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The Technoarete Transactions on Intelligent Data Mining and Knowledge

Aim & Scope

Technoarete Transactions on Intelligent Data Mining and Knowledge Discovery (TTIDMKD) is a double-blinded, peer-reviewed open access International Journal published by Technoarete Publishing. With the exponential growth of data in today's digital world collected through the internet there is a definite need for mining useful information and discovering knowledge using Artificial Intelligence. The journal aims to promote and coordinate research development between academic experts, database manager, backend developer, knowledge engineers and to share their research findings in the broad area of data integration, data exchange, data architecture, data mining and warehousing, intelligent knowledge acquisition, knowledge dissemination and discovery techniques.

The journal invites original research articles in the sub discipline of basics of data mining-spatial data mining, graphing parallel, and Distributed Data Mining, Algorithms and Data-Preprocessing technique, Web mining Multimedia data mining, Data visualisation techniques, Data stream mining, Information security in data mining, Advancement of data Mining in the area of bioinformatics, Financial Modelling, Classification, Clustering, Educational data mining, Social network data mining Image analysis, Biometric are also recovered under the scope of this journal. Various knowledge Discovery and knowledge processing strategy such as knowledge representational Framework knowledge Discovery Framework, Data preprocessing and post processing strategies OLAP and Data mining, Expert system, Decision support system, Statistical Techniques, Data analysis Data protection KOD framework and process Online data mining and knowledge Discovery are also covered under the scope of this journal.

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Contents

Adaptation of Text Mining as Text Data Mining, Similar to Text Analytics for the Process of Driving High-Quality Information from Text

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A B S T R A C T

This research study describes the text mining adaptation of the business organization. In the present time, text mining helps the business organization to analyze the vast text document and extract valuable data from this text. This study has adopted the secondary qualitative data collection methods and from this secondary data, this study has conducted the thematic analysis to find the authentic result. This text mining process has used several types of tools and technologies that can help to increase the capacity of the organization. The business organization can get several benefits from this text mining process..

Keywords :Automated Process, Text Analytics, Text Mining.

I. INTRODUCTION

Text mining is a significant process that helps to get high-quality information from the text. A business organization has used several types of data to increase its capacity. In this regard, text mining plays an effective role in the business organization. Text mining is also used as text data mining for developing organizational value and performance. The text mining process analyzes large sizes of documents and extracts valuable data that helps the organization to increase its profit in the marketplace. Text mining has used several important tools and techniques for data extraction. These various tools and techniques mainly affect the business organization significantly.

LITERATURE REVIEW

Concept of text mining

Text analytics is the most significant process that helps to arrange the unstructured text and find valuable information from this document. This is the automated process of text analysis. In this regard, through this text analysis process find quantitative data from the vast text documents[1]. The business organization has used text analytic processes through several types of tools and techniques. In a business organization, the customer's experience plays an effective role in developing the organization. In this regard, to analyze the customer's experience and find the result has used a text analytics process. Text analytics and text mining are the same types of process that is used in business performance. This process has used different types of techniques. The text mining process is the new approach and it has used more upgradable techniques to find high-quality information.

Figure 1: Text mining process [1]

In the present time, technological uses are increasing in every sector to develop organizational capacity. In this respect, text mining is the most effective process that helps the business organization to get high-quality information. Text mining has helped to analyze the previous and unknown data and from this data extract important information. This analysis helps to increase the knowledge about the market and the competitors. In the other words, this text mining also gives new information about the market. For research purposes, this analytical process has been used to examine large-size information[2]. In the present time, the business process has used various types of data to develop their business performance. In this respect, the text mining process helps to extract various data from large text documents. Text mining has followed some processes for analyzing high-quality data. In the analysis process, first, gather several large sizes of text documents and process these text documents to find high-quality data. After processing the large text documents stored the data through algorithm, inference, and information extraction and analysis of this data to get high-quality information.

Useful techniques of text mining

Text mining is a software-based process that helps to arrange unstructured data and find high-quality information. This process uses various types of tools and techniques for examining the large size of text documents. In this regard, through these tools and techniques, the text mining process runs effectively.

Information Extraction (IE)- In the text mining process, information extraction is the most effective technique that helps to extract important information from large text documents. These techniques arrange the unstructured text and recognize the relationship with the organization.

\Information Retrieval (IR)- This technique is used for extracting particular information from vast text documents. The IR technique has used different types of algorithms for finding associated information[3].

Natural language processing (NPL)- In the text analysis process, natural language processing techniques play an effective role in examining the structure data [4]. This NLP helps to summarize the text data and analyze the sentence construction and grammar.

Clustering- Clustering is another significant technique that helps to find valuable information from large text documents[3]. These techniques classify the text documents in various groups using the different clustering This technique helps to extract the data from top to bottom of the text documents.

Categorization- In the business organization uses different categories of data to develop their performance. In this regard, categorization techniques help to classify in various categories with objectives of this business organization.

Visualization- In the text mining process, the visualization technique helps to differentiate the text data. In this process, use different shades and colors to represent the documents. This technique has arranged the data with visual hierarchy tools.

Text summarization- The text summarization gives the overall perception of the text documents. In other words, it also helps to describe the frequency, position and suggest the most effective information

from the exact sentence.

Figure 2: Useful techniques of text mining [3]

Effects of text mining to get high-quality information

In the business process, the text mining affects significantly. In business organizations text mining helps to increase their performance quality and profit. In the business organization, customers' sentiment analysis plays the most significant role in business development[5]. In this regard, text mining analyzes the customer's experience. According to this sentimental analysis, the business organization can increase their products and service quality through text mining.

The text analysis process helps to identify the risks of this business organization in the marketplace. In the marketplace, business organizations have faced several risks and challenges. The text mining process helps to identify the actual problem of the organization. In this present time, through the software, the business organization has collected large amounts of text data. On the other hand, the internet now presents various types of text documents that can help the organization to improve performance[5]. Text mining extracts high-quality information from large text documents. The text mining process increases the accuracy level of the business organization. This text mining process helps the organization to improve performance quality by providing effective text data and valuable information. Increase the performance quality this organization can get competitive advantages in the marketplace.

