Web Based Decision Support System
Integrated with a Time and Expense Transaction System
Of a Consulting Firm

IGN KRISH PURNAWARMAN

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
BOGOR AGRICULTURAL INSTITUTE
BOGOR
2001
With everything that Hyang Widhi have invested in me, I would like to present this thesis to my Father, Mother and Brother and most of all to my Grand parents.
Web Based Decision Support System
Integrated with a Time and Expense Transaction System
Of a Consulting Firm

IGN KRISH PURNAWARMAN

A Thesis submitted for the degree of bachelor in
Computer Science
of the
Computer Science Study Program
Bogor Agricultural Institute.
2001

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
BOGOR AGRICULTURAL INSTITUTE
BOGOR
2001
Name: IGN Krish Purnawarman
NRP: G0631.1978

Approved By

Dr. Ir. Kudang Boro Seminar, M.Sc.
First Supervisor

Dr. Ir. Abdurrauf Rambe, M.St.
Second Supervisor

Date of Graduation: 29 AUG 2001

Dr. Ir. Abdurrauf Rambe, M.St.
Head of the Department of Computer Science
SUMMARY

IGN KRISH PURNAWARMAN. Web Based Decision Support System Integrated with a Time and Expense Transaction system Of a Consulting Firm. Supervised by Dr. Ir. KUANG BORO SEMINAR, MSc and Dr. Ir. ABDURRAUF RAMBE, MSt.

Each day companies are turning to Information Technology for the answers to questions concerning competitive advantage and performance measurements. It is due to this reason that consulting companies in specific utilizes a decision support system to integrate directly to a transactional processing system of the respective company into its database to gain direct insights into the lowest level of the organization. With the advent of the Internet, consulting companies are even more aggressive in applying the above means through a thin client web solution. It is considered a cost effective solution and are centralized in nature of its processing but distributed in its view and ease of use. Through this means, not only enabling the ease for a consultant to report his/her activity, it enables managers to make decision and pinpoint problems from anywhere he is accessing from, which is connected to the Internet. Furthermore, it also gives clients the ability to view necessary details without the hassle of generating them from scratch.

The integrated web application is constructed by using the active server page technology releasing workstations from the difference in technological accessing power capabilities. Via the hypertext transfer protocol (HTML), an active server page is requested from the server, processed in the Server and sent back as a full HTML in each workstation using the application. The web server utilized is personal web server (PWS), which is a down scale of the famous Internet Information server (IIS). Workstation with various types of platforms can use the application and hence access the information.

The concept being applied in relations to the decision support system performance measurements is via the measurements of a criterion or multiple criteria such as weighing and trend analysis.
Author’s Bibliography

I was born on the 15th March 1976 as the first son out of two brothers in the family, as the eldest son of Ir. I gusti Made Oka Nurjaya. M.Rur.Sc, PhD and Ir. I gusti Ayu Mas Sri Agung, M. Rur. Sc, PhD.

In 1994 I graduated from Unley High School, Senior High School, Adelaide, South Australia and in the same year was accepted in IPB where I chose to enter the study Program Computer Science, the Faculty of Mathematics and Natural Sciences.
PREFACE

Much sincere gratitude I would like to say to Hyang Widhi Wasa for all the strength that Hyang Widhi has invested in me so that this thesis can be completely finished. The theme chosen by the writer is Web Decision Support System integrated with a time and Expense transactional system in a consulting firm.

Many thanks the writer has also to Dr. Ir. Kudang Boro Seminar, M Sc. and Dr. Ir. Abdurrauf Rambe, M St. for their patience, understanding and support as the supervisors. Apart from that the writer would also like to thank, Mr. Michael Olsson, CEO of Atlantis and Mr. Handi Sjarif, MIS Manager of ABB Sakti Industry, for their support and advices, Ir. Meuthia Rachmaniah, Msc, Yenny Herdiyeni, SKom, Ahmad Zaenuri and Ronni Situmorang for their encouragements, Jeffrey Hutapen, Anwar and Hermawan for their help and mostly to my Parents and Brother and last but not least to my love IGAM Sulianti Mahaputri, my big family in Bali and my Grand Parents, for being there when they are needed and for all their prayers.

