DEVELOPMENT OF BUSINESS PERFORMANCE MANAGEMENT AT THE MINISTRY PUSLITBANG JALAN AND JEMBATAN KOTA BANDUNG

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ABSTRACT

A division of the program and cooperation is one of division in the public works ministry puslitbang roads and bridges in the city of bandung .During this puslitbang having some of the process of a very potential to be integrated with the support of technology .In implementation found several problems which are in the processing of data to multidimensional and indicators in measuring the success of the company .So that these problems can be handled it takes a draft busines performance management in terms of cooperation can optimize the use of existing data as an alternative solution in looked at the success and decision-making .

An analysis of the data used namely data processing using oltp , using data storage mart , olap the process to the spread of the information , the determination of kpi busines to the needs of management and performance perspective analysis used with scorecards .All of the data analysis used adapted to the state of the environment company .This research strategy produce busines design performance management for the managerial that can be used to be helped give alternative solutions and the means of making decisions on the existing problems .In addition can also be used as the process presentation of information required by the managerial.

Keyword : *bussines performance management,datamart,* OLAP , KPI , *Scorecard*

1. INTRODUCTION

The ministry of public works puslitbang roads and bridges is one of the government non-profit in bandung. Their activities in this institution having business processes very potentially to can be integrated with the support of processing technology but the data have not well integrated. Because it needed a data processing that multi-dimensional and a performance measurement work , to the development of the performance of work better and help improve the image of companies .

1.1. Business Performance Management(BPM)

Business performance management (BPM) is a system or method used to design , integrating , analyze and control the process of the business operationalization to help improve the performance of work in an organization or company .The term business performance management (BPM) actually referring to 4 it is the business of the process , methodology , metriks and technology that can be used by companies to measure , monitor and manage performance business. The following is the advantage that gathered in implementing the bpm, among them:

1. Productivity increasing organization.Activity will run more smoothly and more efficient after modeled and otomation.
2. Can detect and fix problems , as downtime , bottleneck , and inefficient use of resources , quickly .Auditing and monitoring that uses real time data obtained in the process of being walked make the detection of an earlier and faster on a problems .
3. Improve the performance of cooperation between the department and with external organizations .
4. Improve control on the activities of the organization .At any time , snapshot of the work being worked can be seen.
5. Have precise information about the company performance to support the decision quickly.Using a balance scorecard in real time, the company performance could be quickly.
6. Save time with automation the manufacture of documentation and information required.

1.2. Datamart

Data mart was a mechanism for data storage and a miniature data warehouse to support the need for a particular at a unit a division or departement in the company.Data mart has two theories using our best to tackle the data. Datamart has three main model namely dimensional models , relational models , and hybrid models every existing data in general occupies one of the three models the data.

1.3. OLAP

Olap is a method of specialized to conduct an analysis of data on a database and then presented to user on demand .Olap data showing a table in a dynamic , who will automatically summarizing the

data into several slices of different data and allow the user to in interactive doing the calculations and making the format of a report. A tool for making the table itself, that is by doing a drag on the line.A user could change the report and menggolongkannya according to the wants and needs a user, olap engine and will automatically calculate a new data.

1.4. Balanced Scorecard

Balanced scorecard as an tools for measuring the performance of a business entity is a guide who right in the face of competition.Scorecard consisting of two words namely scorecard and balanced. Scorecard used to measure the performance of a person as well as an enterprise.The score cards can also be used to plan a score who were just about to be realized in future. Word balanced (balanced) intended to show that personnel measured performance from two aspects is a balanced financial and non financial , the short term and long term , internal and external . Balanced Scorecards measure based on performance factors critical success so that the information produced and directed the implementation process can be monitored using the level of accomplishment key performance indicator (KPI). Performance measurement used in balanced scorecard is a translation vision and strategy from the company , so that it result be pertinent and is beneficial to the process of system management company. In non-provit organization balanced scorecard also looked at from three perspectives