METHODS AND TECHNIQUES

In the research study, the methodology is the most effective part that helps to find the authentic result. In the methodological section, data collection plays methodological section, data collection plays the most significant role in completing the research study. In the data collection method, mostly qualitative and quantitative data is used to find the authentic result of the study [6]. Due to the pandemic situation, the researcher was not able to follow the primary data collection method and for this reason, this study has adopted the secondary qualitative data collection method. In this secondary qualitative data collection method mostly the researcher has used online articles, books, journals, and authentic websites which were published five years ago [6]. In the previous articles and journal mainly helps the researcher to collect the information and get the idea about the topic. In other word, from this secondary qualitative data collection process, the researcher gets the chance to compare the previous situation with the current situation of this research topic. According to the secondary qualitative data, the researcher has adopted thematic analysis. This research study has followed the descriptive research design to represent the findings of this study accurately. In the other words, this research study has adopted the positivism philosophy to complete this study successfully.

DATAANALYSIS

Thematic analysis

Utilization of text mining in business process In the business process, text mining helps to develop the organizational products and services quality. Text mining mainly utilizes several sectors for increased efficiency. In the marketplace, the health sector, financial sector, manufacturing sector, automobile sector, and food sector have used the text mining process in their business. In the financial sector, text mining helps to analyze the profit and loss and also gives information about the other organizational activity [7]. On the other hand, in the manufacturing sector to develop their performance and produce better quality products the text mining process helps to improve the manufacturing system of the organization.

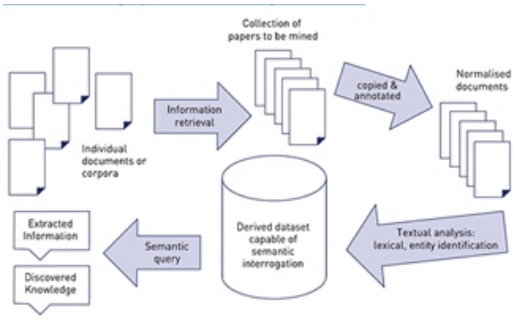

Figure 3: Utilization of text mining in business process[7]

Text mining gives opportunity in the business process

Text mining has given many opportunities to business organization to increase their capacity in the marketplace. In the manufacturing process, text mining plays the most effective role in analyzing text information. In the present time, in the marketplace, several manufacturing companies also produce the same type of products [8]. In this regard, the business organization has got the chance to understand the capability of the competitors. According to the text mining data, the organization can develop its product quality and can introduce to the market new products. The business organization can increase its capabilities through this text mining process [9]. In the business process, text mining gives the organization the statistical data that helps the organization to understand the current situation of the market and also the organizational position.

Benefits of text mining

Text mining helps the marketplace to give different types of benefits to the organization. In the marketplace, the most effective benefit is increased economic potential. Text mining helps to analyze the organizational overall performance and through this text mining, the organization can implement upgradable technologies and innovation in their business process. The computerized text analytic process can increase the accuracy of the organization [10]. In the health sector, text mining helps to get information aboutBenefits of text mining Text mining helps the marketplace to give different types of benefits to the organization. In the marketplace, the most effective benefit is increased economic potential. Text mining helps to analyze the organizational overall performance and through this text mining, the organization can implement upgradable technologies and innovation in their business process. The computerized text analytic process can increase the accuracy of the organization [10]. In the health sector, text mining helps to get information about the market position of this organization. In another word, text mining helps to analyze the previous situation of the organization and it also helps to find the future carrier of the organization. In the marketplace, the financial organization has got 36%

profit through the high-quality text information.

CONCLUSION

After all these discussions, it can be concluded that the text mining and text analytic are the same processes. These two processes have helped to analyze the text documents and extract the valuable data from the large size text document. In this regard, the text mining is a more upgradable text analysis process that can give accurate data to the business organization. Text mining has used several types of technologies for the analysis of text documents. In the present time, several text documents are available in the marketplace. These text documents help to analyze the market position of the organization and give a competitive advantage to the business organization.

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Application of Spatial Data Mining in the Process of Discovering Interesting and Previously Unknown, but Potentially Useful, Patterns from Large Spatial Datasets

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ABSTRACT

Spatial data mining has been typically used in the Geographical Information system from physical datasets and locations to real-world events. One of the procedures generally used in capital data mining is vector data representation. Vector data is the most commonly used data across the world. Information in this format consists of tips, angles, and quadrilaterals. It is the simplest method of analysing the data where the vector data consists of tips correlate pairs to indicate a physical location in the world. These points can be joined in a particular way to form closed areas marked as quadrilaterals. Vector data is extremely useful for storing and representing data that has discrete boundaries such as international borders, streets, buildings, and many more. Modern technologies such as Google use geological information and open street maps to represent the data in vector data stricture wise.

Keywords :*Data, Information System, Security, Spatial Data Mining, Vector Data.***.**

I. INTRODUCTION

Spatial data mining is used to discover potentially useful data, interesting and non-tribal patterns from spatial datasets. The aim of this study is to understand and verify the data mining process in relation to the collection and analysis of the real-time data obtained from a particular research field. Computational data management is mostly used for this purpose since it gives the actual real-time data. Spatial data has unique specialisations like spatial autocorrelation which involves the presence of systematic spatial variation in a given set of variables. Another feature of spatial data mining involves spatial heterogeneity which violates independent and similarly distributed presumption of old statistic and data mining procedures. Advancement in this strategy of data mining has led to additional challenges like a modifiable areal unit problem, focusing on the primary spatial pattern facilities the following are considered as one of the efficient ways for collecting the spatial data. These are hotspot detection, collocation, spatial prediction, and spatial outlier detection.

Process of spatial data mining

Spatial data mining relates to the process of discovering interesting and previously unknown datasets. These datasets are potentially very useful obtained from large data sets. This requires specific techniques and resources to get the specific geographical data into the relevant and useful formats.

