Table of Contents

[I. Introduction 1](#_Toc152699295)

[II. Demonstrate the use of business intelligence tools and technologies (LO3) 1](#_Toc152699296)

[II.1 Determine, with examples, what business intelligence is and the tools and techniques associated with it (P3) 1](#_Toc152699297)

[II.2 Design a business intelligence tool, application or interface that can perform a specific task (P4) 12](#_Toc152699298)

[II.3 Customise the design (M3) 17](#_Toc152699299)

[II.4 Critical review of the design in terms of how it meets a specific user or business requirement and identify what customisation has been integrated into the design (D3) 17](#_Toc152699300)

[III. Discuss the impact of business intelligence tools and technologies for effective decision-making purposes and the legal/regulatory context in which they are used (LO4) 17](#_Toc152699301)

[III.1 How business intelligence tools can contribute to effective decision-making (P5) 17](#_Toc152699302)

[III.2 Legal issues involved in the secure exploitation of business intelligence tools (P6) 18](#_Toc152699303)

[III.3 Conduct research to identify specific examples of organisations that have used business intelligence tools to enhance or improve operations (M4) 18](#_Toc152699304)

[IV. Conclusion 18](#_Toc152699305)

[V. Reference 18](#_Toc152699306)

# Introduction

Introduce your scenario. Introduce the report.

This report focuses on Business Intelligence (BI), begins using the concept of identification, and provides examples of related tools and techniques. Next, I describe the process of designing a BI application or interface capable of implementing a tool and then customizing the design to meet the specific requirements of the business.

The report evaluates the design results and clearly states reasonable adjustments. I present the impact of BI tools and technology for effective decision making and problem solving such as privacy. The report concludes with a study of organizations using BI to improve operations, providing real-life examples of BI applications in business.

# Demonstrate the use of business intelligence tools and technologies (LO3)

## Determine, with examples, what business intelligence is and the tools and techniques associated with it (P3)

1. Business Intelligence

* ***Definition***



Figure 1: Business Intelligence (BI)

Business intelligence (BI) is a technology-driven process for analyzing data and delivering actionable information that helps executives, managers and workers make informed business decisions. As part of the BI process, organizations collect data from internal IT systems and external sources, prepare it for analysis, run queries against the data and create data visualizations, [BI dashboards](https://www.techtarget.com/searchbusinessanalytics/definition/business-intelligence-dashboard) and reports to make the analytics results available to business users for operational decision-making and [strategic planning](https://www.techtarget.com/searchcio/definition/strategic-planning). (Stedman, 2022)

* ***The important of BI***

Overall, the role of business intelligence is to improve an organization's business operations using relevant data. Companies that effectively employ BI tools and techniques can translate their collected data into valuable insights about their [business processes](https://www.techtarget.com/searchcio/definition/business-process) and strategies. Such insights can then be used to make better business decisions that increase productivity and revenue, leading to accelerated business growth and higher profits. (Stedman, 2022)

Without BI, organizations can't readily take advantage of data-driven decision-making. Instead, executives and workers are primarily left to base important business decisions on other factors, such as accumulated knowledge, previous experiences, intuition, and gut feelings. While those methods can result in good decisions, they're also fraught with the potential for errors and missteps because of the lack of data underpinning them. (Stedman, 2022)

* ***Benefits of BI***
* Speed up and improve decision-making.
* Optimize internal business processes.
* Increase operational efficiency and productivity.
* Spot business problems that need to be addressed.
* Identify emerging business and market trends.
* Develop stronger business strategies.
* Drive higher sales and new revenues; and
* Gain a competitive edge over rival companies. (Stedman, 2022)
* ***How to BI work***

The steps involved in business intelligence processes are gathering data, building models, using queries to analyze the data, producing reports that company decision-makers may utilize, and developing data visualizations like charts. Applications of BI procedures include both strategic and operational decision-making. (Taylor, 2023)

* ***Example of BI:***

BI enables C-suite executives and department managers to monitor business performance on an ongoing basis so they can act quickly when issues or opportunities arise. [Analyzing customer data](https://www.techtarget.com/searchbusinessanalytics/definition/customer-analytics) helps make marketing, sales, and customer service efforts more effective. Supply chain, manufacturing and distribution bottlenecks can be detected before they cause financial harm. HR managers are better able to monitor employee productivity, labor costs and other workforce data. (Stedman, 2022)

1. BI tool

* **Power BI**

**Microsoft Power BI** is a data visualization platform used primarily for business intelligence purposes. Designed to be used by business professionals with varying levels of data knowledge, Power BI’s dashboard is capable of reporting and visualizing data in a wide range of different styles, including graphs, maps, charts, scatter plots, and more. (coursera, 2023)

***Pros of Power BI***

**Cost:** Power BI is a premium service, and the expenses can vary based on the version and features required. Despite offering a free version, Power BI's limited capabilities make it unsuitable for larger enterprises or more intricate data projects.

