**ASSIGNMENT 2 FRONT SHEET**

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| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** | Unit 14: Business Intelligence | | |
| **Submission date** | 9/5/2023 | **Date Received 1st submission** |  |
| **Re-submission Date** |  | **Date Received 2nd submission** |  |
| **Student Name** | Do Huu Duy | **Student ID** | GCC200018 |
| **Class** | GCC0903 | **Assessor name** | Nguyen Minh Khiem |
| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice. | | | |
|  |  | **Student’s signature** | huuduy |

**Grading grid**

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| P3 | P4 | P5 | P6 | M3 | M4 | D3 | D4 |
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| **❒ Summative Feedback: ❒ Resubmission Feedback:** | | |
| **Grade:** | **Assessor Signature:** | **Date:** |
| **IV Signature:** | | |

Assessment Brief

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| Student Name/ID Number |  |
| **Unit Number and Title** | **14: Business Intelligence** |
| Academic Year | 2018 |
| Unit Tutor |  |
| **Assignment Title** | **Assignment 2: Apply BI tools & techniques and their impact** |
| **Issue Date** |  |
| Submission Date |  |
| IV Name & Date |  |

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| **Submission Format** |
| Part I: Project submission. This should be a zip / rar folder of your project, including all necessary files to run your project. There should be a link to your Tableau work on Tableau Public cloud.  Part II: The submission is in the form of a group written report. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. Please also provide a bibliography using the Harvard referencing system.  Part III: Team needs to present their point of view about how business intelligence tools can contribute to effective decision-making as well as the legal issues involved in exploiting user data for business intelligence. You may need to research for specific examples of organizations that use BI tools to enhance or improve their business and evaluate how they can use BI tools for extend their target audience and make them more competitive within the market. |

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| **Unit Learning Outcomes** |
| **LO3** Demonstrate the use of business intelligence tools and technologies. |
| **Assignment Brief** |
| (Continued from previous scenario)  Your next task is to demonstrate to the board of directors the ability to apply business intelligence in the company's current business processes. To demonstrate BI, you need to prepare a presentation about BI and related tools & techniques and a demonstration on a real company dataset.  For the presentation, you need:   * Explain general concept of what BI is. * Introduction to some tools / techniques for BI and their application in general   For the demonstration, you need:   * A (some) data set(s) extracted from the company's business processes. Explain the dataset. * Show how you pre-process data for later analysis, explain each step and it purpose. * Design dashboards to show your analysis on pre-processed data. Explain clearly purpose of dashboards and charts. Suggestions should be made after analysis.   During the demonstration, you need collect feed-back and comments from users to review how well your dashboards design meet user or business requirement and what customization needed for future use.  Team needs to present their point of view about how business intelligence tools can contribute to effective decision-making as well as the legal issues involved in exploiting user data for business intelligence. You may need to research for specific examples of organizations that use BI tools to enhance or improve their business and evaluate how they can use BI tools for extend their target audience and make them more competitive within the market.  To summary, you need to submit a report in PDF includes 4 parts: your presentation, result of demonstration and review of user feedback, point of view on BI contribution and legal issues. |

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| Learning Outcomes and Assessment Criteria | | |
| Pass | Merit | Distinction |
| LO3 Demonstrate the use of business intelligence tools and technologies | | D3 Provide a 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. |
| P3 Determine, with examples, what business intelligence is, and the tools and techniques associated with it.  P4 Design a business intelligence tool, application or interface that can perform a specific task to support problem-solving or decision-making at an advanced level. | M3 Customise the design to ensure that it is user friendly and has a functional interface. |
| LO4 Discuss the impact of business intelligence tools and technologies for effective decision-making purposes and the legal/regulatory context in which they are used | | D4 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. |
| P5 Discuss how business intelligence tools can contribute to effective decision-making.  P6 Explore the legal issues involved in the secure exploitation of business intelligence tools | M4 Conduct research to identify specific examples of organisations that have used business intelligence tools to enhance or improve operations. |