1. Customer perspective
2. Internal process business perspective
3 . Learning and growth perspective

1.5. KPI (*Key Performance Indicator*)

Kpi as a measure or an indicator that will provide information as far as which organization or company has managed to create a strategic target has been set .In preparing kpi an organization or company should menentapkan performance indicators clear , specific and measurable. There are 6 components kpi, determinants among them:

1. Strategy
   Strategy is the determination of the purpose of the strategy in order to realize the purpose of the company
2. Target
   Target is the determination of the success of the company , like sitting to be achieved
3. Range
   Range is the determination of the value of a target , whether the target of what we want to achieve them is above or below the target we have set early
4. Encoding
   Encoding is visualizing performance in the form of color , suppose of red to the state of emergency , yellow and green safe in accordance with regular percentase or other complex rules
5. Time Frame
   The target to be achieved by the skeleton of determined when must be settled .Usually determined by the determination of the deadline in an interval of time the smaller
6. Benchmark
   Benchmark is a reference for measuring in based on the basis of the target of previous or also can use in external measure [15].

1.6. Dashboard

Dashboard is one category of business intelligence applications that in real time will be monitoring a variety of information required by an organization or company . Dashboard can also represent kpi and scorecard other or aspect in data processing company in the environment . Dashboard always in one view, but can also be adapted to the needs of user, decision-making scope, and preference other visual. Dashboard will follow a pattern of scorecards , then there will be various kinds of dashboard as dashboard strategic to senior executives , dashboard operational to middle management , and tactical dashboard to the manager of the lower level . Dashboard this is all the objectives and targets will be linked to needed .The main objective of a dashboard is to present data is organized making it easier for parties the decision makers in decision-making. There are some stunning dashboard as graphical gadgets , typically gauges , charts , indicators , and color-coded maps [15] .

2. CONTENTS OF THE RESEARCH

2.1 Method of development

Method of development on PU Pusjatan is :

1. *Requirement analysis and definition*
   The requirement analysis and the definition is doing collecting data to the study of literature and live interview
2. *System and software design*
   The system design and software design is to make data , interface design , the design of scorecards , design and other work done after the needs of a complete collected .
3. *Implementation and unit testing*
   Unit testing and implementation phase is the implementation of the design stage formed into line those of the program based on previous ditentuka programming that has been
4. *Integration and system testing*

The integration and testing system is the bond of units of the program into a unity of the system later in the overall.

5. *Operation and maintenance*

Phase operation and maintenance is performing maintenance , like error correction that is not previously found in phases of testing system .

2.2 Data Sources

The source of that is used in building bpm this is from the operational division co-operation and the associated with the mou.

2.3 Strategic necessity information systems

Strategic information that is applied is part of the needs of companies and determined by the company itself .

2.4 Dimension and Fact Business

Viewed from the strategic used then we can create a model of business.This is a dimension of the table and used, based on the information its strategic.

1. Dimensi waktu
2. Dimensi Belanja
3. Dimensi Kerjasama
4. Dimensi Jasa
5. Dimensi Pasar
6. Dimensi Jenis_lingkup
7. Dimensi Partner
8. Fakta Pengeluaran
9. Fakta Kerjasama_partner
10. Fakta Alokasi

2.5 Data Stagging

At this stage will be done or commonly called extract etl process , transform , and load . The process of etl dimension and the facts to any table .To detail the process can be seen in Figure 2.1

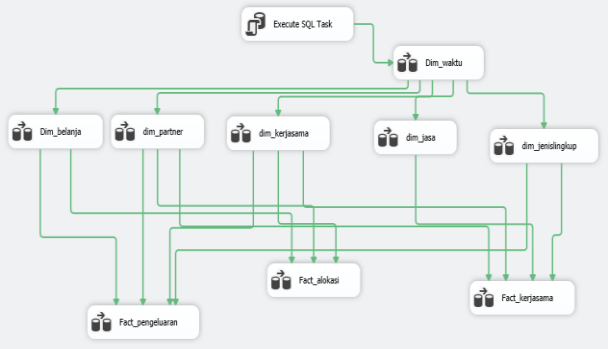


Figure 2.1 ETL Process

Figure 2.1 is staging control flow data from the process carried out to the flow of data from the source to a destination.The following explanation of any task done in the process of etl in Figure 2.1

1. *Preparing SQL*

Sql is a task execute this task which built an order to clean the data with regard to relationships between table in a database of interconnected in the mart .In use in the task this is a drop and create all the table , view , and function ' procedure .

