Building A Datamart for Dashboard Design to Decision Support System of Legal Division

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ABSTRACT

The goal of development and implementation is to identify, analyze needs, design datamart and making a dashboard for Decision Support System, especially in the data analysis process of the legal division at PT.XYZ. The design of business intelligence uses a Business Intelligence Roadmap approach that refers to justification, planning, and application prototyping. The analysis is carried out on ongoing business processes, then the results of the analysis are used as a reference in the design of the datamart and dashboard for Legal division consisting of a contract dashboard, brand dashboard, opinion dashboard, licensing dashboard, SPSK dashboard, and produce legal reports that meet the provisions of PT.XYZ. The resulting datamart and dashboard can help the Legal division of PT.XYZ perform data analysis and facilitate the decision-making process.

Keywords: datamarts, dashboard, business intelligence roadmap, decision support system

INTRODUCTION

Information technology has an important role in all areas of life. One of the roles of information technology is as a means of supporting in finding opportunities and developing innovations. In order to inform management or key stakeholders, it is necessary to monitor an ongoing activity to determine the progress and achievement of results in the appropriate use of company resources. According to Few (2016) monitoring is a routine process of collecting data and measuring progress on program objectives. Monitor changes focused on processes and outputs.

By monitoring, the company can assess whether the work pattern and management used are appropriate to achieve the objectives of the activity. Monitoring information technology will develop effectively and efficiently if the data within the company can be visualized properly. One form of monitoring visualization is a dashboard.

According to Rojas, Viviana, and Cabrera (2020), a dashboard is software that allows visualization of information through graphs, charts, and indicators, providing a better understanding of what is happening. Furthermore, according to Sarikaya, Corel, Bartram, Tory, and Fisher (2018) dashboards are one of the most common use cases for data visualization, as well as their design and context of use are very different from exploratory visualization tools. One of the tools that can be used to create a dashboard is Tableau. According to Fireteanu [4] Tableau is a data visualization tool that produces special graphs and very detailed representations of the information obtained.

METHOD

A dashboard is a visual display of the most important information needed to achieve a goal. Consolidated and organized in one screen into information that can be monitored at a glance.

A datamart is a subset of a data warehouse that focuses on a particular line of business, department, or subject area. Datamart provides specific data for a specific group of users, allowing users to quickly access important insights without wasting time searching entire data warehouses. For example, many companies may have datamarts that align with specific departments within the business, such as finance, sales, or marketing (IBM, 2021).

According to scientific journal (Amaldo, 2016) Business intelligence (BI) is a general term consisting of technologies and processes for handling information to improve decision making.

According to Connolly and Begg (2015), a star schema is a dimensional data model that has a fact table in the middle and is surrounded by a dimension table that contains reference data. Starschema can be used as a reference to create a datamart.

According to Sutarman (2014), a database is a collection of interconnected and organized files or a collection of records that store data and the relationships between them. Furthermore, according to Yakub and Hisbanarto (2014) explained that the database or database is data that is interconnected or has a relationship.

Implementation according to Jones theory, Mulyadi (2015) says that implementation is the process of realizing a program to show the results. Furthermore, according to Grindle states that implementation is a general process of administrative action that can be investigated at a certain program level. Meanwhile, according to Lister (Taufik and Isril, 2013) puts implementation as a result so that implementation concerns the action of how far the direction that has been programmed is really satisfying. So, implementation is a process where an activity is carried out to achieve a predetermined goal or result.

According to Bradbourne (2017), Tableau is a leading Business intelligence tool focused on data visualization. On the website www.tableau.com the mission section explains that Tableau is a product that is changing the way people use data to solve problems. Making the process of analyzing data easy and fast, beautiful and useful, this is software for anyone and everyone.

To find out the condition of PT XYZ and its problems, appropriate data and information are needed to carry out the analysis and design process of the datamart. Therefore, it is necessary to extract information through interviews, analysis of data usage, analysis of the current system, and finding out about the problems faced by PT XYZ on the system that is running.

For the interview method, the data collection method by conducting interviews is the most commonly used method and usually the most useful (Connolly, 2015).

