

# Dashboard Marketing System for Student's Enrollment. Case Study : UNIS Tangerang

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Dashboard Marketing System  
Object Oriented Design  
Marketing intelligence  
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## ABSTRACT

The problem were discussed in this study are university management have difficulties in getting report for locations, time and promotions of student's enrollment data. This study was design to develop a dashboard marketing application to solve the problem on university management. The methodology that this study use is experimental methods that consist of 3 methods, from collecting data using interview and requirement elicitation form, designing the system using use case diagram until implementation by creating the application base on PHP, MySQL and fusioncart. Result of this study are by using dashboard marketing system, university have their own student enrollment database where they can trace and evaluate three part of marketing intelligence that is location, time and promotion as marketing channel. Marketing division can segmented their market, while university management can view the result on the dashboard.

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## 1. INTRODUCTION

Most private universities in Indonesia have a problem in generating data and report in student enrollment from marketing division. There are still struggles in findings th effective marketing promotion channels, location and year that has the most student entrance. To have a better decision on leveraging student enrollment, university need to have a multidimesional view of supporting data. That can be archive and design in a form of decision support application. With development of information system technology, this multidimensional view can be generated from an online analytical processing(OLAP).

OLAP refers to the general activity of querying and presenting text and number data from datawarehouses for analytical purposes [1] . The approach divided OLAP into three type,that is Relational OLAP(ROLAP) that perform direct multidimensional analysis of data stored in relational database, Multidimensional OLAP(MOLAP) that create dimensional table of data aggregation and Hybrid OLAP(HOLAP) that combine features of ROLAP and MOLAP [2]. In this research we're using an MOLAP by creating a dimensional table to have a fast insight on multidimensional view of the problem above.

MOLAP is use to provide a dimensional table that will be represented by a dashboard system. While dashboard system is an organization's key performance indicators in graphical presentation of trends and status that easy to read and real-time to enable decision making[3]. Where as Business Intelligence information flow is presented to the manager via a graphics display called Dashboard the same function as a car's dashboard. Specifically, it reports key organizational performance data and options on a near real time and integrated basis [4]. A dashboard system by forester research is as one part of top layer in business intelligence(BI) architectural stack in narrow BI market. Where as BI in a broad definition by forester is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making.

The definition of marketing dashboard is interconnected key perfomance metrics and performance driver for a period of time that can be seen commonly by part of organization[9].The study is defining marketing dashboard with it key performance metric, the roadblock to their use in organization as relationship between marketing expenditure and financial value and framework for adoption of success of

marketing dashboard. The study refer to marketing metric rather than technical issues on how to develop the dashboard system. In other study, dashboard marketing help to guide organization marketing programs with key information and measurement of organizational directions and condition activity[13]. On our research we create a dashboard application for marketing purpose that measure three marketing component using multidimensional OLAP for marketing analytic purpose to find out which time, location and promotion get the highest number of students enrollment in the university.

## 2. RESEARCH METHOD

Research background of this study is shown by the figure below.