**Learning Curve:** Especially for individuals unfamiliar with Microsoft products or data analysis techniques, Power BI presents a challenging learning curve. Efficiently utilizing the platform and acquiring the skills to produce sophisticated reports and visualizations may require a significant investment of time.

**Limited Customization:** While Power BI provides a diverse range of visualization options, users might find that customization options are constrained. Expertise in the Power BI development environment and advanced skills are necessary for graphic customization or writing custom code.

**Limited Data Sources:** Despite supporting connectivity to various data sources, Power BI may not cover some specialized data sources or types. This limitation can pose challenges in interpreting and presenting certain data formats.

**Online-only:** Power BI being a cloud-based application mandates users to be connected to the internet for utilization. This may be a drawback for businesses with slow or inconsistent internet connections or for users requiring offline access to data and reports.

**Performance:** Depending on the dataset size and analysis complexity, Power BI may take longer to process data or generate reports compared to other data analysis tools. Users dealing with large or intricate datasets or those in need of real-time analytics might perceive this as a drawback.

***Cons of Power BI***

**Data Volume:** Power BI imposes limitations on the amount of data it can handle, despite its capability to manage large datasets. The extent to which data can be loaded is determined by the type of Power BI license in use. For instance, while a Power BI Premium license can support up to 100 TB of data, the Power BI Pro license has a maximum data capacity of 10 GB per user.

**Data Complexity:** Power BI is not designed to handle highly complex data models. It lacks features for establishing intricate hierarchies and links, performing optimally with straightforwardly organized data.

Data Processing: Power BI's absence of in-memory data processing for significant datasets can impact processing speed. Dealing with intricate data may result in lengthier processing times and potentially necessitate additional hardware resources.

**Limited Visual Customization:** While Power BI provides diverse visuals, customization is constrained. Users can modify fonts and colors, but making extensive changes may require the development of custom code.

**Custom Code:** Extending Power BI's functionality through custom code is possible, but writing and debugging such code can be challenging. It demands a thorough understanding of programming concepts and data analysis.

**Data Security:** Despite robust security capabilities, Power BI has limitations on the amount of data that can be secured. For example, row-level security on Excel files or certain specific types of data sources is not supported by Power BI.

**Compatibility Issues:** There is a potential for compatibility issues with Power BI, as not all data sources and applications may integrate seamlessly. Challenges may arise when connecting to specific types of data, exporting data, or exchanging data between Power BI and other programs. (geeksforgeeks, 2022)

* **Tableau**

**Tableau** is a visual analytics platform that is revolutionizing the way we use data to solve problems by enabling individuals and organizations to make the most of their data.

**Tableau** is a great data visualization and business intelligence application that can be used to report and analyses massive amounts of data. (geeksforgeeks, 2023)

***Pros of Tableau***

**Quick calculation-** All the calculations on the tableau done by the backend, so it is relatively faster than any other tool.

**Interactive dashboards**– Tableau dashboards are very interactive and easy to draw.

**No manual calculation-**All the calculations are done by the tableau only. There is no manual calculation, but in some specific cases, we used calculated fields for calculation.

**A large amount of data-**Tableau can handle a large amount of data. Different types of visualization can be created with a large amount of data without impacting the performance of the dashboards.

***Cons of Tableau***

**High Cost-** tableau is a paid tool for visualization, and it is a reason why people are not using tableau so much.

**Static and single value parameters-**Tableau’s parameters are static and always single value can be selected using a parameter. Whenever the data gets changed, these parameters need to be updated manually every time.

**Limited Data Preprocessing-**Tableau is strictly a visualization tool. Tableau Desktop allows you to do very basic preprocessing. (geeksforgeeks, 2023)

* **FineReport**

**FineReport** is the web reporting tool developed by Java, which can address your need for data integration, data visualization, data analysis, data query, data management and data entry across the organization. (softwareadvice, 2022)

Pros of FineReport:

**User-Friendly Interface:** FineReport is known for its intuitive and user-friendly interface, making it accessible to both technical and non-technical users. The drag-and-drop functionality simplifies the report creation process.

**Rich Data Visualization:** The tool provides a variety of data visualization options, including charts, graphs, and maps. Users can create visually appealing and interactive reports to better understand data trends.