For analysis of data usage, In the analysis phase of the design of the datamart and dashboard, an analysis is carried out whether the existing data is appropriate or not. If so, the data can be used immediately. The analytical method applied is based on the book Business intelligence Roadmap Written by (Moss&Attre, 2013)

For the analysis of the current system, the data collection method that the author uses to collect data that will be used for thesis writing is through observation and sensing where the researcher is really involved in the daily lives of the respondents. This observation is carried out by making direct observations of the research object to obtain data that is needed in the analysis process.

RESULTS AND DISCUSSION

Here is an example of designed star schema of an Legal Merek. Tr_merk is related with ms_negara, ms_user, and ms_category_merk at Figure 1.

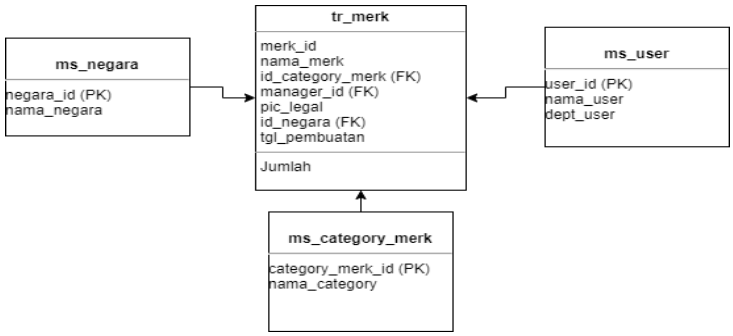

Figure 8. StarSchema legal merk

In this step, the ETL (Extract, Transform, and Loading) process is carried out for the datamart by retrieving data from the Legal database. ETL Development is carried out in designing a datamart for the Legal division using the Tableau Prep Builder application. There are two steps in making ETL, the first is to enter the table that will be needed in the datamart and the second is to create a datamart consisting of the tables needed in the datamart.

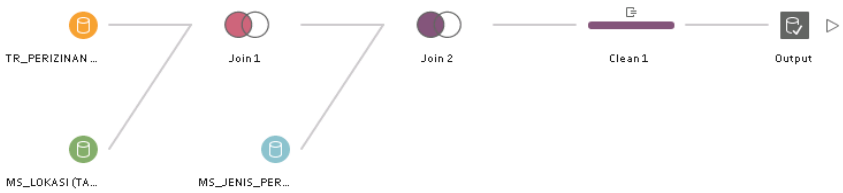

Figure 9. Datamart Legal Perijinan relational

Figure 2 shows data relational in datamart Perijinan and Figure 3 shows data relational in datamart Kontrak.

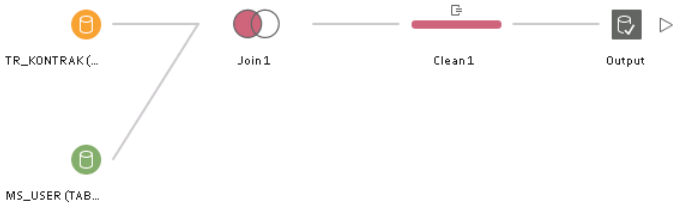

Figure 10. Datamart Legal Kontrak relational

ETL Development is carried out in the design of the datamart for the Legal division using Tabelau Prep Builder. Tableau Prep Builder (2019) is a tool in the Tableau product suite designed to make preparing our data easy and intuitive. Tableau Prep Builder can combine, shape, and clean our data for analysis in Tableau.

Here is an example of table that consists from legal merk star schema that has been pointed out into a table (Table 1).

