

**DEVELOPING BUSINESS INTELLIGENCE DASHBOARD BASED ON DATA  
WAREHOUSE USING PENTAHO FOR PROCUREMENT PROCESS WITH BUSINESS  
DIMENSIONAL LIFE-CYCLE METHODOLOGY FOR PUBLIC CORPORATE  
INDONESIAN BUREAU LOGISTIC DIVRE JABAR**

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**Abstract**

In the agricultural sector, rice is the staple food of Indonesian society is important and can not be replaced. The price of rice became a barometer for other prices. If the price of rice goes up then the price of other goods would also be affected, thus leading to instability in various fields. Divre was important to meet rice supplies in each province. Then performance of divre should be monitored to see its development. Monitoring procurement performance with a look of fulfillment divre subdivre, realization contract partners and availability of goods that can be measured in value through realization of contract, is there divre are able to meet rice procurement in accordance with the target planning. Developing business intelligence using pentaho on the procurement process with business methods dimensional life-cycle is required to monitor procurement performance. By using the business intelligence, data contract realization divre particularly from aspect of performance availability and fulfillment of goods displayed into the dashboard. Dashboard of performance availability and fulfillment of goods are visualized informatively, so executive manager can read data more quickly and easily in monitoring and evaluating performance of appropriate rice procurement divre compliance of contract.

**Keywords:** Business Dimensional Life-Cycle, Business Intelligence, Data Warehouse Procurement of Rice, Pentaho, Dashboard, Perum Bulog Divre Jabar

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**Abstrak**

*Dalam sektor pertanian, beras merupakan bahan makanan pokok masyarakat Indonesia yang penting dan belum bisa tergantikan. Harga beras menjadi barometer bagi harga-harga lainnya. Jika harga beras naik maka harga barang lainnya juga akan terkena dampaknya, sehingga menimbulkan ketidakstabilan diberbagai bidang. Divre berperan penting untuk memenuhi persediaan beras pada tiap provinsi. Maka kinerja divre perlu dimonitor untuk melihat perkembangannya. Memonitor pengadaan beras divre dapat dilakukan dengan melihat performa pemenuhan subdivre, realisasi kontrak mitra kerja dan ketersediaan beras yang hal ini dapat diukur nilainya melalui realisasi kontrak, apakah divre mampu memenuhi pengadaan beras sesuai dengan target perencanaan. Pengembangan business intelligence menggunakan pentaho pada proses procurement dengan metode business dimensional life-cycle diperlukan untuk memonitor performa pengadaan. Dengan menggunakan business intelligence, data realisasi kontrak divre khususnya dari aspek performa pemenuhan dan ketersediaan barang ditampilkan menjadi dashboard. Dashboard dari performa pemenuhan dan ketersediaan barang divisualisasikan secara informatif, sehingga executive manager dapat membaca data dengan lebih cepat dan mudah dalam memonitor dan mengevaluasi kinerja divre pengadaan beras sesuai realisasi kontrak.*

**Kata Kunci:** Business Dimensional Life-Cycle, Business Intelligence, Data Warehouse, Pentaho, Dashboard, Perum Bulog Divre Jabar

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**1. Introduction**

In agriculture sector, rice is one of important foodstuff for Indonesian society and has not been able to replaced, although in fact there was another foodstuff replacement. The price of rice became a barometer for other prices, if the price of rice had increased, then the other foodstuff prices had an effect, thus create fluidity in many aspects. Divre was important to meet rice supplies in each province. Then performance divre need to be monitored to see its development. Procurement performance monitoring of fulfillment divre and subdivre, realization of the contract partners and the availability of goods that can be measured in value through the realization of the contract, whether divre able to meet rice procurement in accordance with the target planning.



