SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Business Intelligence Implementation to Analyze Perfect Store Data Using the OLAP Method

Afik Maulana[1)]
Information System
STMIK Nusa Mandiri
Jakarta, Indonesia
afixmaulana@gmail.com

Dewi Ayu Nur Wulandari[2)]
Accounting Information System
Universitas Bina Sarana Informatika
Jakarta, Indonesia
dewi.dan@bsi.ac.id

Abstract— Perfect store is one of the business strategies owned by PT. Unilever where a store provides an appropriate product assortment and ensures visibility by displaying products in accordance with the planogram, and placed in the right position by taking into account the habits of the buyer and using the right display tools. This perfect store strategy aims to increase sales in the context of business development. To find out whether the perfect store strategy has been applied in all existing areas, a perfect store audit is needed. The method used to audit perfect store data is OLAP (Online Analytical Processing). The results of data processing with OLAP are in the form of a perfect store audit report that is accurate, relevant and timely which is presented in the form of an analysis chart that will be used by PT. Uniliver to see which areas have increased sales from the perfect store strategy that has been implemented so that PT Uniliver can determine the right marketing strategy.

.

Keywords— OLAP, Data Analysis, PT. Uniliver and Information Technology

I. INTRODUCTION

To increase sales, PT. Uniliver has a business strategy known as the perfect store. Perfect store is a condition where a store ensures the availability of an appropriate product assortment and ensures visibility by displaying the product according to the planogram, placed in the right position by calculating the buyer's habits and using the right display tool. To find out whether the perfect store strategy has been implemented in all stores covered by distributors in each area, a perfect store audit is required.

Audit perfect at PT. Uniliver began since 2013. But in its implementation it still uses survey paper that is spread throughout the area, then the survey results will be manually inputted using excel by each admin area. In 2016 the perfect store audit was stopped, and in mid-2017 the perfect store audit began to run again using the mobile app.

In conducting a perfect store audit, the results of the data obtained are quite large, due to the large number of stores covered by distributors in each area. The obstacle faced is that there is no good management of the data obtained and also there is no analysis of business activities which causes the making of reports and decision making to be slow.

Fast and efficient analysis and processing of data is absolutely necessary in business activities. This is because the results of analysis and processing of data on the company can be used as a basis for analysis and reporting in supporting decision making in determining the company's next strategy.

Analysis of data using OLAP can provide levels of analysis with complex query capabilities, data comparison trends, data mining and reporting. OLAP produces information in a multidimensional manner, meaning it is able to view data from various perspectives. This makes policy makers or DSS (Decission Support System) easier to carry out the analysis process of historical data that comes from transactional data to provide strategic policies and decisions [1]

With the existence of information technology, companies that have business activities will have great potential in generating abundant data. Abundant

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

company data causes the information retrieval process to be slow.[2]

This is a challenge for companies to be able to manage data and retrieve information quickly and efficiently. Abundant data will be useless if there is no good management and also analysis of business activities. With information, companies can improve their performance in making accurate decisions with minimal risks to maximize the benefits and progress of PT Unilever's company. [2]

In this study, the author will use the OLAP (Online Analytical Processing) method to audit the perfect store data owned by PT Uniliver by using power queries and power pivots using Microsoft Office 365. In auditing data used 5 key performance indicators (KPIs) that have been determined by the company, namely osa, npd, promo, sstd and cta. This 5 KPI data will be used to audit the perfect store data. the results of this audit will determine the strategy that will be carried out by the company.

OLAP stands for On-Line Analytical Processing. Basically OLAP is a special method for analyzing data contained in data storage media (databases) and then making reports according to user requests [3]

The results of data processing with OLAP are in the form of a perfect store audit report that is accurate, relevant and timely which is presented in the form of an analysis chart that will be used by PT. Uniliver to see which areas have increased in sales from the perfect store strategy that has been implemented.

