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Types of Decision Support Systems: Review

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A B S T R A C T

Decision Support Systems (DSS) are a class of automated data framework that support decision-making activities. DSS are intelligent PC based frameworks and subsystems expected to help decision makers to utilize interchanges advancements, information, records, learning as well as models to complete decision process tasks. A decision support system may introduce data graphically and may incorporate an expert system or artificial intelligence (AI).There are various Decision Support Systems. These can be arranged into eight types. The purpose of this project is to review the literature according to these types and group studies under these types.

أنواع انظمة دعم القرار: مراجعة

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الكلمات المفتاحية :

انظمة دعم القرار
أنظمة دعم القرار الذكية

الملخص

أنظمة دعم القرار هي فئة من أطر البيانات الآلية التي تدعم أنشطة صنع القرار. أنظمة دعم القرار هي أطر وأنظمة فرعية تعتمد على الكمبيوتر الذكي من المتوقع أن تساعد صناع القرار على الاستفادة من تطورات التبادلات والمعلومات والسجلات والتعلم بالإضافة إلى النماذج لإكمال مهام عملية اتخاذ القرار. قد يقدم نظام دعم القرار البيانات بيانياً وقد يتضمن نظامًا خبيرًا أو ذكاءً اصطناعيًا . هناك أنظمة دعم قرار مختلفة. يمكن ترتيبها في ثمانية أنواع. الغرض من هذا المشروع هو مراجعة الأدبيات وفقًا لهذه الأنواع ودراسات المجموعة تحت هذه الأنواع.

1- Introduction

Information has become one of the main factors that affect the success of the organizations and information have effects on the decisions made by organizations. Here, the urgent need on the organizations appeared to provide a mechanism to ensure the quality of this information, which is independent on the assessed several properties in that information such as holism, and accuracy in time appropriate, but this importance was for the information systems involved in organizing it. Important organization of information, such as systems used for decision support (DSS).

One of the most important complex activities and administrative work of organizations is solving decision-making problems and the decision-making process consists of a set of stages, begins to gather information about the problem of the resolution ends by choosing the most appropriate alternative decision, and that several theories dealing with the process of popping managerial decision-making. Computer now no longer only just a temporary fashion, because the perpetrators are aware that information systems can add computational power to carry out critical tasks in addition to the construction process itself, where he became a work in these days complicated more because of the environmental changes that have

affected the management decision-making, and return the reasons for the complexity decision-making to the abundance of alternatives dramatically process and the possibility of falling into the big mistakes in the present.

1.1. What is IDSS?

Intelligent Decision Support System (IDSS) has been developed to be used at different stages of decision makers by amalgamate modeling tools and human knowledge When information is uncertain or insufficient it uses IDSS tools to assist in the decision-making process exists and where decisions involving risk must be made using human judgment and preferences. IDSS also   used to support decision-making and is not intended to replace the decision maker's task. In addition, IDSS works under an assumption that the decision maker is familiar with the problem to be solved.

1.2.Why Do We Need IDSS?

Time savings for all categories of DSSs, research has demonstrated and substantiated reduced decision cycle time, increased employee productivity and more timely information for decision making. We need IDSS in order to increase effectiveness. A second advantage that has   been   widely   discussed   is   improved   decision-making

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effectiveness and better decisions. Decision quality and decision making effectiveness are however difficult to document and measure. Most researches have studied soft measures like perceived decision quality rather than objective measures. Advocates of building data warehouses identify the possibility of more and better analysis that can improve decision-making.

1.3. Where do we use DSS?

As one of a variety of new tools coming out of modern computing and data modeling, DSS is getting a lot of attention from many businesses as a way to promote better projections, management and analysis within a company or business. DSS combines the power of human thought with the power of modeling systems to get optimal, informed decision-making. IDSS applications are developed in various areas such as in product development and planning; management decisions; enterprise and manufacturing industries; services etc.

2- Literature review

DSS is an intelligent, PC based framework went for supporting, as opposed to supplanting, leaders' judgment, by helping them in their choice procedures in semi-organized or unstructured undertakings. To accomplish this usefulness, DSSs utilize an extensive variety of innovations and ideas, including correspondences, information, reports, learning and models. As per the device or part that is giving the overwhelming usefulness, DSSs are ordered into information driven, demonstrate driven, learning driven, archive driven, and correspondences driven (Bohanec et al, 2016).

A & Bahnasawy (2011) defined decision support system as a tool that an organization uses to support and enhance decision-making activities.