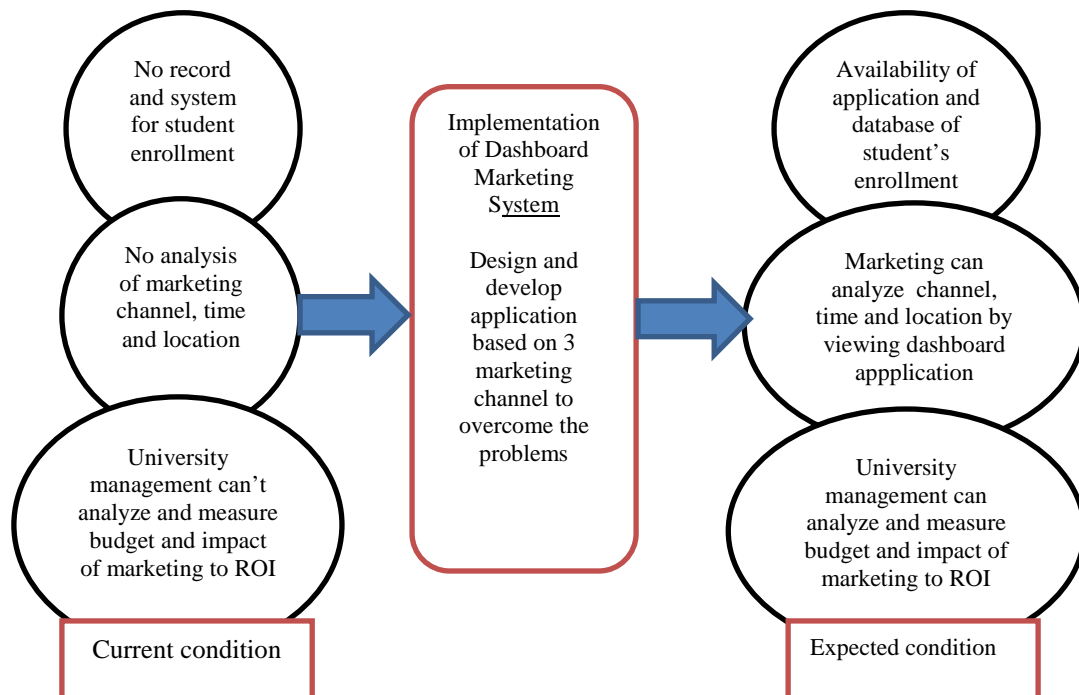


Figure 1. Research methodology

The research methodology were used in this paper is an experimental methods that experiment in developing a dashboard marketing system application using bussines intelligence. This methode consist of several phase as described below.

**Phase 1: Study of metric use in Marketing and OLAP.** This phase involves the identification, understanding and analysis of marketing metrics and OLAP technique. After this phase, the metrics and OLAP technique should be choosen.

**Phase 2: Research of processes to design dashboard.** As the aim of the project is to design a tool that displays the most important information required to achieve objectives defined by a business in a single screen, or dashboard, it is essential to know the best practices of dashboard marketing design and to look for future trends[5].

**Phase 3: Requirement gathering.** This phase involves the identification of user requirement using demand-driven requirement analysis [6]. After this phase, there have to be a requirement elicitation(RE) form of dashboard marketing system design that signed by user and system developer.

**Phase 4: MOLAP server and Dashboard Design .** After having an understanding of the main metrics on marketing measurement,OLAP Techniques, compliance on RE form, and the knowledge and skills to create dashboards, the outcome of this task is a concrete design for dashboard marketing and Analysis System.

**Phase 5: MOLAP Server and MDX development.** This phase involves of creating dimensional and fact table,MOLAP server, MDX and development of script base migration data from another system into mysql database.

**Phase 6: Development of Analysis System.** The tool is expected to displays the most important we information required to achieve objectives defined by a business in a single screen, or dashboard and to be developed in a local intranet environment, hence it can be located in a web, host and be accessed from any place in the world with an Internet connection.

**Phase 7: Testing.** In this phase involves functionality test for the application, desin testing and RE compliance test by user.

All of this research methodology show in the figure below :

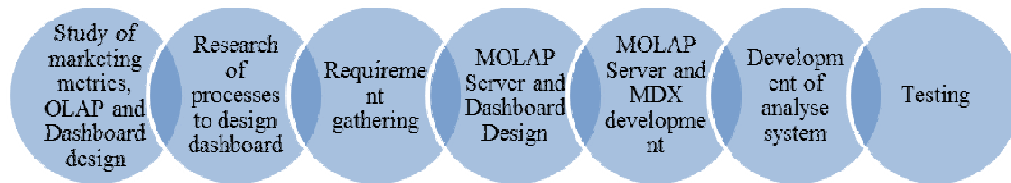


Figure 2. Research methodology

### 3. RESULTS AND ANALYSIS

Application Architectural Design of dashboard marketing system shown by figure below :