2. Dimensi Waktu

Dimensi waktu formed based on source of table that has attributes the time namely table detail _ cooperation and merupakam the realization of the process of analysis of the dimensions of business .Each of the data used in the extraction , the transformation , and in the fit to table the dimensions of the time .A picture 2.2 describe the flow of data occurred on the dimensions of the time .

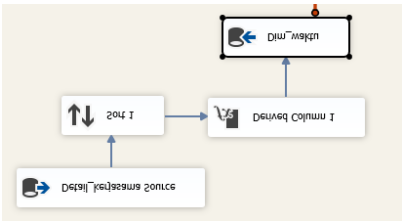


Figure 2.2 Dimensi Waktu

3. Dimensi Belanja

Dimensi_belanja formed based on analysis of the dimensions of the business of dim _ belanja .Each of the data source of needed in the extraction , the transformation , and in fits into the dimensibelanja .Figure 2.3 describe the flow of data occurred on the dimensi_belanja.

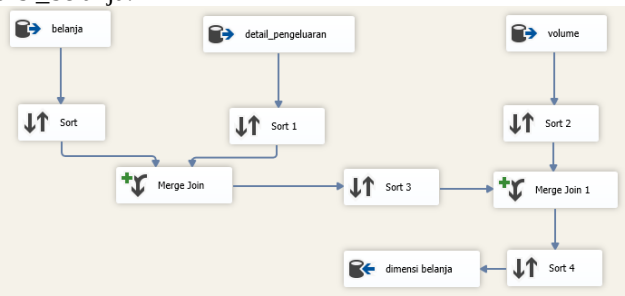


Figure 2.1 Dimensi Belanja

4. Dimensi Partner

Dimensi_partner formed in accordance with the dimensions of dim_ partner based on source of table table partner _ partner city and provincial.2.4 describe pictures of flow of data occurring in dimension partners.

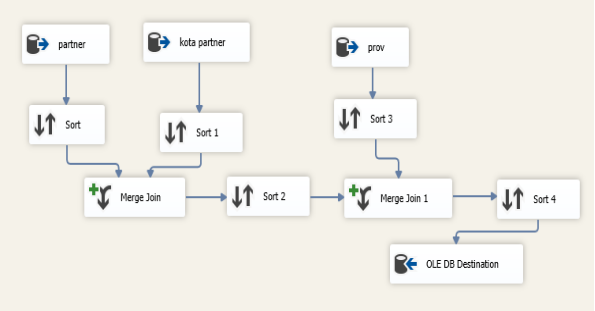


Figure 2.2 Dimensi Partner

5. Dimensi Kerjasama

Dimensi_kerjasama established in accordance with the analysis of the dimensions of dim _ cooperation based on source lingkup_kerjasama from the table .Figure 2.5 describe the flow of data occurred on the dimensions of cooperation .

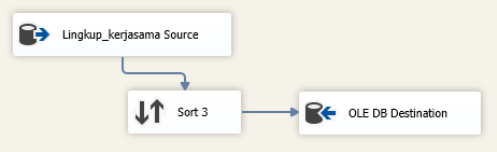


Figure 2.3 Dimensi Kerjasama

6. Dimensi Jasa

Dimensions jasa constituted in accordance with an analysis dimensions dim_jasa on the basis of the table a source of merit.Figure 2.6 describe the data stream that occurs in dimension services.

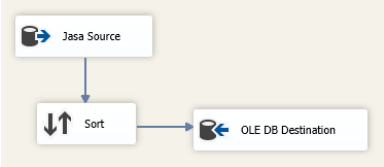


Figure 2.4 Dimensi Jasa

7. Dimensi Pasar

The dimensions of the market established in accordance with the analysis of the dimensions of dim_pasar from the table based on market sources . describe the flow of data occurred on the dimensions of the market .