Table 1. tr_merk table

Nama Tabel	tr_merk		
Keterangan	Tabel ini berisi data transaksi merk		
Primary Key	merk_id		
Foreign Key	-		
Nama Field	**Tipe Data**	**Panjang**	**Keterangan**
merk_id	int	-	ID Merk
nama_merk	nvarchar	255	Nama Merk
id_category_merk	int	-	ID Category Merk
pic_legal	nvarchar	255	Nama PIC Legal yang membuat Transaksi Merk
manager_id	int	-	ID user yang membuat Transaksi Merk
tgl_pembuatan	datetime	-	Tanggal Pembuatan Transaksi Merk
id_negara	int	-	ID Negara

At Table 2 can explain that Tr merk table consists of Nama Tabel, Keterangan, Primary Key, and foreign Key.it also contain the table that explain all about the primary key that are inbound with the tr merk database. Merk id, id category merk, manager id, id negara have the int data type. Nama merk, pic legal have nvarchar data type and tgl pembuatan have datetime datatype

Table 2. Source Table metadata of transaksi_merek

Source		
Database	Table	Attribute
Legal	Ms_negara	Negara_id
Legal	Ms_category_merk	Category_merk_id
Legal	Ms_user	User_id

Metadata of Transaksi_merk consists of source tables and target tables. Source tables are from legal database.

Table 3. SPSK Table.

User	Activities	Description
PIC User	Permintaan Legal SPSK	PIC User melakukan permintaan pembuatan legal SPSK
PIC Legal	Verifikasi Permintaan Legal SPSK	PIC Legal memverifikasi permintaan Legal SPSK. Tahap verifikasi meliputi pemeriksaan data yang diberikan PIC User, apakah sudah sesuai atau tidak, tidak melanggar kebijakan perusahaan, dan persetujuan dari pihak lain yang berhubungan dengan pembuatan Legal tersebut. Jika sudah diterima, maka akan dilanjutkan ke proses selanjutanya, tapi jika belum, maka akan kembali ke proses permintaan legal SPSK
PIC Legal	Create Legal SPSK	PIC Legal akan membuat Legal SPSK

Figure 4 shows the worksheet of Tahun permintaan SPSK that have been finished with Tabelau Desktop.

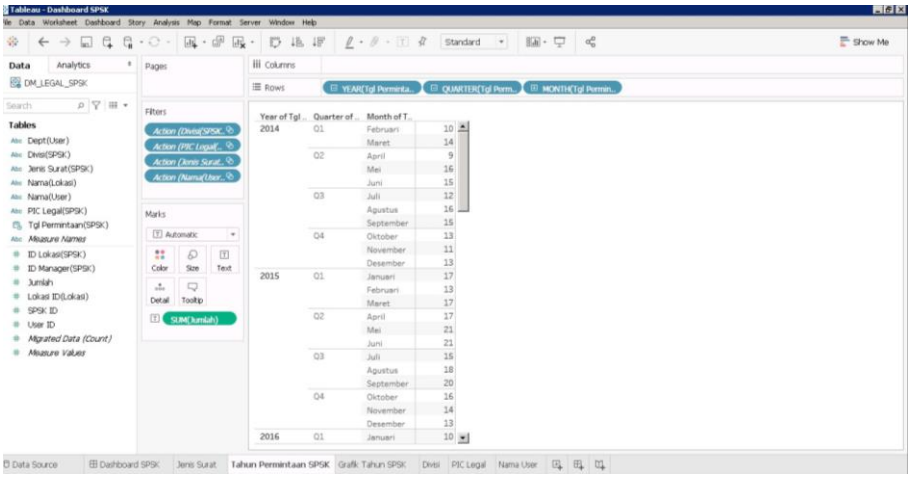

Figure 11. Worksheet Tahun Permintaan SPSK

Figure 5 shows the dashboard of spsk that have been finished using Tabelau Desktop. The dashboard show us the name of PT XYZ User,date,division,PIC Legal, and Jenis Surat SPSK. And also the graphics of tgl permintaan SPSK

