take various decisions.
- Information storage: After the information is obtained in the previous stage, it is stored in databases to be ready for decision makers upon request.

4.3. Strategic decision making

The concept of strategic decision has attracted the attention of researchers and administrative thinkers, and its concepts have diversified due to the different methods of its study. Many researchers, such as may agree that the concept of a strategic decision is that decision that was chosen from among a set of strategic alternatives, which represents the best way to reach the organization's goals. Decision-making is not limited to companies and administrators in the general sense. It is a process that takes place at the level of the person, at home, in companies, in government departments, and anywhere that a decision needs to be taken. Important decisions are made by leaders and managers who are at the top of the hierarchy (Hickson et al., 1986). Decision making is the process of identifying organizational problems and trying to solve them by managers (Bartoll, Martin, 1994). In the words of Harris (2009), decision-making process, several conditions crystallize, including the selection process, that is, the best choice from alternatives. Thus, decision-making requires examining the data and also requires the decision-maker to work and make an effort in order to achieve a successful decision.

The successful strategic decision-making process is considered a major effective means in achieving the maximum effectiveness of organizational institutions. Guillemettea, et al. (2014) put forward four main dimensions in strategic decision-making:

- Procedural rationality: It is a mechanism used when collecting and analyzing relevant information, and its use leads to improving decision performance.
- Comprehensiveness of information: As it is known, more detailed, comprehensive and accurate information increases the quality of the decision.
- Effort: There is a direct relationship between the effort made by the decision maker and the quality of the decisions, meaning that the higher the purposeful effort, the higher the quality of the decision.
- Openness of the soul: This term refers to the openness of decision-makers to new members and assistants, who can be benefited from in improving the decision-making process.

4.3.1. Importance of making decisions

Maher (2008) believes that the importance of making decisions is reflected in the following points:

- It is an inevitable scientific and technical means to implement the policies and strategies of the organization in achieving its objectives in an objective and scientific manner.
- Administrative decisions play an important role in embodying, adapting, interpreting and applying the objectives, policies and general strategies of the organization.
- It has a significant impact on the success or failure of the organization.
- It plays a role in collecting information and data for administrative functions through the use of various scientific and technological means.
- It is a means of measuring the extent to which managers are able to perform the functions assigned to them.

5. Methodology

In this section, the research method is described and explained. Also, it explains the mechanism of designing the study tool and selecting the study sample. Moreover, describing the statistical method used to analyze data and verify hypotheses.

5.1. Determining the study sample and developing the questionnaire

This study has been applied on Syrian civil society organizations in Gaziantep, Turkey. The research focused on the employees of civil society organizations as the target population because of their extensive use of applications of decision support systems and business intelligence in decision-making. The study used a survey to measure or quantify the impact of decision support systems and business intelligence on decision-making. To achieve the goal of the study, a total of 110 participants were surveyed using a Google Form. After retrieving the researchers' data, the researcher obtained a total of 100 questionnaires valid for statistical analysis.

The questionnaire consisted of three parts: the first part was used to display the demographic information of the participants such as gender, age and educational level, educational qualification, years of experience, and job title. The second part deals with the areas of application of decision support systems and business intelligence in organizations, departments that use decision support systems, and business intelligence, in addition to business intelligence tools used in organizations. The third part also focuses on the participants' opinions regarding decision support systems, business intelligence applications, as well as making strategic decisions. It consists of statements that need to be answered using a five-point Likert scale, ranging from 1 = "strongly disagree", 2 = "disagree", 3 = "neutral", 4 = "agree", 5 = "strongly agree". The Likert scale was used in previous studies with the same measurements (Alwan, 2019; Jones, 2011; Al-Malkawi, 2015). Likert scale is used in research to know the role of decision support systems and business intelligence in decision-making, especially as it measures the extent to which each of the decision support systems and business intelligence apply in organizations. Furthermore, the survey was designed within the framework of positive and negative data.

The first part includes the DSS questions in the third section which rely on previous studies, (19) items were selected depending on Components of Decision Support Systems DSS: Senior Management Support (1-7), A Computers (8-10), Databases (11-13), Software (14-19). The second part also represents the elements of business intelligence and consists of (9) questions: Data Collection and Analysis (20-22), Flexibility (23-26), Risk Support (27-28). The third section consists of (6) items representing Making Strategic Decision.

5.2. Data collection

As mentioned earlier, data was collected from employees working in Syrian civil society organizations operating in Gaziantep, Turkey. Through the use of Google Forms, the questionnaire was distributed to institutions only once, after which the researchers obtained the required data from employees through the participation of a total of 110 participants. After that, the researchers transferred the responses to an Excel file and then performed the statistical analysis using the SPSS program.

5.3. Results

Descriptive and inferential statistical methods were used to analyze the data. The arithmetic mean and standard deviation coefficient were used to know the responses of each item. Pearson correlation coefficients were used to measure the strength of the relationship between the variables. The study also used regression coefficients to find out the percentage of the influence of independent variables on the dependent variable, and t-tests and F-tests to discuss the hypotheses of the study.

