Volume 3, Issue , 2024
PP 266-278

International Journal of Futuristic Innovation in Arts, Humanities and Management (IJFIAHM)

A COMPARATIVE STUDY OF BUSINESS INTELLIGENCE AND ARTIFICIAL INTELLIGENCE WITH BIG DATA ANALYTICS

1st **Mr. Kunal Sur**
kunalsur2001@gmail.com
Student of
Department of CSE
Shri Sai college of
Engineering and
Technology
Chandrapur, India

2nd**Prof. Neehal Jiwane**
neehaljiwane@gamil.com
Assistant Professor
Dept. of CSE
Shri Sai College of
Engineering and
Technology
Chandrapur, India

3rd **Prof. Vijay Rakhade**
vijayrakhade@gmail.com
Assistant Professor
Dept. of CSE
Shri Sai College of
Engineering and
Technology

ABSTRACT

Business intelligence combines operational and historical data with analytical tools, providing business planners and decision makers with valuable and competitive information. Business intelligence (BI) aim to improve the timing and quality of data so managers can better understand the company's position relative to competitors. For example, business intelligence tools and techniques can be used to analyze changes in the market, customer behavior and usage patterns, customer preferences, company capacity and the economy. Additionally, analysts and managers can use business intelligence to determine which changes are most likely to translate into change. The process of extracting implicit, previously unknown and useful information from data is called data mining. Clustering, data collection, learning classification rules, discovering relationships, identifying changes, and investigating anomalies are examples of such techniques. The introduction of data storage as a repository, advances in data cleaning, better hardware and software capabilities, and the advent of web architecture have all combined to create better business intelligence. This document attempts to provide a framework for developing business intelligence. Artificial intelligence is already being used to detect and investigate vulnerabilities. Manipulation and Movement Given a static environment, AI robots can easily detect and map their environment.

Business intelligence combines operational and historical data with analytical tools, providing business planners and decision makers with valuable and competitive information. Business intelligence (BI) aims to improve the timing and quality of data so managers can better understand the company's position relative to competitors. For example, business intelligence tools and techniques can be used to analyze changes in the market, customer behavior and usage patterns, customer preferences, company capacity and the economy. Additionally, analysts and managers can use business intelligence to determine which changes are most likely to translate into change. The process of extracting implicit, previously unknown and useful information from data is called data mining. Clustering, data collection, learning classification rules, discovering relationships, identifying changes, and investigating anomalies are examples of such techniques. The introduction of data storage as a repository, advances in data cleaning, better hardware and software capabilities, and the advent of web architecture have all combined to create better business intelligence. This document attempts to provide a framework for developing business intelligence. Artificial intelligence is already being used to detect and investigate vulnerabilities. Manipulation and Movement Given a static environment, AI robots can easily detect and map their environment.

Keyword: Business Intelligence, Artificial Intelligence, Big Data

INTRODUCTION:

Sudha Murthy, an eminent Indian author and social worker, has made significant contributions to the world of literature through her thought-provoking novels. Her works provide insightful glimpses into Indian society, culture, and thehuman condition, whilealso addressing pertinent social issues. This research paper aim stodelve into the literary contributions of Sudha Murthy, focusing specifically on hernovels.

Work is the production of useful goods to meet one's needs, to live, and to improve the world.

Work actions are recorded on paper or electronically and then this information is converted into a file. Therefore, customer reaction and more information about the business can be obtained. This data can be examined and extracted using specialized tools and programs to reveal patterns and intelligence that represent how the company operates. These suggestions

will be fed back to the company enable the company to improve and achieve more meet customers' needs [1]. And so, the cycle continues. Business intelligence in any industry includes tools and techniques for collecting, analyzing and visualizing data to aid decision making. Statistics and machine learning use data mining to create decision models from raw data. This book discusses decision trees, regression, artificial neural networks, cluster analysis, and other data mining techniques. Text mining, web mining, and big data are also directly discussed.

