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# IMPLEMENTATION OF BUSINESS INTELLIGENCE DASHBOARD IN RESEARCH, SERVICE / DEDICATION TO SOCIETY AND COOPERATION

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**Abstract.** Accreditation of department is an education quality measuring standard, such as recognition on department in university for showing about department in university has fulfilled standard or requirement which is assigned by Badan Akreditasi Nasional Perguruan Tinggi (BAN-PT). Accreditation of department has seven standards which one of standard is research, service / dedication to society and cooperation by lecturer and student. Those reasons make University of Bina Darma evaluate, monitor, and fulfill requirement on 7<sup>th</sup> standard. One of solution which can be implemented is business intelligence dashboard. Business intelligence dashboard is an application which has function for collecting, analyzing, saving, and providing required data in organization or company into knowledge, then be used for supporting decision and planning. Business intelligence dashboard is going to be implemented to report of accreditation of department in the University of Bina Darma in accordance with 7<sup>th</sup> standard. On these business intelligence dashboards, University of Bina Darma can fill 7<sup>th</sup> standard efficiently and correctly.

**Keyword :** Accreditation of department, BAN-PT, Dashboard, Business intelligence and 7<sup>th</sup> standard.

## 1. Preface

So rapidly development of university in Indonesia, make government set a university education quality standard, where kind of universities are state university, official university, religious university and private university. These standards become reference and benchmark of quality of university education, called accreditation.

Accreditation is an education quality standard, form recognition of university or department for showing about a university or department has fulfilled standard or requirement that is assigned by BAN-PT. Implementation of accreditation by BAN-PT is done with evaluating a process, performance and correlation with goal, input, process and output from university or department, that are responsible with each university and department. That accreditation is accreditation of department that always do every 5 years.

Research and service / dedication to society, and cooperation is seventh item

that is evaluated by BAN-PT. This standard is a reference of education quality, service / dedication to society and cooperation that is organized and related to develop department. University of Bina Darma has borang team that has job for fulfilling criteria that is set on 7<sup>th</sup> standard. Items that are evaluated on 7<sup>th</sup> standard are department, lecturer, source of research fund and dedication fund, research and dedication of lecturer in the last three years.

After all of items were getting, team started to do data collecting process. Those data are collected in excel form. Team started to do selecting process, evaluating, and calculating that based on standard 7<sup>th</sup> and is set on BAN-PT. Amount of big data that are processed, can be able error in arranging 7<sup>th</sup> standard. This condition always held up performance of team. Whereas those activities are carried out periodically every five years. Therefore, it needed a technology that can help team correctly and efficiently, then reduce error in arranging accreditation.

One of technology can be used for helping those problems is business intelligence. Business intelligence is a system that has function for collecting, analyzing, saving and facilitating data that are needed an organization or company in knowledge form, then are used for supporting decision and planning. With those power, business intelligence can help borang team.

## **2. Research Methodology**

### **2.1 Analysis and Design Method**

Methods are used in this research is business intelligence roadmap[3]. According to Larisa T.Moss's book, business intelligence is divided into analysis method and design method [3].

#### **2.1.1 Analysis Method**

Analysis method that is used consist of seven steps, among others

1. Justification
  - Business Case Assessment  
For designing a business intelligence application, first step that must be done is determine, check or evaluate and collect needed information, such as goal, strategic and aim an organization
2. Planning  
This step has two main activities that are done, they are enterprise infrastructure evaluation and project planning.
  - a. Enterprise Infrastructure Evaluation  
Infrastructure Design that is done is for BI application can run well. This step consists of Technical Infrastructure and non-technical infrastructure.
  - b. Project Planning  
This step is created for design of application that can finish on time.

### 3. Business Analysis

This step has four main activities, they are project requirement definition, data analysis, application prototyping and metadata repository analysis.

