ASSIGNMENT 3

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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	

Grading grid

P5	P6	M4	D4

❒ Summative Feedback:		❒ Resubmission Feedback:
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I. Introduction

Business intelligence (BI) software tools have become increasingly essential for enterprises to gain insights, stay competitive, and maximize their growth. BI refers to the process of extracting and analyzing insights and analytics from raw data to ensure better business decision-making. Firms of all sizes must be able to effectively dissect, monitor, manage, and visualize their data to create appropriate business strategies and make informed decisions.

P5. Business intelligence tools that contribute to effective decision making

1. Evolution of BI Tools

Some form of business intelligence has always been around, stemming from manual spreadsheets and simple visualizations. As applications grew more complex, connecting databases and extracting summaries became increasingly challenging. As a result, business users began demanding that BI tools respond to changing markets and technologies. Eventually, firms started looking for standalone BI tools that were vendor-agnostic and compatible with the complex and fragmented enterprise landscape.

Each Business Intelligence Tool plays a supporting role in one or more phases of the decision-making cycle. The decision-making cycle comprises of the following phases, which can be supported by the following tools:

- Collecting information using dashboards and reports
- Designing and analyzing using interactive analysis and data mining
- Online Analytical Processing (OLAP)
- Very crucial for strategic decision making
- Selecting and implementing using ad hoc query, what-if and forecasting
- Evaluating using dashboards and reports
- Separate components that are hardly related
- Increase the coherence between the tools

2. Collecting information using dashboards and reports

The decision-making cycle starts with gathering the right information: 'scanning' the environment (or the internal organization) in order to see if a problem exists. Mainly dashboards and reports are used for this purpose. This first phase should be seen as a 'wake-up' moment during which any current or potential deviation from the desired situation is a decision problem. In order to qualify or trace something as a problem, the first phase should – in principle – include (or be preceded by) a process in which we identify our organizational objectives.

3. Designing and analyzing using interactive analysis and data mining

Once a problem is discovered, we know where the issue resides but we do not yet know its exact location or its whys and wherefores. For example: the customer satisfaction indicator on the dashboard flashes. Subsequently, we will want to find out what causes this. We may, for example, use interactive analysis 'on-the-fly' to split out customer satisfaction per region, per account manager and, if necessary, per product group.

4. Online Analytical Processing (OLAP)

We might also use interactive analysis (OLAP) in order to easily compare the number of complaints with the customer satisfaction in the same region and period. By doing this, we gain insight into the reasons why customers are less satisfied – a recently launched product exhibiting start-up problems, to name a random example. We use data mining – discovering 'hidden' relationships – to gain insight into

characteristics that are a determining factor for more complex issues such as fraud. In such cases, interactive analysis is not sufficient because we generally lack the required detail data. In addition, the complexity associated with discovering such (causal) relationships is simply a bridge too far for interactive analysis.

5. Very crucial for strategic decision making

"This phase in the decision-making process seems to be crucial for strategic decision-making, because it is during this phase that we determine our entire course in terms of decision-making." (Mintzberg, 2004). It is thus important to apply these tools well and to adjust the organization accordingly. This also means that an effective working relationship should arise between managers and analysts so that the intuition and the authority of the managers can go together with the analytical brain of the analyst and with the methods and functionalities available to him (or her).

6. Selecting and implementing using ad hoc query, what-if and forecasting

Once we have established the cause of a problem and we have mapped the (causal) relationships, we can take action – in consultation with managers and stakeholders. Ad hoc query ('ad hoc' querying of data sets) can support this. We may for example use ad hoc query to create a detailed set of customers whom did not place any orders in the last month, based on the results of the interactive analysis. Subsequently, we can write a letter to the selected customers in which we emphasize the benefits of doing business with us and include some interesting offers. We use 'what-if' and forecasting in order to calculate actions in advance. In this way, we gain insight into the impact of our actions before we actually implement them.

7. Evaluating using dashboards and reports

Once we addressed a certain problem by taking action, we use either a dashboard or reports in order to assess whether the problem has indeed been resolved. It may be that the problem reflects a key success factor of the organization, which we did not know about yet. If this is the case, we can place the key success factor – including the associated KPI – on the dashboard or in the report so to permanently evaluate it. In this way, it becomes an integral part of the organization's management model.