5.4. Analyze of Demographic Variables

A number of 100 male and female employees participated in the survey process, as shown in Table (1). The number of males and females was 69, and the number of females was 31, where their age ratios indicated 62% of them aged between 31-40 years, while 22% were aged between 25-30 years old, as well as 16% of individuals aged 41 years and over. Looking at the academic qualifications of the study sample members, we find that 49% have university degrees and 30% have postgraduate studies. As for the experience factor of the participants in the survey process, we notice that 55% of them have 6-10 years of experience, and 28% have 1-5 years of experience. In conclusion, the results of the job title among the individuals participating in the survey indicated that 33% were heads of departments, as well as 26% for both ordinary employees and senior managers, while there was 15% of the heads of the board of directors.

Table (1): The demographic characteristics of the participants in the questionnaire

Gender	**Frequency**	**Percent**	**Mean**	**Std. Deviation**
Male	69	69.0	1.31	0.46
Female	31	31.0		
Total	100	100.0		
Age	Frequency	Percent	Mean	Std. Deviation
25 – 30	22	22.0	1.94	0.61
31 – 40	62	62.0		
41 years and over	16	16.0		
Total	100	100.0		
Qualification	Frequency	Percent	Mean	Std. Deviation
secondary and less	21	21.0	2.09	0.71
College degree	49	49.0		
Postgraduate	30	30.0		
Total	100	100.0		
Experience	Frequency	Percent	Mean	Std. Deviation
1 - 5	28	28.0	1.89	0.66
6 - 10	55	55.0		
11 years and over	17	17.0		
Total	100	100.0		
Job Title	Frequency	Percent	Mean	Std. Deviation
administrative employee	26	26.0	2.30	1.020
department head	33	33.0		
senior management	26	26.0		
Management Board	15	15.0		
Total	100	100.0		

Source: prepared by the researchers from SPSS output

Table (2) indicates the areas in which decision support systems and business intelligence applications are applied in Syrian civil society organizations. Looking at the results of this table, we notice that the systems use decision support systems and business intelligence in many fields such as (reporting, data analysis, decision making, business control) as well as many other areas shown in the table. However, we note that there is a disparity in the percentage of application between these areas, and it may be due to the importance of each field and the extent of its need to use decision support systems and business intelligence applications. We note that both decision support systems and business intelligence applications are widely used in terms of reporting by 32%, data analysis by 19%, and decision-making by 15%, and they are used in other fields in varying proportions, shown in the table below.

Table (2): Areas of application of decision support systems and business intelligence in organizations

Application areas	**Frequency**	**Percent**	**arrange**
Reports preparation	32	32.0	1
data analysis	19	19.0	2
Decision making	15	15.0	3
continuous improvement	6	6.0	5
Business Monitoring	5	5.0	6
financial regulation	4	4.0	8
management jobs	1	1.0	10
Performance Measurement	3	3.0	9
Find out the most profitable products	5	5.0	7
Collaboration and integration	9	9.0	4
knowledge management	1	1.0	11
Total	**100**	**100.0**	

Source: prepared by the researchers from SPSS output.

The table below indicates the departments that use business intelligence applications and decision support systems. When analyzing its results, it was found that the Information Technology Department in civil society organizations uses these applications primarily, with a rate of 38% because of their importance in the results of this department. It was also concluded that civil society organizations use decision support systems and business intelligence applications by 15% in the statistics department and 11% in the human resources management departments. In the same context, we note that project management departments use decision support systems and business intelligence applications by 19%, in addition to several other departments that use business intelligence applications and decision support systems to help managers and decision-makers make decisions in civil society organizations. These departments are presented in the table below.

Table (3): Departments that use decision support systems and business intelligence applications

Departments	**Frequency**	**Percent**	**arrange**
Information and Communication Technology	38	38.0	1
Department of Statistics	15	15.0	3
Department of Human Resources	11	11.0	4
Financial Management Department	9	9.0	5
projects Department	19	19.0	2
Monitoring and Evaluation Department	8	8.0	6
Total	**100**	**100.0**	

Source: prepared by the researchers from SPSS output

Speaking about the most applied business intelligence tools that civil society organizations benefit from, as mentioned in Table 4, we note that the (Power BI) tool or application was one of the most used and common tools in civil society organizations, at a rate of 50%. We also note that (MicroStrategy) is commonly used in civil society organizations by 13%, the application (Datapine) by 12%, and (Zoho Analytics) by 10%.

Table (4): Business intelligence tools used in organizations

Business intelligence tools	Frequency	Percent	arrange
Datapine	12	12.0	3
MicroStrategy	13	13.0	2
SAP Business Objects	6	6.0	6
Power BI	50	50.0	1
SAS Business Intelligence	9	9.0	5
Zoho Analytics	10	10.0	4
Total	**100**	**100.0**	

Source: prepared by the researchers from SPSS output

Through the data in Table 5, the relationship between three variables is clarified: the independent variables that crystallize in decision support systems and business intelligence, and the dependent variable that crystallizes in the strategic decision-making process. The results showed a positive relationship between these three variables equal to 0.667, 0.778, which indicates that the participants' strategic decision-making is affected by decision support systems and business intelligence.

Table (5): Correlation result between decision support systems, business intelligence, and strategic decision making

		Decision Support Systems	Business Intelligence	Strategic Decision Making
Decision Support Systems	Pearson Correlation	1	**0.789	**0.667
	Sig. (2-tailed)		.000	.001
	N	100	100	100
Business Intelligence	Pearson Correlation	**0.789	1	**0.778
	Sig. (2-tailed)	.000		.000
	N	100	100	100
Strategic Decision Making	Pearson Correlation	**0.667	**0.778	1
	Sig. (2-tailed)	.001	.000	
	N	100	100	100

Source: prepared by the researchers from SPSS output **. Correlation is significant at the 0.01 level (2-tailed).