- a. Project Requirement Definition  
This step is evaluating of available infrastructure, what they are appropriate with needed infrastructure or not.
- b. Data analysis  
This step is evaluating of quality of data, what they are good quality or not.
- c. Application Prototyping  
This created feature designs that base on needed company, then application is created appropriately with features that are agreed or negotiated in prototype form
- d. Metadata Repository Analysis  
Metadata is designed for saving company contextual information.

#### 2.1.2 Design Method

According to Larissa T.Moss's book, design method that was used, consisted of seven steps, among others[3] :

1. Design
  - a. Database design  
Database design is done for supporting application that is built with creating star schema or snowflake schema.
  - b. ETL design  
This step is done if those data are bad quality. Yet, if data are good quality, so this step does not need to be done.
  - c. Metadata repository design  
This step is done for designing of repository metadata. This is for showing source of database that are used.
2. Construction
  - a. ETL Development  
This step described about process of drawing ETL that was done in creating business intelligence dashboard. This step will do if data are bad quality, and this step won't do if data are good quality.
  - b. Application Development  
This step is creating business intelligence dashboard and result of output or display from that application.
  - c. Data Mining  
It is carried out with clustering technique. If data don't need to cluster, so this this step doesn't need to be carried out.
  - d. Metadata Repository Development  
This step showed display from each metadata repository that were created before in project that based on result of information. Metadata repository consists of OLAP's data.

### **3. Theoretical Basic**

#### **3.1 Dashboard**

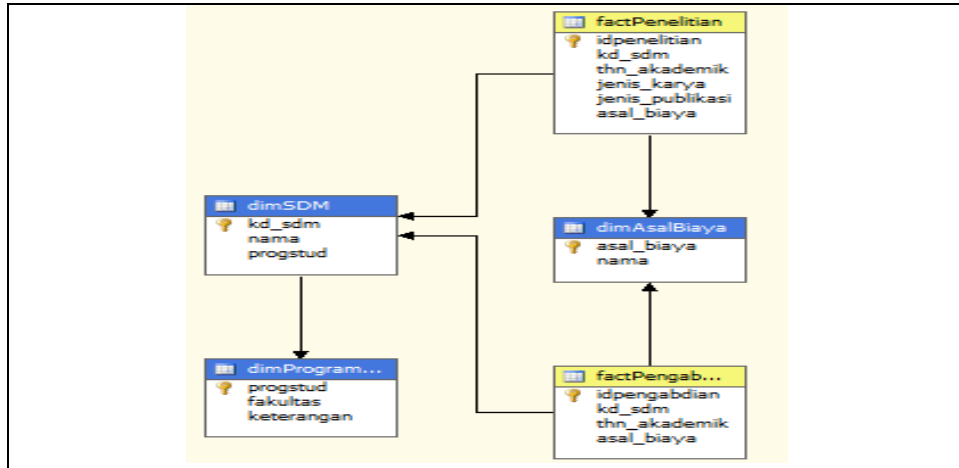
There are several kind of dashboard, according to Rasmussen, Bansal and Chen put forward three types of dashboard[4], among others :

1. Strategic Dashboard  
Strategic dashboard is used for supporting management of strategic level that give information and make business decision, predict chance and give guidance of achievement of strategic goal.
2. Tactical Dashboard  
This dashboard focus on analysis process for determining factor that caused a condition or event.
3. Operational Dashboard  
Operational dashboard has function as supporting and monitoring activities of specific business process. This focus on monitoring activities.