**Versatile Reporting:** FineReport supports a wide range of reporting requirements, from basic tabular reports to more complex and customized reports. It allows users to create detailed and comprehensive reports based on their specific needs.

**Flexible Data Source Connectivity:** FineReport supports connectivity to various data sources, including databases, Excel files, and web services. This flexibility makes it easier to integrate and analyze data from different platforms.

**Customization Capabilities:** Users have the ability to customize reports and dashboards according to their preferences. FineReport allows for extensive customization in terms of layout, formatting, and branding.

**Collaboration Features:** The tool offers collaboration features, enabling multiple users to work on the same report simultaneously. This fosters teamwork and improves efficiency in the report creation process.

Cons:

**Learning Curve:** While FineReport is user-friendly, there may still be a learning curve for new users, especially those who are not familiar with similar reporting tools. Training may be required to fully leverage all of its features.

**License Costs:** FineReport may have associated license costs, and the pricing structure can vary based on the edition and features required. This could be a consideration for organizations with budget constraints.

**Performance with Large Datasets:** Some users have reported performance issues when dealing with large datasets. Processing and rendering reports with extensive data may take longer, affecting overall performance.

**Dependency on Java:** FineReport is built on Java, and this may be a consideration for organizations that have specific technology preferences or restrictions. It requires Java Runtime Environment (JRE) for deployment.

**Limited Advanced Analytics:** FineReport is primarily focused on reporting and visualization, and it may not offer as advanced analytics features compared to some dedicated analytics platforms.

**Community Support:** While FineReport has a user community, it may not be as extensive as the communities for some other popular reporting tools. This could impact the availability of community-generated resources and support. (F., 2022) (finereport, 2022)

Sisense

Sisense is a business intelligence (BI) and data analytics platform that enables organizations to gather, analyze, and visualize data from various sources. It is designed to help businesses make informed decisions by providing a user-friendly interface for data exploration and reporting. (sisense, 2023)

Pros of Sisense:

**Data Integration Capabilities:** Sisense supports a wide range of data connectors, allowing users to easily integrate and consolidate data from various sources, including databases, cloud services, and spreadsheets.

**Easy-to-Use Interface:** Sisense is known for its user-friendly interface, making it accessible to both technical and non-technical users. The drag-and-drop functionality simplifies the process of creating interactive dashboards and reports.

**Data Visualization:** The platform provides powerful data visualization tools, enabling users to create visually appealing and informative dashboards. It supports a variety of charts, graphs, and widgets for effective data representation.

**In-Chip Technology:** Sisense utilizes in-chip technology for data processing, allowing for faster query performance and analytics. This can be beneficial for handling large datasets and complex analyses.

**Single-Stack Architecture:** Sisense follows a single-stack architecture, which means that all components are tightly integrated. This results in a seamless user experience and simplifies the management of the entire analytics ecosystem.

**Scalability:** Sisense is scalable, making it suitable for both small businesses and large enterprises. It can handle increasing data volumes and user loads, ensuring that the platform can grow with the organization's needs.

AI and Machine Learning Integration: Sisense integrates AI and machine learning capabilities, enabling users to uncover patterns, trends, and insights from their data. This can enhance predictive analytics and decision-making.

Cons:

**Cost:** Sisense may have a relatively higher cost compared to some other business intelligence tools. The pricing structure can be a consideration for smaller businesses or organizations with budget constraints.

**Learning Curve:** While Sisense is user-friendly, there may still be a learning curve for new users, particularly those who are not familiar with similar analytics platforms. Training may be required for optimal utilization.

**Limited Advanced Analytics Features:** Sisense primarily focuses on business intelligence and data visualization, and it may not offer as advanced analytics features as some dedicated analytics platforms.

**Customization Complexity:** While Sisense allows for customization, some users have reported that more complex customization tasks may require additional effort and expertise in the platform.

**Limited Data Preparation Tools:** Some users find that Sisense's data preparation tools are not as advanced as those in other data analytics platforms. Advanced data cleaning and transformation may require additional tools.

**Community Support:** While Sisense has a user community, it may not be as extensive as the communities for some other analytics tools. This could impact the availability of community-generated resources and support. (yurbi, 2022)

QlikView

**QlikView**is a flexible Business Intelligence platform that allows the user to translate data. Through this data tool, [users](https://www.arimetrics.com/glosario-digital/usuario-nuevo) have the opportunity to consolidate, search and visually analyze all their data to perfect the knowledge of their business.

