

**DATA WAREHOUSE SCHEMA FOR MONITORING KEY  
PERFORMANCE INDICATORS (KPIS) FOR UNIVERSITY  
TEACHING AND LEARNING USING GOAL ORIENTED  
APPROACH**



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APPROACH**

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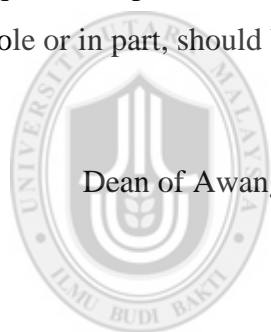
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## Abstrak

Pertumbuhan dan pembangunan universiti sama seperti pertumbuhan-pertumbuhan lain, bergantung kepada kebolehan mereka untuk merancang dan melaksanakan pelan induk pembangunan secara strategik yang juga selaras dengan visi dan misi yang telah dinyatakan. Secara terasnya, kenyataan-kenyataan ini yang sering dirangkumi dalam matlamat dan sub-matlamat dan dikaitkan dengan pihak yang terlibat adalah lebih baik sekiranya diukur melalui Petunjuk Prestasi Utama (KPI). Di universiti-universiti yang mengendalikan data sederhana besar dan pelbagai, perkembangan dan penggunaan gudang data adalah sangat penting. Secara khususnya, Universiti Utara Malaysia (UUM) masih belum mempunyai gudang data untuk memantau Petunjuk Prestasi Utama (KPI) bagi organisasinya. Dengan ini, kajian ini mencadangkan skema gudang data digunakan untuk memastikan KPI universiti dari segi KPI pengajaran dan pembelajaran dengan menggunakan Analisis Keperluan Matlamat bagi Gudang Data KPI (ReGADaK) yang merupakan kesinambungan daripada analisis serta reka bentuk keperluan berorientasikan matlamat (GRAnd). Skema yang dicadangkan merangkumi fakta-fakta, dimensi, ciri-ciri dan langkah-langkah unit pengajaran dan pembelajaran UUM. Langkah-langkah daripada analisis matlamat unit ini berfungsi sebagai asas bagi membangunkan KPI universiti yang berkaitan. Skema gudang data yang telah dicadangkan dinilai melalui semakan dan kajian pakar, prototaip dan penilaian dari segi kebolehgunaan. Hasil daripada proses penilaian menunjukkan bahawa skema gudang data yang dicadangkan adalah sesuai untuk KPI universiti dari segi pemantauan KPI pengajaran dan pembelajaran dan ia jugadianggap sebagai sesuatu yang boleh dilaksanakan.

**Kata kunci:** skema gudang data, berorientasikan matlamat, petunjuk prestasi utama, Universiti Utara Malaysia



Universiti Utara Malaysia

## Abstract

The growth and development of universities, just as other organisations, depend on their abilities to strategically plan and implement development blueprints which are in line with their vision and mission statements. The actualizations of these statements –which are often abstracted into goals and sub-goals and linked to their respective actors –are better measured by defined key performance indicators (KPIs). And in universities that handle modestly large and heterogeneous data, development of data warehouse is important. Specifically, Universiti Utara Malaysia (UUM) is yet to have a data warehouse for monitoring its organisational KPIs. This study therefore proposes a data warehouse schema for university’s KPIs for teaching and learning KPIs using a Requirement Goal Analysis for Data Warehouse KPI(ReGADaK)approach which is an extension of goal-oriented requirement analysis and design (GRAnD). The proposed schema highlights the facts, dimensions, attributes and measures of UUM’s teaching and learning unit. The measures from the goal analysis of this unit serve as basis of developing the related university’s KPIs. The proposed data warehouse schema is evaluated through expert review, prototyping and usability evaluation. The findings from the evaluation processes suggest that the proposed data warehouse schema is suitable for university’s KPIs for teaching and learning KPIs monitoring and practicable.

**Keywords:** data warehouse schema, goal-oriented, key performance indicators, Universiti Utara Malaysia



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# CHAPTER ONE

## INTRODUCTION TO THE STUDY

### 1.1 Overview

This chapter serves as the introductory part of this study. It establishes the motives of the study, its underlying problem statement, its significance. The research questions and objectives to be attended to are also elicited. In summary, the background of this study is laid for further discussion on how the concept of business intelligence can be used to develop a data warehouse schema that is usable in monitoring the Universiti Utara Malaysia's key performance indicators (KPIs) by using Goal-oriented requirement analysis and design methodology (GRAnD).

### 1.2 Background of the Study

A university is a place that houses students from diverse backgrounds. These students come from every part of the globe for the purpose of knowledge acquisition and learning. Universities serve as places to cultivate thought process and where inquiries are provoked for discoveries to be made and verified (Altbach, Reisberg&Rumbley, 2009). Universities, as the topmost knowledge creation community, are always with their respective vision and mission statements. These vision statements are the university goals and they are periodically designed and revisited in line with the university future and the path to be taken for its actualization (The University of Edinburgh Strategic Plan: 2012- 2016). Universities, just as other organisations, are expectedly passionate about the actualizations of their goals and attainment of their visions. This has undoubtedly brought a fair apprehension to the decision making process of the organisation, and the need to

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