



Development of Digital Economy Teaching Materials: Basic Concepts of Business Intelligence

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ABSTRACT

This study aims to develop digital economy teaching materials in accordance with the concept of business intelligence. Good and thoroughly structured teaching materials are very important in preparing students to understand and apply concepts in the digital economy, especially business intelligence. This research method is a study of literature, analysis of learning needs, development of teaching materials, and evaluation of the effectiveness of teaching materials developed. A literature study will be conducted to gather information about the latest developments in the field of business intelligence and to study existing teaching materials. This research confirms that the digital economy is an important aspect of the development of today's business world. Advances in digital technology have opened up new opportunities and influenced how business is done, becoming the main foundation for developing digital economy teaching materials. The first recommendation is to develop interactive teaching materials based on digital technology.

Keywords: Digital Economy, Teaching Materials, Basic Concepts, Business Intelligence

INTRODUCTION

In this increasingly advanced era of globalization, advances in digital technology have fundamentally changed the face of the business world. The digital economy (Li et al., 2020) has become a major driving force behind revolutionary changes in the way companies operate and interact with their customers. This phenomenon drives the need for a deep understanding of the basic concepts underlying the digital economy. One concept that has emerged as a critical element in this context is business intelligence.

Business Intelligence refers to the process of collecting, processing, analyzing, and presenting information (Chandra et al., 2018; Nyoto et al., 2023; Renaldo & Murwaningsari, 2023) that is relevant and useful for making business decisions. The basic concept of business intelligence involves using technology, systems, and data analysis methods to transform raw data into meaningful insights that can be used to improve company performance (Kang & Yang, 2017).

Business Intelligence is an aspect or component in a company that is important to implement in order to obtain maximum profit. Without the use of Business Intelligence, it will be difficult for companies to recognize or know their greatest profit potential (Wren et al., 2021).

The successful development of this teaching material will provide great benefits for educators, students, and business practitioners. Educators can integrate these teaching materials in the curriculum to enhance students' understanding of the digital economy and business intelligence concepts. Students will gain relevant and up-to-date knowledge about trends and innovations in the digital economy. Meanwhile, business practitioners will be able to apply the concept of business intelligence in making smart and strategic decisions.

This study aims to develop digital economy teaching materials that are in accordance with the concept of business intelligence. What makes this research different from previous research is that this research develops teaching materials that are easy to understand and based on more up-to-date knowledge. Through the development of effective and innovative teaching materials, it is hoped that stakeholders will be better prepared to face the dynamic changes and complexities offered by the ever-evolving digital economy.

LITERATURE REVIEW

Digital Economy

The digital economy refers to all economic activities that occur online or involve digital technology. In the digital economy, the exchange of goods, services and information is carried out through digital platforms, the internet and information technology. The concept of the digital economy covers various aspects, including electronic commerce (e-commerce), digital payments, software applications (software as a service - SaaS), digital agriculture, digital finance, and more.

The digital economy has changed the way business is done, creating new opportunities for growth and efficiency. However, it also brings new challenges, such as cybersecurity, personal data protection, and the digital divide between different regions. Regulation is also an important issue in ensuring a fair and sustainable digital business environment.

Business Intelligence

The definition of Business Intelligence (BI) can vary depending on the particular perspective and business context, but there are some core elements that are commonly associated with this concept:

1. **Data Collection:** Business intelligence involves collecting data from various internal and external sources of a company. This data can include operational data, financial data, customer data, market data, and more. It is important to collect relevant and high-quality data to ensure the reliability and accuracy of the information generated.
2. **Data Transformation:** The raw data collected is then processed and transformed into a more usable form. This process involves cleaning data, combining data from various sources, transforming data formats, and organizing data to suit the needs of the analysis.
3. **Data Analysis:** Once the data is processed, the next step is to analyze it to gain meaningful business insights. The analytical methods used in business intelligence include statistical analysis, predictive analytics, natural language processing, data visualization, and others. Its purpose is to identify trends, patterns, relationships and business insights that can help make better decisions.
4. **Information Presentation:** The results of data analysis are transformed into information that is easy to understand and accessible to business users. These can be reports, dashboards, graphs and interactive data visualizations. The purpose of presenting information is to provide relevant insights that are comprehensive and easily understood by decision makers.
5. **Decision Making:** The results of the business intelligence process are used as a basis for making better business decisions. The information generated assists corporate leaders, managers and executives in making more informed decisions, identifying new opportunities, managing risk, increasing operational efficiency and achieving competitive advantage.