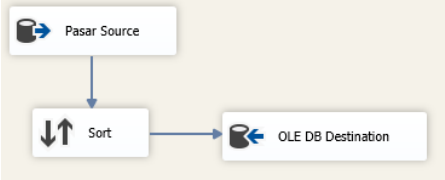
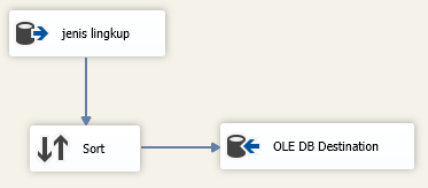


Figure 2.5 Dimensi Pasar

8. Dimensi Jenis Lingkup

Dimensions jenis_lingkup constituted in accordance with an analysis dimensions dim _ jenislingkup virtue of table a source of a kind of ruang_lingkup .described the data stream that occurs in dimension jenis_lingkup.



Gambar 2.6 Dimensi Jenis Lingkup

9. Fakta Pengeluaran

A fact indicating all expenditure expenditure formed from table volume, table detail _ pengeluaran, table belanja, table alokasi, table table detail _ kerjasama, table partner, table kota_partner, table _ provinsi and table the kerjasama that is in the source and the results from table lookup dimensions that has been formed. the flow of data describe what happened in fact expenditure.The following is the data flow from table fact pengeluaran

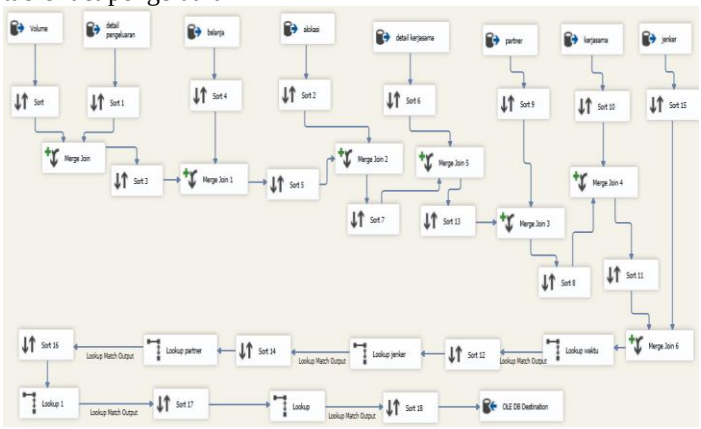
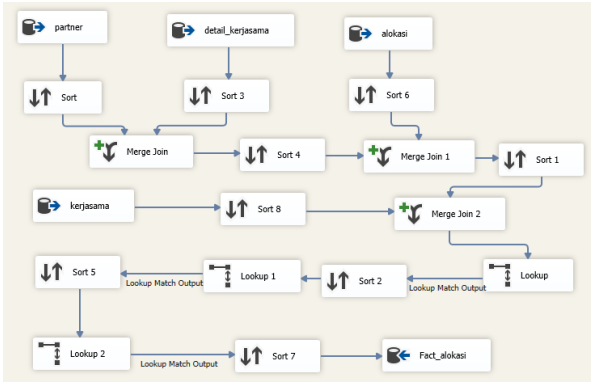


Figure 2.7 Fakta Pengeluaran

10. Fakta Alokasi

Fakta alokasi shows the allocation of funds and the total allocation of funds that has formed from the table provinsi , table kota _ partner , table partner , tables alokasi , table detail _kerjasama, and table lingkup_kerjasama, in the source and the results of a table lookup dimension that has been formed .Error !Reference source not found . Describe the flow of data occurred in the allocation of fact .Error !Reference source not found . Is a picture of the data flow from the fact the allocation of .