II. LITERATURE REVIEW

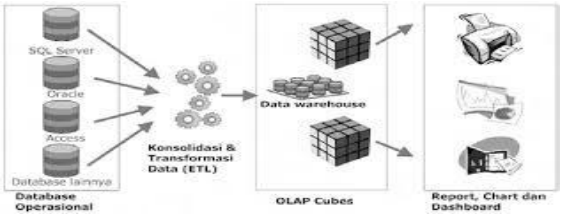
A. Business Intelligence

Business Intelligence (BI) is an application and technique for collecting, storing, analyzing and providing access to data, which in turn will help better business users and make strategic decisions. " The definition of Business Intelligence according to Powers is "a concept and method on how to improve the quality of business decision making based on a data-based system. BI is often equated as briefings books, reports and query tools, and executive information systems [4].

Business Intelligence (BI) is a set of theories, methodologies, processes, architectures, and technologies that convert raw data into meaningful and useful information for business purposes. BI can handle large amounts of information to help identify and develop new opportunities. Taking advantage of new opportunities and implementing effective strategies can provide competitive market advantages and long-term stabilityMaintaining the Integrity of the Specifications [5]

The Business Intelligence function is as a decision support system where these systems and applications change data in a company or organization (operational data, transactional data, or other data) into the form of knowledge [5].

Business intelligence is the ability to collect data from various sources, process and display in forms that can be easily analyzed by managers in an organization so that the results of the analysis can produce better decisions for the organization. Of course with good decision making will help businesses grow rapidly and keep the business at its best [6].



Source : [6]

Fig. 1 The Process Of Bussines Inteligence

B. Online Analytical Procecessing (OLAP)

Online analtycal processing (OLAP) is a device that describes technology using multidemensional visualization of data to provide faster access to information strategies with the aim of speeding up analysis [7].

OLAP is an approach that quickly provides answers to multidimensional analytical queries in the database. OLAP is part of a more global category of business thinking, which also summarizes the relationship between reporting and data mining. OLAP was introduced by E. F. Codd who is the father of relational databases. Basically OLAP is a special method for analyzing data contained in data storage media (databases) and then making reports according to user requests [1].

OLAP enables users to gain a deeper understanding and knowledge about various aspects of their corporate data through a fast, consistent, interactive access to a wide variety of possible views of the data. OLAP allows the user to view corporate data in such a way that it is a better model of the true dimensionality of the enterprise [8].

OLAP is a collection of rules that provide a dimensional framework to support decision making. OLAP is also an approach to quickly providing answers to multidimensional analytic queries. OLAP

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

is part of a more global category of business thinking, which also summarizes the relationship between reporting and data mining [9].

Data warehouses often consist of large data and allows analysis of the data, there are many tools for analyzing data, one of the tools is Online Analytical Processing (OLAP) is possible analysis of this data is stored in the data warehouse online to support retrieval decision. And the aforementioned analysis is called OLAP (Moehildin Mahmud inside [10].

Online Transactional Processing (OLTP) is a technology for managing application oriented on transactions [1]. Because this technology is related to databases, each database is related with OLTP called the OLTP database. OLTP databases are databases commonly used on transaction-oriented applications, namely applications that tend to do more processes insert, update and delete in real-time and generally intended for applications classified as missions [11].

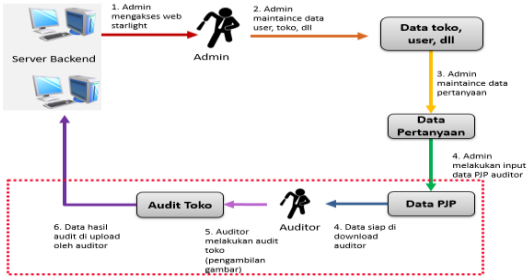
OLAP displays data in a dynamic table, which automatically will summarize the data into several different data slices and allow the user to interactively perform calculations and format a report. Tool for creating reports is the table itself, that is by dragging on columns and rows. Users can change form reports and classify them according to user wants and needs, and OLAP The engine will automatically calculate the new data. OLAP is a technology allows analysts, managers and executives to simultaneously access data, consistent and interactive with a variety of reviews of information where each row of data can transformed to reflect the dimensions of the company so that it is easily understood by the user [12].