Table 6 shows all the dimensions of decision support systems and the questions related to them that were mentioned in the questionnaire regarding the impact of decision support systems on making strategic decisions. The participant needed one of the five criteria: strongly disagree, disagree, neutral, agree, and strongly agree. Most of the answers indicate the approval of the study sample on the content of these paragraphs. The general arithmetic mean of the dimensions was as follows: Computers had an arithmetic average of (3.97), senior management support (3.91), software (3.87) and databases had a mean of (3.82), which indicates that the study sample members agreed that the dimensions of decision support systems affect making strategic decisions in civil society organizations.

Table (6): Mean values of the dimensions of decision support systems

Senior Management Support	Mean	Std. Deviation	Databases	Mean	Std. Deviation
X1	3.74	1.070	X11	3.84	1.002
X2	3.85	1.009	X12	3.62	1.023
X3	3.94	1.11	X13	4.00	0.865
X4	4.06	0.908	Databases	3.82	0.817
X5	3.81	1.16	Software	Mean	Std. Deviation
X6	4.11	0.909	X14	4.00	0.953
X7	3.89	1.091	X15	4.02	0.899
Senior Management Support	3.91	0.839	X16	3.75	1.086
Computers	Mean	Std. Deviation	X17	3.92	0.907
X8	3.89	1.118	X18	3.72	1.111
X9	3.95	1.077	X19	3.82	0.989
X10	4.07	0.998	Software	3.87	0.810
Computers	3.97	0.9321			
Decision Support System			**3.89**		

Source: prepared by the researchers from SPSS output

Table No. 7 indicates the applications of business intelligence and strategic decision-making, and the sub-questions that were mentioned in the questionnaire regarding the impact of business intelligence applications on strategic decision-making. The participant needed one of the five criteria: strongly disagree, disagree, neutral, agree, and strongly agree. Most of the answers indicate the approval of the study sample members on the content of these paragraphs. The general arithmetic average of the dimensions of the business intelligence applications variable was as follows: Data collection and analysis had an arithmetic mean of (3.94), risk (3.71), and flexibility (3.58). The general arithmetic mean of the expressions of the dependent variable for strategic decision-making was (3.76),

which indicates that the study sample members agree that business intelligence applications affect strategic decision-making in civil society organizations.

Table (7): Mean values of the business intelligence and strategic making decision

Data Collection and Analysis	Mean	Std. Deviation	Risk Support	Mean	Std. Deviation
X20	4.00	0.791	X27	3.82	0.978
X21	3.89	1.118	X28	3.61	1.034
X22	3.95	1.077	Risk Support	3.71	0.811
Data Collection and Analysis	3.94	0.845	Strategic Decision Making	Mean	Std. Deviation
Flexibility	Mean	Std. Deviation	X29	3.64	1.087
X23	3.13	1.178	X30	4.00	0.932
X24	3.98	0.975	X31	3.70	1.106
X25	3.87	1.060	X32	3.38	1.090
X26	3.46	1.049	X33	4.00	0.791
Flexibility	3.58	0.848	X34	3.86	0.876
			Strategic Decision Making	3.76	0.702
Business Intelligence	3.73				

Source: prepared by the researchers from SPSS output

5.5. Model Measurement

Reliability and validity were determined, and the study tool was evaluated using Cronbach's alpha, an internal consistency measure. Confirmation reliability is defined as the extent to which the internal components of convergent validity and discriminant validity are related to the accepted 0.70 guideline (Haque et al. 2007). The mean scores and standard deviations from the data in Table 8 are summarized, along with the reliability indices. The results showed that all parameters passed the test and received a higher value than the accepted value of 0.70. Convergent validity was inferred by controlling for standard variable loads and mean variance (AVE), as suggested by Fornell and Larcker (1981). Convergence is confirmed when the following conditions are met: (1) All measurement items greater than 0.70 (2) composite reliability greater than 0.70 (3) AVE greater than 0.50 (Fornell, Larcker 1981; Hair et al. 1998). By examining the study data as shown in Table 8, the results showed strong confirmation of convergent validity. According to Suki and Suki (2017), the discriminant validity of the variables is checked by comparing the square roots of the variables and the correlations of the variables with each other. Table 9 shows that each variable has the highest value in its own column and row, indicating that the combinations between the variables are different.