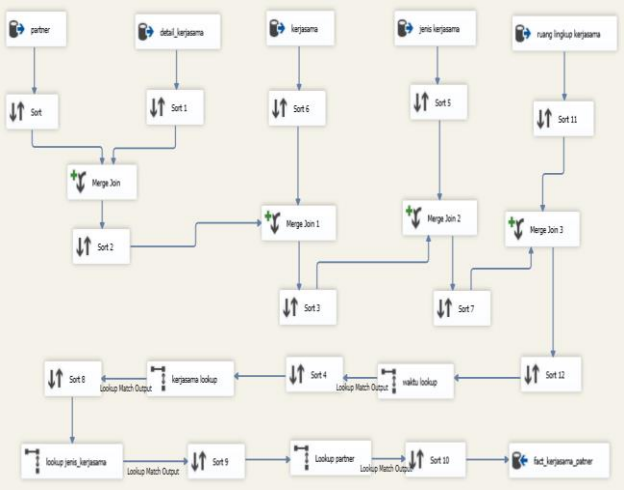


Gambar 2.8 Fakta Alokasi

11. Fakta Kerjasama Partner

Fakta_kerjasama show cooperation partner and formed from the table jasa , table pasar , table partner , table alokasi, table detail_kerjasama , and table lingkup_kerjasama , in the source and the results of a

table lookup dimension that has been formed .Figure 2.11 describe the flow of data occurred in fact kerajsama_partner.



Gambar 2.9 Fakta Kerjasama Partner

2.6 OLAP dan Reporting Tools

OLAP presented a lot of data in the form of multidimensional in order to become easier to an analysis of any information .In this research , OLAP is a method that used pivoting as a method that allows users to see a value in the layout of different sake of our analysis and other supporting decision-making . OLAP process used by using a process slicing & dicing and the process of roll up & drill down in accordance with needs strategic information used.

a. OLAP process for coorperation

An assumption that is used manager want to know the spread of a kind of cooperation and cooperation partner. OLAP process that could be used for your information, this is strategic.

1. *Roll up* used to see the number of cooperation which is woven summary of every year .. Figure is a sample for coorperation table that already through the roll up process.

Tahun	Jenis Kerjasama			
	Kerjasama Implementasi	Kerjasama Komersialisasi	Kerjasama Litbang	Kerjasama Publikasi
2015				
2014				
2013				
2012				
2011				
2010				
2009				

Figure 2.10 *Roll Up* Coorperation

2. *Drill down* used to see detail the number of cooperation which is woven and cooperation partners every year . Figure is an example for coorperation table that already through the drill down process.

Tahun	Jenis Kerjasama
	Kerjasama Implementasi
2015	
Bandung	
2014	
Gorontalo	

Figure 2.11 Drill Down Coorperation

3. Slicing & Dicing used to see type of coorperation and partner for every year. Figure is a type coorperation sample for every year.

Tahun	Jenis Kerjasama			
	Kerjasama Implementasi	Kerjasama Komersialisasi	Kerjasama Litbang	Kerjasama Publikasi
2015				
Bandung				
2014				
Gorontalo				

Figure 2.12 Slicing & Dicing Coorperation

b. OLAP processing for expenditure

The assumption used is the manager wanted to know the amount of expenditure in accordance with established partners.

1. Roll Up used to view the summary amount of spending on shopping on each partner ineach year according to the type of cooperation and in scope. Figure is an example of a table of expenditures that have been through the process of roll up.

Tahun	Kerjasama Implementasi			Kerjasama Komersialisasi		
	1	2	3	1	2	3
2015						
2014						
2013						

Figure 2.13 Roll Up expenditure

2. Drill Down is used to view the details of the amount of expenditure incurredeach year. Figure 2.16 is an example of a table of expenditures that have been through the process of drill down.

Tahun	Kerjasama Implementasi			Kerjasama Komersialisasi		
	1	2	3	1	2	3
2015						
Balitbang						
2014						
FSTP						

Figure 2.14 Drill Down expenditure

3. Slicing & Dicing used to view spending this type of cooperation and coorperation scope thing that issued the most expenditure amounts each year. Figure 2.17 is an example of a table of expenditures that have been through the process of slicing & of dicing.