Business Intelligence is a powerful tool for companies to improve decision making and overall business performance. By leveraging the right data and technology, companies can optimize operations, identify market opportunities, increase customer satisfaction, and gain competitive advantage in a complex and dynamic business environment.

METHODOLOGY

This research method is a literature study (Sekaran & Bougie, 2016), analysis of learning needs, development of teaching materials, and evaluation of the effectiveness of the developed teaching materials. A literature study will be conducted to gather information about the latest developments in the field of financial accounting and accounting standards, as well as to study existing teaching materials.

Analysis of learning needs will involve identifying challenges and difficulties faced by students in understanding intermediated accounting concepts. In this stage, data will be collected through surveys and interviews with students and experienced teachers. This data will be used as a basis for developing teaching materials that are relevant and in accordance with student needs (Renaldo et al., 2023).

The development of teaching materials will be carried out by taking into account the principles of effective instructional design, including the use of multimedia, logical organization of material, and presentation of clear and easy-to-understand information. The teaching materials developed will include subject matter, practice questions, case studies, and relevant reference sources.

After development, the teaching materials that have been developed will be evaluated for their effectiveness. The evaluation will involve collecting data from students who use the teaching materials. This data

will be analyzed qualitatively and quantitatively to evaluate the effectiveness of teaching materials in increasing students' understanding of financial accounting and accounting standards.

RESULTS AND DISCUSSION

Purpose and Benefits of Using Business Intelligence within Companies

In short, the goal is to facilitate the interpretation of large amounts of data (Renaldo, Jollyta, et al., 2022). Then to be able to identify new opportunities, and of course implement effective strategies based on insights. Thus providing a competitive market advantage as well as long-term business stability. Purpose of using business intelligence within a company:

1. **Better Decision Making:** One of the main goals of business intelligence is to provide relevant and accurate information to decision makers. By using business intelligence, companies can make more informed, fact-based decisions. The information provided through data analysis can help identify business trends, patterns and insights that can be used to plan strategy, manage operations and optimize business results.
2. **Improved Operational Efficiency:** Business intelligence helps companies to analyze and understand their operational performance. By monitoring and analyzing operational data, companies can identify areas that need improvement or efficiencies. This enables appropriate actions to be taken to improve processes, reduce costs, optimize resource use and increase overall productivity.
3. **Recognition of Opportunities and Challenges:** In a highly competitive business, recognition of new opportunities and understanding of the challenges faced is very important. With business intelligence, companies can analyze markets, consumer trends, customer behavior and business competition. This information helps companies identify new opportunities, anticipate changes in market trends, face challenges, and adjust business strategies according to needs.
4. **Enhanced Competitive Advantage:** Business intelligence plays a vital role in gaining competitive advantage. By leveraging the data and insights provided by business intelligence, companies can identify and capitalize on unique opportunities, develop smarter strategies and take action more quickly than competitors. By having access to quality information, companies can take more timely and relevant steps to win the business competition.
5. **Data collection,** which uses databases, statistics, and machine learning to show trends in large data sets.
6. **Reporting,** this aims to share data analysis with stakeholders, so that it can be concluded as a tool for decision making.
7. **Performance metrics and benchmarks,** which aim to compare current performance data with historical data used as a performance tracking tool to be targeted.
8. **Descriptive analysis,** which aims to find out what happened using the initial data analysis.