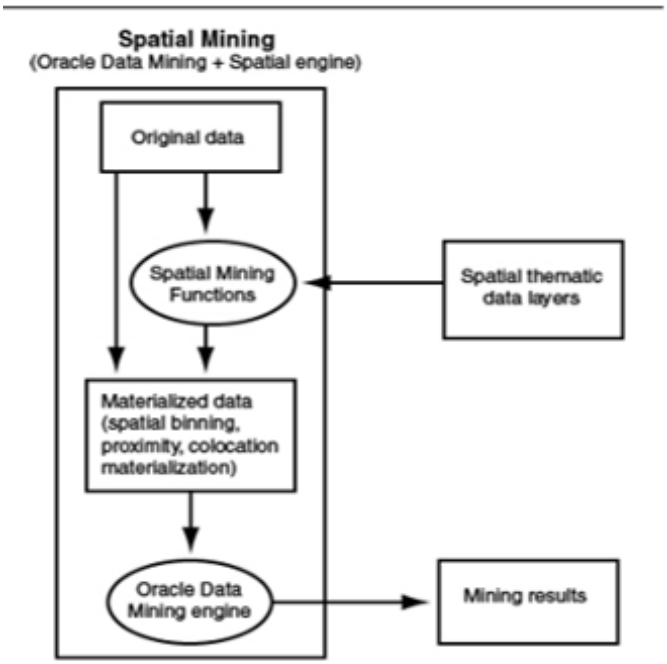

Figure 1: Factors on which spatial mining of data depends
(Source: Zhou *et al.* 2018)

From the above-given diagram it is clear that the process of finding the spatial data depends upon several factors there are:

1. The original data includes the spatial as well nonspatial data which is further processed to form the materialized data. spatial data is any type of information that is directly or indirectly related to a specific geographic location. This kind of data mainly involves point locations or more complicated objects such as countries, roads and waterbodies.SQL is the most commonly used server in the case of spatial data management (Zhou et al. 2018). SQL provides support to two spatial data types which include the geometry data type and geography data type. Spatial data types generally use two models. These are the vector data model and raster data model. Non- spatial data involves the objects which are not involved or related in the perception of a relationship. There are four types of non-spatial data there are integer, float or real, text, and date. The major advantage of materializing the data since it is easily retriable at a faster rate. The data is precomputed and stored at the expense of insert or deleted data. The database will keep the materialized view in synchronization with the real data obtained.
2. Spatial data in original data is prepared by vector data and raster data model to prepare the materialized data. These procedures of vector & raster data models involve the following steps. These are operations such as spatial binning, proximity, and colocation materialization.
3. The oracle data mining engine processes the materialized data which includes the spatial and nonspatial data to generate the specific data mining results

Benefits and challenges of spatial data mining for discovering unknown dataset 250

The benefits of the data mining process can be stated as below:

1. To create different business models, marketing companies use data mining processes. This can be done by analysing the response from the customers sent via advertisement. This means that the marketers can sell profitable products to specific customers [6].
2. Helping the financial institutions with information on loans, credit reports as well as by creating a model related to the history of dealing with existing customers. Thus, it is helping the bank to detect

fraudulent transactions.

Figure 2: Benefits of spatial data mining
(Source: Zhou *et al.* 2018)

3. Data mining is motivating the researchers to accelerate the method of analysing the data according to the preferred mindset of the customers and specific geographic location regarding the demand and supply rate of any particular product launched in the market [7].
4. Data mining can be used to increase brand loyalty in business by understanding customers' needs and habits regarding the choice for any specific data.
5. It can be used to increase the company revenue which reduces the cost and services of the product by collecting the information needed regarding the processing of the raw materials. Thus, increasing profitability of a company to around 80% [11].

Challenges faced spatial data mining for discovering unknown data:

1. The concern about personal privacy is one of the major challenges faced by data mining. This is because people are afraid that their personal information is collected in an unethical way. For example, the business relationship between the organization and the customers may not last forever and some hackers take the advantage of this situation because the data of the customers are stored along with the information of their monetary transaction which involves the bank details of every customer. Hackers can use this information and can badly affect the financial conditions of customers [8].
2. Security issues have been another major problem of data mining since the information of the employees as well the customers including the social security number, date of birth, and much more information are provided during the survey of data mining. This information goes to the hands of the hackers and fraudsters when they hack specific e-commerce sites which becomes a beneficial factor for them to utilize [9].

METHODS AND TECHNIQUES

This research is based on secondary qualitative data which has been collected from several reliable sources. For this research, a lot of scholarly articles were collected, and based on that the results are described in this study. According to the opinion of [1], directional data consists of lines joined with the endpoints which meet at the junction. The vectorial system consists of two factors: the one which merges with the spatial data and the one which manages thematic data. The directional system acts as a hybrid model since it bridges the relationship between the databases for the characteristics with a geological dataset for the spatial data. The identifier acts as a major element in such cases since it provides different results for each specific item which helps the machine to connect to both the databases. In a directional-based system, the calculation of the geological data is represented in the form of correlation and the building blocks of geographical information are given as border, angle, and quadrilateral shape. Therefore, more details regarding this are explained below.

RESULTS AND DISCUSSION

The directional data system is generally used to store non-linear data. Directional storage involves the storage of clearly expressed topological information that elevates on a high scale. Thus, it only collects the information which defines the purposes and can be stated as non-existent data. There are different ways of the double database, involving the geographic and schematic data. A vector system involves two components: the one that operates the geographical data and the one that manages the schematic data. This results in the formation of a dual system since it bridges links the relationship between the database for the characteristics with one geographical data with another geographical data. The identifier acts as the key element for such cases since the identifier is unique and different for each object which allows the system to get connected to both the databases [5].

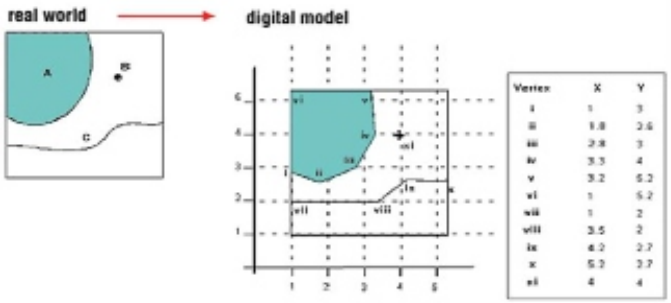

Figure 3: Graph representing the different elements of the vector data system [2]

A directional data system defines the distinctive substances. Some examples of the distinctive substances are fire hydrants, roads, and water bodies. A directional data system is broken down into three basic types. These are the points, lines, and polygons and all these three types of vector data are composing the coordinates and attributes. A tip is used as a single correlates pair to define a specific geographic location. The points don't have any specific dimensions. They can have actual real-world dimensions. In the case of a geographic information system, no dimensions are assumed. Each point has associated tribute information and the information is attached to the centre of the point. A line vector type is defined by an ordered set of coordinates. According to [3] Each line and curve is composed of multiple line segments and the curved lines are always represented mathematically. The line is composed of two components that are the nodes and the vertex. A vertex is defined where the line changes its direction. A node is defined as where a line begins or ends. The smallest border will have two nodes a start junction and an end node whereas the longer borders will have two junctions and many vertices in between where the line changes its direction. Examples of geological phenomena that are represented well by junctions are roads, pipelines, outlines of different objects, and power lines. For example, if a line represents a road, each road segment between two intersections may have its address The intersection can represent a stop sign or a spotlight [10].