III. RESEARCH METHODS

The type of data used in this study is secondary data. Secondary data is a data source that does not directly provide data to data collectors, for example through other people or through documents. In this study, the authors used perfect store data per KPI obtained from IQ units.

The stages of OLAP carried out are as follows:

A. OLTP Process Analysis (Online Transaction Processing)



Source : [13]

Fig 2. OLTP Process (Online Transaction Processing)

B. ETL phase (Extraction, Transform, Load)

At this stage it is divided into 3 parts, namely the data extraction stage, the data transform phase and the data loading stage

1) Extraction phase

At this stage, extract data from the audit results from the OLTP (online transaction processing) database that will be used for analysis

2) Transform phase

At this stage the data transformation is done which is the stage of adjusting data that has been extracted using power queries. However, the processes carried out at this stage are:

a) Data extracted from the OLTP system database PT Unilever has a .csv format. the data is then exported into power queries for transformation

b) The store code data is exponential, therefore it needs to be changed by changing the data format to text

3) Loading phase

The Loading process is entering data into the data warehouse which in this study uses an excel database

C. Designing the OLAP Cube

In designing OLAP cube is one way to display data in a multidimensional manner which later data in the cube will be the material for analysis. Steps - Steps in making a cube.

1) Determining Dimension

Dimension is a line (axis) or axis that is opposite to the figure that will be displayed, from the data that will be displayed, in this study the dimension built by OLAP is the dimension region, area and distributor.

2) Determining Time Dimension

Time Dimension is a special type of dimension defined as the time detail of a cubes. which will normally be in cubes is defined as the main axis. Specific calculations, including turnover from the

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

average in the year of year will only work if the time dimension is defined. This Time Demision can be changed from model to model and can change from year level to levenit minutes, in OLAP the Time Dimension that is built is Period or month.

3) Measure

Measure is an entity that can be monitored and measured from dimensions, this measure in OLAP is the number of stores audited and the number of each compliant KPI and calculates the measure of each KPI to be made a score.

IV. RESULT AND DISCUSSION

A. OLTP Process

In the process of running the system or OLTP (Online Analytical Processing) process the admin accesses the starlight website for maintenance and uploading store data, pjp, audit questions, data uploaded by the admin will be downloaded by the auditor from the mobile app for audit and shooting, from the results the audit will be uploaded to the server

B. Process of Extraction, Transformation and Loading (ETL)

At this phase, extract the audit data from the OLTP database (online transaction processing) which then transforms the data into the power query to find, connect, merge and improve the data source to meet the analysis needs. The results of the transformed data will be loaded into in OLAP cube databases (data models) use Power pivot.

1. Extraction Phase

   Extract process is the process of retrieving data from data sources. Called extract, because this data retrieval process does not take all the data in the operational database, but only takes mature data (Non volatile). There are 5 data extracted from OLTP database (online transaction processing), namely data kpi osa, npd, promo, sstd and cta.

2. Transformation Phase

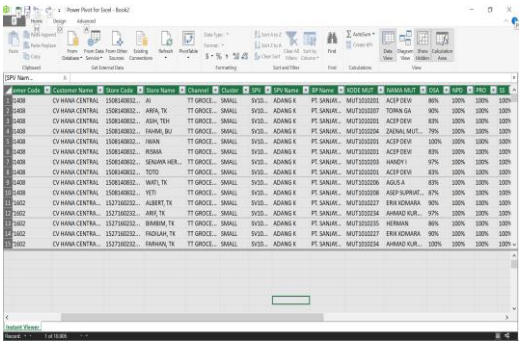
   Transformation is needed when legacy data does not meet the needs of the data structure. Following this is the transformation process that is carried out.