Tahun	Kerjasama Implementasi		
	1	2	3
2015			
Balitbang			
2014			
FSTP			
2013			

Figure 3.15 Slicing & Dicing expenditure

c. OLAP processing for allocation

The assumptions used are the manjer wanted to know the amount of allocation funds spending, whether appropriate or not.

1. Roll Up summary used to see the number of the allocation each year. Figure 2.18 is an example of a table of expenditures that have been through the process of roll-up.

Tahun	Kerjasama Implementasi	Kerjasama Komersialisasi	Kerjasama Litbang	Kerjasama Publikasi
2015				
2014				
2013				

Figure 3.16 Roll Up allocation

2. Drill Down is used to view the details of the allocation in accordance with thetype of cooperation. Figure 2.19 is an example of a table of expenditures that have been through the process of drill down.

Tahun	Kerjasama Implementasi
2015	
1	
2014	
2	

Figure 2.17 Drill Down allocation

3. Slicing & Dicing used to view the allocation on each scope for each year. Figure 2.20 is an example of a table of expenditures that have been through the process of slicing & dicing.

Tahun	Kerjasama Implementasi	Kerjasama Komersialisasi	Kerjasama Litbang	Kerjasama Publikasi
2015				
1				
2014				
2				

Figure 2.18 Slicing & dicing allocation

After drill down & roll up, slicing & dicing process next is giving the coloring on the pivot table will be displayed. There are 3 staining in the pivot table is used.

1. White, used to indicate that the data are on a minimum measure.
2. Yellow, used to indicate that the data is in the middle position of the measure.
3. Green, used to indicate that the data is at the maximum position of the measure.

2.7 KPI (*Key Performance Indicator*)

KPI is an indicator of company in looking at the performance of the company. KPI isderived from strategic data, information, and interviews that have been done, but not all of the needs of strategic information referable to specify KPI because not all the information can be used as a reference for strategy. A KPI is determined by the needs of the company and the company's indicator on. The aspects used in KPIS covers 6aspects that value or the target has been determined by the company and in accordance with the regulations of the company before. Figure 2.21 is the KPI that is used.

No	Strategi	Target	Range	Encoding	Time frame	Benchmark
1	Jumlah kerjasama litbang yang di jalin	10	0-10 tidak baik , 11-25 baik	tidak baik baik	1-3 tahun	Jumlah kerjasama litbang yang di jalin dalam setiap bulan harus mencapai 5 kerjasama
2	Jumlah kerjasama komersialisasi yang di jalin	10	0-6 tidak baik, 7-15 baik	tidak baik baik	1-3 tahun	Jumlah kerjasama litbang tidak dihitung menurut jenisnya
3	Jumlah kerjasama implementasi yang dijalin	10	0-9 tidak baik, 10-25 baik	tidak baik baik	1-3 tahun	Jumlah kerjasama litbang tidak dihitung menurut jenisnya
4	Jumlah kerjasama publikasi yang dijalin	10	0-9 tidak baik, 11-25 baik	tidak baik baik	1-3 tahun	Jumlah kerjasama litbang tidak dihitung menurut jenisnya
5	Jumlah mitra kerjasama yang dijalin dalam satu tahun	20	0-30% baik, 31-60% cukup baik , 61-100% baik	tidak baik cukup baik baik	1-5 tahun	Jumlah kerjasama litbang yang di jalin dalam setiap bulan harus mencapai 5 kerjasama
6	Jumlah kerjasama baru setiap tahun	10	0-10 cukup baik , 10-25 baik	cukup baik baik	1 tahun	Jumlah kerjasama litbang yang di jalin dalam setiap bulan harus mencapai 5 kerjasama
7	Jumlah kerjasama yang telah berhasil dijalin sesuai dengan MoU	10	0-30% kurang baik, 31-60% cukup , 61-90% baik	kurang baik cukup baik baik	1-5tahun	Jumlah kerjasama dinilai berhasil dilakukan jika sesuai dengan MoU dan ruang lingkup
8	Jumlah kota yang paling sering menjalin kerjasama	20	0-10 baik, 11-20 cukup baik	tidak baik baik	1 – 5 tahun	-
9	Jumlah kerjasama yang masih dalam masa perjanjian kerjasama	20	0-10 baik, 11-20 cukup baik	tidak baik baik	1 - 5 tahun	-
10	Jumlah ruang lingkup kerjasama yang telah terpenuhi	25%	0-10% cukup baik, 11-25% baik	tidak baik baik	1-5tahun	Kerjasama dinilai berdasarkan ruanglingkup yang ada