I. Determine, with examples, what business intelligence is, and the tools and techniques associated with it.

1. Definition about Business Intelligence (BI)

Business intelligence (BI) is the term used to describe the procedural and technological framework used to gather, store, and analyze the data generated by a company's operations. BI is a wide phrase that includes descriptive analytics, process analysis, performance benchmarking, and data mining. BI analyzes all the data produced by a company and delivers simple-to-understand reports, performance metrics, and trends that help managers make choices (FRANKENFIELD, 2022)

According to the (DivyankSinghSikarwar, 2023), Business Intelligence is the talk of a new changing and growing world that can be defined as a set of concepts and methodologies to improve decision-making in business through the use of facts and fact-based systems. Enhancing corporate analysis and decision-making is the aim of business intelligence. Business intelligence is a collection of ideas and methodologies rather than just a single concept. Business Intelligence uses analytics and gut feelings for making decisions.

2. Real example of BI

In my project, I used Tableau to assist me in making statistics and making business decisions. In my business, I have applied BI to 3 business processes, which are order generation, warehouse management and sales statistics. With the application of BI to the business, it has helped the board of directors to easily statistics the sales revenue of the business and from there can make decisions to develop in the furture and improve the limitation of the business. In short, this is a real example of BI as it applies to the business.

3. BI Techniques

According to the (Beatrice, 2021), there are some the following techniques in Business Intelligence:

**OLAP:** The key business intelligence method known as online analytical processing (OLAP) is utilized to resolve analytical issues with many dimensions. The flexibility that OLAP's multi-dimensionality affords users to examine data issues from many angles is one of its main advantages. They may even find hidden issues because of doing this. To execute activities like budgeting, CRM data analysis, and financial forecasting, OLAP is mostly used.

**Data Visualization:** Data is frequently kept in the form of a matrix made up of integers. However, it's a crucial task to interpret the matrix in order to make business decisions. When data is saved as a set, anyone, even an analyst, may determine how things are going. The use of data visualization helps to unravel the tangle. Professionals can look at data from several dimensions using data visualizations to aid in decision-making. As a result, it is simple and practical to grasp the position by visualizing the data in charts.

**Data Mining:** Data mining is the technique of automatically or semi-automatically analyzing vast amounts of data to find significant patterns and rules. The volume of data kept in a company data warehouse is enormous. It is quite important to locate the true facts that might inform company decisions. As a result, analysts employ data mining techniques to reveal the underlying correlations and patterns in data. The whole process of using the database, together with any necessary selection, processing, subsampling, and selecting the best method for data transformation, is knowledge discovery in databases.

**Analytics:** Analytics in business intelligence refers to the analysis of data to derive useful conclusions and identify patterns. Business organizations are well known for their use of analytics since it enables analysts and business executives to fully comprehend their data and get value from it. Numerous business facets, including marketing, call centers, and the use of analytics in various forms. Speech analytics are used in contact centers, for instance, to better convey responses and track consumer sentiment.

**Reporting:** Business intelligence reporting encompasses the entire process of planning, creating performance data, sales data, reconciling data, and preserving content. It supports the management, planning, and decision-making processes by assisting businesses in efficiently gathering and presenting information. According to their demands, business executives can read the reports every day, every week, or every month.

4. BI Tools

4.1. QlikView

According to(javatpoint, 2015)**,** QlikView is a self-service Business Intelligence, Data Analytics, and Data Visualization tool.

Non-technical users who are unfamiliar with business intelligence, statistical analysis, or data mining utilize self-service business intelligence as a method of data analytics. When compared to traditional business intelligence platforms, QlikView is distinctive in many ways. It always preserves the link between the data as a tool for data analysis. Utilizing color, this relationship can be visually represented. Additionally, it displays data that is unrelated. Through the use of individual searches in the list boxes, it offers both direct and indirect searches. In-memory data processing is a key component of QlikView, a fundamental and proprietary technology that provides users with quick results. It performs on-the-fly aggregation calculations and reduces the size of the data to 10% of its initial size. The relationships between the data in QlikView apps are not managed by either users or developers. It's dealt with automatically.