   a) Import 5 kpi data (osa, npd, promo, sstd and cta) into the power query
   b) The process of combining 5 KPI data
   c) Formation of OLAP cube database fields / columns using the pivot table
   d) Change the score to binary with the logical function formula to calculate the number of perfect store stores, for calculating the perfect store applying a hurdle rate system for each KPI. The store will be categorized as Perfect store if it reaches the target value on each KPI, namely:
      1) The minimum OSA reaches 75% in each shop, it will be considered complied
      2) The minimum NPD reaches a value of 50% in each shop, it will be considered comply
      3) Promotion Compliance reaches 100%.
      4) Shelf Standard reaches 100%
      5) CTA reaches 100%

   The percentage of each KPI is determined by the company as standardization in determining the store category. the results of this audit will determine the next strategy that will be carried out by the company.

3. Loading Phase

   After the transformation process is carried out, the loading or inserting of data into the excel database is then carried out which will be imported into the data model or cube data using power pivot for OLAP (online analytical processing).



Source : [13]

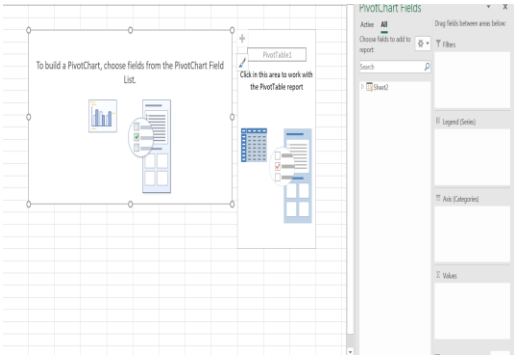
Fig 3. Data Loading Results to power pivots

C. Online Analytical Processing (OLAP) Design

In this study, OLAP was built using power pivot quickly by connecting to the database, then pivoting the data in the following way:

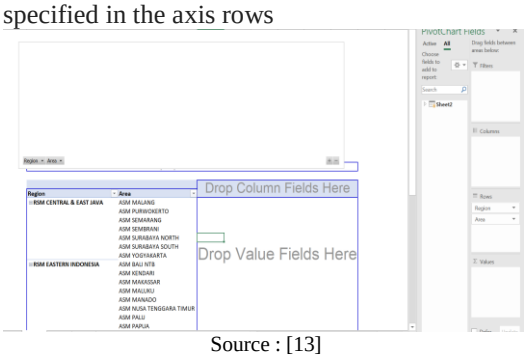
1. In power pivot, on the home page click pivotable to pivot the data

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X



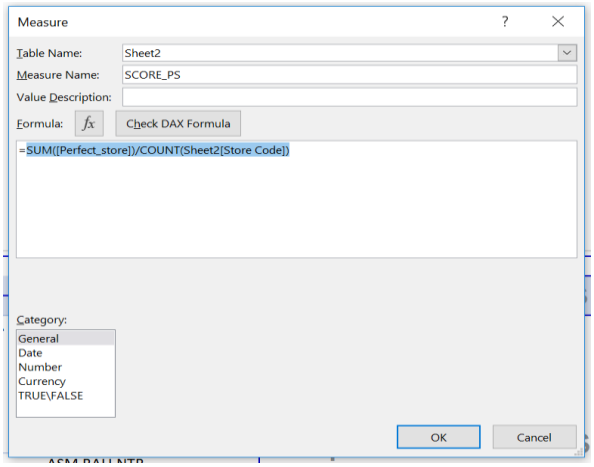
Sumber : [13]
Fig 4. PivotTable view

2. Determining dimension, in this study the researcher determines the dimension Region and area, because he wants to analyze how much growth or perfect store in each region and area. then drag and drop dimensions that are specified in the axis rows



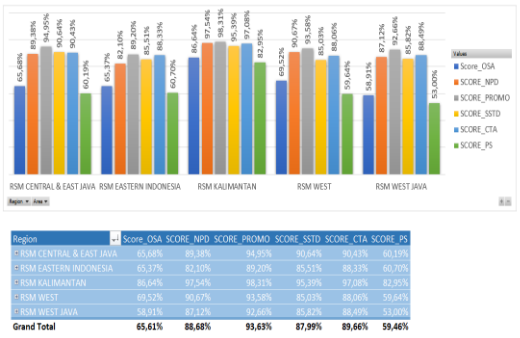
Source : [13]
Fig 5. The results of drag and drop dimension region and area