The last directional information type is the quadrilateral that is formed by a set of connected lines where both ends have the same coordinates. Since the start and the endpoints have the same coordinates, the quadrilateral will get enclosed and will have a curved space. Attribute information is attached to the centre of the quadrilateral irrespective of the complexity of the quadrilateral. Some examples of geographical phenomena designed with quadrilaterals are lakes, cities, tree stands, and different political boundaries [4].

Vector type data are usually involved in locating the specific geographical infrastructure with the help of specific signs and symbols.

CONCLUSION

Spatial data mining has an important contribution to Geographic Information systems that provides the ability to capture and analyse the spatial and topographic data of any specific location around the world. It acts as a mathematical model for representing geographical objects and landmarks as data types. Vector type data are usually involved in locating the specific geographical infrastructure with the help of specific signs and symbols. Thus, helping the geomorphologist to survey their particular research regarding any geographic location by only optimizing the vector type data in their research of interest. Data mining is motivating the researchers to accelerate the method of analysing the data according to the preferred mindset of the customers and specific geographic location regarding the demand and supply rate of any particular product launched in the market.

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Aspect of the Knowledge Representation Framework (KR Framework) for Offering the Basis for a Number of Research Activities in the Caisor

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ABSTRACT

The representation of knowledge refers to the technical challenge of capturing human understanding and thinking in a conceptual framework that enables computer networks to handle information. This research study is aimed to critically analyse the impact of the knowledge representation framework on the efficiency level of CAISOR activity. The research study has provided a sustainable viewpoint about the way KRF presents visualization data that is easy to understand for the human as well as the CAISOR agenda. A wide variety of different initiatives are founded on the CAISOR agenda through the Knowledge Representation Framework. The KR model covers many features of structured information representation ranging from simple facts to sophisticated formulations and programs. In addition, the research study has followed a secondary qualitative data collection method to collect the secondary sources of data regarding the research topic.

Keywords AI System, CAISOR, Framework, Knowledge

I. INTRODUCTION

A method to the representation and arrangement of organizing data in both conventional and knowledge bases and knowledge-based systems is an approach of Knowledge representation framework (KRF). KRF is built on the usage of KR functions as a more legible and powerful alternatives to S-expressions, JSON, transcription and the same to describe specific data. However, through the utilization of various brackets and infixes, KRF notation is comparable to the logic and extensive setting interpretation. Many of the KRF's languages employ KR as its syntax frameworks, such as KIF, KQML and PDDL for the sake of Syntax. This comprises the common language of expression that performs a function comparable to KIF, the documents and website marking language and numerous more. The Session Command Language has been designed to give orders to KRF-style sessions containing software agents and is a KRE-based scripting language. Moreover, presently the usage of Knowledge representation framework has enhanced up to 27%, as it creates a positive impact on the activities of CAISOR. Here in this research study a brief overview will be provided on the impact of knowledge representation framework on the CAISOR activities. The aim of this research study is to evaluate the importance of the Knowledge representation framework on the CAISOR activity.

The concept of Knowledge Representation Framework and its benefit

In the CAISOR agenda, a series of research initiatives are based on the framework for representation of knowledge (KR Framework). The introduction to a lay individual is provided via several different effective methods. The KR framework defined many features of defined data representation, varying from minor facts to sophisticated formulae and scripts [9]. This format is used for publishing languages and marking and scripting in KRF based software both in lecture and technical documents. As per the

words of Wu et al. (2018), knowledge representation relates to the technological challenge of encryption of human knowledge and reasoning into a symbolic language, which enables information technology to manage it.[8]

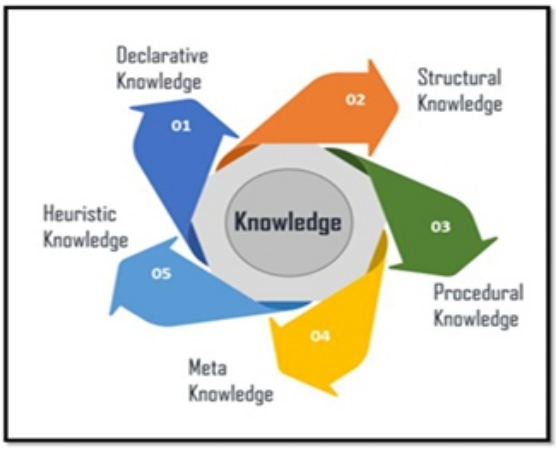

Figure 1: Types of Knowledge in the Knowledge representation framework [9].

Knowledge representation is employed in systematic biology to integrate scientific concepts and understanding into data to increase its usefulness for scientific understanding. Real-world knowledge has an essential and significant function for intelligent creation. In showing intelligent human behaviour in AI entities, knowledge plays a significant role. An agent can only act on certain information accurately if he has some knowledge or understanding of the information. On the other hand, as per the words of Bruno et al. (2019), the representation and reasoning of knowledge is part of the intelligence that deals with the thinking of AI agents and how thought leads to intelligent action. It represents factual information so that a computer can comprehend and use this skill to solve complicated real-world issues, such as the diagnosis of a medical condition or the communication with people in natural languages. It is also a technique to define how knowledge in artificial intelligence can be represented. The representation of knowledge is not only data storage in a transaction window. Nevertheless, it also allows a smart machine to learn from information and experience, so that it may be intelligent like a person. The representation of the frame of knowledge facilitates the programming by grouping associated data. A rather flexible framework representation is employed by many AI applications. Slots for additional attributes and connections can be very easily added. The default data can be included, and missing values can be searched through the utilization of knowledge representation framework.[1]