Figure 2.19 KPI Table

2.8 Scorecard

In addition to determining the KPI is required as well as a determination of the value of a scorecard that is used, by giving value to each perspective taken. Pespektifscorecard is taken from two perspectives, namely the internal business processes and customers (customer) with a grant of a maximum score. Table 2.1 table of scale is the value of a scorecard, score is a standard score that is given if the performance of all aspects of the company's "good" and this score is derived from the rules of thecompany which have been determined in advance.

Table 2. 1 Rating Scale

Score	Nilai
0-10%	Kurang
11-50%	Cukup
51-100%	Baik

Based on the above, so weighting can be formed a table of criteria scorecard. Table 2.2 table criteria scorecard is used:

Table 2.2 Scorecard Criteria

Perspektif	Sasaran Strategik	Bobot	Ukuran Pemicu Kinerja	Bobot
Perspektif Pelanggan	*Brand Equity*, Meningkatnya kualitas layanan customer, Kepercayaan dan kesetiaan customer	50%	Jumlah kerjasama yang dijalin	25%
			Jenis kerjasama yang paling banyak dijalin setiap tahunnya.	10%
			Jumlah ruang lingkup yang telah dijalin	25%
			kota yang paling sering menjalin kerjasama.	15%
			Jumlah kerjasama yang masih berlaku	25%
			Subtotal	100%
Perspektif Bisnis Internal	Peningkatan Kualitas proses layanan kerjasama	50%	Jumlah pengeluaran	35%
			Jumlah produk puslitbang yang digunakan	65%
			Subtotal	100%
Total		100%	Total ukuran kinerja	200%

Below are described the results of the measurement data and the calculation of any size perspective. The calculation methods used are:

1. Calculate the TPT (the level of fulfillment of the targets) at the strategicmeasurement KPI'S.
   In the calculation of this target and strategic data obtained from the specified KPI table, the following calculation formula.
   Equation :
   If condition is maximum
   When actual > target, then

$$TPT = 100\% - \frac{(\text{actual data} - \text{KPI targets})}{\text{actual data}} \times 100\%$$

   If actual > or >= target then the TPT 100%
   If actual < target, then

$$TPT = 100\% - \frac{(\text{target strategic} - \text{actual data})}{\text{target strategic}} \times 100\%$$

2. Calculate the strategic goals
   These calculations will be calculated on a percentage of the existing strategic goals on the table, the following is a scorecard of calculation formula of strategic objectives.
   Equation:
   Strategic Objectives =
   $\{(KPI1 + KPI2 + \ldots.. + KPIn)\} * B$
   Description:
   KPI = values have been determined from the value of TPT
   N = number of strategic size
   B = srategis target strategic Weights
3. Calculate the perspective
   These calculations will be calculated on a percentage of the perspective used in thetables following is a formula, a scorecard from a calculation perspective.
   Equation:
   Perspektif = (C1 * D1) + (C2*D2)+….+(Cn*Dn)
   Description:
   C = strategic goals
   D = weight of strategic goals
   N = number of strategic goals
4. Calculate the overall performance of the company
   This will be counted in the calculation of a percentage of the whole perspective that has been calculated at the previous stage, here is the formula of calculation of all ofthe company's performance.
   Equation:
   Overall company = (X1+X2)/N
   Description:
   X = Perspective used
   N = number of perspective

3. CLONCLUSSION

At this stage it is described about the conclusions of the research that has been done.

1. BPM System can be used by managers for strategic information to help make adecision.
2. The system of BPM can help in identifying the production management, party performance of the company and the state of the company so that it can be determine the appropriate decisions to increase work efficiency.

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