The design proposed to be used to overcome the management problems, increase the production rate and quality, in addition to controlling and improving the production lines performance. The specific objectives of this work are: (a) constructing a general database for the industry, (b) developing an appropriate daily data for industry, (c) reporting and controlling industry, and (d) remarking of applying the DSS to a case study. System was constructed by building a database for the Industry, which includes general data such as company name and activities, daily data, which has all the daily activities such as raw materials status, workers, machines, failures, processing stages, and final production data. Secondly, each database was built using the "Visual Basic Language" statements.

By applying, the design on the case study will help to make easy management and decision-making and can help for understanding the future needs by continual reporting and controlling of the system. It could be used for more than one activity or company at the same time. Clark et al. (2016) proposed a framework-modeling tool that helps to solve a complicated problem in agricultural systems by evaluating production, environmental, economic, and nutritional effect of applying agricultural technologies for increasing food production and use of littleness natural materials.

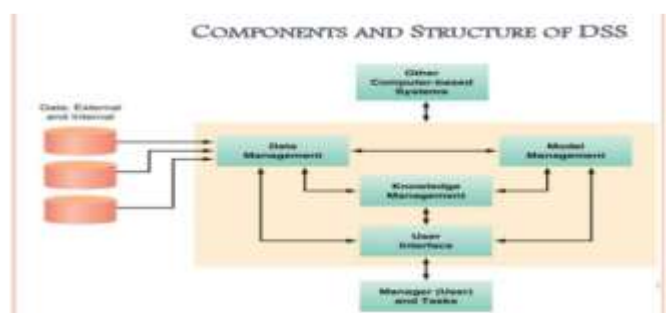### 2.1 Components and Structure of DSS

Fig. 1: Components and Structure of DSS

In figure 1 : Components and Structure of DSS : -
- ❖ Data Management:
  Includes the database containing relevant data for the decision situation.
- ❖ User Interface :
  Enables the users to communicate with and command the DSS.
- ❖ Model Management :

Includes software with financial, statistical, management science or other quantitative models.
- ❖ Knowledge Management :
  Provides knowledge for solution of the problem, supports any of the other subsystem or act as independent component.

2.2 Type of DS

There are seven different types of DSSs

1. **Communications Driven DSS** is a kind of DSS that emphasizes connections, joint effort and shared basic leadership strengthen. A basic release board or strung email is the most rudimentary level of usefulness. Additionally, characterized as "programming and equipment for shared instinctive conditions" expected to support and increase movement. Groupware is a subset of a more extensive idea called Collaborative Computing course organization: Contains the organizations/institutions that offered the course.

2. **Data-driven DSS**: is a sort of DSS that focus on access to and control of a period arrangement of interior organization data and some of the time outer data. Basic document frameworks gotten to by inquiry and recovery devices give the most basic level of usefulness. Information store frameworks that permit the control of information by electronic apparatuses custom fitted to a particular errand and setting by more broad devices and administrators give extra usefulness. Course rating: The rating that each course attained, based on numerous learners who had taken it.

3. **Model-Driven DSS**: stress access to and control of a model, for instance, factual, money related, advancement or potentially reenactment models. Straightforward factual and logical devices give the most rudimentary level of usefulness. Some OLAP frameworks that permit complex investigation of information might be delegated cross variety DSS frameworks giving both demonstrating and information recovery and information synopsis usefulness. Overall, show driven DSS utilize complex budgetary, reenactment, improvement or multi-criteria models to give choice support. Course students enrolled: Contains the number of students that took the course, indicating its popularity and providing insight into the course's relevance to learners.

4. **Simulation based DSS:** is an intuitive PC based system or subsystem expected to help the user utilize junction innovations, information, records, learning or potentially models to distinguish and take care of issues, finish choice process undertakings, and decide. DSS is a general term for any PC application that improves a man's or gathering's capacity to decide (Power 2010). There are numerous basic leadership points in the assembling framework area. Vital and strategic points concentrate on the outline or choice of another assembling framework or on the change of the current assembling framework the arranging time skyline is years or months.