The impact of Knowledge Representation Framework on the CAISOR activity

Presently, the knowledge representation system is one of the most crucial components in the CAISOR activity, as the utilization of KRF has created a positive impact on the CAISOR process by maintaining the factual data. The area artificial intelligence is knowledge representation and reasoning, which is devoted to expressing world information in a way a computer system, can use to perform difficult jobs. As per the words of Saha (2020), the representation of knowledge includes psychological insights on how people solve issues and express knowledge, to create formalisms that facilitate design and building complicated systems. The representation and reasoning of knowledge also includes logical results to automate other types of reasoning such as rules or the relationship between sets and subsets. A constant sequence of standards and notes for the acquisition of information, software development, intelligent autonomous agents and arrangement of documents are developed under the knowledge representation framework (KRF).[6]

In such a scenario, documentation not only contains articles and reports, but also WebPages that are static and dynamic [3]. Much of CAISOR's work is defined by the use of design iteration as work

towards a big and complicated design. Therefore, the utilization of Knowledge representation framework supports the CAISOR agenda to gain the necessary information from the complex design of data. On the other hand, according to the words of Cornet(2019), Knowledge representation and reasoning are the primary components of the cycle, showing human intelligence in computers. The depiction of knowledge is all about intelligent comprehension. It aims to understand and develop intelligent behaviour from the top town and concentrate on what a CAISOR agenda wants to know to be knowledgeable instead of attempting to comprehend or build brains up from below.[2]

It also describes how evolutionary computing methods can provide this information as necessary. Knowledge plays an essential part in intelligence and the creation of artificial intelligence in the actual world. The intelligent behaviour of AI agents or systems can be demonstrated with an agent or system that is only able to behave properly on certain inputs if they are aware of the input. A frame is a structure resembling a record consisting of a set of characteristics and attributes which characterize an object in the world. The utilization of frame representation creates a positive impact on the efficiency level of CAISOR by making the programming understandable for the CAISOR agenda. Therefore, through the findings it can be easily stated that the inclusion of KRF creates a positive impact on the performance of CAISOR agenda.

METHODOLOGY

This research study utilized a philosophy of positive research to assess the ideology and find the factual proof of information. As per the words of Ryan (2018), using the concept of positivism research can help a research study by developing the hypotheses and factual facts in the collection of useful information. The research study, on the contrary, has selected a descriptive research design to explain the research study's aim and goals in order to minimize the research objectives. Furthermore, instead of relying on logical induction, the research study used a deductive research strategy in establishing an original assumption based on current concepts and practices.[5]

As per the words of Pearse (2019), the researchers can use a deductive method to explore the relationships between the study components. In this research study, the researcher utilized a deductive strategy to research to develop and assess a proposed hypothesis to help the researchers in describing the topic. In addition, a secondary qualitative data collecting approach has been used in the research study to enable researchers to obtain useful information from diagrams and tables from verified reputable online sites and scientific papers. In the course of this research study, publications, scholars and peer reviews were also employed to gather the secondary source of data on the research subject from 2017 to 2021.[4]

RESULT AND DISCUSSION

In the present time, the framework of knowledge presentation has created a positive impact on the efficiency of CAISOR. The infliction of this framework has also created a positive impact on the efficiency level of AI knowledge circle. The main components of the AI knowledge system are learning, knowledge representation, planning, perception, and execution.

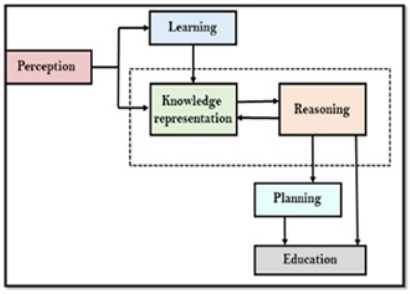

Figure 2: Components of knowledge representation framework [7]

The picture above shows that an AI system can engage with the actual world and which elements allow it to demonstrate understanding. AI has a perception element, via which information is retrieved from its surroundings, as the audio or other sensory input format can be graphical. The learning component is responsible for learning from perception-captured data. Knowledge representation is the fundamental component in the entire cycle. Both of these components demonstrate intelligence in computer people. Both components are autonomous, but yet interconnected however, planning and implementation depend on the examination of representation and reasoning of knowledge.

On the other hand, as per the words of Siregar et al. (2018), the inclusion of Knowledge representation framework also creates a positive impact on the efficiency level of CAISOR agenda through the ability to summarize the collected data. However, the implication of this framework also supports the AI system to understand the prospective CAISOR agenda that supports them to work according to the proposed agenda. The representation of knowledge in artificial intelligence systems is a fundamental part. The technologies with a natural language interface require three categories of information such as word knowledge, sentence structure knowledge and domain knowledge. Knowledge of the structure of phrases is called grammar or works, knowledge of objects and relationships is referred to as a model for the field of knowledge. On the other hand, when it is understandable by the knowledge engineers and at the same time the system acts as though it actually had this information, it will be regarded as effective in presenting it. Since in reality there are no ideal models, knowledge engineers and developers must compromise on their unique objectives. The breadth of the topic is wide-ranging and involves the logic, ontology, and computer fields. The logic and ontology of a particular knowledge field enable the construction of an appropriate computer model.[7]

CONCLUSION

This research study is based on the aspects of knowledge representation framework on the efficiency level of CAISOR activity. In addition, a number of CAISOR's research efforts are based on the Knowledge Representation Framework Framework). The KR Framework covers many features of structured information representation ranging from simple facts to sophisticated formulae and scripts. Moreover, the research study has also highlighted the impact of knowledge representation in AI systems as well as the CAISOR agenda. Knowledge representation is a framework that supports an organization to evaluate the complex data in a simple form that creates a positive impact on the efficiency level of the CAISOR agenda.

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Expert Systems for Emulating the Decision- Making Ability of a Human Expert

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A B S T R A C T

Expert systems are a type of technology that supports an organization to identify the challenges of a project and help the organization to take effective steps to resolve the challenges. The research study is based on the utilization of expert systems on the decision-making ability of human experts. The research study has adopted a positivist research philosophy, exploratory research design, and deductive research approach to mitigate the research objectives. On the other hand, the research study has been done through the implication of a quantitative data collection method. Based on the secondary quantitative research study, the study has shown the potential impact of an expert system on the decision-making ability of human experts. This research study has explained the way expert systems are creating a positive influence on the operational efficiency of an organization and the utilization of expert systems has also enhanced the decision-making ability of human exports up to 42%. Moreover, the implication of expert systems is beneficial for providing growth in business.