Table (8): Measurement Model

Item	Code	CFA Loading1	AVE2	CR3	Cronbach's Alpha4
Senior Management Support			0.65	0.92	0.91
The senior management of the organization sets all the programs and policies that support decision support systems.	SMS1	0.85			
Senior management attaches utmost importance to decision support systems and considers it one of its most important priorities.	SMS2	0.82			
Senior management supports efforts to encourage and employ the concept and practice of decision support systems.	SMS3	0.82			
Management in the organization provides material and moral support to all managers in the organization to deal with decision support systems.	SMS4	0.76			
The senior management of the organization is concerned with providing the requirements for implementing decision support systems.	SMS5	0.76			
The top management in the organization gives the different departments enough flexibility to solve the problems they face.	SMS6	0.75			
The senior management provides the facilities and equipment necessary for the implementation of decision support systems programs.	SMS7	0.85			
Computers			0.76	0.90	0.84
Sophisticated computers are available in all departments and sections to exchange information needed for decision-making.	CMP1	0.88			
Computers and basic parts for implementing decision support systems are available.	CMP2	0.88			

The organization has the necessary devices to store the data and information necessary to implement decision support systems.	CMP3	0.85				
Software			0.66	0.92		0.90
The organization has the required software for decision support systems.	SOF1	0.82				
The organization has software capable of carrying out the operations required for decision support systems.	SOF2	0.81				
The organization has the software required to run databases to implement decision support systems.	SOF3	0.78				
The organization has special programs for decision support systems.	SOF4	0.76				
Decision support systems software is available in the organization to assist employees in making decisions.	SOF5	0.85				
The decision support systems software in the organization is characterized by the ability for the flexible exchange of information.	SOF6	0.86				
Database			0.71	0.88		0.82
Files related to data and information are stored on the organization's databases.	DAT1	0.86				
The organization maintains a full description of its activities and operations in special databases.	DAT2	0.84				
Databases are easily updated without complexity to match business needs.	DAT3	0.8				
Data Collection and Analysis			0.70	0.87	0.79	
The organization plans to increase its efforts in the application of information technology in the field of business data analysis using business intelligence systems.	DCA1	0.82				
The organization maintains an organized effort to all analyze data and generate reports on business intelligence.	DCA2	0.85				
The organization uses business intelligence tools and software to structure the unstructured information that has been collected.	DCA3	0.83				
Flexibility			0.63	0.87	0.80	
Business intelligence can quickly meet changes in business needs.	FL1	0.75				
Business intelligence can make it easier to deal with exceptional cases.	FL2	0.82				
Business intelligence is highly scalable with respect to operations.	FL3	0.78				
Business intelligence is highly scalable by users.	FL4	0.82				
Risk Support			0.64	0.78	0.64	
Business intelligence supports high-risk decisions.	RSP1	0.85				
Business intelligence supports decisions related to discovering new opportunities or encouraging the discovery of new opportunities.	RSP2	0.75				
Strategic Making- Decision			0.51	0.85	0.80	
Both decision support systems and business intelligence systems contribute to the strategic decision-making process.	SMD1	0.66				
Both decision support systems and business intelligence systems contribute to the decision-making process in relation to administrative processes (planning, organizing, directing and controlling).	SMD2	0.69				
Business intelligence applications and decision support systems contribute to accelerating strategic decision-making processes.	SMD3	0.76				
Qualifications qualified scientifically and practically in decision-making are available.	SMD4	0.72				
Decision support systems and business intelligence applications contribute to selecting the best solutions to a problem.	SMD5	0.78				
Decision support systems and business intelligence programs contribute to removing obstacles that prevent the implementation of organizational goals.	SMD6	0.73				

Source: prepared by the researchers from smart PLS3 output

1 - All element Loadings > 0.5 indicates the reliability of the indicator

2- (AVE) Average Variance Extracted > 0.5 as indicates Convergent Reliability

3- (CR) Composite reliability > 07 indicates Internal Consistency

4- Cronbach's alpha> 0.7 indicates the reliability of the indicator

Table (9): Inter-construct correlations

Variables	Computers	Data Collection and Analysis	Database	Flexibility	Risk Support	Senior Management Support	Software	Strategic Making-Decision
Computers	0.87							
Data Collection and Analysis	0.89	0.84						
Database	0.60	0.57	0.84					
Flexibility	0.51	0.57	0.46	0.79				
Risk Support	0.37	0.39	0.46	0.45	0.80			
Senior Management Support	0.80	0.81	0.63	0.56	0.43	0.83		
Software	0.77	0.80	0.71	0.46	0.42	0.76	0.81	
Strategic Making-Decision	0.62	0.72	0.56	0.63	0.64	0.67	0.63	0.74

Source: prepared by the researchers from smart PLS3 output

Table 10 shows the path coefficients. The statistical results of the t-tests show the results of the search analysis. According to Eze and Lee (2012), the t-test is a type of statistical inference that measures the presence of a significant difference between the mean of two independent groups. The T-test is a measure to prove or disprove hypotheses. It is allowed to be quantified based on the choice of the population in the survey. Accordingly, all variable values range from 6.77 to 19.83, which is above the minimum acceptable t-value of 1.96 (p, 0:1, two-tailed). P values for all variables are also shown as significant values with parameters. From the results, we conclude that there are high correlations between all the variables, and this supports our proposed hypotheses. The last two columns indicate the level of the confidence interval, indicating the high band of 97,500% and the lower band of 2.5%.

Through the data in Table 10, the results indicate the acceptable range above the t-test (1.96), as well as with loading variables ranging from 6.77 to 19.83. This was demonstrated by all the statistics, which proved the acceptance of the hypotheses put forward. Based on that, all variable values were calculated using Smart PLS 3 programs. The loading variable values were also displayed in the model built in Figure 2. The figure indicates the links between the elements of each variable and their relationship to the independent variables, as in the first stage, while the second stage shows that the independent variables are related to the mediation variables. In the same vein, the last stage shows that the mediator variables are related to the dependent factor, which is the result of the model. Based on the above, all the path coefficient values are greater than the accepted value 1.96 for hypothesis testing, where the values indicate that the higher the path coefficients, the greater the acceptance of the research hypotheses, which gives the degree of freedom of the study model for all paths in the proposed model.