### **4. Result**

Explaining from result of dashboards that are created, among others:

1. Data were taken from sources where data were saved in MySQL database. Those data consisted of 3 tables, factPenelitian table, factPengabdian table and dimSDM table. FactPenelitian table consisted of 1662 data, factPengabdian consisted of 1321 data and dimSDM table consisted of 275 data. Those tables were imported to SQL Server database with using SQL Server Integration Service (SSIS). In SSIS, this also created dimAsalBiaya table from factPenelitian or factPengabdian table, and dimProgramStudi table was from dimSDM. dimAsalBiaya consisted of 8 data and dimProgramStudi consist of 19 data.
2. Those tables were cleaned in SQL Server Integration Service (SSIS).
3. Then those tables were analyzed in SSAS (SQL Server AnalysisService). This step had goal for creating OLAP (Online Analytical Processing). In this step, it consisted of cube and dimension. Cubes consisted of two cubes, penelitian cube and pengabdian cube, whereas dimensions consisted of AsalBiaya, SDM, Penelitian and Pengabdian dimension. If there was attribute that was showed, so it can be added that attribute in data source view to available dimension. it can be seen at picture 1.
4. Then creating dashboard in SSRS (SQL Server ReportAnalysis). This step created dashboards that were designed before with using data source from SSAS that were created before. Display of those dashboard consisted of penelitian table, pengabdian table, penelitian dashboard and pengabdian dashboard. As for result of dashboard display, it can be seen at picture 2,3,4 and 5:



Picture 1 Display Cube

Dashboard Penelitian Dan Pelayanan/Pengabdian  
 Kepada Masyarakat, Dan Kerjasama Di Universitas Bina  
 Darma Palembang

Program Studi : Sistem Informasi

Sumber Biaya Penelitian	2010	2011	2012	2013	2014	Total
Biaya Instansi Sendiri	2	7	13	25	3	50
biaya sendiri	21	15	15	22	11	84
lembaga pemerintah kerjasama		1			1	2
lembaga pemerintah kompetensi			3	11	6	20
lembaga swasta kerjasama			1			1
lembaga swasta kompetensi					1	1
tidak diketahui	1	5	9	10		25
<b>Total</b>	<b>24</b>	<b>28</b>	<b>41</b>	<b>68</b>	<b>22</b>	<b>183</b>