3. Make a Measure score for each OSA, NPD, Promotion, SSTD, CTA and perfect store KPI by right-clicking on the OLAP Cube database then write the formula as follows:
Measure OSA: = SUM ([Achieve_OSA]) / COUNT (Sheet2 [Store Code])
Measure NPD: = SUM ([Achieve_NPD]) / COUNT (Sheet2 [Store Code])
Measure Promo: = SUM ([Achieve_Promo]) / COUNT (Sheet2 [Store Code])
Measure SSTD: = SUM ([Achieve_SSTD]) / COUNT (Sheet2 [Store Code])
Measure CTA: = SUM ([Achieve_SSTD]) / COUNT (Sheet2 [Store Code])
Measure Perfect_Store: = SUM ([Perfect_store]) / COUNT (Sheet2 [Store Code])



Source : [13]
Fig 6. Display Form Measure

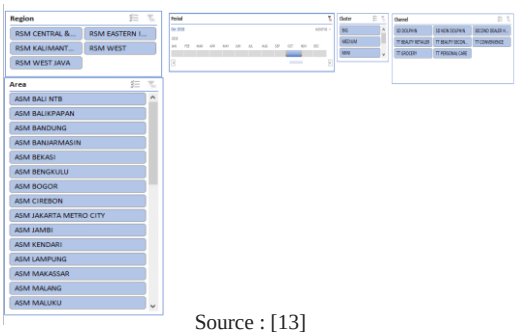
4. After the measure has been made, drag and drop it into the axis values, and change the format measure to percentage by clicking measure and selecting the value fields setting



Region	Score_OSA	SCORE_NPD	SCORE_PROMO	SCORE_SSTD	SCORE_CTA	SCORE_PS
RSM CENTRAL & EAST JAVA	65,68%	89,38%	94,95%	90,64%	90,43%	60,19%
RSM EASTERN INDONESIA	65,37%	82,10%	89,20%	85,51%	88,33%	60,70%
RSM KALIMANTAN	86,64%	97,54%	98,31%	95,39%	97,08%	82,95%
RSM WEST	69,52%	90,67%	93,58%	85,03%	88,06%	59,64%
RSM WEST JAVA	58,91%	87,12%	92,66%	85,82%	88,49%	53,00%
Grand Total	65,61%	88,68%	93,63%	87,99%	89,66%	59,46%

Source : [13]
Fig 7. The Result Of Drag And Drop Measure

5. Creating filtering or slincer dimension Region, area, channel, cluster and Period, the more data it is, the more difficult it is to read and evaluate data. OLAP presents filtering or slincer for the data displayed.



Source : [13]
Fig 8. Display of Slincer Dimension

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

After the process is complete, we will see the appearance of OLAP that is built and can know quickly the score compliance perfect store in the region. In the region table there are sub dimension areas, which can be seen which are the lowest and the highest perfect store area.

Based on the report region of RSM Central Java & East Java, the results of its perfect store score were 60.19%. The highest perfect store score is found in the Yogyakarta Asm area with a perfect store score of 75.00% and the lowest area in Surabaya North Asm with a perfect store score of 47.37%

Sumber : [13]

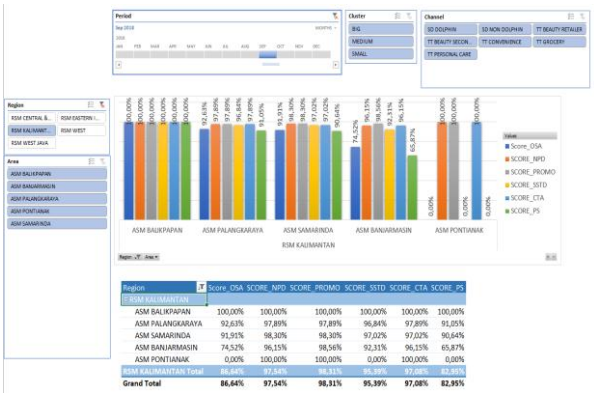
Fig. 9 OLAP Perfect Store processing results for the RSM Central & East Java region