Table (10): Factor coefficients with the T-test and P-value

Factor	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Valu	Confidenece interval (CI)	
						2.5 %	97.5 %
Business Intelligence -> Strategic Making Decision	0.68	0.68	0.09	6.91	0.000	0.47	0.88
Flexibility-> Business Intelligence	0.53	0.53	0.04	11.73	0.000	0.44	0.62
Data Collection and Analysis-> Business Intelligence	0.45	0.44	0.03	11.64	0.000	0.37	0.52
Senior Management Support->Decision Support System	0.40	0.40	0.02	15.00	0.000	0.35	0.46
Software->Decision Support System	0.34	0.34	0.01	19.83	0.000	0.31	0.38
Risk Support-> Business Intelligence	0.22	0.22	0.03	6.77	0.000	0.17	0.22
Computers->Decision Support System	0.19	0.19	0.01	14.78	0.000	0.15	0.28
Database ->Decision Support System	0.15	0.15	0.01	9.01	0.000	0.11	0.37
Decision Support System -> Strategic Making Decision	0.14	0.14	0.001	12.11	0.000	0.12	0.12

Source: prepared by the researchers from smart PLS3 output ($p < 0.001$, $N = 100$)(T-test > 1.96)

Table 11 shows, through the data it contains, how each component of the variable has an external load on each variable in the links. We can know external loads as relationships predicted in reflective measurement models, and therefore they determine the absolute contribution of a component to the configuration assigned to it. Thus,

attributions may be considered a superior target for evaluating reflective measurement models, but they are also interpreted when formative measurements are included. The element of external loading is mostly associated with the first stage of the independent variables, and all values (1.96) in Table 10 indicate that the test is acceptable. The links show how much outward loading each path has in the overall connection and how the export contributes to the structure of the model. The P value indicates acceptance, and the external loads of all roads are significant. The P-value is defined as the marginal significance level within a statistical hypothesis test and is an estimate for a particular event. A P value less than 0.001 is considered acceptable. Also, in Tables 9 and 10 the standard deviation is low, indicating that the data are clustered around the mean.

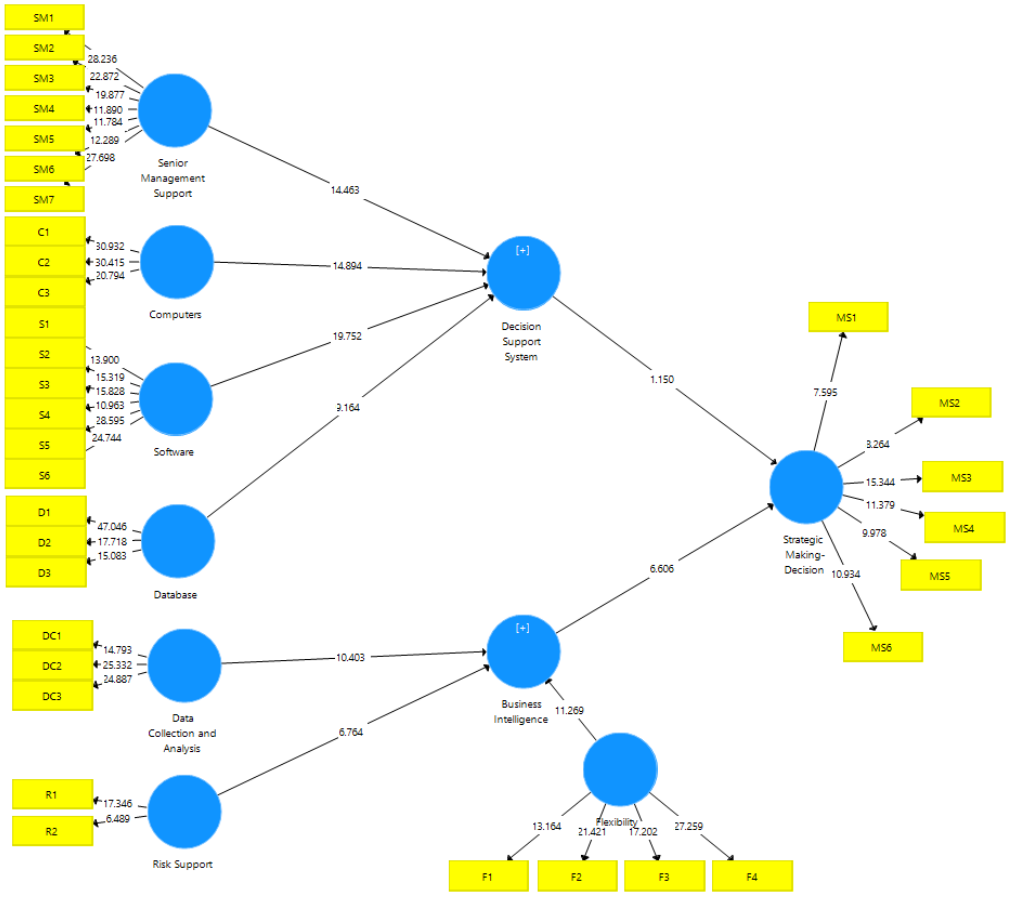

Figure (3): The figure below shows the structural model for top management support, hardware, software, database, data collection and analysis, resilience, risk support, and load variable forecasting using PLS Bootstrapping in Smart PLS.
Source: Smart PLS output

