

**DEVELOPMENT OF KEY PERFORMANCE INDICATOR (KPI)  
REPORTS FOR WATER BILLING SYSTEM IN  
BUSINESS INTELLIGENCE APPLICATION**

**RAFED S. AL-JBOWRRY**

**UNIVERSITI UTARA MALAYSIA  
2011**



**KOLEJ SASTERA DAN SAINS**  
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**Universiti Utara Malaysia**

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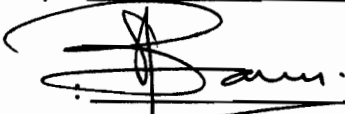
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*(Name of Supervisor)* : **MUHAMAD SHAHBANI ABU BAKAR**

Tandatangan  
*(Signature)* :  Tarikh (Date) : 24/2/2011

Nama Penyelia  
*(Name of Supervisor)* : **PROF. DR. NORSHUHADA SHIRATUDDIN**

Tandatangan  
*(Signature)* :  Tarikh (Date) : 2/3/2011

Nama Penilai  
*(Name of Evaluator)* : **MADAM ALAWIYAH ABD WAHAB**

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## **ABSTRACT**

In today's world, in order to achieve strategic objectives and to track enterprise performance, large amount of data gets analyzed thus becoming an essential business activity to improve decision-making. Key Performance Indicators (KPIs) are associated with specific purpose, so that work progress towards organization's objectives or mission can be measured. However, huge and small business requires such indicators to be carried out in the form of data warehousing (DW)/business intelligence (BI) applications. To develop KPI Reports for Utility Billing Information System (UBIS), which further facilitates activities for Water Billing Department, becomes the main objective of this research. A list of requirements that is needed to develop this kind of reports was identified in order to achieve the stated objective. Furthermore, in order to design and develop DW for UBIS, DW/BI developing process was used, the dimensional model (DM) of the UBIS-KPI was defined and its DW model was designed. Moreover, the prototype of a BI application was developed based on the proposed DW model. To ensure that UBIS user's requirements are satisfactorily met, Computer System Usability Questionnaires (CSUQ) was used to evaluate the prototype. Finally, providing guidance to BI developers and supporting decision making of Water Billing department serves as the key contribution of this study.

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## **LIST OF ABBREVIATIONS**

<b>KPI</b>	<b>Key Performance Indicator</b>
<b>BI</b>	<b>Business Intelligence</b>
<b>CSUQ</b>	<b>Computer System Usability Questionnaires</b>
<b>DW</b>	<b>Data Warehouse</b>
<b>DM</b>	<b>Dimensional Model</b>
<b>ERD</b>	<b>Entity Relational Diagram</b>
<b>ETL</b>	<b>Extract- Transfer-Load</b>
<b>LDM</b>	<b>Logical Data Map</b>
<b>MDX</b>	<b>Multi-Dimensional Expressions</b>
<b>OLAP</b>	<b>On-Line Analytical Processing</b>
<b>OLTP</b>	<b>On-Line Transaction Processing</b>
<b>PWD</b>	<b>Public Work Department</b>
<b>RAD</b>	<b>Rapid Application Development</b>
<b>UBIS</b>	<b>Utility Billing Information System</b>
<b>UBIS-KPI</b>	<b>Utility Billing Information System-Key Performance Indicator</b>
<b>WB</b>	<b>Water Billing</b>
<b>WBS</b>	<b>Water Billing System</b>
<b>WSB</b>	<b>Water Supply Branch</b>
<b>XML</b>	<b>Extensible Markup Language</b>

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Introduction**

One of the main reasons that led to the selection of this study is its concentration towards the subject of developing KPI-reports for WBS using BI applications. In this chapter, we identify the objectives, significance and the scope of this study based on the illustration and study background of the selected field.

### **1.2 Study Background and Motivation**

In order to satisfy the strategic plan and exacting performance goals, performance management is used to trace the organizational progress as well as to monitor the progress of their organization's performance by managers and decision-makers (Kennerley & Neely, 2002). Gorbach et al. (2006), noted that using Key Performance Indicators (KPIs) was one of the recent ways by which, business estimated the health of an activity by measuring its progress against predefined goals. Managers and decision-makers are measuring the success against some pre-defined goals using KPI as the common application in business intelligence (BI) whereby, each KPI has an actual value against a target value that represents the goal. In addition, the goal should be well thought-out to the success of any business or organization. In order to determine the health of an organization, the actual value is compared to the target value. Each KPI can give one aspect of business growth when KPIs are grouped to give the overall health of

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