8. Separate components that are hardly related

Relatively many organizations still appear to regard the above-mentioned tools as separate components that are hardly related. For Business Intelligence to be effective, it is however, of the utmost importance that the tools can work together very closely so creating a solid and smoothly operating entity. Users should ideally be able to both use and apply the tools more or less unwittingly in their daily activities. Metadata, web technology and a proper architecture play an important role in achieving this.

9. Increase the coherence between the tools

Additionally, the suppliers of BI tools undertake actions – based on the integral needs expressed by users – to increase the coherence between different tools. Portals are a typical example of this development. However, we cannot start celebrating yet: practice shows that when it comes to integration of different tools within the portal, there is still a lot to be desired. Unfortunately, it also still happens that certain functionalities are present in the desktop version, but have not yet been implemented in the web version.

Benefits of Business Intelligence

BI tools utilize OLAP (Online Analytical Processing) to help enterprises perform data analysis, monitor KPIs, and generate all types of reports. As a result, firms can identify business trends (both negative and positive), communicate findings to their stakeholders, and gain actionable insights for informed decisions. When it comes to staying ahead of the competition, these tools can also give firms a leg up by providing data to predict market trends, discover new opportunities, and develop breakthrough strategies.

The benefits of BI tools include:

- Fast reporting and analytics
- Actionable business insights
- Increased customer and stakeholder satisfaction
- Past, present, and future market trends
- Competitive analysis
- Increased operational efficiency
- Increased revenue
- Better, informed decisions