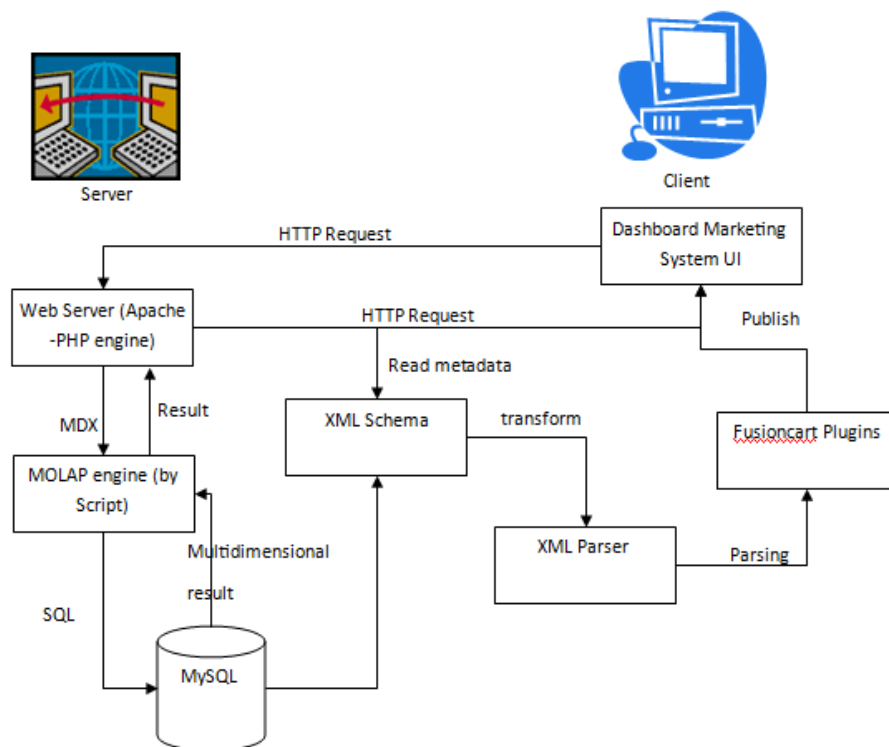


Figure 3. Application Architecture

Figure 3. explained that Client have to login into dashboard marketing system user interface(ui) that will send yang an http request to webserver, then web server continue its in a form of multidimensional query (MDX) to MOLAP engine in a form of view, and continued by SQL syntax to MySQL server, that generate multidimensional result of table in database and send it back to MOLAP engine. From MOLAP engine it will send out the result as MDX result to web server and continue it to DMS application as HTTP response. Processes of data changing are extraction dan transformation done by XML Parser from datawarehouse that sent from XML schema. After extraction and transformation data is load into fusionchart as graphical view of dashboard in DMS application. Schema that we use in MOLAP server is star schema as show in figure below.

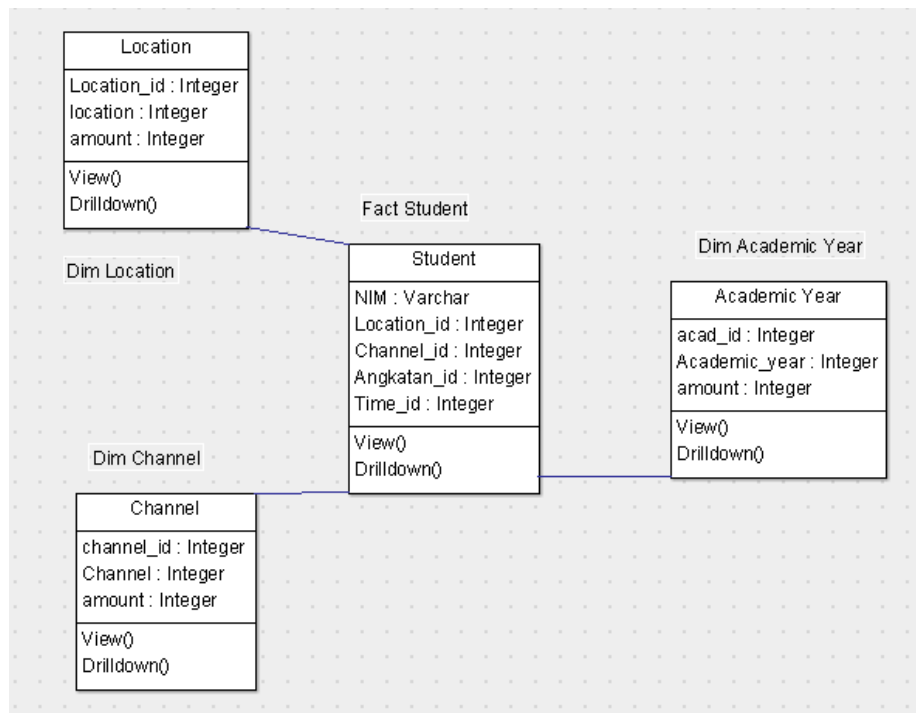


Figure 4. MOLAP Schema

To enter into the application, marketing staff have to login using their name and password, after they login, it will be presented by 4 basic dashboard menu that is overview of all channel and 3 channel division that is per location, channel and per time that can be drill down to view detail and print out b the channell. As shown by Figure 5. below.