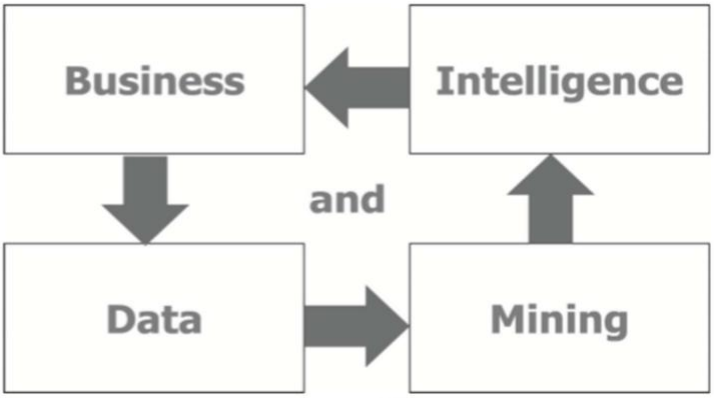

Figure 1. Business intelligence and data mining

Every company needs to constantly evaluate its business and its progress so that it can quickly change its strategy for the future. Marketing intelligence work involves carefully monitoring competitors, suppliers and customers. Managers often choose metrics based on key performance indicators (KPIs) or key results [2]. Legal reports should be created to ensure all managers receive the information they need.

These reports can be turned into customizable dashboards that provide quick information for easy understanding. Business intelligence is a broad set of information technology (IT) solutions that include tools to capture, analyze, and report user data about the organization's performance and environment. These IT solutions are prime investment opportunities. Imagine a store that offers many products and services online and in physical locations around the world. It collects sales, purchases and price data across space and time Analyzing this data can identify best-selling products, regional best-selling products, selling products, fast-growing customers, etc. can help you determine. It can also help you think about which products sell well together, who buys what, and more. These insights and information can be used to optimize advertising plans, products and market offerings and can contribute to the business by adding value to many benefits [3]. Data mining is the process of analyzing blocks of data in big data or making expert judgments and extracting them for use in areas

such as decision support, forecasts, forecasts, and predictions. Data is often large but of little value because it cannot be used directly; The information stored in the file is very important. A model is a structure or pattern that helps understand something. Patterns help connect like different objects. Patterns can help avoid distractions and can show patterns that are easier to understand. The model can be based on strict scientific standards, such as the fact that the sun rises in the east every day.

Machine Intelligence is called Artificial Intelligence (AI). Artificial Intelligence (AI) is a technology that uses a set of algorithms to test human intelligence to create new computers that can perform tasks similar to humans while also performing mathematical equations. Machine learning is a subfield of artificial intelligence that paves the way for the creation of intelligent computers. Deep learning is a type of machine learning that uses structured models to represent abstractions of data. Deep learning simulates data that can study the human brain, create models, reduce possible models, and achieve accuracy. In this study, technical skills, applications, hardware and software used, and some research questions are explained. ML is a new artificial intelligence (AI) technology that has been used by many disciplines over the past few years to simplify complex decision-making and problem-solving processes. Machine learning refers to techniques designed to teach machines how to solve problems by teaching them historical examples [4]. Among the different methods available, the most important are Artificial Neural Networks (ANN),

It was inspired by the connections between neurons in the human brain and was originally designed to simulate human learning. Other methods include inductive learning, case, based reasoning, genetic algorithms, natural language processing, and others. The Agricultural Science Service (SAS) is the foundation of North Carolina State University (NCSU), an agriculture program that ushered in the digital age of scientific data in the mid1900s[5]. When research data is first presented to a business, the aim is to produce
more accurate and reliable answers than those found through business analysis. The skills acquired are those that analysts need to work in data science, such as data processing, modeling and visualization. Python and R are currently the most popular programming languages. On the other hand, Google's Go programming language will be used for data processing and analysis in the future. Data science is on the rise due to the abundance of tools, methods, and resources. It solves many real-world problems and provides effective solutions.