When viewed from its understanding, of course there are many benefits of business intelligence. One of the benefits is explaining a concept and method to improve the quality of business decision making based on data-based systems. Because it provides a raw data set, where data can be turned into decision-making information (Alasiri & Salameh, 2020). Benefits of using business intelligence within a company:

1. **Informed Decision Making:** With business intelligence, companies can make decisions based on measurable data and facts. Information provided through data analysis helps reduce speculation and decision making based on intuition alone, thereby increasing the accuracy and effectiveness of decisions.
2. **Better Risk Management:** Business intelligence assists companies in identifying possible business risks. With a better understanding of market trends, changes in the business environment and customer behavior, companies can take preventive actions or implement appropriate risk mitigation strategies.
3. **Improved Efficiency and Productivity:** With careful data analysis, companies can identify areas that need improvement or efficiency. This enables companies to optimize business processes, reduce costs, and increase employee productivity.
4. **Better Understanding of Customers:** Business intelligence helps companies to better understand customer behavior, preferences and their needs. With the right analysis, companies can provide a more personalized customer experience, improve customer retention, and develop more effective marketing strategies.
5. **Responsiveness To Faster Change:** In the fast-changing world of business, business intelligence enables companies to identify market changes or trends affecting their business. By having access to accurate, real-time information, companies can adapt their business strategies more quickly and respond better to changes.
6. **Can integrate data and information,** thereby increasing the value of a data and information desired by the company.
7. **Easy access and easy to understand,** making it easier to draw conclusions about business conditions.
8. **Helping managers to make the right and wise decisions.**
9. **Helping decision making in times of crisis.**

The use of business intelligence within a company provides significant benefits in terms of informed decision making, operational efficiency, competitive advantage, and better understanding of markets and customers. By optimizing the use of business intelligence, companies can achieve better performance and achieve long-term success.

Roles and Responsibilities of Business Intelligence Professionals

Professional business intelligence (Business Intelligence Professional) has an important role in managing and implementing business intelligence within the company. They are responsible for ensuring that relevant and useful information is made available to business decision makers. The following are some of the main roles and responsibilities that business intelligence professionals have (Charles et al., 2023):

1. **Data Collection and Management:** Business intelligence professionals are responsible for identifying, collecting, and managing the data required in business intelligence processes. They should have a good understanding of available data sources and effective data collection techniques.
2. **Data Transformation:** Business intelligence professionals must be able to transform raw data into a format that can be properly processed and analyzed. They need to have expertise in the use of data analysis software and tools to clean, aggregate, and process data into more usable forms.
3. **Data Analysis:** One of the main tasks of business intelligence professionals is to analyze data to identify business trends, patterns and insights that can be used for decision making. They must have a solid understanding of data analysis methods and the ability to apply them in relevant business contexts.
4. **Development of Reports and Dashboards:** Business intelligence professionals must be able to create interactive reports and dashboards that can provide information in a way that is easily understood and accessible to business users. They should have expertise in using report development and data visualization tools to present information in an effective manner.
5. **Collaboration with Other Teams:** Business intelligence professionals often work cross-departmentally with business teams, data analysts, software developers, and enterprise management. They must have good communication and collaboration skills to understand business needs, coordinate tasks with other teams, and communicate analysis results clearly.
6. **Data Security:** Business intelligence professionals must ensure the security and confidentiality of data used in business intelligence processes. They must understand and apply proper data security practices, and follow policies and regulations regarding data privacy.
7. **Monitoring and Evaluation:** Business intelligence professionals are responsible for monitoring and evaluating the performance of business intelligence processes. They must be able to identify areas requiring improvement or improvement, and propose and implement the necessary actions.
8. **Development and Maintenance of Business Intelligence Systems:** Business intelligence professionals must keep abreast of the latest technology and data analysis tools. They need to develop and maintain business intelligence systems to keep them relevant and effective in supporting the company's business needs.

Business intelligence professionals play a crucial role in providing relevant and accurate information to business decision makers. With a deep understanding of data, analytics and related technologies, they contribute significantly to improving company performance and achieving competitive advantage.

Data sources and information collection

Data sources and information collection is one of the key components in a business intelligence system. This component deals with how data is collected from various sources to be used in business analysis and decision-making processes. Following are some examples of data sources and information gathering methods in business intelligence (Davenport & Mittal, 2023):

1. **Company Internal Data Sources:** Company internal data is data generated or collected by the company from its various internal systems and processes. These internal data sources include financial data, operational data, sales data, customer data, inventory data, human resources data, and more. This data can be obtained from accounting systems, manufacturing systems, sales systems, CRM (Customer Relationship Management) systems, and other systems used by companies.
2. **External Data Sources:** In addition to internal data, business intelligence also utilizes external data that comes from outside the company. This external data includes market data, industry data, economic data, competitor data, potential customer data, and many more. External data sources can be data from market research institutions, government data, public data, social media data, and various other data sources.
3. **Surveys and Questionnaires:** Surveys and questionnaires are methods of gathering information that involve interviews or questions posed to respondents. Surveys and questionnaires are used to collect data from customers, employees or other interested parties to understand their preferences, needs and views of the company's business.