5. **Knowledge-Driven DSS:** are known as computer-based reasoning systems. They reflect intelligent human behavior and make it easier for decision makers to solve specialized problems. Therefore, these systems are called "personal computer systems." A knowledge-based DSS can suggest or recommend actions to managers. Decision support systems (DSS) are personal computer systems that have the ability to solve problems through the expertise they possess. "Expertise" consists of knowledge about a particular field, and "skill" Relevant data is extracted to solve some problems .In database classes of analytical applications are used to search for hidden patterns .data mining is the process of scraping a large amount of data to produce data content relationships The tools used to create a knowledge-based decision support system are sometimes called intelligent decision support methods (Dhar and Stein, 1997).

6. **Web-based DSS**: helps users in a more effective way to identify their data and any service available online on the intranets. Web-Based DSS convey decision strengthen data or decision strengthen apparatuses to an administrator or business expert utilizing a "thin-customer" Web program like

Netscape Navigator or Internet Explorer that is getting to the Global Internet or a corporate intranet. The PC server that is facilitating the DSS application is connected to the client's PC by a system with the TCP/IP convention. Electronic DSS can be interchanges driven, information driven, archive driven, learning driven, display driven or a half breed. Web innovations can be utilized to execute any class or sort of DSS. Online means the whole application is executed utilizing Web advancements,

7. **GIS based DSS** or a spatial decision support system (SDSS) is an intelligent, PC based framework intended to aid basic leadership while taking care of a semi-organized spatial issue.

It is intended to help the spatial organizer with direction in settling ashore utilize choices A framework which models choices could be utilized to help recognize the best choice way. A SDSS is now referred to as an arrangement supportive system, and involves a DSS (DSS) and a geographic data framework (GIS). This includes the use of a database management system (DMS), which handles and stores geological information; a library of potential models that can be utilized to the conceivable results of decision; and an interface to help the clients association with the PC system and to aid examination of results.

Ta+ble1: Communication -driven DSS

Author	Title of the paper	Industry	Method	Aim	Results
Harald Vacik & Manfred J. Lexer2016	Past, current and future drivers for the development of Decision Support Systems in forest management	Forest management industry	The systems are electronic data processing (EDP) and Multi-criteria decision making systems (MCDSS) and the model are group of techniques with AI	To evaluate different pieces of evidence that collected from different resources or literature about the concerned research topic.	Improved timber production ,maintaining biodiversity and participation ensuring multi-functionality
T. Nowakowski & S. Werbińska-Wojciechowska 2014	Data gathering problem in decision support system for means of transport maintenance processes performance development	Database management industry	It was prepared as a computer program that helps in obtaining conclusions in an easy and quick way based on the normalization of the EXSYS Professional system..	Analysis of operational data availability with the relation between the costs of data gathering process and the effect of their acquirement for developed DSS for transportation means' maintenance processes performance.	The consideration of uncertainty in decision process gives the possibility to obtain not only one final maintenance strategy but a list of strategies
Khalid A. Fakeeh2015	Decision Support Systems (DSS) in Higher Education System	Education industry	Proposed specific DSS modules. All modules rely on questionnaire applied to students, research, and teaching	Described some of the past dedications in representing the modules of the DSS	Help staff, students to decisions for all the performing craftsmen caught in the procedures, in diverse explicit circumstances or settings

Table2: Data-driven DSS

Author	Title of the paper	Industry	Method	Aim	Results
Alexey V. Krikunov1, Ekaterina V. Bolgova1 , Evgeniy Krotov, Tesfamariam M. Abuhay , Alexey N. Yakovlev, Sergey V. Kovalchuk 2016	Complex data-driven predictive modeling in personalized clinical decision support for Acute Coronary Syndrome episodes	Healthcare Industry	Combining different data-driven models and procedures within a complex data-driven model with improved predictive capability.	This paper describes the development of a complex clinical incident model, and a data-driven pproach, to support decision-making used in specialty areas of cardiac treatment and utilization.	Proposed approach should be "preventive"decision making. Therefore, prediction of the possible complications, deteriorations and other undesirable even may help the doctor to take proactive acti
Ali Dag, Auburn, Alabama 2016	A Data Driven Framework to Identify the Critical Variables, Visualize Their Conditional Relations and Predict the Outcomes of U.S. Heart Transplants	Healthcare industry	Hybrid data analytic methodology is utilized within this research paper.	To gain hidden, novel and useful information from these large and complex heart transplant data sets by employing data mining techniques,	Predictive factors from multiple sources helps to increase the performance of the prediction model used
Alexandros Bousdekis ,Nikos Papageorgiou , Babis Magoutas , Dimitris Apostolou and Gregoris Mentzas 2016	Continuous Improvement of Proactive Event-driven Decision Making through Sensor-Enabled Feedback (SEF)	Automation industry	This paper is utilizing qualitative and quantitative approaches for identifying issues and functional impacts of technology.	learning cost functions from SEF for the continuous improvement of proactive event-driven DSS	The approach uses sensor data noise filtering and dynamic curve fitting capabilities to extract corrected data at each step and at a specific time.
Hugh J. Watson2014	Tutorial: Big Data Analytics Concepts Technologies and Applications	Information Technology	Fact-based decision-making culture; a strong data infrastructure; the right	Analyzing massive amounts of data and the benefits of big data and	Data organized to support a single decision or a set of related decisions and support a wide variety of analytic applications