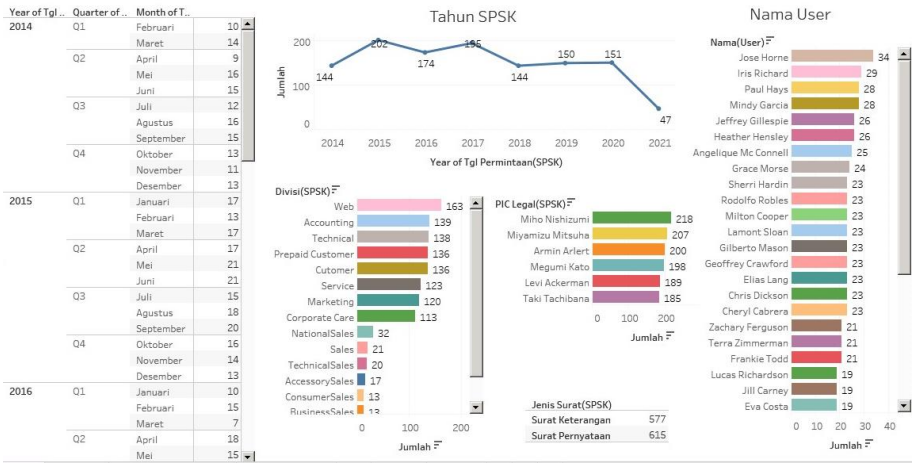

Figure 12. Dashboard SPSK

Figure 6 shows dashboard visualization of Demand Graphic. The graphic shows the demand that are asked from client to the PT XYZ. As we can see from 2005-2021 the graphic seems not too stable so the company staff could get some feedback to improve their company.

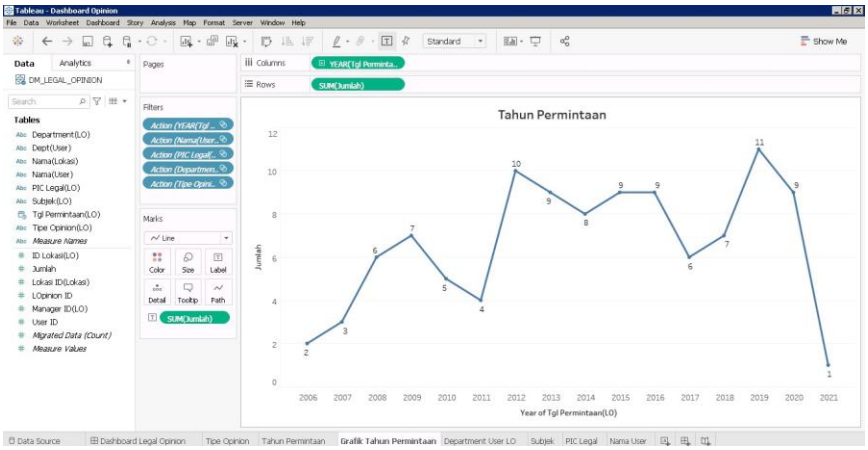

Figure 13. Workshee Graphic Permintaan

Dashboard kontrak (Figure 7), Dashboard kontrak aims to represent or visualize data contained in the data warehouse so it is easy to understand and help the management to explore data visualization.

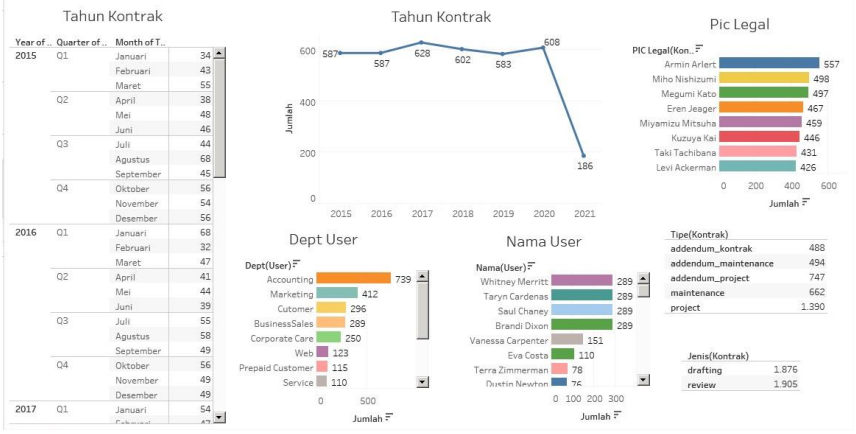

Figure 14. Dashboard Kontrak

CONCLUSION

Based on the results of the development and implementation of the Legal Report Dashboard at the Legal Division of PT XYZ with the final result being the Legal report dashboard, it can be concluded:

- With the Dashboard, it is hoped that it will make it easier for users to see the status of the report and find out what is going on, making it easier for the decision-making process.
- With the Dashboard, it is hoped that it will make it easier for users who initially had difficulty making reports.
- Improved business processes used to make financial reports using dashboards because they are more effective, that is, they do not involve a lot of staff who have to work on reports, and minimize the occurrence of miscommunication.
- With the dashboard, make the process of making legal reports and decision making becomes more accurate because the user can directly access the Dashboard that has been completed by other users, so that the data needed for continuous analysis becomes more consistent.

REFERENCES

Few, S. (2016). *Information Dashboard Design: The Effective Visual Communication of Data*. California: O'Reilly.

Rojas, E., Bastidas, V., & Cabrera, C. (2020). IEEE Internet of Things Journal.

Cities-Board: A Framework to Automate the Development of Smart Cities Dashboards. (Online). Diakses 5 Maret 2021 dari https://doi.org/10.1109/JIOT.2020.3002581

Sarikaya, A., Correll, M., Bartram, L., Tory, M., & Fisher, D. (2018). IEEE Transactions on Visualization and Computer Graphics. *What Do We Talk About When We Talk About Dashboards?, 25*(1), 682-692. *(Online)*. Diakses5 Maret 2021 dari doi:https://doi.org/10.1109/TVCG.2018.2864903

Fireteanu, V.-V. (2020). International Conference on Electronics, Computers and Artificial Intelligence (ECAI). *Integrating Tableau with Internet of ThingsAcquiring Projects. (Online)*. Diakses 5 Maret 2021 dari
https://doi.org/10.1109/ECAI50035.2020.9223228

IBM Cloud Education. (2020). *IBM Cloud Learn Hub. (Online)*. Diakses 5 Maret 2021 dari https://www.ibm.com/cloud/learn/data-mart

Nuno, C., & Arnaldo, C. (2016). Competitiveness Review: An International BusinessJournal. *Business Intelligence and Competitiveness: The Mediating Role Of Entrepreneurial Orientation*. *(Online)*. Diakses 5 Maret 2021 dari http://iranarze.ir/wp-content/uploads/2018/05/E7305-IranArze.pdf

Beg, C. E., & Connolly, T. M. (2015). *Database Systems: A Practical Approach toDesign, Implementation, and Management.* England: Pearson.

Sutarman. (2014). *Buku Pengantar Teknologi Informasi.* Jakarta: Bumi Aksara.

Yakub, Hisbanarto, V. (2014). *Sistem Informasi Manajemen Pendidikan.* Yogyakarta: Graha Ilmu.

Mulyadi, Deddy. 2015: 45 .Studi Kebijakan Publikdan Pelayanan Publik: Konsep dan Aplikasi Proses Kebijakan Publik dan Pelayanan Publik. Alfabeta. Bandung.

Mulyadi, Deddy. 2015: 47. Studi Kebijakan Publikdan Pelayanan Publik: Konsep dan Aplikasi Proses Kebijakan Publik dan Pelayanan Publik. Alfabeta. Bandung

Taufik, Mhd. dan Isril. 2013. Implementasi Peraturan Daerah Badan Permusyawaratan Desa. Jurnal Kebijakan Publik, Volume 4, Nomor 2.

Bradbourne, M. 6 Juni (2017). *What is Tableau*. *(Online)*. Diakses 5 Maret 2021 dari https://community.tableau.com/thread/238491

Beg, C. E., & Connolly, T. M. (2015). *Database Systems: A Practical Approach toDesign, Implementation, and Management.* England: Pearson.

Moss, L. T., & Atre, S. (2013). *Business Intelligence Roadmap: The CompleteProject Lifecylce for Decision-Support Applications.* Boston: Addison Wesley.

Tabelau Prep Builder (2019). *Product Knowledge.(online)*- diaksess 5 Juni 2021 dari https://help.tableau.com/current/prep/en-us/prep_about.htm