4. **Sensor Data and Internet of Things (IoT):** In some cases, companies use sensor data and Internet of Things (IoT) technologies to automatically collect data from physical devices. For example, data from production machine sensors, vehicles or smart devices can be integrated into business intelligence systems for analysis and monitoring.
5. **Public and Open-Source Data:** Public and open-source data are data that can be freely accessed by the public. For example, demographic data, weather data, geospatial data, government data and many more. This data can provide additional insights to support business analysis and decision making.
6. **Data from social media:** In the digital and social media era, data from social media platforms like Twitter, Facebook, Instagram, and others can be a valuable source of information about customer views, sentiments, and interactions with brands or products.

Gathering this information is an important first step in building effective business intelligence. In the data collection process, it is necessary to pay attention to data integrity, security and privacy policies to ensure that the data used is of high quality and legally valid. In addition, it is important to select and use data sources that are relevant to the goals and needs of the company's business analysis.

Data transformation and integration process

The process of transforming and integrating data is an important stage in business intelligence that involves processing and unifying data from various sources into a form that is more usable and easily accessible. This process ensures that data collected from various sources can be efficiently used for analysis and business decision making. The following is a more detailed explanation of the data transformation and integration process (Weber, 2023):

1. Data Transformation:

- **Data Cleaning:** The first stage in data transformation is cleaning data from errors, duplications, or format discrepancies. Raw data often has problems such as missing values, unreadable special characters, or inconsistent formatting. This data cleaning process aims to ensure that the data used is accurate, complete, and well structured.
- **Data Integration:** After the data has been cleaned, the next step is to combine the data from various sources into a single unit. This data integration process involves combining data from different systems or databases so that it can be accessed and analyzed centrally. It is important to align data schemas and data formats so that data can be seamlessly integrated.
- **Data Format Transformation:** This process involves changing data formats from one form to another that is more suitable for analysis and presentation of information. For example, converting date values to a format that can be processed, changing units of measure, or converting code to more meaningful descriptions. This data format transformation ensures the data is in a form suitable for data analysis and visualization.

2. Data Integration:

- **Data Source Integration:** The data integration process involves bringing together data from multiple sources, such as databases, text files, software systems, and data from external sources. It is important to identify and define sources of relevant, high-quality data for use in business analysis.
- **Data Grouping and Consolidation:** Data that is integrated often has different structures and formats. The data integration process involves grouping and consolidating data with consistent standards so that it can be used efficiently in analysis.
- **Data Connection Management:** The data integration process also involves managing data connections between systems and data sources. This includes managing data extraction, transformation, and loading (ETL) processes from various data sources into business intelligence systems.
- **Real-Time Data Integration:** In addition to batch data integration, in some cases, business intelligence also requires real-time data integration which allows for instant data updates as data is changed or updated at the source.

Good and efficient data transformation and integration processes play an important role in producing high quality and reliable data for analysis and business decision making. With well-integrated and transformed data, companies can take smarter steps and make more informed decisions to improve business performance and success.

Tools and technologies used in business intelligence

Business intelligence uses a variety of tools and technologies to collect, process, analyze, and present information that is relevant and useful to business decision makers (Calof et al., 2017). Here are some tools and technologies commonly used in business intelligence:

- Database Management System (DBMS): DBMS is used to store, manage, and access data from various sources which form the basis of business intelligence processes. DBMS allows integration of data from multiple sources and provides a platform for accessing data efficiently.
- Data Warehouse: A data warehouse is a subject- and time-oriented central data storage system. The data warehouse integrates and stores data from various internal and external sources in a format that can be used for analysis and reporting. The data warehouse provides access to historical data and allows in-depth data analysis.
- Data Mart: Data mart is a subset of data warehouse that focuses on a specific business area or department. Data marts facilitate faster and relevant data access for specific users.
- Extract, Transform, Load (ETL) Tools: ETL tools are used to extract, transform, and load data from various sources into a data warehouse or data mart. This tool facilitates the process of data integration and transformation of data formats so that they can be processed in analysis.
- Data Analysis Tools: Data analysis tools are software used to analyze data in depth, identifying business patterns, trends and insights. Some of the well-known data analysis tools include Microsoft Power BI, Tableau, Qlik, IBM Cognos, and Google Data Studio.
- Programming Language and Operational Research (OR) Tools: Programming languages such as SQL, Python, R, and Julia are used to process and analyze data with greater freedom. OR tools also assist in the development of predictive and mathematical models to optimize business decisions.
- Cloud Technologies: Cloud services such as AWS (Amazon Web Services), Microsoft Azure, and Google Cloud Platform enable companies to store, manage, and analyze data at scale and reduce the need for physical infrastructure (Yuan et al., 2020).
- Big Data Technologies: Big data technologies such as Hadoop and Apache Spark are used to manage, store and analyze large volumes of data that traditional systems cannot handle (Alasiri & Salameh, 2020).
- Data Search Technologies: Data search tools such as Elasticsearch and Solr are used to access and index huge amounts of data and enable real-time data search.
- Artificial Intelligence (AI) and Machine Learning (ML) Technologies: AI and ML technologies are used for advanced data analysis, including prediction, classification, classification, and natural language processing.

The combination of these tools and technologies forms a powerful business intelligence system that enables companies to make more informed decisions and better understand trends and opportunities in a changing business environment.

Data warehousing and data marts

Data warehousing and data mart are two key concepts in business intelligence that focus on storing and organizing data for analysis and business decision making (Reddy, 2019). While both share the same goal of providing access to relevant and integrated data, they differ in scope and scale.

1. Data Warehousing: Data warehousing is a subject- and time-oriented central data storage concept. A data warehouse is a large system that stores data from various internal and external sources of a company. The main purpose of a data warehouse is to store historical data in a format usable for analysis and reporting. Characteristics of data warehousing:
 - Data Integration: Data warehousing integrates data from multiple systems and sources to provide a centralized and consistent database.
 - Historical Data: Data warehouses store data over a long period of time, allowing analysis of trends and patterns that have occurred over a period of time.
 - Subject-Oriented: Data warehouse is grouped based on certain business subjects, such as financial data, sales data, customer data, and others.
 - Separate from Operational Systems: The data warehouse operates separately from operational systems, thereby avoiding the performance impact of intensive analysis on daily business operations.
2. Data Marts: A data mart is a subset of a data warehouse that is more focused on a specific business area or department. Data marts contain relevant and consolidated data to support the analytical needs of specific users or groups of users. Data marts can be thought of as "parts" of a data warehouse that are more focused and personalized for certain groups of users. Characteristics of data marts:
 - Specific Focus: Data marts are focused on the analysis needs of a specific group of users, for example, data marts for marketing departments, finance departments, or sales teams.
 - Organizing by Subject: The data mart organizes data by a particular subject that is relevant to the needs of user groups.
 - Integrated from Data Warehouse: Data marts are usually integrated from the data warehouse, and the data contained in the data mart can be a subsequent of the existing data in the data warehouse.

- **Can Stand Alone:** While it can originate in a data warehouse, a data mart can stand alone as an independent entity with a narrower focus.

In general, data warehousing and data marts are important parts of business intelligence systems that enable companies to store, manage, and analyze data for better decision making and support deeper business analysis. The data warehouse functions as a central data source that stores data from various sources, while the data mart functions as a subset of the data warehouse that focuses more on the analysis needs of certain user groups.

Data analysis methods and techniques in business intelligence

In business intelligence, there are various data analysis methods and techniques used to analyze data and generate useful business insights (Vugec et al., 2020). The following are some of the data analysis methods and techniques commonly used in business intelligence:

1. Descriptive Analysis:

- **Frequency Analysis:** This method is used to calculate the frequency or number of occurrences of a certain value in the data. This helps in understanding the distribution of the data and the frequency of the categories present.
- **Distribution Analysis:** This analysis is used to understand the distribution of data in the form of histograms, pie charts, or other graphs.
- **Summary Statistics:** This analysis includes calculating basic statistics such as mean, median, quartiles, standard deviation, etc. to understand the characteristics of the center and distribution of the data.