			analytical tools	provides a compelling argument for its use	

Table3: Model-driven DSS

Author	Title of the paper	Industry	Method	Aim	Results
Rezgui Y.2015	A Model-Driven Approach to The Integration of Product Models into Cross-Domain Analyses	Manufacturing industry	cross-model analysis using a CityGML model and IFC models.	Discussed a conceptual framework for analysis involving more than one product model type.	This helps modeling principles to take effect with regard to the analysis problem domain.
Magdalena Habrat, Michal Lupa, Monika Chuchro, and Andrzej Le´sniak 2015	A decision support system for emergency flood embankment stability	Data base management	The method based on the analysis of data from both a flood embankment measurement network and generated through numerical modeling be based on the analysis of data retrieved from sensors located inside the flood embankment	presents a concept of decision support system for emergency flood embankment stability.	The system can define any possible dangers, which may affect the stability of a flood embankment, resulting from e.g. increased precipitation, which may affect the humidity of a flood embankment
Adnan Javeda, Farooque Azama , Amjad Umarb 2015	Model Driven Upstream and Downstream Artifacts	Airlines industry	This paper designed a Multi-disciplinary Collaborating advisors developing Models step-by-step	provide means to computer assisted creation of higher-level business architectural artifacts,	extended to hold diverse knowledge about a diverse range of enterprises in a number of scenarios in forms of Advisors that use Patterns.
Y. Liu, J. Zhou, L. Song , Q. Zou, J. Guo, and Y. Wang2014	Geographic information system for flood risk management is effectively used and applied in central China	Flood behavior assessment	In this paper methods based on functional models are used to focus on functional tasks and consequences	This paper demonstrates the use of a well-capable method to enable a DSS flood workflow	Create a model in a strategic way for all technical and organizational contents that show the correct outcome of flood risk management

Table4: Simulation-driven DSS

Author	Title of the paper	Industry	Method	Aim	Results
Claudio Ciancio Francesco Gagliardi Giuseppina Ambrogio and Luigi Filice 2016	Dynamic DOE for porthole die extrusion optimization	Manufacturing industry	This paper is using statistical quantitative methodology for their research process	Define the relationship between input and output process parameters in porthole die extrusion	The results Demonstrate that the proposed method based on an adaptive sampling and a prediction tool based on shape similarities between a set of surfaces leads to better prediction compared to benchmark approaches used for this kind of problems
Petter Kyösti 2015	Predicting Functional Product Availability and Cost through a Simulation Driven Approach	Business measures	Development of simulation software and A decision support tool is created, based on the integrated model	This paper is to design a support system model in order to predict the service completion time for the support system.	model can be utilized in the analysis of a real industrial system
Björn Backe 2014	The Need of Condition Monitoring to Support Simulations when Predicting System Availability of Functional Products	Manufacturing industry	collect data and achieve this understanding and holistic system view several visits to the company have been made, whereby interviews with engineers and managers from different disciplines have been performed	Proposed a model for predicting and monitoring industrial system availability	Improved prediction capabilities. and developed a software tool to predict system availability
Johann es Unglert, Sipke Hoekstra , Juan Jauregui-Becker , Fred van Houten 2016	Towards decision-support for reconfigurable manufacturing systems based on Computational Design Synthesis	Information technology	A structured programming model contains rules and methods suitable for analysis and based on which solutions are created. And evaluate the candidate solutions after implementing this model	Computational design assembly tools explore their role in and utilization of decision support In the design and manufacture of repetitive manufacturing systems	The company predicts that it will benefit from assembling equipment differently in the future

Author	Title of the paper	Industry	Method	Aim	Results
JC Smithers, KT Chetty, MS Frezghi, DM Knoesen and MH Tewolde 2013	Continue to develop and evaluate the simulation method in a structured time for flood design Estimation at unmeasured sites locations: ACRU model and Thukela Catchment case study	Flood behavior assessment	This paper has used several methods to define the problems of flood management operations with a described physical model that runs daily at a specific time, and where the simulation of river flow and discharge time are sensitive to them.	Continued development of the simulation modeling system to design flood estimation in not measured watersheds	The study focuses on the challenges of hydrological modeling in operational watersheds and the need for reliable data on rainfall and runoff.