**Features of QlikView:**

According to(javatpoint, 2015)**,** Here are some features of QlikView:

* With the use of custom connectors, QlikView can be integrated with a variety of databases to provide unique data discovery and global search. It conducts a thorough and advanced search to hasten the finding of data.
* **Collaboration:** All data visualization reports and insights are shareable. These reports can be shared by a user via a cloud or business server.
* **Total data control:** QlikView enables user-driven data discovery. Users may build models and are regularly advised by the tools as to how best to interpret the provided data.
* **Workplace security:** QlikView offers users a highly safe working environment. The only data being used is extremely private company data.
* **Integration and versatility:** QlikView give clients complete choice in how they want to design their dashboards and wish to handle data. Users of QlikView tools can create scripts for data mapping.
* **Consistent reporting:** QlikView offers user-shareable templates for appealing reports that may be shared as MS Office documents or in other formats. Additionally, it produces personal or business reviews.
* **Associative data modeling:** QlikView utilizes an associative model that is stored in memory. There is hence no need for IT specialists if you are able to create SQL, select queries and comprehend your data.
* **Platform:** QlikView is only compatible with the Windows operating system, but it is 64-bit and multi-processor optimized.
* **Cost-effective:** Because QlikView is a memory-resident program, it is a very affordable choice for your company.

**Advanatges and disadvantage of QlikView:**

**Advantages:**

* **Unique data discovery and global search:** QlikView's bespoke connectors enable it to connect to a variety of databases. It conducts a thorough and advanced search to hasten the finding of data.
* **Collaboration:** All data visualization reports and insights are shareable. These reports can be shared by a user via a cloud or business server.
* **Complete control over the data:** QlikView enables user-driven data exploration. Users may build models and are regularly advised by the tools as to how best to interpret the provided data.
* **Safe working environment:** QlikView offers its users a very secure working environment. All of the used data is extremely private company information.
* **Choice and integration:** QlikView gives clients complete choice in how they wish to handle data and design their dashboards. Users of QlikView tools can create scripts for data mapping.
* **Reliable reporting:** QlikView offers user-friendly report templates that may be shared as MS Office documents or in other formats. Additionally, it produces personal or business reviews.
* **Associative data modeling:** QlikView uses an associative model that is stored in memory. Therefore, if you are able to write a SQL select query and comprehend your data, you won't need an IT specialist.
* **Platform:** QlikView can run only on Windows platform, but it is optimized for 64-bit and multiple processors.
* **Cost-effective:** QlikView is a memory-resident application; that's why it is a highly cost-effective option for your organization.
* **Economical:** QlikView is very inexpensive with disk space as the amount of memory depends upon the amount of data you want for each application.

**Disadvantages:**

* QlikView is a tool specifically made for interactive analysis, not for creating reports.
* You require the macros, duplication, and maintenance of the QlikView objects in order to create a formatted report in QlikView.
* It is only a straightforward reporting and analysis tool that forbids "WRITE BACK" to the database.
* The majority of the data is loaded into the system RAM by QlikView, and reloading the data requires a lot of effort and can take some time.
* For more complicated data integration, extensive ETL capabilities are not provided by QlikView.
* It also lacks certain sophisticated features needed to create fully structured reports.

4.2. Tableau tool

According to(javatpoint, 2015)**,** The robust and rapidly expanding data visualization tool is Tableau. Tableau is a business intelligence application that enables us to visually evaluate raw data, whether it takes the shape of a graph, report, etc. For instance, you may use Tableau to analyze any data, including Big Data, Hadoop, SQL, or cloud data, in the form of a visual representation of the data. With Tableau, data analysis is completed very quickly, and worksheets and dashboards are used to create the visualizations. The data produced by Tableau may be understood by any professional. The Tableau software is completely non-technical and non-programming. Tableau makes it simple and quick to create visual dashboards.

**Features of Tableau:**

* **Data Blending:** The key function of Tableau is data mixing. When combining relevant data from many data sources that you wish to examine in a single view and portray as a graph, it is employed.
* **Real-time analysis:** When the Velocity is high and real-time data analysis is challenging, real-time analysis enables users to swiftly interpret and evaluate dynamic data. With interactive analytics, Tableau can assist in obtaining valuable information from rapidly changing data.
* **The Collaboration of data:** Data analysis is not a lonely endeavor. Tableau is designed for collaboration because of this. Members of the team may distribute data, do follow-up research, and provide simple visualizations to those who could benefit from the information. Success depends on ensuring that everyone can grasp the facts and make educated decisions.