10. Business intelligence tools and technology.

10.1. Tableau

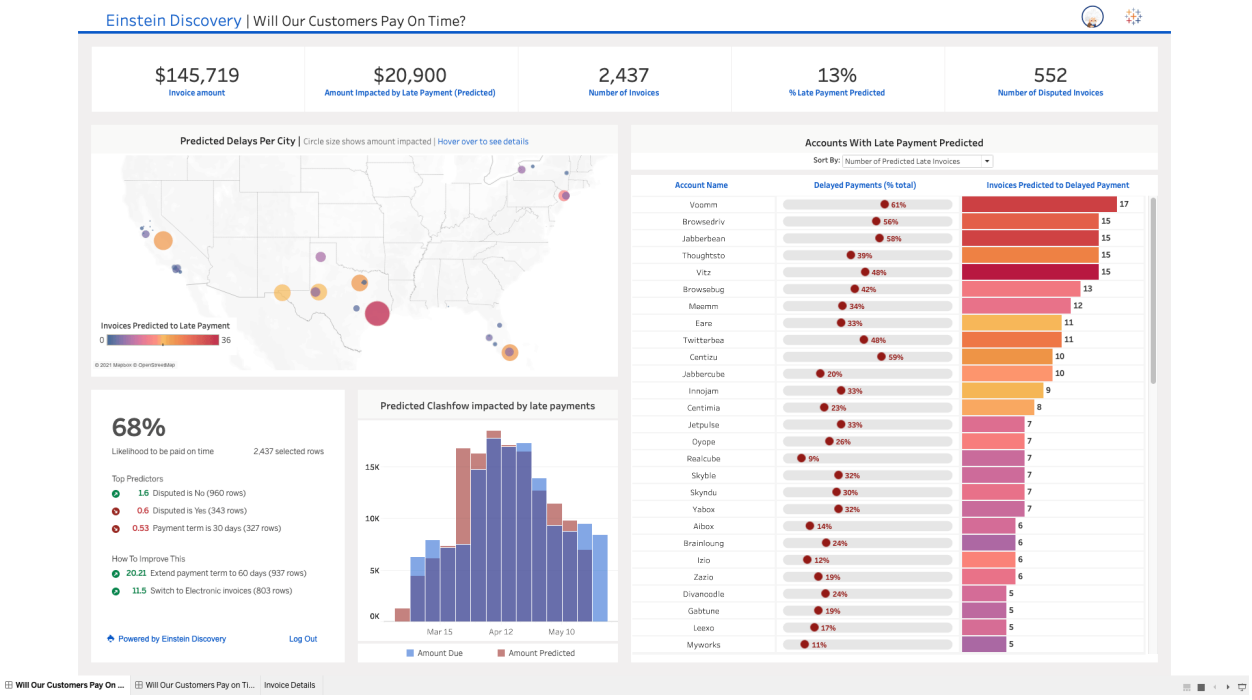


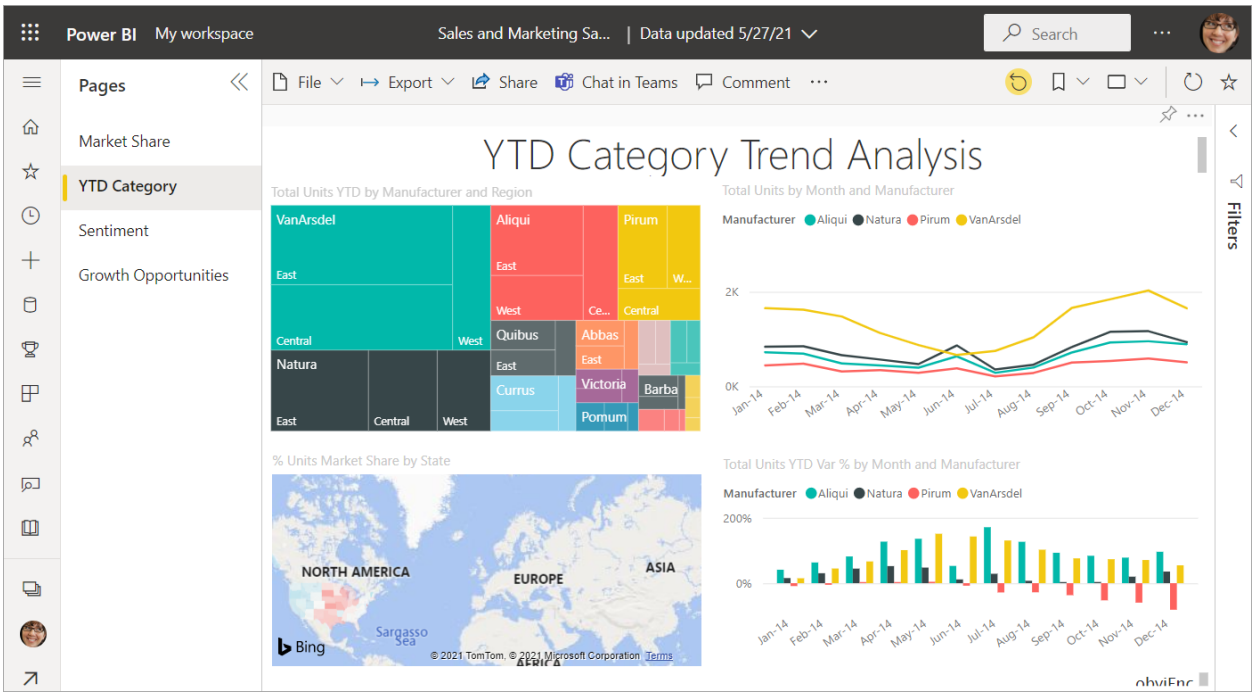
Tableau is a software that supports data analysis and visualization (Data Visualization), widely used in the BI (Business Intelligence) industry. Like Excel, Tableau helps aggregate data, but at a higher level when converting this data from series of numbers into visual images and charts.

The Importance of Tableau

The need to analyze data today has become extremely urgent, the data is not just a collection of numbers. Instead, visualizing the data helps viewers compare, summarize, evaluate and make accurate decisions.

This work becomes even more important for businesses of scale. As reports increase, it takes too long to evaluate through traditional reports. That's where Tableau data visualization and analysis tools come into play

10.2. PowerBI



Power BI excels at creating reports or business dashboards. This will be an extremely effective tool for those of you who have a need to process data in large quantities and require high expertise.

Compared to Excel, Power BI has many advantages, specifically:

- Enable users to access data from multiple sources and automate data processing.
- Support for connecting, converting large-scale data analysis: Power BI's data processing ability is extremely powerful when it can work with 8-10 million data lines at a time.
- Enhance data visualization

- Use Analytical Expressions (DAX) to analyze data: DAX is an extremely powerful analytical expression with fast, efficient processing speed.
- Build data models to combine data from multiple sources.