Table5: Knowlege-driven DSS:

Author	Title of the paper	Industry	Method	Aim	Results
Khalid Eldrandaly and Soad Naguib 2011	A Knowledge-Based System for GIS Software Selection	Information technology	The proposed approach integrates the capabilities of Analytic Hierarchy Process (AHP), and Multicriteria Decision Making(MCDM) and provides an advisory system to assist the user during the tool selection procedure.	To utilize qualitative research method for analyzing the impact of knowledge-based DSS	Approach integrates the capabilities of ES, and AHP and provides an advisory system to assist the decision maker in selecting the most suitable GIS software for a particular GIS problem
Mohsen Naderpour and Jie Lu (2014)	Dynamic object-oriented Bayesian networks on which a decision support system is based on situation analysis	Engineering and automation industry	This paper is analyzing results collected from different research processes and evaluated the result with respect to Fuzzy methodology.	To decrease the difficulty of the decision-making process by aiding operators cognitive activities	Assessment methods for partial and full validation of condition analysis decision support system (SADSS)
Liangtie Dai, Qiongyu Zhou 2014	Research on the knowledge-based comprehensive decision support system for human resource management in SaaS mode	HR industry	Building the modules of HRM to form a comprehensive HRM	Various research paper is evaluated within this paper in order to identify the impact of knowledge-based DSS.	Designed a Human Resource Management system and it is more comprehensive and professional Compared with previous studies
Bing Shao (2013)	Realizing a Decision Support System for Different Deployment Automation Approaches	Automation Industry	Deployment Automation Approaches by characterized a appropriated data model,	To analyze technological impacts on society and development.	Deployment automation approaches to deploy application to the cloud
Tindara Abbate , Clara Bassano , Anna Maria Coppola , Sergio Miranda4 and Luigi Rarità 2014	A Knowledge – based Decision Support System for the Service Quality Improvement in Organizations	Business industry	Proposed model using an XML document	The paper presents a literature survey of four Collaborative Business Processes CBP paradigms (namely oriented on activity flows, documents, cases, and business artifacts) conducted from the perspective of a vendor of the Enterprise Resource Planning (ERP) system	Determination of a knowledge demand and focusing on the demand for knowledge services on the individual layer and the organizational knowledge demand
Antonino Fiannaca , Massimo La Rosa , Alfonso Urso, Riccardo Rizzo , Salvatore Gaglio 2013	A knowledge-based decision support system in bioinformatics: an application to protein complex extraction	Biotechnology	Compare the results obtained through KDSS with literature by several research	Face the Protein Complex Extraction issue. Using a Knowledge Base (KB) coding	The KDSS knowledge base provides a novel workflow that gives the best results with regard to the other workflows produced by the system

Table6: Web-based DSS:

Author	Title of the paper	Industry	Method	Aim	Results
Digiesi, S., Facchini, F., Mossa, G., Mummolo, G., & Verriello, R. 2015	A Cyber- based DSS for a low Carbon Integrated Waste Management System in a Smart City	Smart infrastructure building	The results of the proposed model using linear programming are the performance of the DSS system to form an environmentally	The main goal DSS is lessen the net carbon Escalation of the Integrated Waste Management System IWMS	Optimization of the performance of the whole IWMS