Keywords *Artificial Intelligence, Expert Systems, Human Experts, Project, Technology.*

I. INTRODUCTION

Presently, the utilization of expert systems or enhanced infrastructure of the expert system has created a positive influence on the decision-making process of human experts. Moreover, the utilization of the expert system also supports the human experts to allocate the resources in the different parts of the organization. On the other hand, expert systems also enhance the knowledge of a project by highlighting the project goals and timeline. As a result, that supports the organization as well as the human experts to take effective decision making to enhance the efficiency of the project. Moreover, an effective experts system such as MYCIN can support the human experts to identify the bacteria or virus in the cloud system that helps them to take effective steps to prevent the issue. Here in this research study, a brief overview will be provided on the impact of an expert system on the decision-making ability of a human expert.

The concept of an expert system and its benefits

In the context of artificial intelligence, expert systems are one of the commonly used technologies in every organization to enhance the efficiency level of the decision-making process of human experts. As per the words of Yazdi et al. (2019), expert systems are designed in a way that can easily identify the factors of ongoing or a future project that might create a negative influence on the project outcome. Therefore, the implication of expert systems can support the human experts to make effective decision making that will support the organization to mitigate the projected issue of a project. In today's competitive world the utilization of expert systems is one of the most essential components in the success of an eerie business organization. As per the words of Leo Kumar (2019), the usage of expert systems supports an organization by enhancing the decision-making process of the organization, which creates a positive impact on the performance as well as the project outcomes. In addition, the utilization

of an expert system also supports an organization to identify the risks and challenges of a project.[5][12] That helps the human experts to take effective decision making to mitigate the challenges and risk that has been identified by the utilization of expert systems. On the other hand, according to the words of Muhammad and Algehyne (2021), organizations with effective expert systems are performing 65% more effectively in the international market, than the organizations that are not connected with the expert system. Moreover, organizations with highly effective expert systems can enhance their productivity as well as the quality of their product by enhancing efficient levels of knowledge and resource management.[6.]

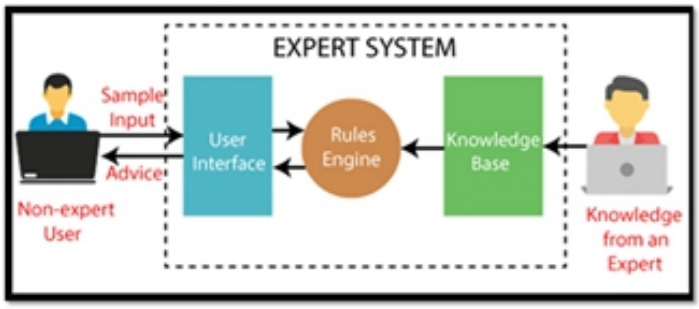

Figure 1: Benefits of Expert System [11]

According to the words of Triantaphyllou (2019), the utilization of expert systems in organizations can enhance the activity of human experts. Since the utilization of expert systems has created a positive impact on the efficiency level of the human experts by 42%. However, the utilization of this experts system can also support the human experts to take effective decisions to maintain the productivity of the organization by allocating proper resources and analyzing the risk factors. On the other hand, by increasing the decision-making ability of the human experts, the expert's system can enhance the project outcome by 93% (Triantaphyllou, 2019). Therefore, through the findings, it can be easily stated that the inclusion of these expert systems can be a beneficial factor in an organization, in order to support the decision-making ability of human experts.[11]

Impact of an expert system on the decision-making ability of a human expert

In the competitive world, the impact of the utilization of an effective experts system is massive. As it enhances the decision-making process of the human experts that support them to take effective decisions to enhance the project outcomes, by preventing the challenges and issues that have been identified by the utilization of effective expert systems. As per the words of Garcia-de-Prado et al. (2017), in recent times, several effective expert systems have been introduced to the world that can take an effective part in the success of an organization. In the year 2015, the CADET has been introduced in business organizations to enhance the efficiency level of the organization. CADET is an expert system that supports human experts to identify cancer (challenges and risk) of a project. As a result, that supports the human expert, as well as the organization to take effective steps to prevent the challenges in the project in order to achieve the project goals.[2]

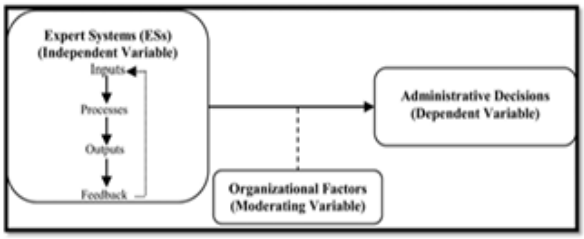

Figure 2: Impact of an expert system on the decision-making ability of a human expert [1]

On the other hand, as per the words of de Diego et al. (2019), the implication of this experts system can support the human experts to take effective decisions to enhance the performance of the organization by taking quick and robust decisions. However, in India, organizations such as TATA and Reliance are utilizing expert systems to enhance the efficiency level of both organizations[1].

According to the annual report of TATA, the utilization of the expert system has enhanced the efficiency of TATA motors by reducing manpower and by recommending effective decision-making. On the other hand, Reliance is utilizing the expert's system to provide a 360-degree service across the international markets, where they are operating. However, while considering the positive impact of expert systems, there are also some negative influences on the utilization of expert systems. According to the words of Rodger (2019), the utilization of these expert systems can reduce the productivity of an organization by reducing the flexibility and the ability to change the decision-making process. On the other hand, it also creates a negative impact on the innovation process of an organization by reducing the creative responses of human experts. Therefore, by analyzing the collected data about the utilization of expert systems can be easily stated that the utilization of expert systems can create a positive impact on the decision-making ability of human experts.[8]

METHODS AND MATERIALS

In order to demonstrate the ideology of the collected data and verify the collected data, this research study has implicated the positivism research philosophy. According to the words of Ryan (2018), the implication of positivism research philosophy and helps the researcher to gain sustainable information about the research topic that helps them to identify the importance of expert systems to enhance the decision-making ability of a human expert. On the other hand, in order to accomplish the research objectives, this research study has utilized an exploratory research design instead of a descriptive or explanatory research design. As per the words of Jardim et al. (2021), the utilization of exploratory research design supports the researcher to give just about the purpose of doing the research. Once the research objectives have been justified, the research study has utilized a deductive research approach to demonstrate the relationship between the expert system and the decision-making ability of human experts.[3][9]

Instead of focusing on logical induction to establish an innovative assumption based on current conceptions and practices, the research study has adopted a deductive research approach. In addition, the utilization of the deductive research approach in this research study has supported the researcher to evaluate and recommended an effective hypothesis that helps the researcher to demonstrate the purpose of this research study. On the other hand, the research study has utilized a secondary quantitative method of data collection that helps the research study to gather sufficient data from graphs and tables from the verified website and scholarly articles. Moreover, the secondary source of data collection has been collected from journals, scholarly and peer review articles from 2017 to 2021.