Based on the report region of RSM Eastern Indonesia, the results of its perfect store score were 60.70%. The highest perfect store score is found in Maluku ASM area with a perfect store score of 81.08% and the lowest area in Bali NTB Asm with a perfect store score of 44.69%

Source: [13]

Fig. 10 OLAP Perfect Store processing results for the RSM Eastern Indonesia

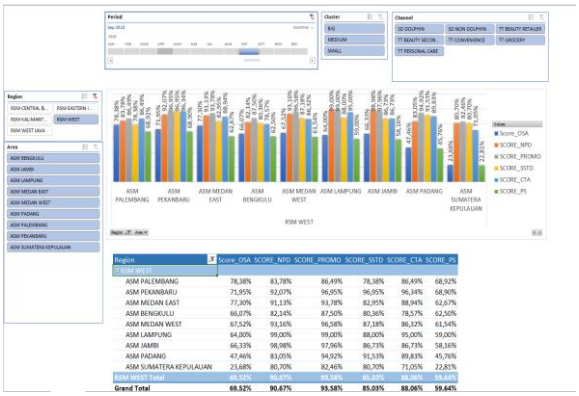
Based on the report region of RSM Kalimantan, the results of its perfect store score were 82.95%. The highest perfect store score is found in Balikpapan Asm area with a perfect store score of 100,00% and the lowest area in Bali NTB Asm with a perfect store score of 0.0%



Source : [13]

Fig. 11 OLAP Perfect Store processing results for the RSM Kalimantan

Based on the report region of RSM West Indonesia, the results of its perfect store score were 59,64%. The highest perfect store score is found in Balikpapan Asm area with a perfect store score of 68,92% and the lowest area in Pontianak Asm with a perfect store score of 22,81%.



Sumber : [13]

Fig. 12 OLAP Perfect Store processing results for the RSM West Indonesia

Based on the report region of RSM West Java, the results of its perfect store score were 53,00%. The highest perfect store score is found in Serang Asm area with a perfect store score of 72,11% and the lowest area in Bogor Asm with a perfect store score of 30,77%.

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Sumber : [13]

Fig. 13 OLAP Perfect Store processing results for the RSM West Java

Overall, the national perfect store score compliance score is 59.46% where the West Java RSM region has the lowest perfect store score with a value of 53.00% and the Central & East Java RSM region has the highest perfect store score with value of 60.19%

Sumber : [13]

Fig. 14 OLAP Perfect Store processing results for national

V. CONCLUSION

OLAP (Online Analytical Processing) method is able to analyze large amounts of data quickly so that it can know the perfect store score in each region and area. the results of data processing with OLAP methods in the form of graphs and tables that can be used and facilitate leaders in making sales decisions and strategies in the future. From the 5 kpi conducted by the audit, the kpi that affects the perfect store is at OSA kpi. The results of OLAP method data processing, the highest perfect store region score results obtained in the RSM Kalimantan region with a value of 82.98% and the lowest perfect store region score found in the RSM West Java region with a value of 53.00%. This research still needs to be developed including in determining dimensions and measures so that the data analyzed can be broader. Product information and visibility where non-reasonable in each store covered by the distributor also need to be added as a criterion in analyzing the data. Furthermore, it is expected that OLAP applications can be integrated directly with OLTP applications on the company, so to display the report just choose the menu that has been prepared and the report can be directly displayed according to the analysis needs.

ACKNOWLEDGMENT

Thank you for the presence to Allah SWT, because of his blessing that this research can be completed well. I gratefully thank to PT. Unilever because we have provided support and opportunity to conduct research. We also thank you to all those who have helped and provided support to us, which we cannot mention one by one, so that this research can be completed. I hope this research can be developed and can be useful for many parties.

