

REQUIREMENT MODEL FOR WATER BILLING INFORMATION SYSTEM

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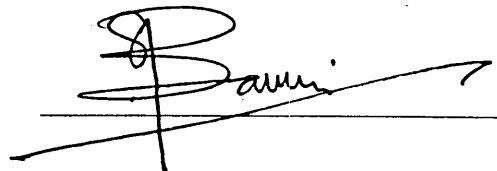
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ABSTRAK

Tujuan kajian ini dijalankan adalah untuk membentuk sebuah model keperluan bagi Sistem Maklumat Bil Air (BILIS) untuk Cawangan Bekalan Air (WSB), Jabatan Kerja Raya Negeri Kedah (PWD). Disebabkan oleh kewujudan masalah yang dihadapi oleh pengguna air dan WSB yang kian meningkat, adalah menjadi nyata bahawa isu yang dihadapi oleh kedua-dua pihak ini adalah disebabkan oleh ketidakbolehan pihak pembangun sistem untuk memahami secara mendalam keperluan pengguna, yang secara tidak langsung menyebabkan implementasi sistem yang tidak lengkap. Siasatan yang lebih mendalam mendapati bahawa masalah ini terbentuk hasil dari spesifikasi keperluan sistem yang jauh dari hakikat keperluan pengguna. Menyedari hakikat ini, sebuah model keperluan boleh membantu mengurangkan isu-isu ini, seterusnya dapat menyediakan sebuah mekanisme pembayaran dan pengesahan yang berkesan. Pembentukan model keperluan bagi BILIS telah dilaksanakan dengan menggunakan kaedah analisa dan penggembleran keperluan yang terdiri dari empat fasa utama iaitu pemahaman domain, penggembleran keperluan, klasifikasi, dan pengesahan. Penggembleran keperluan dan klasifikasi telah dilaksanakan dengan menggunakan notasi-notasi *Unified Modeling Language* (UML) yang terdiri dari *use cases*, gambarajah aktiviti, gambarajah kelas untuk menggambarkan model konseptual, gambarajah jujukan untuk mewakili gelagat dan interaksi objek, serta spesifikasi tambahan yang lain. Sebuah perisian yang dipanggil *Visual Paradigm for UML* (VP-UML) telah digunakan bagi mengesahkan sintaks model keperluan ini, manakala prototaip *throw-away* telah digunakan bersama-sama dengan skrip penilaian untuk tujuan pengesahan model secara keseluruhan. Model keperluan boleh digunapakai sebagai sumber rujukan bagi pembangunan sistem bil air serta boleh digunakan untuk kegunaan pembangunan sistem bil utiliti yang lain di dalam usaha memenuhi kehendak pengguna sistem dan pelanggan. Kajian ini diakhiri dengan perbincangan penemuan serta kekangan dan halangan yang dihadapi sepanjang tempoh penghasilan model ini, disamping mengesyorkan kajian lanjut di dalam domain ini.

ABSTRACT

The purpose of this study is to form a requirement model for Water Billing Information System (BILIS) for the Water Supply Branch (WSB) of Kedah Public Works Department (PWD). Due to recent arising issues and concerns faced by both consumers and WSB, it is inherent that such disputes are caused by inability to understand consumers' and users' needs are, resulting in inadequate system implementation. Further investigation suggests that the problem lies in requirements specification being a harsh reality of the needs. Realizing this fact, a requirement model could assist in minimizing these issues, thus providing an effective payment and verification mechanism. The formation of a requirement model for BILIS was approached using a requirement analysis and capturing methodology that consist of four main phases, namely domain understanding, requirements capturing, classification, and validation. Requirements capturing and classification was done using Unified Modeling Language (UML) notations that includes use cases, activity diagrams, and class diagrams to depict a conceptual model, sequence diagrams to represent object behavior and interaction, and additional supplementary specifications. A tool called the Visual Paradigm for UML (VP-UML) was used for validating the syntax of the requirement model while a throw-away prototype with test scripts were used for validating the requirement as a whole. The requirement model provides a referencing point for the development of a water billing system, and can be extended for use in development of other utility billing system in meeting the needs of system users and consumers. This study was concluded by discussing the findings and constraints as well as limitations arising during the course of producing the model, in addition to recommended future study in this domain.

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LIST OF ABBREVIATIONS

BILIS	Water Billing Information System
CORBA	Common Object Request Broker
EBI	Event-based Integration
HAT	HOORA Analysis Tool
HRDM	Health Care Domain Reference Data Model
IDE	Integrated Development Environment
IS	Information Systems
IT	Information Technology
KAOS	Keep All Objectives Satisfied
MEPS	Malaysian Electronic Payment System
MII	Multimodal Input Interpretation
PHCES	Patient Headache Care Education System
PWD	Public Works Department
RUP	Rational Unified Process
SDE	Smart Development Environment
SGML	Standard Generalized Markup Language
SIS	Semantic Indexing System
SME	Subject Matter Expert
UML	Unified Modeling Language
VP-UML	Visual Paradigm for UML
WADP	Workflow Applications Development Project
WSB	Water Supply Branch

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CHAPTER 1

INTRODUCTION

Water is an essential part of our lives where humans cannot live without. According to researches in areas of medicine and biochemistry, water constitutes on average 60% or two-thirds of overall human body, depending on various factors such as age, gender, and weight (Morris, 2001; Harwich Water Department, 2004). Water constitutes most of earth's compound with 80% of total earth's buildup (Harwich Water Department, 2004). In order to provide safe and reliable water for intake by the human body, it must be treated, tested, and manufactured. Due to this, it has been long established that safe and reliable water supply is chargeable. Inline with this, billing is required as by definition, billing is a request for payment, where an entity sends an invoice or other type of claim for a specific amount, including receivables due from private persons, firms, or corporations, other agencies, and the federal government (Google's Web Definitions, 2004). Understanding how consumers can be billed effectively and efficiently, and on serving consumers' billing needs are crucial for the development of a complete and thorough requirements of an information system as it is one of the weakest drivers of value where inability to resolve its issues is one of the most cited reasons for churn (Google's Web Definitions, 2004). In conjunction with the rising concerns of water billing by consumers, it was made clear that billing system effectiveness relates directly to the complete understanding of the needs of the system users and consumers. Guidance in requirements facilitates efforts in building a scalable water billing system, therefore this project serves to present a requirement model for the Water Billing Information System (BILIS) that can be used as a referencing point for such system development initiatives.

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