RESULT AND DISCUSSION

In the current circumstances of the international market, the utilization of effective expert systems has enhanced the performance of the organizations through enhancing the decision-making ability of human persons. In this part of the research study, a critical analysis will be provided on the impact of expert systems on the decision-making ability of human experts. In recent times, almost every organization is investing in expert systems to enhance the performance of the organization. According to the words of Jin et al. (2020), an organization with an effective artificial intelligence system is 38% more effective than an organization without expert systems[4][10].

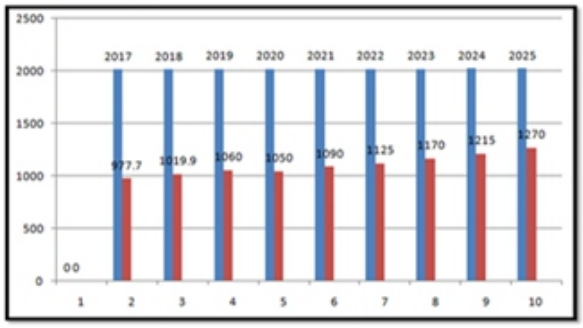

Figure 3: revenue of the business organization through the utilization of expert systems (Source: MS.Excel)

In the figure number 3, it has been demonstrated that the organizations with efficient expert systems can enhance their revenue up to 1270 billion USD by the end of 2025. As per the words of Nguyen and Bui (2019), along with the revenue the utilization of an effective expert system can also enhance the decision making process and other factors of an organization that can enhance the operational efficiency of the organization. The beneficial factor of the utilization of expert systems will be demonstrated in the figure number 4.[7]

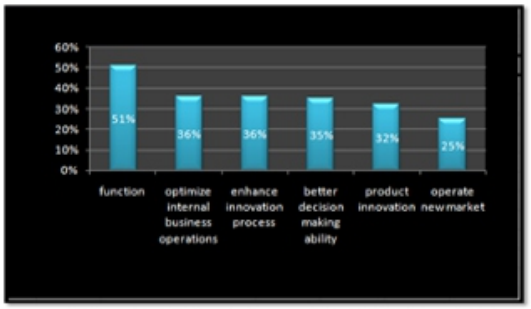

Figure 4: Impact of AI on the operational efficiency (Source: MS.Excel)

The figure number 4 has provided a sustainable viewpoint about the beneficial impact of AI technology on the operational efficiency of an organization. Through the graph it can be easily understood that the utilization of these expert systems has created a positive impact on the decision making ability of the human experts. Therefore, through the findings it can be easily stated that the implication of expert systems has created a positive influence on the decision making ability as well as the operational efficiency of an organization.

CONCLUSION

The research study has successfully demonstrated the impact of expert systems on the decision making ability of the human experts. Therefore, using an expert system is beneficial to identify the challenges and risks of a project, and helps the human experts to take effective steps in order to prevent the challenges. However, the research study has also explained the way international organizations such as TATA and Reliance are utilizing the expert systems to enhance the operational efficiency of their organization.

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Role of Data Visualization in Storytelling by Curating Data into an Easier form

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ABSTRACT

Data visualization is an effective method to enhance the efficiency of the storytelling process through clearly delivering the message to the audience. This research study is based on the role of data visualization in storytelling through curetting data into an easier form. In order to demonstrate the importance of data visualization, the research study has provided a concept about the data visualization and its benefits on the organization. In addition, the research study has critically evaluated the impact of data visualization on the process of storytelling. However, the research has implicated the positivism research philosophy, descriptive research design and deductive research approach to justify the research purpose. On the other hand, the data has been collected through a secondary method of data collection to collect the valuable data regarding the research topic.

Keywords *:Data Visualization, Information, Organization, Storytelling.*

I. INTRODUCTION

Storytelling through data visualization creates a positive impact on the efficiency level and it helps the audience to understand the message in a clear manner. Data visualization can enhance the presentation of the storytelling by attracting the audience through insights, graphs and recognizable trends regarding the storyline. An excellent view conveys a storey, removes the sound from the data and highlights the important facts. A careful balancing act between form and feature is effective data display. In addition, data visualization is the process of combining factual data with human communication to present an attractive visual of the story that will support the organization to deliver their message in a succinct way. Moreover, the process of data visualization can support the governance and any other professional industry to minimize the data that will support the organization to understand the important data in a succinct way.

In addition, data visualization also supports an organization to analyse their financial statement that supports the organization to prepare the budget. As per the words of Waskom (2021), professional industries that are connected with the data visualization, they are performing 93% better than the organizations that are not connected with data visualization. On the other hand, according to the words of Qin et al. (2020), 68% of the enterprise believe that the data provided through data visualization are accurate and that support them to get the essential information regarding the project. Moreover, if the utilization of data visualization can be presented in graphs then the project outcome can be enhanced up to 97%. According to Perin et al. (2018), management with an effective data visualization technique can recover their data or identify any data 47% faster than the management who is depending on the reporting dashboards process. Here, in this research article a brief overview will be provided on the importance of data visualization in storytelling by crating data into an easier form. The aim of this

research study is to evaluate the importance of data visualization in storytelling by crating data into an easier form.[5][7][10]

The concept of Data visualization and its benefits

Data visualization is a process of transforming data into a visual presentation in a succinct manner that supports the organization to convey their audience through data visualization. As per the words of Po et al. (2020), visualization of data is a method of presenting a graphical presentation through the utilization of graphs, charts based on the information. As a result, it supports an organization to deliver a clear message about the company's goals and future activities. On the other hand, the concept of data visualization also supports an organization to minimize the big data and summarize the valuable information in a succinct manner from the big data. In addition, data visualization also provides
a clear image about the information that the organization is passing through their presentation. In recent times, the usage of advanced technology has generated more data that is quite hard for an organization to maintain in a succinct way. In that context data visualization creates a massive impact by compressing the data into graphical images that can be understood in an easy way.