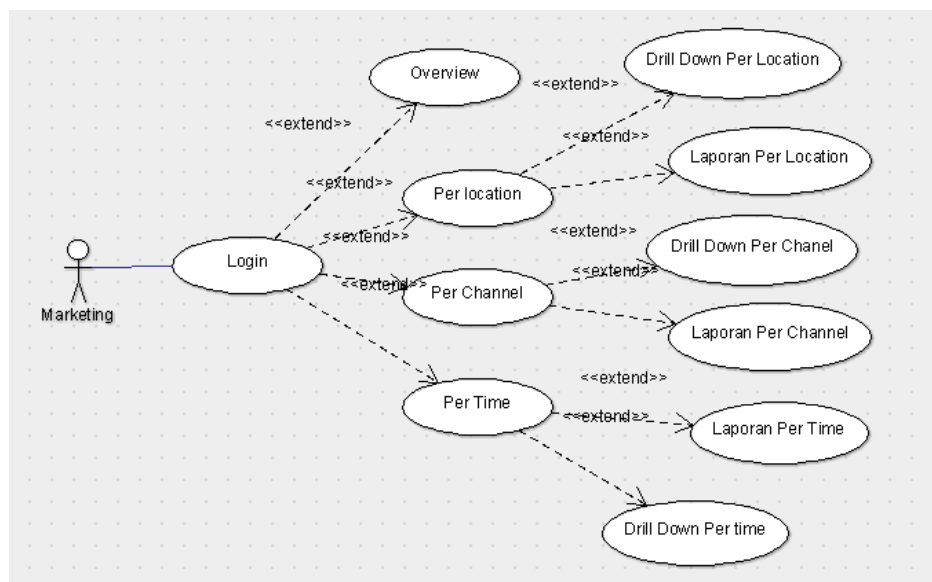


Figure 5. Use case DMS on Marketing Staff

In figure 6., shows the main dashboard marketing system layout that divide three graphical overview of channel, location and academic year overview and one table description of channel overview

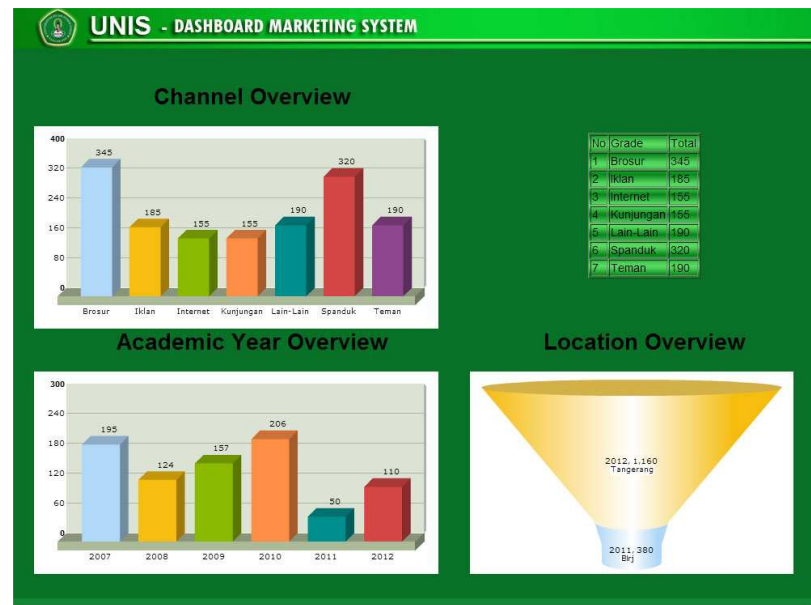


Figure 6. Dashboard Marketing System

In this study, there are 5 type of test were taken that is blackbox testing as unit testing to see if every action of the program react to it, the inter-browser testing using an online browser tester that is browsershots.org with result browser that had the fastest load time is google chrome at  $\pm 17$  seconds while mozilla firefox and opera load with  $\pm 20$  second, for HTML code testing we use [www.validator.w3.org](http://www.validator.w3.org) stating that the code is in conformity with the standards of WWW, for PHP code testing we use SimpleTest application from [simpletest.org](http://simpletest.org) which states that no problems with this application php code and for load time tests we use an online website tester that is loadimpact.com with result of  $\pm 25$  second load time from multiple locations .

By using dashboard marketing system, all data of student's enrollment will be capture in a database and presented in graphics to make marketing division easier in deciding about effective promotion channel, more suggested, accurate and segmented marketing location and overview of academic years with the highest students enrollment number. For universities management, it will be easier to analyze data to support a holistic view on budgeting and return of investment calculation for marketing activity especially on student enrollment mapping and promotion. The result of data analysis from this study are; the most gained marketing channels are through traditional channel that is using brochure and spanduk, the highest student entrance location is on kota Tangerang and time of academic year with the highest students are 2010 and 2007. For further studies, this research can be reference to develop dashboard with more comperhensive marketing metric, using different OLAP techniques or to develop the research more to mobile or cloud computing application.

#### 4. CONCLUSION




University management have difficulties in getting report on location,time and promotion data on student's enrollment by marketing division. That related to calculation of budget and return of investment analysis for marketing activities. In this study dashboard marketing system application is developed to help marketing division of an educational institution, in analysing students entrance data and for universities management to have a sight or snapshot of data marketing channelling, student location and summarize division of student enrollment by academic year. With this system, user have a basic framework of marketing metric on three basis which are time, location and promotion as an analytic tool to have a better decision making on marketing activities in an educational institution.

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