Figure 1 Rice procurement data in 2010 to 2015 (Bulog, 2015)

Based on rice procurement data of Perum BULOG divre jabar in 2010 to 2015, the actual provision which done by Perum BULOG divre jabar had not accordance with the target that determine by national government except in 2012. Amount of target and realization have significant differences each year. The largest different was in 2014 that 59% of national government target had not fulfilled. These differences occur because Perum BULOG divre jabar has not had a good procurement system. They have not a good system yet because Perum BULOG divre jabar has not system that can help in making decision related to rice procurement. In making decision related to procurement of rice, Perum BULOG divre jabar still using intuition from procurement division. Because of improper planning which done by Perum BULOG divre jabar will create several problems such as increase of price of rice because due to rarity and over stock that lead rice rotten.

One important factor in determining the company's business strategy is about decisions made by the company. In this case, the decision on Perum BULOG divre jabar need done based on facts and information. The information obtained from the operations of rice procurement covers demand of rice procurement, partner contracts, rice procurement contracts, realization of rice procurement, goods receipt, acceptance of the bill until payment level that gained from ERP adempiere system. With ERP adempiere system, have not been able to monitor the entire procurement activities according to executive manager needs. Related those problems, Bulog divre Jabar requires analytical systems that can help to analyze and manage the data into an information that can be used as an auxiliary decision making in setting the rice procurement planning. So Bulog divre Jabar is not only using the intuition on planning related to procurement of rice, but also using system which based on data.

**2. Basic Theory and Research Method**

**2.1. Business Intelligence**

Business Intelligence (BI) is a collection of activities to get an understanding and insights about a business by performing various types of analysis on the company data as well as on external data from third parties

to help make strategic, tactical, and operational business decisions and take the necessary actions to improve business performance [1].

2.2. Business Intelligence Dashboard

Dashboard is a business intelligence application that give a quick high-level summary of business performance in graphical gadgets, typically gauges, charts, indicators, and color-coded maps. By clicking these gadgets, we can drill down to lower-level details. Dashboard applications that are based on a data warehouse are typically updated daily, but sometimes weekly or monthly, depending on how frequently business performance measurements are required. Real-time dashboards are becoming increasingly popular, querying data from operational systems rather than from a data warehouse [1].

2.3. Procurement Business Intelligence

For many companies, procurement is a critical business activity. Effective procurement of products at the right price for resale is obviously important to retailers and distributors. Procurement also has strong bottom line implications for any organization that buys products as raw materials for manufacturing. Significant cost savings opportunities are associated with reducing the number of suppliers and negotiating agreements with preferred suppliers. A flurry of procurement transactions, such as purchase requisition purchase orders, shipping notifications, receipts, and payments [2].

2.4. Business Dimensional Life-Cycle

Business Dimensional Life-Cycle is an approach in building a data warehouse. A sequence diagram explaining the required tasks ranging from planning, requirements, design, development, and implementation of effective data warehouse, as figure 2.6 [2]:

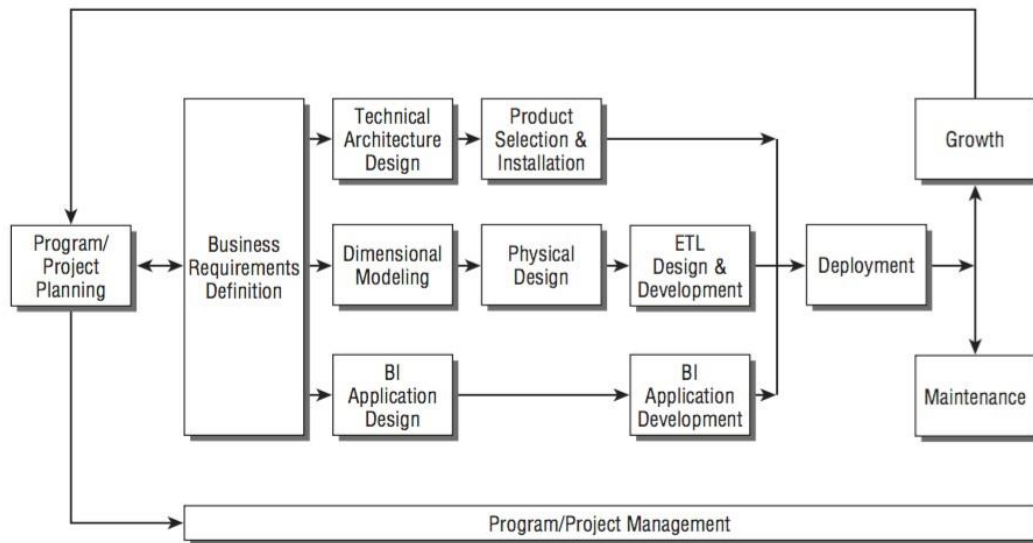


Figure 2 Business Dimensional Life-cycle [2].

3. Discussion

3.1 Research Systematic

In conducting this research is necessary to think logical flow that has a clear direction, regular and systematic in solving the problem surface. So that flow would be useful in achieving the goals that have been set. Figure 3 illustrates research systematic in developing business intelligence based on data warehouse using pentaho with business dimensional life-cycle methodology