As per the words of Engebretsen and Kennedy (2020), the utilization of data visualization can also enhance the financial performance or efficiency of an organization through analysing the financial statement of the organization. In the competitive world, 73% of the international organization is utilizing the data visualization technique to critically analyse the financial statement for the organization, which creates a positive impact on the preparation of the budget. On the other hand, data visualization also takes an essential step in the intelligence process of an organization by providing an appropriate conclusion of the raw data. In addition, data visualization also supports the advanced analytics of data science by presenting the machine language and any other algorithm analytics to visual context to illustrate the concept of that data in an easy way.

Figure 1: Concept of Data Visualization [2]

Impact of data visualization in storytelling Data visualization is one of the most essential and crucial components in the process of storytelling. Since the utilization of data visualization supports an organization to present the insights of a data through visual representation that can be easily understood by the viewer. As a result, that supports the organization to deliver their message in a better way however, there are two types of data visualization method presented in the data visualization process such as, exploratory visuals and explanatory visuals. In order to enhance the efficiency level of the storytelling process an organization must adapt an effective data visualization technique based on their storytelling data. Moreover, also in the financial management of an organization data visualization can create a massive impact by analysing the budget and financial statement of an organization. As a result, that will support the organization to prepare an effective budget to mitigate the company's goal. On the other hand, data visualization also creates a positive impact on the context of attracting the attention of the audience towards the story telling.

Figure 3: Storytelling process with visualization [11]

As per the word of Watson (2017), the utilization of data visualization can support an organization to gain more customers through the process of storytelling. Moreover, data visualization also enhances the efficiency of an organization by providing clear messages to the employees as well as the stakeholders. As a result, that supports the employees and the stakeholders to work accordingly with the goal of an organization that creates a positive impact on the performance of an organization. As per the words of Weber (2020), organizations that are presenting their storytelling activity through the data visualization process are 73% more effective than the organizations that are utilizing the normal reporting and dashboard system. Therefore, through the findings it can be easily stated that the utilization of data visualization can create a positive impact on the performance of the storytelling process.[11][12]

METHODS AND MATERIALS

In order to evaluate the ideology and identify the factual evidence of information, this research study has adopted a positivism research philosophy. As per the words of Ryan (2018), the utilization of positivism research philosophy can support an organization to gain valuable information by elaborating the hypothesis and factual data. On the other hand, to mitigate the research objectives the research study has adopted a descriptive research design to give justification to the purpose and objectives of the research study. In addition, instead of focusing on logical induction to establish an innovative assumption based on current conceptions and practices, the research study has implicated a deductive research approach. As per the words of Pearse (2019), the usage of deductive approach can support the researcher to examine the relationship among the research components such as data visualization and storytelling. On the other hand, in this research study the researcher used a deductive research approach to generate and evaluate a recommended hypothesis that supports the researcher to describe the research subject. Moreover, the research study has implicated a secondary quantitative method of data collection that supports the researcher to gain the valuable data from graphs and tables from reliable verified websites and scholarly articles. In addition, journals, scholar, and peer reviewed articles from 2017 to 2021 have been used in this research study to collect the secondary source of data regarding the research topic.[4][8]

RESULT AND DISCUSSION

Data visualization in the process of storytelling has created a positive impact on performance as well as the efficiency level of the storytelling. Here in this part of the research study a brief overview will be provided on the impact of data visualization in order to enhance the efficiency level storytelling process. In order to critically analyse the importance of data visualization on story telling a graph chart has been created on the basis of the number of age groups in India affected by the spread of Covid 19 pandemic [9]. In addition, many news channels are also utilizing this digital visualization to provide information

about the rise of Covid 19 cases in India through demographic charts. As a result of this, the audience is getting a better image of the message that the news channel is trying to deliver to the audience.

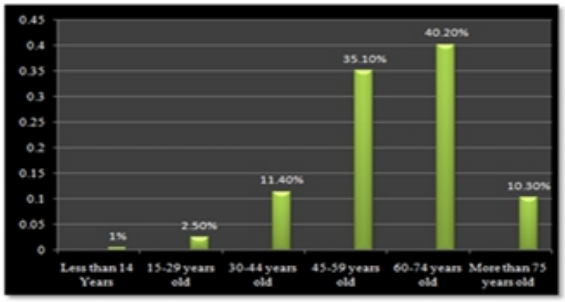

Figure 3: Impact of Covid 19 on the various age groups of people[9]

The impact of Covid 19 on the different age group has been demonstrated in the figure number 3. According to figure number 3, researchers can easily gain a sustainable overview about the impact of Covid 19 on the various age groups. By following the figure number 3, it can be easily stated that the visualization process does not need to be elaborated to the audience, the audience can easily grasp the necessary information through the demographic charts.

Table 1: Growth of the International data visualization market from 2020 to 2026 [3].

Years	*Growth (Billion USD)*
2020	2.99 billion USD
2021	3.10 billion USD
2022	3.65 billion USD
2023	3.98 billion USD
2024	4.53 billion USD
2025	4.98 billion USD
2026	5.17 billion USD

In recent years the market of data visualization has reached up to 18%, the international market of the visualization of data was 2.99 Billion USD by the end of 2020. However, according to the global market of data visualization, they estimated that the market of data visualization will rise up to 5.17 Billion USD by the end of 2026, and it will also grow at a rate of 9.69% CAGR [3]. Therefore, it can be easily stated that the future of data visualization is really bright, therefore, in order to enhance the level of efficiency of the storytelling activity an organization must need to adapt the data visualization process that will support the organization to grow internally as well as externally by mitigating the demand of stakeholders. As per the words of Bogucka et al. (2021), through the implication of storytelling process and data visualization process an organization can enhance their stakeholder's loyalty by conveying the clear message about the achievable goal of the company. As a result, that supports the organization to gain customer loyalty, and through the customer engagement organization can easily identify the customer demand that will support them to mitigate the client demand.[1]

CONCLUSION

According to the previous description it can be easily stated that the utilization of data visualization in the process of storytelling is helpful to clearly describe any content to the audience. This research study has provided a sustainable viewpoint about the way an organization can utilise the data visualization

and its benefits on the performance of an organization. On the other hand, the research study has elaborated the importance of data visualization in order to enhance the performance of the storytelling process through demographic graph in the result and discussion part of the research.

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