REFERENCES

[1] B. Santosa, "ANALISA PEMROSESAN DATA SECARA ONLINE (ONLINE ANALYTICAL PROCESSING / OLAP)," *Telematika*, vol. 1, no. 10, pp. 71–78, 2013.

[2] R. Akbar, E. Yuliani, and Q. Mawaddah, "Analisis Data Penjualan Perusahaan Detergen XYZ dengan Aplikasi Zoho Reporting Menggunakan Metode OLAP (Online Analytical Processing)," *J. Edukasi dan Penelit. Inform.*, vol. 3, no. 1, pp. 71–75, 2017.

[3] A. H. Widaningrum, "Analisis Data Peminjaman Bank Menggunakan Metode OLAP (Online Analytical Processing)," *J. Inform. Upgris*, vol. 4, no. 1, pp. 117–119, 2018.

[4] A. Johar, A. Vatresia, and L. Martasari, "APLIKASI BUSINESS INTELLIGENCE (BI) DATA PASIEN RUMAH SAKIT M . MENGGUNAKAN METODE OLAP (ONLINE ANALYTICAL PROCESSING)," *Rekursif*, vol. 3, no. 1, pp. 12–22, 2015.

[5] R. Akbar, E. Yuliani, Q. Mawaddah, and dan F. Ardhana, "Analisis Data Penjualan Perusahaan Detergen XYZ dengan Aplikasi Zoho Reporting Menggunakan Metode OLAP (Online Analytical Processing)," *J. Edukasi dan Penelit. Inform.*, vol. 3, no. 1, p. 72, 2017.

[6] A. S. Kusumo, *Intelegensi Bisnis SQL Server 2014*, Pertama. Jakarta: Elex Media Komputindo, 2017.

[7] I. M. D. A. B. Joni and M. Nurudin, "PENERAPAN OLAP UNTUK MONITORING KINERJA PERUSAHAAN," in *Seminar Nasional Sistem Informasi Indonesia*, 2013, pp. 441–447.

[8] A. K. Hamoud and T. A. S. Obaid, "Using OLAP with Diseases Registry Warehouse for Clinical Decision Support," *Int. J. Comput. Sci. Mob. Comput.*, vol. 3, no. 4, pp. 39–49, 2014.

[9] A. Supriyatna, "SISTEM ANALISIS DATA MAHASISWA MENGGUNAKAN APLIKASI ONLINE SISTEM ANALISIS DATA MAHASISWA MENGGUNAKAN APLIKASI ONLINE ANALYTICAL PROCESSING (OLAP) DATA WAREHOUSE," *J. Pilar Nusa Mandiri*, vol. XII, no. 1, pp. 62–71, 2016.

[10] A. Cucus and Rosita, "Implementasi OLAP Untuk

Journal Publications & Informatics Engineering Research
Volume 3, Number 2, April 2019
DOI : https://doi.org/10.33395/sinkron.v3i2.10030
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Efektifitas Pelaporan Data (Studi Kasus Data Dosen dan Karyawan)," *Explor. - J. Sist. Inf. dan Telemat.*, vol. 8, no. 1, pp. 1–6, 2017.

[11] A. Nugroho, "APLIKASI OLAP PROFIL MAHASISWA DAN LULUSAN," *J. Simetris*, vol. 9, no. 1, pp. 533–540, 2018.

[12] T. D. Puspitasari and B. Etikasari, "Metode Online Analytical Processing untuk Sistem Informasi Tracer Study," in *Seminar Nasional Inovasi dan Aplikasi Teknologi di Industri 2019*, 2019, pp. 24–28.

[13] A. Maulana and D. A. N. Wulandari, "ANALISIS DATA PERFECT STORE DI PT. UNILEVER DENGAN MENGGUNAKAN METODE OLAP (ONLINE ANALYTICAL PROCESSING)," Jakarta, 2019.