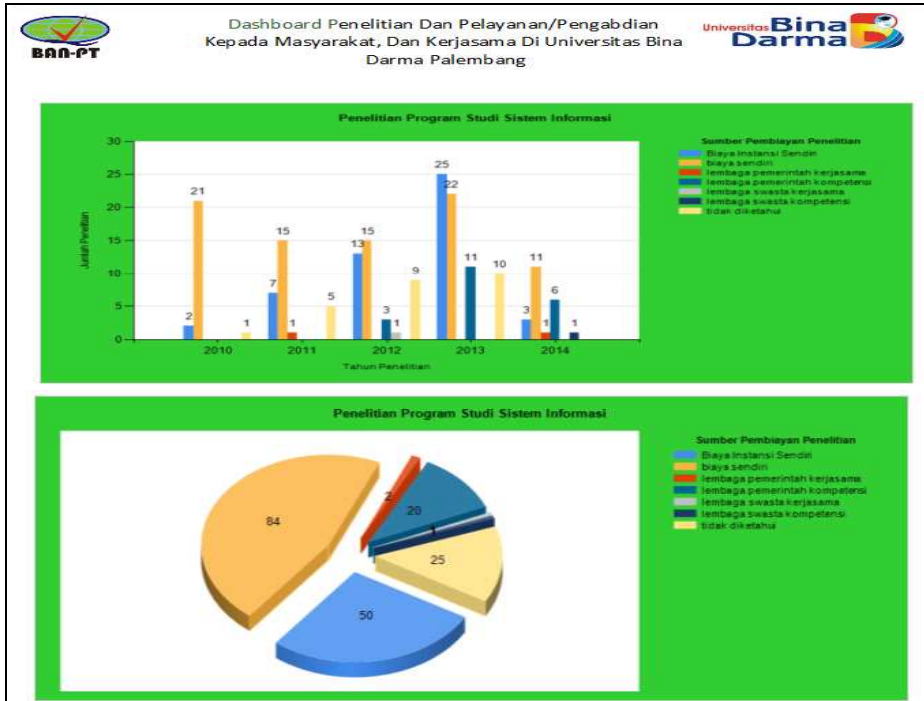
Picture 2 Display Research Table

Dashboard Penelitian Dan Pelayanan/Pengabdian  
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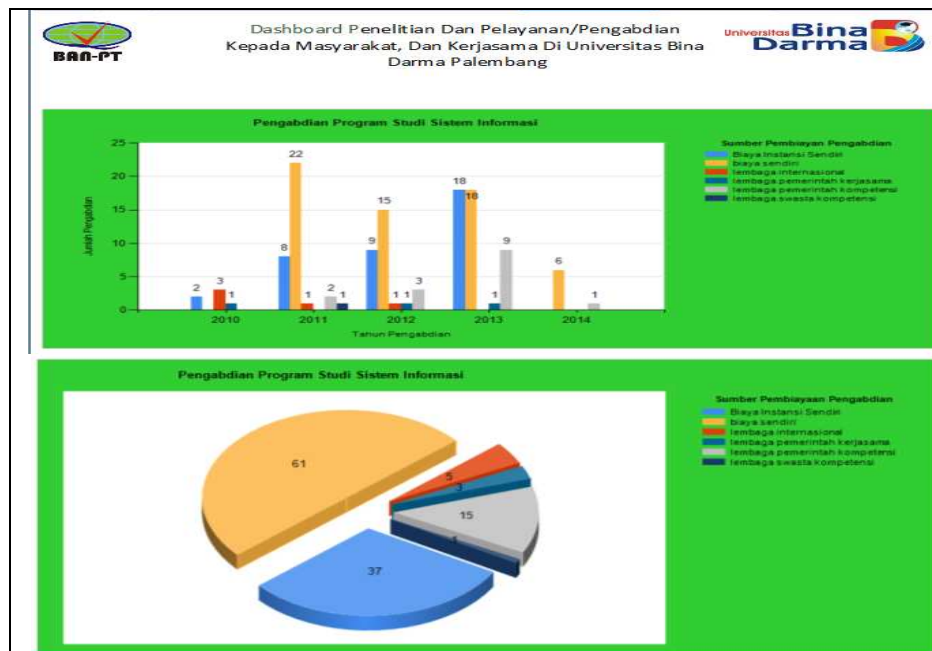
Program Studi : Sistem Informasi

Sumber Biaya Pengabdian	2010	2011	2012	2013	2014	Total
Biaya Instansi Sendiri	2	8	9	18		37
biaya sendiri		22	15	18	6	61
lembaga internasional	3	1	1			5
lembaga pemerintah kerjasama	1		1	1		3
lembaga pemerintah kompetensi		2	3	9	1	15
lembaga swasta kompetensi		1				1
<b>Total</b>	<b>6</b>	<b>34</b>	<b>29</b>	<b>46</b>	<b>7</b>	<b>122</b>

Picture 3 Display Dedication Table



Picture 4 Display penelitian Dashboard



Picture 5 Display Pengabdian Dashboard

5. Result of dashboards that were created, were deployed to reporting server with submitting target of server url. This target was <http://localhost/ReportServer>. Url was run on Internet Explorer.

## 5. Conclusion

Conclusion that can be got from this research, among others:

1. Designing of business intelligence dashboard followed steps or rules on business intelligence roadmap[3]. Business intelligence dashboard can produce informations that contain matrix and table that can help borang team in monitoring research and dedication of lecturer, and giving informations accurately to borang team about lecturer research data and lecturer dedication data in the last five years, accordance with 7<sup>th</sup> standard, that eased team's job and efficiently time.
2. Business intelligencedashboard that were created, consisted of penelitian table, pengabdian table, penelitian dashboard and pengabdiandashboardeach department in University of Bina Darma.
3. Business intelligence dashboard in research, service or dedication and cooperation with lecturer and student of University of Bina Darma, gave information about mount of research and dedication of lecturer department during the last five years.
4. Business intelligence dashboardthat were created were appropriate with goal and advantage, so that borang team easily filled accreditation of department and chief of department could see result of research or dedication on every department.

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