LITERATURE REVIEW:

BI has evolved greatly in recent years since its founding in the field of DSS and is now a DSS field gaining traction through business and education. It can be defined as an architecture, tool, technology or process aimed at providing information and knowledge, and therefore helping to collect and store data, analyze it using analytical tools, easily publish and ask. Organizations improve decision making. Although BI is a form of KDS, it has a broader meaning. It is the process of obtaining useful information about the subject under study, helping people analyze the information, draw conclusions or make them think, BI takes big data to make and provide. gathering information, concentrating the data source at the core of business operations, gaining control when making important business decisions every day According to Cui and others, BI is a method that improves decision-making by empowerment. It enables decision makers to understand the ideas and methods of doing business so that they can easily understand the information. BI tools are considered a tool that increases the efficiency of a company's operations by increasing the value and use of company data. Zeng et al. He believes BI is “the process of collecting, processing, and reporting information to reduce uncertainty when evaluating all options.” According to the introduction, BI is "a business management term used to describe applications and technologies that capture and provide access to a company's analytics and data, allowing them to do their jobs smarter. Van Drune said BI is different from its executives" decision support” because it is a strategic tool designed to assist in planning and business maintenance, not Purdy's job selection [6]. Similarly, Cui et al. Think of BI tools as the evolution of information management systems (EIS). Decision making systems (DSS) provide greater information distribution and the ability to support processes such as queries, reports, custom reviews, and deep reviews, all referred to as online analytical processing (OLAP). This diversity pushes companies to invest in smart technology. However, organizations need to have a clear BI strategy as part of their IT strategy [7]. While Business Intelligence (BI) is defined as an organization's ability to understand and use data to its advantage, Enterprise BI is a method that integrates into entrepreneurship and creates new value in various sectors. BI provides the business with a “single version of the truth” by ensuring information remains consistent and coordinated across all departments. According to Arents, to ensure that information is consistent across multiple applications in a complex

organization, three main points must be ensured: Timeliness: All other applications must be linked to information in the organization. system.

Accuracy: All data from other applications must be included in the file

Acceptance: Users who trust the timeliness and accuracy of the information should be able to use the process as a decision tools.

Due to rapid economic changes such as globalization, deregulation, mergers and acquisitions, and technological innovations, companies are forced to rethink their strategies [8] . In this competition, business intelligence (BI) plays an important role in decision support and supports competition by establishing a good relationship between the business and IT. BI technology is constantly evolving and improving to solve increasingly complex business problems. Data warehousing (DW), online analytical processing (OLAP) and data mining, BI enabling technologies (DM) are used. BI technology works to help people make "better" business choices by providing accurate, up to date and relevant information when they need it. Competing companies use BI to analyze their environment to gain long- term competitive advantage, and sometimes this intelligence can be considered a core competency.

METHODOLOGY:

MACHINE LEARNING:

Machine learning technology already exists. In 1990, the data driven approach was replaced by machine learning. The purpose of language searching and data retrieval has changed. Neural networks were first tested on a neural network computer in 1957 and revised in2005[9]. Machine learning is one of those technologies that has had many successes and some failures, but it has the potential to happen a lot in a short time (2 to 5 years). In order for the field of machine learning to become widespread, some factors affecting it, such as infrastructure and capacity, need to increase.

DEEP LEARNING:

Alexey GrigoryevichIvakhnenko and Valentin Grigor' evict Lapa developed deep learning in 1965. They used static statistical models with multiple functions and equal numbers. In 1995, a system for checking and reporting similar data was developed. Long-term short- term recurrent neural networks were developed around 1997 [10]. With the introduction of high-speed processors in the 1990s, computation speed increased by 1000 times and GPUs became

better at photo processing. In the early 2000s, many layers of pretraining and development were used in short-term memory. By 2011, as GPU speed increased, computers were able to run neural networks without requiring layer-by- layer pretraining. Deep learning is now used to process big data. Artificial intelligence and deep learning continue to advance and complex concepts are emerging [11].