RESEARCH SYSTEMATICS

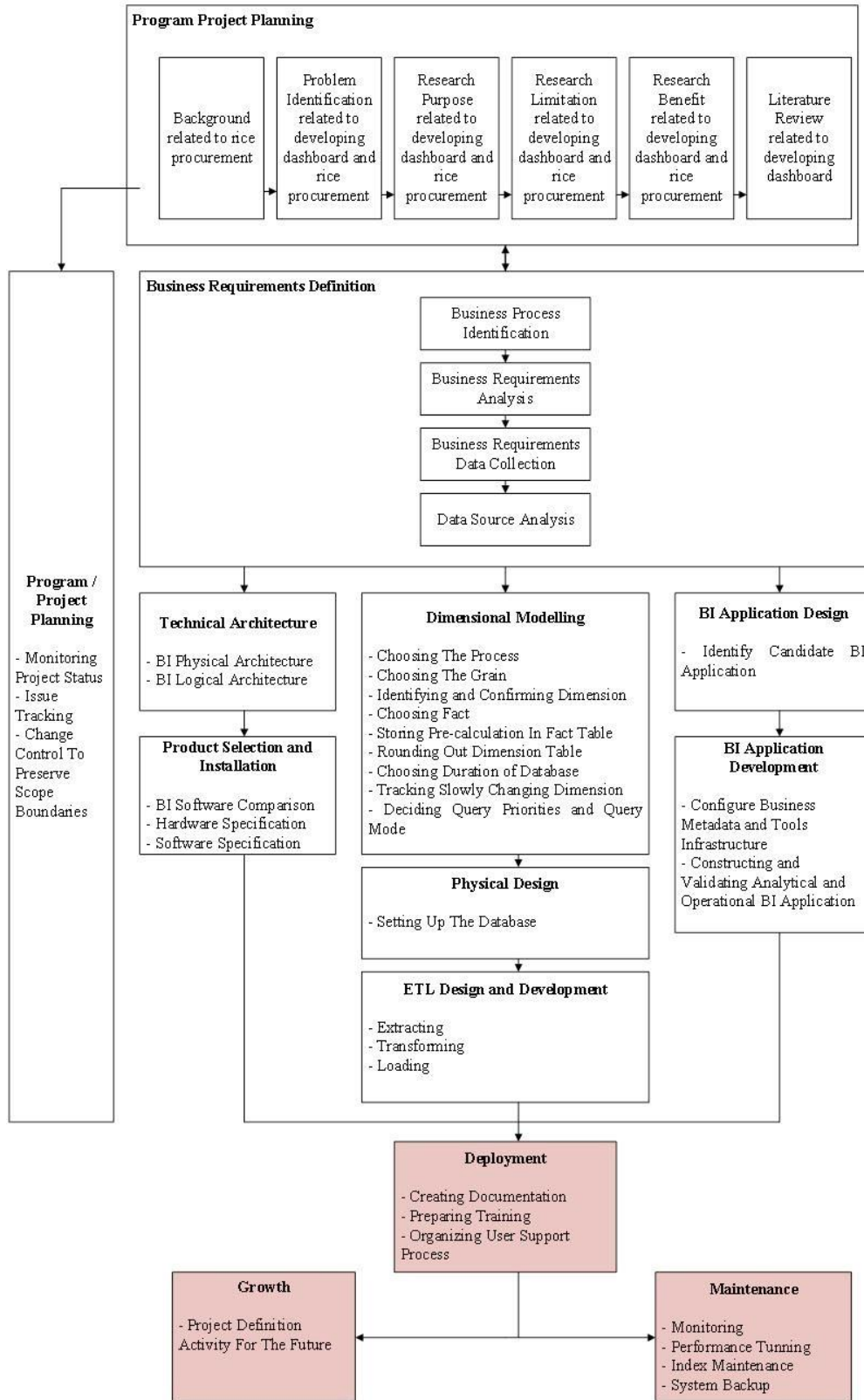


Figure 3 Research Systematic

3.2 Business Process

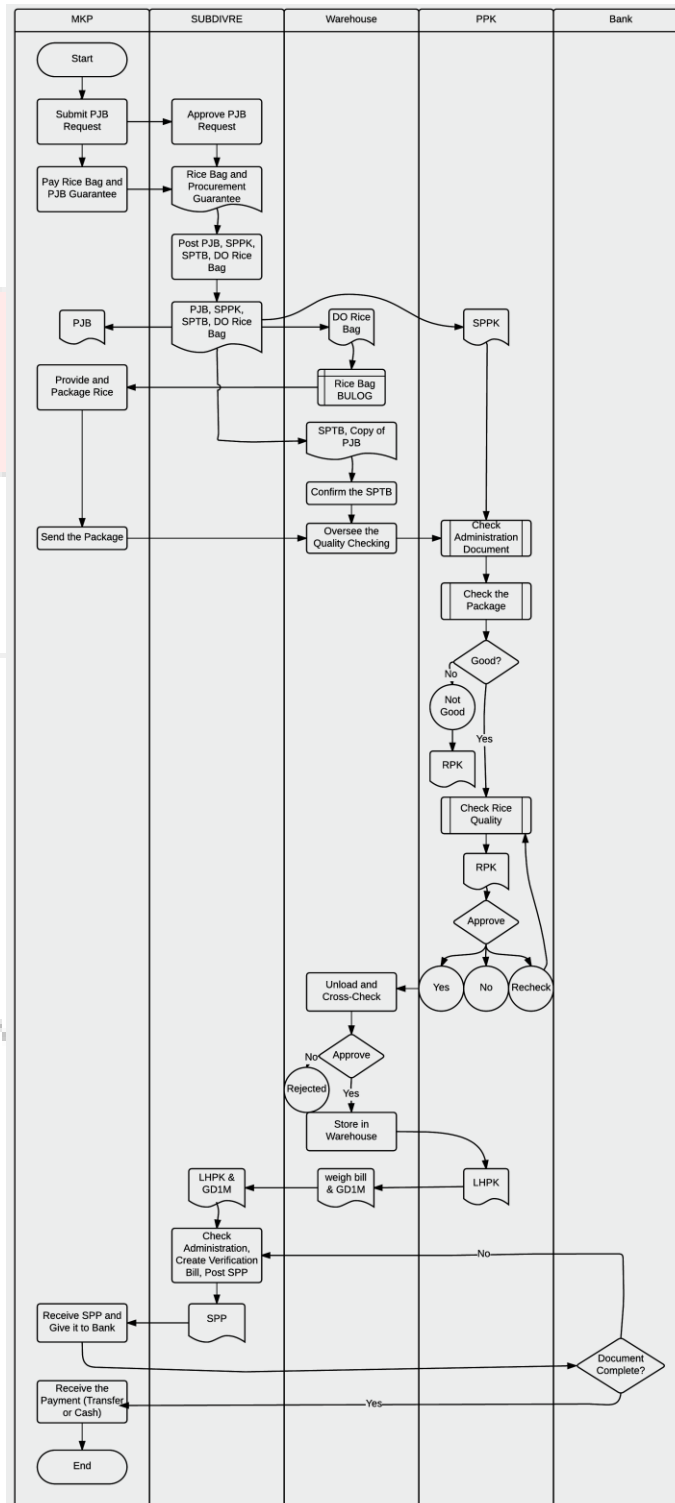


Figure 4 Business Process Procurement Perum BULOG Divre Jabar

This research was conducted on the business processes on identification process of procurement division that runs at Perum BULOG divre jabar. Rice procurement process consists of several stages, starting with the partner doing the purchase order (PJB) and subdivre with sending limit, price and quantity agreed. By receiving PJB, partners can purchase plastic sack in accordance with agreed quantity. The next step is part of subdivre issued warrant of surrender of goods (SPPB) to partners and warrants received goods (SPTB) to warehouse. The stuff up in the storage will do quality checks (RPK). The results of quality checks in form of quality inspection results Sheets (LHPK) with eligible or not eligible or re-check. Eligible items will be done weighing (Nota Timbang) before it is entered into warehouse. Goods that have been entered into warehouse weighed (GDIM). The last process is partners receive a warrant payment (SPP) which was submitted to the disbursements section. Some of the actors who played the procurement business processes against rice on perum BULOG divre jabar consists of, MKP, Subdivre, Warehouse, PPK and the bank. In Figure 4, is a business process in the process of procurement of rice in Perum BULOG divre Jabar.