Table (11): Outer loading of factors and two elements

Element	Factor	M	STDEV	T Statistics	P Value
SMS1	Senior Management Support	0.85	0.031	27.51	0.000
	Decision support system	0.84	0.034	24.33	0.000
SMS2	Senior Management Support	0.82	0.036	22.24	0.000
	Decision support system	0.83	0.036	22.65	0.000
SMS3	Senior Management Support	0.81	0.041	19.77	0.000
	Decision support system	0.72	0.053	13.67	0.000
SMS4	Senior Management Support	0.75	0.060	12.69	0.000
	Decision support system	0.61	0.081	7.70	0.000
SMS5	Senior Management Support	0.75	0.065	11.53	0.000
	Decision support system	0.69	0.072	9.72	0.000
SMS6	Senior Management Support	0.76	0.058	13.14	0.000
	Decision support system	0.66	0.077	8.67	0.000
SMS7	Senior Management Support	0.84	0.030	28.22	0.000
	Decision support system	0.83	0.08	21.87	0.000
CMP1	Computers	0.88	0.027	31.84	0.000
	Decision support system	0.82	0.040	20.47	0.000
CMP2	Computers	0.88	0.028	30.83	0.000
	Decision support system	0.76	0.054	14.12	0.000
CMP3	Computers	0.85	0.039	21.90	0.000
	Decision support system	0.72	0.060	12.05	0.000
SOF1	Software	0.82	0.056	14.61	0.000
	Decision support system	0.76	0.068	11.070	0.000

SOF2	Software	0.80	0.050	15.97	0.000
	Decision support system	0.73	0.062	11.84	0.000
SOF3	Software	0.78	0.067	11.23	0.000
	Decision support system	0.72	0.078	8.70	0.000
SOF4	Software	0.74	0.052	11.23	0.000
	Decision support system	0.67	0.078	8.70	0.000
SOF5	Software	0.85	0.031	27.18	0.000
	Decision support system	0.79	0.055	14.41	0.000
SOF6	Software	0.86	0.034	24.90	0.000
	Decision support system	0.82	0.045	18.05	0.000
DAT1	Database	0.87	0.020	43.02	0.000
	Decision support system	0.79	0.056	14.06	0.000
DAT2	Database	0.85	0.040	17.62	0.000
	Decision support system	0.59	0.10	5.60	0.000
DAT3	Database	0.78	0.061	12.97	0.000
	Decision support system	0.55	0.096	10.21	0.000
DCA1	Data Collection and Analysis	0.78	0.052	15.05	0.000
	Business Intelligence	0.68	0.067	10.21	0.000
DCA2	Data Collection and Analysis	0.87	0.035	24.56	0.000
	Business Intelligence	0.74	0.059	12.47	0.000
DCA3	Data Collection and Analysis	0.85	0.034	25.24	0.000
	Business Intelligence	0.69	0.063	11.03	0.000
FL1	Flexibility	0.73	0.050	13.05	0.000
	Business Intelligence	0.63	0.062	10.13	0.000
FL2	Flexibility	0.83	0.037	22.43	0.000
	Business Intelligence	0.75	0.079	9.56	0.000
FL3	Flexibility	0.79	0.045	17.61	0.000
	Business Intelligence	0.67	0.072	9.32	0.000
FL4	Flexibility	0.81	0.029	27.33	0.000
	Business Intelligence	0.75	0.043	17.61	0.000
RSP1	Risk Support	0.85	0.046	18.34	0.000
	Business Intelligence	0.57	0.010	5.45	0.000
RSP2	Risk Support	0.73	0.11	6.62	0.000
	Business Intelligence	0.45	0.11	4.02	0.000

Source: prepared by the researchers from smart PLS3 output

Figure 4 shows the model trajectory diagram with the calculation of the trajectory weight. Depending on the model path, the accepted value of the elements should be 0.7 and above. Also, through the correlation Between the dimension and its questions, all these values exceed the accepted value. It is clear that the element of each variable has values close to each other, which indicates how closely they are related to each other and related to the connection factor. In addition, the previous figure shows that all the variables have a strong relationship among them.