[QlikView,](https://www.qlik.com/es-es)through its automatic associations, allows you to create endless possibilities to perform ad hoc queries, without the need for structures and hierarchies defined one by one and more slowly. QlikView promotes unrestricted analysis of application data, helping users save time and make the right decisions. (arimetrics, 2022)

**Pros of QlikView:**

**User-friendly Interface:** QlikView provides a user-friendly and intuitive interface, making it easy for non-technical users to create and explore visualizations.

**In-Memory Processing:** QlikView uses an in-memory data processing engine, allowing for faster data retrieval and analysis. This can significantly improve performance compared to traditional disk-based systems.

**Associative Data Model:** QlikView uses an associative data model, enabling users to easily explore relationships and connections within the data. This helps in uncovering insights that may not be apparent in a more traditional, structured data model.

**Rapid Development:** QlikView allows for rapid application development. Users can quickly create interactive dashboards and reports without extensive programming knowledge.

**Powerful ETL Capabilities:** QlikView has strong Extract, Transform, Load (ETL) capabilities, allowing users to easily load and transform data from various sources into a unified format for analysis.

**Collaboration and Sharing:** QlikView enables collaborative decision-making by allowing users to share their insights and analyses with others. Dashboards and reports can be easily distributed and accessed by team members.

**Security Features:** QlikView provides robust security features, allowing administrators to control access to data and dashboards. This ensures that sensitive information is protected.

**Cons of QlikView:**

**Cost**: QlikView can be expensive, especially for smaller organizations or individual users. Licensing fees and implementation costs can add up quickly.

**Learning Curve:** While QlikView is user-friendly, there is still a learning curve, especially for more advanced features and functionality. Training may be required for users to fully leverage the tool.

**Resource Intensive:** In-memory processing can be resource-intensive, requiring significant RAM to handle large datasets. This may result in higher hardware requirements.

**Limited Mobile Support:** While QlikView does offer mobile support, it may not be as extensive or seamless as some other BI tools. Mobile users may encounter limitations in terms of functionality and responsiveness.

**Dependency on QlikView Server:** For collaborative features and centralized management, QlikView relies on the QlikView Server. This can introduce dependencies and potential points of failure.

**Limited Data Visualization Options:** While QlikView provides a good range of visualization options, some users may find that other BI tools offer more advanced or varied visualization choices.

1. BI techniques

* Analytics
* Predictive Modelling
* OLAP
* Data Mining
* Model Visualization
* Reporting

## Design a business intelligence tool, application or interface that can perform a specific task (P4)

1. Introduce the company.

Auto Heritage operates as a specialized dealership focused on the acquisition and resale of used vehicles. The company is committed to procuring a diverse range of used cars from individuals seeking to sell, and subsequently making these vehicles available to the public at reasonable and competitive prices.

In addition to facilitating the buying and selling process, Auto Heritage distinguishes itself by placing a strong emphasis on the quality of the vehicles it offers. Upon acquiring a used car, the company diligently conducts comprehensive inspections to assess the vehicle's condition. Following this, Auto Heritage undertakes necessary maintenance procedures and carries out any required repairs. This meticulous approach is designed to ensure that each vehicle is in optimal condition before being presented to customers for purchase.

Looking ahead, the forthcoming report will delve into Business Intelligence (BI) theories and processes, exploring their profound impact on decision-making within the organization. The report will likely address the ways in which BI technologies and methodologies contribute to informed decision-making processes, enhancing efficiency and effectiveness across various aspects of Auto Heritage's operations. It may also touch upon specific BI tools or strategies that the company employs to analyze and leverage data for strategic decision-making, ultimately contributing to the overall success of the busine

1. Explain the data set

A screen shot of a computer

Description automatically generated

Figure 5 : Datasets

* ***Explain data set***
* Id: This column will store the IDs of the units that will be in the company's data.
* Manufacturer: This column stores information about the manufacturer of that vehicle
* Year: This column will store the year the car was produced and available on the market
* Price: This column will store information about the price of the company's car to be sold
* Region: This column contains information about which region in the United States the vehicle was manufactured in
* Odometer: This column stores information about how many kilometers the car has been used
* Fuel: This column stores information about the type of fuel the vehicle needs to use to operate
* Owner: This column contains information about how many owners the car has been used for
* Engine: This column contains information about the vehicle's engine information
* Max\_power: This column contains information about the maximum output the vehicle can achieve.