ARTIFICIAL INTELLIGENCE (AI) :

The corporate world is changing rapidly and corporate processes are becoming more complex, making it difficult for managers to understand the space. Modernization, liberalization, acquisitions and mergers, competitiveness and technological developments force businesses to rethink their strategies. To gain competitive advantage, many large businesses are turning to business intelligence (BI) technology to help them understand and manage their business processes [12]. BI is often used to improve the quality and timeliness of data and to help managers better understand the company's competition. Companies can use business intelligence (BI) tools and techniques to analyze changes in market share, changes in human consumption and usage habits, customer preferences, market potential and business situation. Analysts and managers can use this to determine which reforms are more likely to respond to changing patterns. It was created as a metric to help analyze data and determine units. In 1951, the Ferranti Mark 1 computer developed and ran artificial intelligence. The study of artificial intelligence was born during a summer seminar held at Dartmouth College in 1956. At that time, it was difficult to use computer hardware data for calculations. In the 1980s, businesses and the government poured billions of dollars int AI development at the government's request [13]. Following the funding and attention exhibited to advance the subject of AI, there was a boom in the field from 2000 to 2010. After the emergence of sophisticated computer hardware, machine learning became an effective approach to various challenges in industry and society [14].].

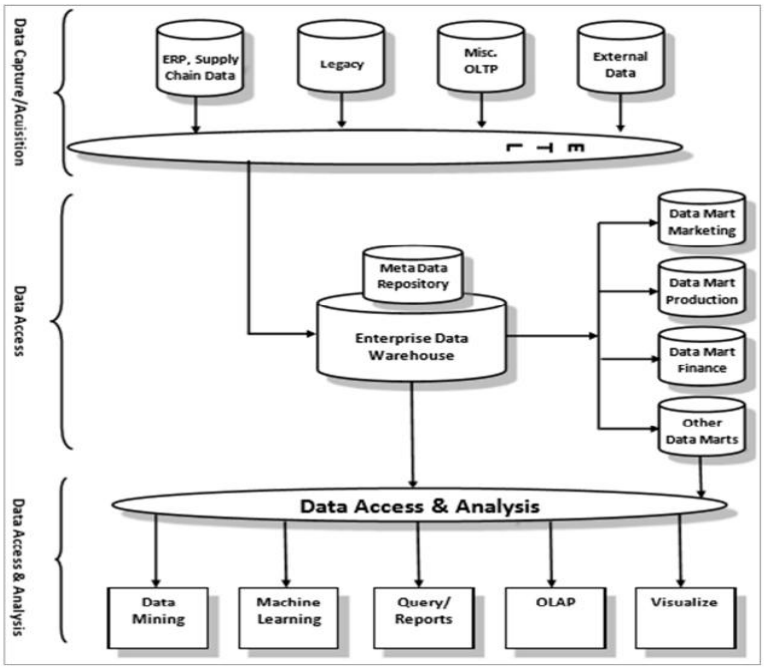

Figure 2. Framework of Business Intelligence

ROLE OF ARTIFICIAL INTELLIGENCE IN DATA ANALYTIC:

Artificial intelligence and data analytics are hot research topics in many parts of the world. Developing countries have invested billions of dollars to gain international recognition.

However, only a few people have invested even a small amount of money into obscure intelligence research. Artificial intelligence has been beneficial to all types of businesses. The backend is the backbone of the data warehouse, which includes the system that depends on the process of putting data into the warehouse [15]. Data is initially entered or processed daily by OLTP business processes and then stored in database operations including Oracle, DB2, Informix, SQL Server, SAP R/3, and others. Before data is loaded into the data warehouse from operational databases and other sources, it must go through the following processes:

EXTRACTION &CLEANSE:

During the retrieval process, data is collected from various sources, including operating systems. Selected data were then combined and filtered to exclude different types of contamination. Finally, data cleaning is the use and maintenance of extracted data to correct

inconsistencies, omissions, or errors. At this stage, results, error reports and correction methods are used [16].

TRANSFORM:

Data transformation is converting data into a schema and using business rules to map the data to the schema store. We predict behavior and aggregation.

LOAD:

Use Data Loading to load clean data into the data warehouse.