### 3.3 Key Performance Indicator

In this research, there are several sources of data that has been collected. Data needs are identified based on the needs of the top level management of the Procurement Division Perum BULOG divre jabar which are made in the form of key performance indicator (KPI) related procurement of rice in table 1.

Table 1 Key Performance Indicator (KPI) Rice procurement of Perum BULOG divre jabar.

Objective	Key Performance Indicator	Measurement
Evaluating rice procurement performance of divre jabar		
Fulfillment	Percentage of rice procurement target compliance divre annually	Percentage
	Amount of rice procurement target fulfillment divre monthly	Ton
	Amount of rice stocks availability at west java region	Ton
Evaluating rice procurement performance each subdivre		
Fulfillment	Percentage of rice procurement target compliance subdivre annually	Percentage
	Amount of rice procurement target fulfillment subdivre monthly	Ton
	Amount of rice stock availability on each subdivre	Ton
	Amount of rice stock availability on each warehouse	Ton
Evaluating rice procurement performance of partner		
Fulfillment	Amount Of Fulfillment Quantity	Ton
	Amount Of Contract Fulfillment	Ton
	Amount of partner delay monthly	Number

### 3.4 Schema

The draft design of the model of the selected dimension to Perum BULOG divre Jabar is a star schema. This is because the star schema is easily understood and used by users than other schemes. The Figure 5 shows star schema of Perum BULOG divre Jabar:

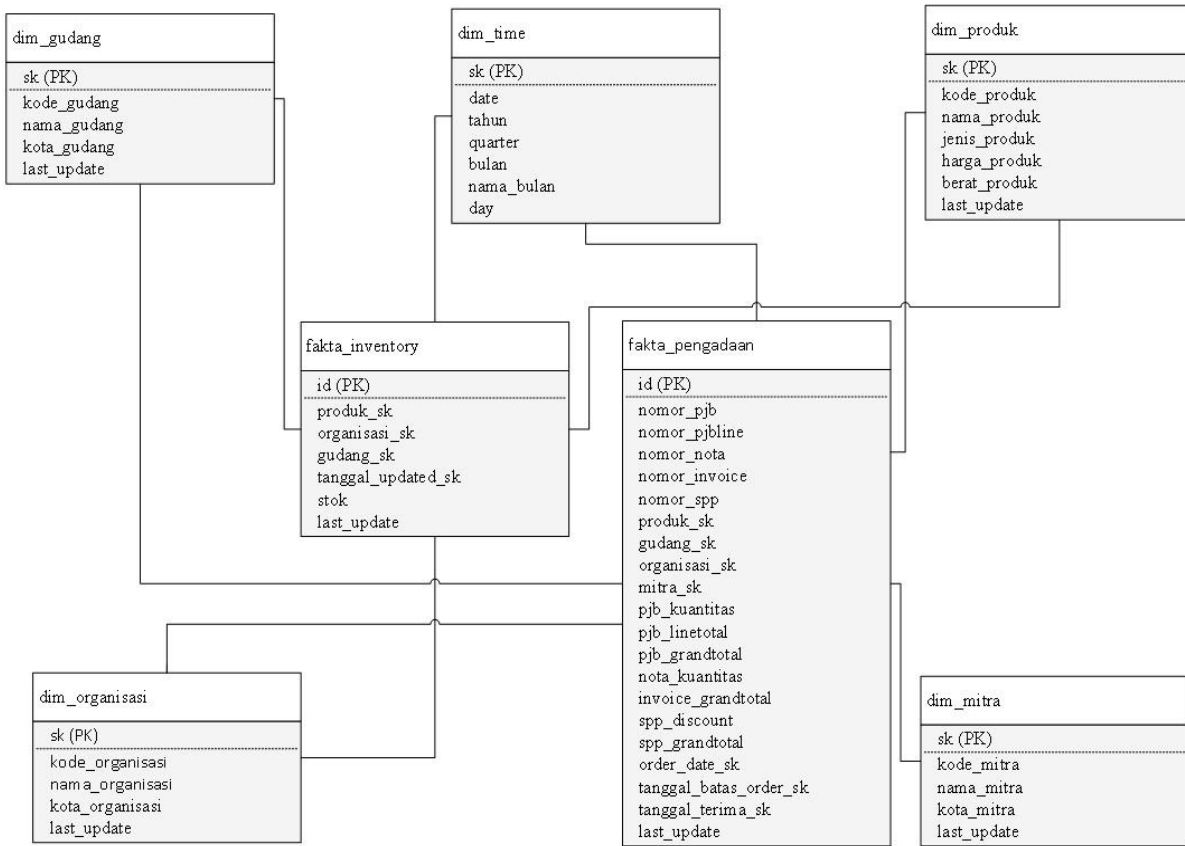


Figure 5 Star Scema Perum BULOG Divre Jabar

### 3.5 ETL Process

On ETL design and development specifies data source and mapping table and field that used in ETL process for data warehouse in Perum BULOG Divre Jabar. The source database is ERP Adempiere database.

## 4. Conclusions

Based on development of business intelligence procurement process conducted on Perum BULOG divre jabar, it can be drawn that are Developing dashboard to monitor performance of rice procurement include percentage of fulfillment divre and subdivre, percentage of realization partners contract and rice stock availability done by ETL process and database queries using pentaho software so procurement data able to visualized through the dashboard. Integration of dashboard with ERP Adempiere system was done by taking data source from ERP Adempiere database for procurement process then, loaded into data warehouse through ETL process.

### Bibliography

- [1] Rainardi, V. (2008). *Building a Data Warehouse: With Examples in SQL Server*. (K. Winquist, Ed.) New York, United States of America: Springer-Verlag New York, Inc.
- [2] Kimball, R., & Ross, M. (2013). *The De nitive Guide to Dimensional Modeling* (Third Edition ed.). Indianapolis, Indiana: John Wiley & Sons, Inc.