Power BI consists of four main components:

- **Power BI Desktop:** has the role of processing, aggregating and building data models used to visualize data for reports. This is a software on Windows operating system.
- **Power BI Apps:** is also Power BI but in the form of an application that can be used on platforms such as Android or iOS.
- **Cloud Service Power BI Service (Power BI Online):** this is a data storage service of Power BI that allows users to store reports and dashboards anywhere, anytime.
- **Power BI Report Server:** users can publish the completed report to the company's Power BI Server system.

Comparison between Tableau and Power BI

Terms	Power BI	Tableau
Meaning	Power BI is a business data analytics tool used to analyze business operations and gather insights.	Tableau is a business intelligence and data analytics tool for creating reports and visualizing data with great flexibility.
Data Source	While Power BI already supports virtually all popular server and database sources, it's still hard to compare with Tableau.	Tableau provides access to a wide variety of database sources and servers.
Data Capacity	Each workspace or group can handle up to 10GB of data. In case of more than 10GB, the data needs to be in the cloud (Azure). If the data is in the local database, Power BI only selects or pulls the data from the database and does not import it.	Tableau works on columnar structure, storing only unique values for each column so it can fetch billions of rows.
Machine Learning	Power BI is integrated with Microsoft Azure. It helps data analysis understand trends and patterns of products or businesses.	Python's machine learning capabilities are built-in to Tableau, making it efficient to perform ML operations on datasets.

Performance	Power BI's data processing capabilities are still limited when compared to Tableau.	Tableau can handle large volumes of data with better performance.
Dashboard	Includes both experienced and inexperienced users.	Although Tableau can be accessed easily and simply. However, this is the choice of many professionals when analyzing data.
Pricing	Power BI Desktop is supported for free (very suitable for beginners). The service plans are quite cheap when compared to Tableau.	The cost of Tableau's products and services is higher than that of Power BI. When you need to connect to a third-party application in Tableau, there is a fee.

P6. The legal issues involved in the secure exploitation of business intelligence tools

The business intelligence tools that are used for the effective decision making for a business can have some legal issues as well. As everything is digital, the tools used are also some sort of software. So, the software that are used should be used the authorized person so that one can make the use of the analyzed data. As these things are critical and are supposed to be kept safe. The privacy and security is also a legal issue. The privacy of the data should be maintained and the security should be great enough to protect the data. For these various tools and techniques are available. The tools are supposed to be used correctly and for the benefit of the business and not for personal use.

1. Legal issues in law

Legal Issues in Business Intelligence and Business Analytics. Several legal issues must be addressed to implement and manage an effective BI / BA program across the organization's internal and external supply chains. Corporate policies should be designed (or at least audited and revised periodically) with a view towards capturing the innovation opportunities that come from analyzing contractual compliance and other operational and performance data.

SLA Design and Management. Service level agreements (SLA's) should be designed for achieving multiple goals:

- quality services for reliability, predictability, scalability and cost management;
- metrics tied to the returns on investment (and equity) for operations that are considered "core" or "prime value drivers" for the internal organization.

2. Privacy

The privacy and security issues are also growing concern over business community. It is everyone's right to control information about them and there are laws and policies to safeguard individual right but are ineffective. Companies use BI to collect and analyze data for improving their performance, therefore it becomes important to access and maintain secure information. Though, on one side technological developments make it easy to access information freely from various sources on the other hand it becomes essential to develop system that can secure that information from misuse by outsiders.

3. Ownership

Ownership and Licensing. The insights derived from BI analysis of outsourced (and insourced) operations can create new business methods. Such methods may include patentable processes. Organizations investing in SLA management, performance metrics analysis and BI need to protect their rights to own exclusively the insights and new business models developed using the data fees from internal sources and outsourcing service providers. The organization should take all appropriate measures to ensure it will own the trade secrets (and any related business method patents).

4. Data security

Data Rights Management for BI Processing. Most BI software applications process data from different sources and different data types. The enterprise needs to ensure that it has legal rights to access and use all data that it wishes to analyze.

- The enterprise should specify, in its third-party supply chain and service contracts, that performance data obtained from evaluating the services of the service provider belong to the customer and may be used for any internal purposes.
- Service providers, of course, may wish to prevent the publication of performance outcomes through the use of appropriate confidentiality agreements.
- The question of data rights management can become a contentious issue in case of a disputed termination for cause, so the outsourcing contract should address how to handle performance metrics and their disclosure in any dispute resolution process.
- Since most enterprises are also service providers and may be subject to similar vendor management, they need to ensure that they can use the “big data” from vendor management tools for their own internal process improvement and innovation strategies. In short, every customer is also a vendor, and everyone needs to have access to use “supply chain data” across internal and external supply chains.