2. Causality Analysis:

- **Regression Analysis:** The regression method is used to identify a causal relationship between one or more independent variables and the dependent variable. This helps in understanding how strong the relationship is between the variables.
- **Correlation Analysis:** This method is used to determine if there is a linear relationship between two or more variables. A positive correlation indicates that the variables are moving in the same direction, while a negative correlation indicates that the variables are moving in the opposite direction.

3. Predictive Analytics:

- **Predictive Regression Analysis:** This method is used to create predictive models based on the causal relationship between the independent and dependent variables.
- **Machine Learning:** Machine learning methods are used to develop complex predictive models that can identify patterns and trends in data to make predictions about future outcomes.

4. **Cluster analysis:** This method is used to group data into homogeneous groups based on certain characteristics in common. Cluster analysis helps in identifying certain customer segments or patterns in the data.

5. **Text Mining Analysis: Natural Language Processing (NLP):** This method is used to process and analyze text data to identify relevant themes, sentiments, and entities in the text.

6. **Visualization Analysis: Data Visualization:** This technique uses graphs, charts, and other visualizations to interactively visualize data and understand information intuitively.

These data analysis methods and techniques help companies extract valuable business insights from existing data. By using the right combination of methods, companies can identify trends, recognize useful patterns, predict future results, and make more informed decisions to improve overall business performance.

Data visualization to understand information effectively

Data visualization is an important tool in business intelligence to understand information effectively (Abai et al., 2019). The use of data visualization can turn complex and messy data into a clearer and easier to understand picture. Here are some ways data visualization helps make sense of information effectively:

1. **Data Simplification:** Data visualization enables the presentation of data in a simpler and more intuitive form. By using graphs, charts or maps, complex data can be simplified so that users can easily see patterns and relationships between variables.
2. **Identify Trends and Patterns:** Data visualization helps to identify trends and patterns in data more quickly and clearly. For example, using a line graph to view time trends, or using a bar graph to compare data categories (Lind et al., 2018).
3. **Disclosure of Hidden Information:** In large and complex data, there is a lot of hidden information. Data visualization can help reveal new insights and relationships that might not be visible in raw data.

4. **Understand Causal Relationship:** Data visualization can help to clearly understand the causal relationship between two or more variables. For example, using a scatter chart to see the linear relationship between variables.
5. **Comparing Data:** By using proper data visualization, comparisons between categories or variables can be done more easily. For example, using bar graphs or pie charts to compare sales between products or branches.
6. **Clarify Data Presentation:** When presenting data in a visual form, the presentation becomes more interesting and easier for the audience to follow. This helps in communicating effectively and highlighting important information.
7. **Presenting Interactive Data:** Interactive data visualization allows users to explore data in greater depth and extract additional insights as needed. Interactive dashboards allow users to view data from multiple perspectives and levels of detail.
8. **Support Decision Making:** Data visualization assists decision makers in better understanding business situations and supports more informed decision making.

In developing an effective data visualization, it is important to choose the type of chart or chart that suits the purpose of the analysis and the characteristics of the data. In addition, data visualizations should be easy to read and avoid displaying confusing or manipulating information. By using data visualization properly, companies can get deeper business insights and make better decisions for business success.

Building predictive models and statistical analysis in business intelligence

Building predictive models and statistical analysis is an important component in business intelligence which aims to make predictions based on historical data and identify patterns that are useful for business decision making (Melegy & Alain, 2020). Following are the general steps in building predictive models and statistical analysis in business intelligence:

1. **Identify Business Goals:** Determine the business goals to be achieved by statistical analysis or predictive models. For example, predicting sales, identifying market opportunities, understanding the factors that affect business performance, and so on.
2. **Collect and Prepare Data:** Collect relevant data from various sources and prepare data for analysis. Ensure data is in proper format and free of errors or missing values.
3. **Data Exploration and Understanding:** Conduct data exploration to understand data characteristics, distribution, patterns, and relationships between variables. Data visualization can help in understanding the data better.
4. **Statistical Analysis:** Use statistical analysis such as regression, correlation, cluster analysis, factor analysis, and other statistical methods to gain insights from the data.
5. **Build a Predictive Model:** Select a suitable prediction technique, such as linear regression, logistic regression, decision tree, k-nearest neighbors, or other machine learning model, to build a predictive model based on historical data.
6. **Model Evaluation:** Evaluate predictive model performance using relevant evaluation metrics, such as accuracy, precision, recall, F1-score, or area under the ROC curve (AUC-ROC).
7. **Model Validation:** Model validation uses discrete data (test data) to ensure that the model can work well on data it has never seen before.
8. **Model Implementation:** Implement predictive models into production environments or business intelligence systems for use in decision making.
9. **Monitoring and Maintenance:** Continuous monitoring and maintenance of models to ensure optimal performance and accuracy over time.