**Advantages and disadvantages of Tableau tool:**

According to the (KnowledgeHut, 2022), Tableau have some the following advantages and disadvantages:

**Advantages:**

* Superior Performance
* Mobile-Friendly
* Fantastic mobile support
* Easy to upgrade.
* Low cost
* Exceptional Customer Service
* Effortless Usage

**Disadvantages:**

* Poor Versioning
* Requires manual effort.
* No automatic refreshing of reports
* Not a full-fledged remedy
* Without version control
* Need understanding of SQL.

4.3. Datapine tool

The three primary areas in which Datapine excels are interactivity, customizability, and shareability. It is perfect for businesses of all sizes that require a method for handling a lot of data. Businesses must collect so much data that managing it just through papers, spreadsheets, or presentations is challenging. The more information you need to save, especially if it's spread out over several locations, the more perplexing it will be. Datapine has the advantage of centralizing all of your data into a single visible dashboard. Additionally, dashboards differ by industry. This is advantageous because you may display your data in a way that accurately conveys the knowledge you require. Additionally, you have the option to modify your dashboard. You may modify graphs and charts, alter the color and style, and choose the particular set of data that shows. Your dashboards may also be exported and published by the program, allowing you to distribute them to various teams or departments (comparecamp, 2020)

**Features of Datapine tool:**

* Interactive Dashboards
* Industry Dashboards
* Adaptive Dashboards
* Dashboards you may share.
* Data Visualizations
* Performance Metrics
* Predictive Analytics
* Drag and Drop UI interface.

**Benefits of Datapine tool:**

**Interactivity:** You may filter results using Datapine's filtering tool. For instance, you might not need to view results from every branch but simply from the one in France. You may always utilize the zoom feature of the program to concentrate on certain details, including individual figures. You can efficiently monitor and analyze your business data and performance KPIs thanks to dashboard interactivity. For further details on business intelligence software solutions, particularly on important features and capabilities, see this article.

**Shareable:** When you are finished configuring the dashboard, you may send it to another department or to your coworkers. This encourages cooperation among the many employees in your firm. Additionally, Datapine has a public URL sharing feature that enables you to post a link to the dashboard so that others may access it via a web browser. Additionally, you can copy the link using the URL sharing tool and paste it into emails or websites. The dashboard can also be improved by the receiver using filters.

**Customizable:** Datapine has predefined themes that you may use to make visually appealing dashboards rapidly. You may use its global style choices in your dashboard as well. You can alter the style and color if you don't want to utilize the pre-existing themes and styles or if your business has specific branding guidelines. To make the colors easily available for future usage, you may even save the hex color codes that you frequently use. Charts and graphs can also have their structures changed. Using the software's drag-and-drop user interface, you can also reposition your graphs and charts. The data you wish to see may also be filtered.

II. Design a business intelligence tool, application or interface that can perform aspecific task to support problem-solving or decision-making at an advanced level.

1. Explain Dataset

Leather fashion is one of the most sought after and sought after trends and since then many fashion designers and apparel manufacturing companies aim to produce a wide range of clothing made from leather. So, many leather businesses like BL were born and provide all kinds of leather to make costumes. BL is a small leather business that recently started selling its products on Amazon. Currently, it has around 40 registered SKUs in the Indian Market.