MACHINE LEARNING METHODS:

A decision tree is a decision tree that uses variables or decisions in the hierarchy to provide a step-by step solution. They make it easy to define a list of different qualities and characteristics. Support vector machine is a supervised learning model used for classification and regression analysis. Data finding [17] They are useful for binary classification of one variable compared to another variable, and the connection between variables is not necessarily linear. Naive Bayes classifiers are based on the concept of probabilistic classifiers based on Bayes' theorem and the required feature independence. They calculate the incidence rate for various combinations [18].

DEEP LEARNING METHODS:

The backpropagation technique is used to generate the gradients needed to calculate the network weights. There are two types of studies: random and batch. Dropping is a deep learning process that involves removing units. Its main purpose is to reduce the number of parameters. Cross gram is a strategy that compares two words only when their meanings are the same. When award is given in a sentence, it looks at the words next to it and chooses one[19]. The network will calculate ways to use adjacent words
in our language

DATA MARTS:

Data marts, also known as regional data centers, are small data centers typically created by a particular department or department to help them make decisions. For example, data marts

can be organized for specific products or purposes, such as customer management, marketing and finance.

METADATA:

Users need to understand the database and its contents to understand and find information. Formats, encoding/decoding strategies, domain restrictions, and content are all contained in metadata, or information about objects. Including business context, good reporting, organizational changes, business rules and opinions, and other business related issues [20]. Metadata helps business users understand what data is available, how to access that data, what it means, what data is used, when it is used, and more. Metadata browser provides a clear picture of the stored data.

DATA ACCESS AND ANALYSIS:

The front end of BI is a tool that allows users to access data. It is a set of tools and processes that encompass the complex process of storing data while allowing business users to access data directly, interactively or in bulk. The interface presents information in a way that is understandable, economical, and easy enough for non-automated workers to use [21]. This is done using a business intelligence (BI) tool, which is a software tool that provides a graphical user interface (GUI) with various reports and business analytics.

SOFTWARE AND HARDWARE RESOURCES

HARDWARE RESOURCES:

Many researchers, data scientists, and research organizations use NVIDIA or INTEL hardware GPU devices to train, test, and optimize deep learning. GPUs are efficient at processing parallel tasks for files, images, videos, and photos in less time. Nvidia Ai Chip - Nvidia's new Jetson Xavier computer is a small computer with processing power. It has Volta tensor core GPU, 8- core ARM 64 CPU, two NVDLA accelerators, and graphics and video processors. It has 9 billion transistors and can perform 30 trillion operations per second (TOPS) using only 30 watts of power. Intel AI chip neural network processor provides easy support for all deep learning processes by creating high-quality hardware. It increases the efficiency of the calculation and measures the number of calculations using less power [23-25]. Software Resources Definition of intellectual property and in-depth study of software and tools. Pylearn2 is a Python library for flexible and extensible machine learning

algorithms, including GPU and CNN libraries. Torch is an AI and DL tool that provides an open-source machine learning library. Lua is the language used. It is one of the most popular tools due to its simplicity and computational efficiency.

However, repetition of logic is not welcome and this is not a good thing. TechNet is a new open source that is easy to use and maintain. Theano is a Python library that allows you to quickly analyze code.

Contains multidimensional arrays. Theano is faster than the CPU at calculating data because it uses arithmetic. Deep learning is used to train large data sets. Caffe is an open- source AI distribution architecture that supports multiple libraries such as C++, Python, MATLAB, and CUDA [26, 27].

Cuda convent: This fast neural network supports C++, CUDA and Python. Using convolutional neural networks. Deeplearning4j is an open-source framework with many libraries including C, C++, Java and Scala. Includes GPU support for distributed function libraries. Almost all deep neural networks are supported. TensorFlow is open source. It is used when the calculator can be modeled as a data stream.

Python makes it run faster. It supports CUDA, has a C++ interface, and is also available on embedded platforms [28].