It is important to remember that building predictive models and statistical analysis requires a solid understanding of statistics, mathematics and algorithms. In addition, it is necessary to consider the business context and user needs in designing and implementing an effective business intelligence solution.

Natural language processing and text analysis

Natural Language Processing (NLP) and text analysis are technologies used to understand and process human language by computers. They enable computers to process, analyze, and understand human text in a natural way, similar to how humans communicate.

Here are some key points about natural language processing and text analysis:

1. **Natural Language Processing (NLP):**
 - NLP includes a variety of technologies and algorithms that enable computers to understand and process human language in text or spoken form.
 - NLP includes tasks such as sentiment analysis, language comprehension, entity extraction, context understanding, language translation and many more.

- NLP focuses on identifying the structure and meaning of text, understanding language with context, and enabling computers to interact with humans naturally.

2. Text Analysis:

- Text analysis is a subfield of NLP that focuses on the extraction and analysis of information from human texts.
- Several text analysis techniques include sentiment analysis, text classification, named entity recognition, information extraction, and other natural language processing.
- Text analytics is used to gain insights from large text data, such as customer reviews, social media content, news articles, and more.

Examples of Applying Natural Language Processing and Text Analytics in Business Intelligence:

1. **Sentiment Analysis:** NLP can be used to analyze customer sentiment based on the reviews, comments or feedback given in the text. This helps companies understand the views of customers about their products or services.
2. **Understanding Customer Questions:** NLP can help in understanding customer questions submitted in text form and providing appropriate responses based on understanding the context.
3. **Text Classification:** NLP is used to classify texts into specific categories or groups based on their content. For example, classifying incoming emails into different categories based on subject or purpose.
4. **Language Translation:** NLP is used in automated translation systems to translate text from one language to another.
5. **Information Extraction:** NLP can be used to extract certain information from text, such as named entities, dates, places, and other important information.

Applications of natural language processing and text analysis in business intelligence are helping companies to understand and explore text data in an environment increasingly filled with text information. This enables companies to identify trends, patterns, and valuable insights in text data and make more informed decisions to improve business performance.

CONCLUSION

Conclusion

Based on the discussion that has been described, the conclusion of this study is to emphasize that the digital economy is an important aspect in the development of today's business world. Advances in digital technology have opened up new opportunities and influenced the way business is done, which has become the main foundation for developing digital economy teaching materials. The basic concepts of business intelligence are especially relevant in the digital economy. Careful analysis of data and information helps companies understand market trends, consumer behavior and business opportunities, enabling smarter and strategic decisions to be made.

This research makes an important contribution to the development of digital economy teaching materials. By focusing on the basic concepts of business intelligence, the resulting teaching materials can help educators and students understand the basic principles of applying digital technology in an economic context.

Implication

This research has practical implications for the world of education and the world of business. For the world of education, the results of this research can be used to design curricula that are more relevant to the development of the digital economy. Meanwhile for the business world, understanding the concept of business intelligence can help organizations increase their efficiency and profits.

Recommendation

Based on the concept of business intelligence, the first recommendation is to develop interactive teaching materials based on digital technology. Use learning methods and tools that utilize information technology, such as learning videos, simulations, and e-learning platforms, to provide a more engaging and effective learning experience. Include real case studies from companies or industries that have successfully applied business intelligence concepts to the digital economy. This will help students understand the practical application of the theory learned and provide insight into how business intelligence can provide real benefits in business. Subsequent research can discuss information systems (Renaldo, Suhardjo, et al., 2022), digital technology (Renaldo, Hafni, et al., 2022), digital culture (Pradana et al., 2022), or other topics of teaching materials that related to the digital economy.

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