Author	Title of the paper	Industry	Method	Aim	Results
			compatible integrated waste management system (IWMS).When viewing the remote control to configure the IWMS system, the SCP framework is required		
Dimitrios Aidonis, Georgios Banias, Charisios Achillas, Nicolas Moussiopoulos 2013	Deconrcm: A Web-Based Tool for The Optimal Management of Waste from Construction Activities	Construction industry	Building DeconRCM with the use of a web mapping via Google Maps API	The paper addresses both technical and functional structure of the developed web application	The result enables users – who do not always have the adequate scientific background- to retrieve information and navigate through data interactively
Jorge E. Hernández Andrew C. Lyons Konstantinos Stamatopoulos 2016	A DSS-Based Framework for Enhancing Collaborative Web-Based Operations Management in Manufacturing SME Supply Chains	Manufacturing industry	Design a framework for collaborative operations management and decision-making in manufacturing SMEs	To utilize qualitative methods within their research process for managing significant development of knowledge-based approaches.	give a Careful analysis of a small and medium-sized enterprises SME and the ideas of business process re-engineering and enterprise resource planning.
Tongle Hu, Zhenjie Zhao, Daichao Zhao, Jjehuazhu and Keqiangcao 2013	Chemical Control Strategy of Potato Late Blight Based on the DSS 'China-blight'	Chemical industry	Double setting" technique of potato seed tubers (Keil *et al.,* 2010), with one healthy tuber and one artificially infected tuber planted on the same position in the field.	To utilize qualitative approaches for elaborating different concerned methods of control strategies.	This service offered to private growers Company allowed anticipating critical conditions and reduced 40% the cost of fungicides
Grigorios Varras Zacharoula Andreopoulou Christiana Koliouska Evangelos Tasoulas , Christos Myriounis 2015	A Web-based DSS for Sustainability in Urban Green Zones	Environment sustainability	built-in web platform for the administration of urban green zones	To develop city microclimatic maps	The results provided a spatial imaging system, through software development for a geographic information systems dais. Reducing heat in the urban heat island through optimal control of shade and temperature Increasing the number of research experts and their participation in the scientific field.

Table7: GIS-based DSS:

Author	Title of the paper	Industry	Method	Aim	Results
Garima Srivastava, R. K. Srivastava, R. C. Vaishya 2014	Distributed GIS-Based Decision Support System for Efficiency Evaluation of Education System: A Case Study of Primary School Education System of Bundelkhand Zone, Uttar Pradesh, India	Education industry	consists of four investigation phases and connect them with each other and the methodology rely on the collection of 10 years background data	To elaborate the important consequences of GIS based DSS within education industry.	Decision maker can graphically visualize those areas which have an education problem with the help of several maps and graphs as well as can find out the sustainable solution without spending so much time to analyze such a complex problem
Abdullah E. Akay*, Aso Azad Haji Kakol 2013	Forest Transportation Planning by using GIS-based Decision Support System	Transport industry	Network analysis was performed by using Network Analyst extension based on two main data layers including links and nodes data layers.	To determine the optimum route that minimized the total cost of transporting forest products.	results indicated that using GIS decision support system was able to reduce total transportation cost by 28.29% by considering both forest depots in the study area.
F. Iyalomhe, J. Rizzi, S. Torresan, V. Gallina, A. Critto and A. Marcomini 2013	Inventory of GIS-Based Decision Support Systems Addressing Climate Change Impacts on Coastal Waters and Related Inland Watersheds	Inventory industry	The method based on the data available in the archives of the Nigerian Meteorological Agency (NIMET), generated from the synoptic weather stations	This study explored and assessed the potential impacts of projected climate change on water resources	Drier climate is expected to impact negatively on the runoff and invariably on the available water resources of the region hence proactive and aggressive management strategy is seriously needed to match any unfathomable impact.
Krunal Patel, Paru Thakkar, Leena Patel, Chandresh Parekh 2014	GIS based Decision Support System for Crime Mapping, Analysis and identify Hotspot in Ahmedabad City	IT	Integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information	To analyze the facts and research aspects with the help of Quantitative methods and qualitative methods.	The result is useful for better planning but also useful for better management of assets in industries and help multiple areas like Health, Defense, and Disaster

Author	Title of the paper	Industry	Method	Aim	Results
Aleksandar Rikalovic, Ilija Cosic, Djordje Lazarevic 2013	Using geographic information systems, the industrial location is selected according to multiple criteria	Technological industry	Geographic information is captured, queried, analyzed, displayed and output using a spatial analysis tool that was designed for this.	More focus on obtaining multi-standard methods for the industry Site selection and spatial database deployment of important factors, in order to obtain a correct location	The decision is made using GIS and MCDM methods, and alternatives are generated and evaluated after allowing the model that was developed in ten steps.

3- Conclusion

The complex functions in organizations, problem-solving and decision-making is One of the most prominent skills and tasks of administrative work, and the decision-making process consists of a set of stages, begins to gather information about the problem of the resolution ends by choosing the most appropriate alternative decision, and that several theories dealing with the process of popping managerial decision-making. In this study, we have mentioned the types of DSSs and gave examples of each from the literature. DSSs have a wide.

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