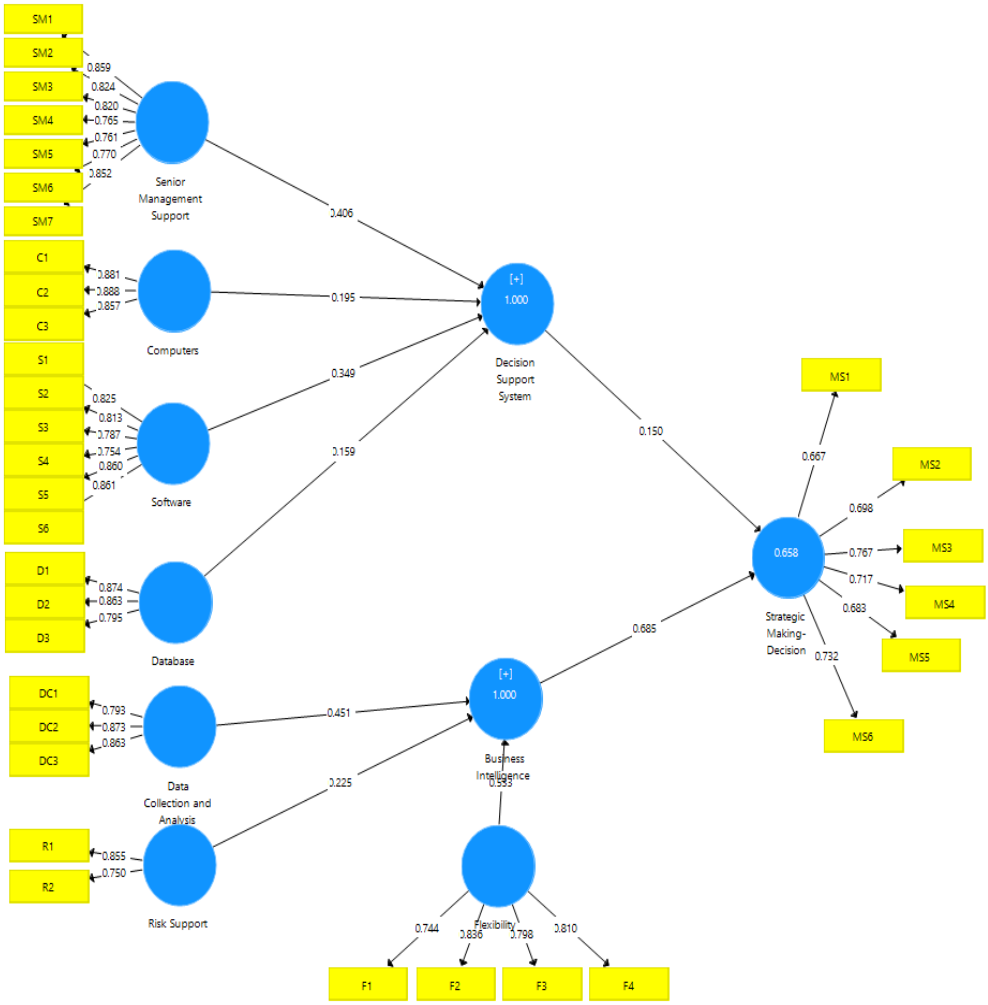

Figure (4): Structural model of senior management support, computers, software, database, data collection and analysis, flexibility, and risk support factor loading using Partial Least Squares Algorithm.
Source: Smart PLS output

Table 12 shows the mean values, standard deviation, and t-test from the data presented in it. We also clearly see how each variable affects the other related variables. In the same context, the results show that the value of the t-test is within the acceptable range.

Table 13 shows the links between the independent variables and the dependent variable through the intermediate variables. The t-test for the first independent variable set (senior management support, computer hardware, software, and database) provides close values ranging from 4.99 to .29, indicating strong relationships between them. We also note that the results of the t-test for the business intelligence variable (analysis and aggregation of data, flexibility and risk) were close to the ratio of t-test, which indicates that there is a relation between the independent variables and the dependent variable. Table 14 shows the decision of hypotheses based on the result obtained.

Table (12): Total effects between every two factors

Factor1	Factor2	(M)	STDEV	T Statistics
Senior Management Support	Decision Support System	0.40	0.026	15.17
Senior Management Support	Strategic Making- Decision	0.35	0.050	11.21
Computers	Decision Support System	0.19	0.013	15.07
Computers	Strategic Making- Decision	0.25	0.025	12.20
Software	Decision Support System	0.35	0.016	21.71
Software	Strategic Making- Decision	0.29	0.043	20.1
Database	Decision Support System	0.15	0.017	9.00
Database	Strategic Making- Decision	0.22	0.020	17.12
Data Collection and Analysis	Business Intelligence	0.44	0.040	11.17
Data Collection and Analysis	Strategic Making- Decision	0.31	0.051	12.25
Flexibility	Business Intelligence	0.53	0.042	6.09
Flexibility	Strategic Making- Decision	0.36	0.059	6.59
Risk Support	Business Intelligence	0.22	0.034	6.09
Risk Support	Strategic Making- Decision	0.15	0.03	4.17

Source: prepared by the researchers from smart PLS3 output ($P<0.001$, $N = 100$)

Table (13): Specific indirect effects for model's factors

Independent Factor	Mediation Factor	Dependent Factor	(M)	STDEV	T Statistics
Senior Management Support	Decision Support System	Strategic Making-Decision	0.57	0.050	7.22
Computers	Decision Support System	Strategic Making-Decision	0.27	0.020	5.22
Software	Decision Support System	Strategic Making-Decision	0.58	0.019	8.29
Database	Decision Support System	Strategic Making-Decision	0.22	0.020	4.99
Data Collection and Analysis	Business Intelligence	Strategic Making-Decision	0.31	0.00	6.055
Flexibility	Business Intelligence	Strategic Making-Decision	0.36	0.059	6.09
Risk Support	Business Intelligence	Strategic Making-Decision	0.15	0.037	4.17

Source: prepared by the researchers from smart PLS3 output (P<0.001, N = 100)

6. Discussion

The study was conducted on decision support systems and business intelligence applications and their impact on making strategic decisions on 100 employees working in civil society institutions in Gaziantep, Turkey. The results show that most of the participants find that decision support systems and their dimensions had the most prominent role in influencing strategic decision-making in civil society organizations. However, this does not prevent the role of business intelligence applications from influencing strategic decision-making. But through the arithmetic averages mentioned in Table No. (6), we note that the higher decision support systems with an arithmetic average amounted to (3.89), and this is a reference to the sample members' viewpoints tending towards decision support systems and its components and their role in making strategic decisions. In addition, the results of the T-test presented in Table No. 14 indicated that the components of decision support systems (senior management support, computers, software and databases) have a positive impact on making strategic decisions. Table 13 shows the decision of hypotheses based on the result obtained.