Processing and analyzing large volumes of data with BI tools open up organizations to several BI security risks. Understanding and managing these vulnerabilities is an essential part of keeping your data secure.

Analytics Software Processes Tons of Data Quickly

The typical BI solution works with data from multiple sources and aims to maximize the speed and accuracy of the reporting, especially if you have real-time or near real-time requirements. The system may ingest sensitive data that is subject to regulatory compliance, which can lead to fines and other penalties.

Dependent on the Security of Third-Party Providers for Cloud-Based BI Tools

When you work with cloud services, you rely on the provider to handle essential security measures. If they don’t place security as a priority, lack a security-centric culture, or have risky policies and procedures, your data could be in trouble. The level of IT security can vary wildly among BI tools.

Cloud Security Vulnerabilities when Moving Data from Your Systems and Sources to the BI Tool

Your data also faces a BI security risk when it’s on its way to the BI tool if you’re not using an on-premises solution. Cyberattacks could compromise the data in several ways, resulting in data breaches, data loss, and other serious consequences.

5. Solution

Due to several types of attacks, there are major types of issues that may occur in the IoT platform which creates an adverse effect on the Business intelligence. Preventive action and maintaining the security measures will assist in mitigating such issues.

Proper Security requirements and the verification of the function: Security is one of the major aspects of IoT which is extremely important to make the function properly. Implementation of security features in the IoT platform for the Business Intelligence will make the system secure in order to prevent the system from any type of cyber-attacks and the threats.

Secure review of good: It is mandatory for the business organization to maintain a secure review of the code. The implementation of IoT platform for the business intelligence requires secure review of the code in order to minimize the level of threat. Implementation of penetration Technique: Penetration technique is crucial to identify the vulnerabilities or the threats over the network. End to end penetration technique will help in finding bugs and the errors in the network for the effective implementation of the Business intelligence in the IoT platform.

Encryption of Data: As it has been discussed, Implementation of Business Intelligence on the IoT platform is entirely dependent on the data. The data which has been gathered is later on the process for the analysis. Encryption of data will enhance the security features of the data during the collection or the transmission over the Network Encryption of data will make the data more secure for the analysis of the data. It can be implemented with the cryptographic technique by using the public key and the private key encryption.

Use of Secure Socket Layer: The IoT is entirely dependent on the network connectivity and the web interface. In most of the business intelligence model, the exchange of information occurs through the web interface. Therefore, the user of secure socket layer will mitigate protect the data from malware or ransomware attacks.

Authorization and the Authentication of the Gateway: Gateway is a bridge which exists between the application server and the LAN which is connected to the internet. In the context of the Business Intelligence the analysis of the data occurs over the internet. There proper authentication of the server and the gateway would be effective for the proper implementation of the Business Intelligence in the organization.

M4. Research to identify specific examples of organizations that have used business intelligence tools to enhance or improve operations

In this research on business intelligence, I had some specific examples of a famous corporation in Korea and also in Vietnam. That is the LOTTE corporation, hereafter I will detail how the LOTTE corporation uses it.

1. Lotte.com: BI Increases Company Revenue

Lotte.com is the leading internet shopping mall in Korea with 13 million customers.

2. Challenge:

With more than 1 million site visitors daily, company executives wanted to understand why customers abandon shopping carts.

3. Solution:

The assistant general manager of the marketing planning team implemented customer experience analytics; the first online behavioral analysis system applied in Korea. The manager used the information to understand customer behavior and implement targeted marketing and transform the website.

4. Results:

With the insights from the new BI analytics program, there was an increase in customer loyalty after one year and an increase of $10 million in sales. The changes came from identifying the causes of shopping cart abandonment, such as a long checkout process and unexpected delivery times and remedying the situation.

II. Conclusion

In this assignment, I thoroughly researched business intelligence, as well as presented the tools used in BI. In this exercise, I presented my view on Business Intelligence and the steps to take. I have also listed some popular BI tools today like Tableau or Power BI, and I have also compared the tools used for each task. In the M4 section I also gave some real-life examples and I also analyzed the strategy of that company.

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