1. Statistic criteria

* Dashboard 1: Statistics by each characteristic
* Number of cars sold by each color
* Number of cars sold per person
* Number of vehicles sold by production model
* Number of vehicles sold by fuel
* Number of cars sold by brand
* Dashboard 2: Statistics by region
* Report revenue by each region
* Number of vehicles by each area
* Average car price by region
* Number of cars sold by each region
* Number of car manufacturers by each region
* Dashboard 3: Statistics by state
* Revenue statistics by state
* Number of vehicles by state
* Average car price by state
* Number of vehicles sold by state
* Number of car manufacturers by state
* Dashboard 4: Statistics by manufacturer
* Number of vehicles belonging to the manufacturer
* Number of vehicles belonging to manufacturer by condition
* Number of vehicles by manufacturer according to cylinders
* Number of vehicles by manufacturer by fuel
* Number of vehicles by manufacturer by color
* Dashboard 5: Average quantity statistics
* Number of vehicles distributed by year of manufacture.
* Number of vehicles distributed according to average price.
* Number of vehicles distributed by distance.
* Number of vehicles allocated according to max power.
* Number of vehicles distributed by engine.

1. Explain pre-process steps on dataset
2. Design business intelligence interface

* Statistic criteria 1: chart or statistic value and explaination (a single chart (sheet) in tableau)
* Statistic criteria 1: chart or statistic value and explaination (a single chart (sheet) in tableau)

## Customise the design (M3)

Design dashboard from the statistic criteria

* Dashboard 1: View, description: purpose of dashboard…, explain how the dashboard work (filter)
* Dashboard 2: View, description: purpose of dashboard…, explain how the dashboard work (filter)
* Dashboard 3: View, description: purpose of dashboard…, explain how the dashboard work (filter)

## Critical review of the design in terms of how it meets a specific user or business requirement and identify what customisation has been integrated into the design (D3)

# Discuss the impact of business intelligence tools and technologies for effective decision-making purposes and the legal/regulatory context in which they are used (LO4)

## How business intelligence tools can contribute to effective decision-making (P5)

Business Intelligence (BI) tools can significantly contribute to effective decision making in many ways:

* Enhanced data accessibility: BI tools empower decision makers with easy access to vast amounts of data, regardless of its source or format.
* Data visualization: These tools can present complex data sets in a format that is easier to understand and more visually appealing, supporting the interpretation and understanding of trends and patterns.
* Improve decision speed and accuracy: By providing real-time insights and analytics, BI tools can help decision makers react quickly and accurately to changes in the business environment.
* Competitive market analysis: BI tools can provide valuable insights into market trends, customer preferences, and competitive analysis, helping businesses plan strategies and stay ahead.
* Predictive analytics: Some BI tools provide predictive analytics capabilities, allowing businesses to forecast future trends and make proactive decisions.
* Cost Optimization: BI tools can help identify areas of inefficiency or waste, allowing businesses to optimize operations and reduce costs.
* Improved customer insights: By analyzing customer behavior and preferences, BI tools can help businesses improve customer service and develop responsive products or services. more than customer needs.
* Risk management: BI tools can help identify potential risks and devise strategies to mitigate them. (thek0, 2022)

## Legal issues involved in the secure exploitation of business intelligence tools (P6)

* Privacy of clients
* Data security
* Compliance with laws and regulations
* Employee training
* Legal action
* ….

Business Intelligence (BI) tools can bring significant benefits to organizations, but their use also raises several legal issues that need to be addressed to ensure safe exploitation:

Privacy of clients: BI tools often involve the collection and analysis of personal data, which can raise privacy concerns. Companies must ensure they comply with data protection laws and regulations, such as the General Data Protection Regulation (GDPR) in the EU. (Walsh, 2023)

Data security: Protecting the integrity and confidentiality of data is important. Companies must implement strong security measures to prevent unauthorized access, data breaches and cyber-attacks. This includes encryption, access controls, and regular security testing. (Smallcombe, 2021)

Compliance with laws and regulations: Companies must ensure their use of BI tools complies with all relevant laws and regulations. This includes not only data protection laws but also laws related to intellectual property, commercial transactions, etc.. (sidley, 2023)

Employee training: Employees need to be trained on how to use BI tools effectively and responsibly. This includes understanding the legal implications of their actions and how sensitive data is handled. (Lee, 2020)

Legal Action: If companies do not comply with the above points, they may face legal action. This may include lawsuits related to data breaches, non-compliance with data protection laws or intellectual property abuse.

## Conduct research to identify specific examples of organisations that have used business intelligence tools to enhance or improve operations (M4)

* Real example of applying BI Tools such as Tableau or Power BI in big companies (citation)
* Make a python application for your dataset or an example dataset

III.4 Evaluate how organisations could use business intelligence to extend their target audience and make them more competitive within the market, taking security legislation into consideration (D4)

# Conclusion

# Reference