TRENDS AND MARKET ANALYSIS:

The global market for artificial intelligence is expected to grow rapidly in the next five years due to its widespread use in automobile, finance, healthcare, electronics and other industries. In addition, increased investments and increase in start- up acquisitions by major players such as Google, IBM, Microsoft have led to the growth of international business acumen. According to "Global Artificial Intelligence Market Research 2012- 2022", the compound annual growth rate from 2017 to 2022 is expected to exceed 60%.

RESEARCH CHALLENGES OF DATA SCIENCE AND DATA ANALYTICS:

Algorithms designed in the 1980s and early 1990s to solve large inference problems were not sufficient because there were many combinations of the problem [33]. This causes the computational speed to decrease as the problem grows. Therefore, artificial intelligence

researchers have developed the concepts of probability and trade-offs as a solution to deal with uncertain or incomplete information [34].

SECURITY:

Object recognition becomes more difficult for the program when a good environment is provided or when movement requires physical interaction with the object. When using business intelligence in business, it can be difficult for senior managers to choose the right solution and make a big impact [35].

CONCLUSION

In today's society, we are getting closer to artificial intelligence and we see its use becoming widespread.

Know these tips The ability to reduce risk is important. Machine learning techniques are increasingly being used for predictive modelling. Deep learning is said to be more effective than traditional machine learning techniques in providing accurate results. However, as we progress in this field, our job becomes more difficult. In today's competitive business world, the quality and timeliness of a company's marketing information can make the difference between bottom line and bottom line; It can mean the difference between survival and employment. But no company can deny the value of marketing intelligence. According to recent business analysts, millions of people will use BI visualization tools and analytics every day in the next few years. In summary, this study shows that big data, business intelligence, and artificial intelligence (AI) technology are real growth foundations for business because they contribute to decision- making, forecasting, and business operations. Additionally, if these technologies are supported by leadership and training, their growth potential is greater.

REFERENCES

1. Mughal, A. A. (2019). A COMPREHENSIVE STUDY OF PRACTICAL TECHNIQUES AND METHODOLOGIES IN INCIDENT-BASED APPROACHES FOR CYBER FORENSICS. Tensorgate Journal of Sustainable Technology and Infrastructure for Developing Countries, 2 (1), 1-18.
2. Lowlesh Nandkishor Yadav, “Predictive Acknowledgement using TRE System to reduce cost and Bandwidth”IJRECE VOL. 7 ISSUE 1 (JANUARY- MARCH 2019) pg no 275-278

3. Mughal, A. A. (2022). Building and Securing the Modern Security Operations Center (SOC). International Journal of Business Intelligence and Big Data Analytics, 5 (1), 1-15.
4. Mughal, A. A. (2021). Cybersecurity Architecture for the Cloud: Protecting Network in a Virtual Environment. International Journal of Intelligent Automation and Computing, 4 (1), 35-48
5. Yonbawi, S., Alahmari, S., Daniel, R., Lydia, E. L., Ishak, M. K., Alkahtani , H. K., ... & Mostafa , S. M. (2023). Modified Metaheuristics with Transfer Learning Based Insect Pest Classification for Agricultural Crops . Computer Systems Science & Engineering, 46(3)
6. Lee, E., Rabbi, F., Almashaqbeh, H., Aljarbouh, A., Ascencio, J., &Bystrova , N. V. (2023 , March). The issue of software reliability in program code cloning . In AIP Conference Proceedings (Vol. 2700, No. 1). AIP Publishing
7. Sharmili , N., Yonbawi , S., Alahmari , S., Lydia, E. L., Ishak, M . K., Alkahtani , H. K., ... & Mostafa , S. M . (2023). Earthworm Optimization with Improved SqueezeNet Enabled Facial Expression Recognition Model. Computer Systems Science & Engineering, 46(2).
8. Rutskiy , V., Aljarbouh , A., Thommandru , A., Elkin , S., Amrani, Y. E., Semina, E., ... & Tsarev, R. (2022). Prospects for the Use of Artificial Intelligence to Combat Fraud in Bank Payments . In Proceedings of the Computational Methods in Systems and Software (pp . 959 -971). Cham : Springer International Publishing.