Table (14): Result of model's hypothesis

Hypothesis	Relationship	(M)	STDEV	T-test	P Values	Decision
H1	Senior Management Support -> Decision Support System-> Strategic Making- Decision	0.57	0.050	7.22	0.000	Supported
H2	Computers -> Decision Support System-> Strategic Making- Decision	0.27	0.020	5.22	0.000	Supported
H3	Software -> Decision Support System-> Strategic Making- Decision	0.58	0.019	8.29	0.000	Supported
H4	Database-> Decision Support System-> Strategic Making- Decision	0.22	0.020	4.99	0.000	Supported
H5	Data Collection and Analysis-> Business Intelligence-> Strategic Making- Decision	0.31	0.00	6.055	0.000	Supported
H6	Flexibility -> Business Intelligence-> Strategic Making- Decision	0.36	0.059	6.09	0.000	Supported
H7	Risk Support-> Business Intelligence-> Strategic Making- Decision	0.15	0.037	4.17	0.000	Supported

Source: prepared by the researchers from smart PLS3 output

Through the results of the study and the discussion of its hypotheses, it was found that the members of the study sample see that each of the decision support systems and its components, in addition to the applications of business intelligence, have a positive impact and have a positive relation in making strategic decisions in Syrian civil society organizations. Thus, the validity of all research hypotheses is proven although the results indicated that decision support systems and their components (senior management support, computers, software, and databases) affect strategic decision-making more than business intelligence applications (data collection and analysis, risk, and flexibility).

Previous studies have dealt with the same problem (Alwan, 2019; Al-Malkawi, 2015), in terms of studying the impact of decision support systems and business intelligence applications in improving strategic decisions, especially the study of Al-Malkawi (2015), which discussed the two dimensions together in making decisions. However, the method of this study's testing of the hypotheses through the (SMART PLS) program and the dimensions discussed by the study in influencing strategic decision-making made this study complementary to previous studies in many points.

The study identified the factors that could contribute to influencing strategic decision-making from the point of view of the Syrian civil society organization employees in the city of Gaziantep. These factors are components of

decision support systems (top management support, computers, software, and databases) as well as business intelligence applications (data collection and analysis, risk, and resilience).

7. Conclusion

Decision support systems and business intelligence with their various components are among the most important tools that business organizations in general and Syrian civil society organizations in particular depend on in the process of building and making decisions. The importance of this is due to the information and knowledge that these systems provide for the various administrative levels, bypassing the traditional, random and improvisational methods of decision-making.

Based on the analysis of the data of the field study and testing its hypotheses, the study concluded that decision support systems and business intelligence are available to a good degree in Syrian civil society organizations in the city of Gaziantep. At the same time, it was found that there is a strong positive correlation between business intelligence and decision support systems with the making strategic decisions. The study also concluded that there is an impact of decision support systems and business intelligence on the strategic decision-making process.

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Global Journal of Economics and Business (GJEB)
Journal Homepage: https://www.refaad.com/Journal/Index/2
E-ISSN 2519-9293 | P-ISSN 2519-9285

أثر استخدام تطبيقات أنظمة دعم القرار و أنظمة ذكاء الأعمال في اتخاذ القرارات الإستراتيجية: دراسة ميدانية في مدينة غازي عنتاب

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DOI: https://doi.org/10.31559/GJEB2022.12.2.8 **قبول البحث:** 2022/4/21 **مراجعة البحث:** 2022 /4/17 **استلام البحث:** 2022/3/23

الملخص:

تهدف هذه الدراسة إلى دراسة أهمية أنظمة ذكاء الأعمال وأنظمة دعم القرار لمنظمات المجتمع المدني السوري بالإضافة إلى دراسة تأثير أبعاد أنظمة دعم القرار وذكاء الأعمال في اتخاذ القرارات الاستراتيجية. تم جمع البيانات من خلال استطلاع أجري على المشاركين ، واستخدمت 100 إجابة صحيحة لتحليل البيانات. تم استخدام برنامجي SPSS و SmartPLS 3 لتحليل بيانات الدراسة. أظهرت النتائج دعم الفرضيات السبع. أن أنظمة دعم القرار وذكاء الأعمال متوفرة بشكل جيد في منظمات المجتمع المدني السورية في مدينة غازي عنتاب وفي الوقت نفسه، وجد أن هناك علاقة إيجابية قوية بين ذكاء الأعمال وأنظمة دعم القرار مع اتخاذ القرارات الاستراتيجية. وخلصت الدراسة أيضًا إلى أن هناك تأثيرًا لأنظمة دعم القرار وذكاء الأعمال على عملية اتخاذ القرار الاستراتيجي.

الكلمات المفتاحية: أنظمة دعم القرار؛ ذكاء الأعمال؛ اتخاذ القرارات الاستراتيجية.