My dataset has some the following tables and is shown in the figure 1 and 2:

Graphical user interface, application

Description automatically generated

Table

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Table | Describe | Type of data |
| 1 | order\_no | This collumn contain the id of order | String |
| 2 | order\_date | This collumn contain the date that customer order | Date-time |
| 3 | Type of Product | This column contains the type of product | String |
| 4 | Month | This column contains the month that product is sold | String |
| 5 | buyer | This collumn contain name of buyer | String |
| 6 | ship\_city | Delivery Address City | String |
| 7 | ship\_state | Delivery Address State | String |
| 8 | sku | Identifier of a product | String |
| 9 | desciption | This collumn contain the description of product | String |
| 10 | quantity | Number of units ordered | integer |
| 11 | Item\_total | Total amount paid by the buyer | float |
| 12 | shipping\_fee | Charges borne by Boss Leathers to ship the item | float |
| 13 | cod | Mode of payment: Cash on delivery or not | String |
| 14 | order\_status | Status of the order | String |

Link of dataset: <https://www.kaggle.com/datasets/pranalibose/amazon-seller-order-status-prediction>

2. The business intelligence that I apply in business

In my business, I apply the BI to three business processes such as create order process, commodity management process, and statistics the revenue of the store.

Firstly, I apply BI to the order creation process. In this process, the staff of Leather shop will get the customer's information and products information when having a customer order item, the staff will get this information such as customer's address, phone number and product's type, quantity that the customer require to check. If the customer's information and the product that customer order is valid the staff will create the order and notify to customer that order successed, but if the customer's information or product that customer want to order is invalid such as the product's quantity that customer want to order is more than the product's quantity in the stock or the product's type is not valid, the staff will notify to the customer that the information is invalid and order is not success.

Seconodly, I apply BI to the manager's goods check-in process when import. In this process, the manager of the Leather shop will get all the goods from the supplier delivery and check whether the product's quality and the number of products is valid or not. If it's not valid the manager will return to the supplier and send feedback to the supplier about the goods's status, then require them re-deliver that is invalid, but if the goods are valid the manager will import goods into the stock and paymentfor supplier, then the manager will write report and send the invoice to the shop's owner. However, this process will depend on the statistic process of store's owner because the owner will decide import goods or not based on the revenue statistic process.

Thirdly, I apply BI to the store's statistical revenue process. With this business process, the owner will perform statistics and check the revenue of the store in each quarter of the year. If the revenue is good the owner can make plan to develop and expand the store, but if the revenue is not good the owner can make plan to remendial and improve.

3. Interface to perform the specific task to support problem-solving or decision-making of the business

3.1. Statistic of the number of products sold by month in year

Chart, bar chart

Description automatically generated

Based on the chart I can see the month that sold good most and I can decide import goods in month that have the best selling. With the chart, it shows me the December is the month that has the best selling in year, this is the last month in year and coming to the new year, so there are a lot of people shopping for new things so the goods will be sold a lot this month. Besides, November and October are also two months that have a lot of sales. However, from the january to Semtember the quantity of goods sold is small. From this data that the chart brings me. I can decide for the import process of the business. Based on the chart, I can decide importing a lot of goods in October, November, and December month and importing less goods from January to Semtember month.

3.2. Statistic of the top 10 city have the best purchase in year

Chart, bar chart

Description automatically generated

With this chart, I can see the top ten cities that have the most purchases in the year. This helps me decide for the import process of business because I know purchasing needs of people in each city. I know what type of product they often buy and from that I will decide what type of product that I should import.

3.3. Statistics of the top 10 buyers in the year

Chart, bar chart

Description automatically generated

Based on this statistic chart I can know the top 10 people who buy most of the year among the customers who buy products at my business. Besides, this chart also tells me how much each person's purchase cost. With this data, I can decide to implement promotional incentives for people who often buy from the business to create loyalty and trust for customers in the business. In addition, this will help me prepare for the future business strategy of the enterprise.

3.4. Statistics of the top 10 best-selling type of products of the year

Chart, bar chart

Description automatically generated

With this chart, I can see the top 10 best-selling products of the business. From the data provided by the chart I can tell that product type 92 is the product type that has the most buyers and is the best-selling product in the business. Followed by product categories 3 and 100. Besides, the remaining product categories are the products with the fewest buyers and slowest sellers. This will also assist me in making decisions during the import process for my business. With this statistical chart will help me to decide which products I should import more for sale and which products should be imported less to avoid inventory situation.

III. Discuss how business intelligence tools can contribute to effective decision-making

IV. Explore the legal issues involved in the secure exploitation of business intelligence tools