Every wish is intended for this thesis to be useful.

Jakarta, August 29, 2001

IGN Krish Purnawarman
# TABLE OF CONTENT

**LIST OF APPENDICES** ................................................................................................. v

**INTRODUCTION**  
- Background ................................................................................................................. 1  
- Purpose of Research ................................................................................................. 2

**LITERATURE REVIEW**  
- Decision Support System .......................................................................................... 2  
  - DSS Topology ......................................................................................................... 3  
  - DSS Components ................................................................................................... 3  
  - Web Based DSS ..................................................................................................... 4  
- Active Server Page ..................................................................................................... 4  
- Web Time and Expense Reporting ........................................................................... 5  
- Knowledge Management System ............................................................................ 5  
  - Knowledge Sharing .............................................................................................. 6  
- Data Mining ................................................................................................................ 6  
- Database system ........................................................................................................ 6  
- Relational Database Model ....................................................................................... 6  
- Normalization ........................................................................................................... 6  
- Measure of Employee Performance ......................................................................... 7  
- Individual Performance Indicator ............................................................................ 7  
- Multiple Criteria Decision Making ........................................................................ 7

**SYSTEM DESIGN**  
- Problem Definition .................................................................................................... 8  
- Feasibility Study ....................................................................................................... 8  
- Analysis ...................................................................................................................... 8  
- Systems Design ....................................................................................................... 9  
- Detail Design ........................................................................................................... 10  
  - Output Design ....................................................................................................... 10  
  - Input Design ......................................................................................................... 11  
  - Process Design ..................................................................................................... 11  
  - Control Design ..................................................................................................... 11  
  - Data Management ................................................................................................. 12  
  - Dialog Design ....................................................................................................... 12  
  - Basic Knowledge ................................................................................................. 12  
- Implementation ........................................................................................................ 12  
- Systems maintenance .............................................................................................. 13

**RESULTS AND DISCUSSION**  
- Web Programming GUI (Graphical User Interface) ................................................... 13  
- Scope and Characteristic Measurements .................................................................. 13  
- Output ....................................................................................................................... 13  
- Input Design ........................................................................................................... 14  
- Process Design ....................................................................................................... 14  
- Database Design ..................................................................................................... 14  
- System Control ....................................................................................................... 15  
- Systems Operation ................................................................................................. 15
APPENDICES

1. Multiple Criteria Analysis ................................................................. 22
3. The program flowchart for the Decision Support System .......................... 27
4. The program flowchart for the Time and Expense System, ......................... 28
5. The Integrated System flowchart ......................................................... 29
6. Integrated Systems Architecture .......................................................... 30
7. The Information Flow of the Integrated System ....................................... 31
8. List of Consultant New Expenses ......................................................... 32
9. Decision Support System - Time Usage Analysis ...................................... 32
10. Add New Members ........................................................................... 33
11. Data Mining – Case Base Reasoning Analysis .......................................... 33
12. The Data Dictionary ........................................................................ 34
13. Normalization Steps ........................................................................ 37
14. The Relational Database for the Integrated System .................................... 41
15. The Menu of each user access level ....................................................... 41
16. The User Login Input Screen .............................................................. 42
17. The Attendance In Function – The server clock value determines the start and end hour ................................................................. 42
18. The add client profile information page .................................................. 43
19. List of Job Task page. Job tasks could either fall to Closed, Open or Public status ................................................................. 43
20. Group Job task solving – Knowledge Management .................................... 44
21. The clients - Job approval page .............................................................. 45
22. The Managers - Expense approval page ................................................ 45
23. Client Approved Rates page .................................................................. 46
24. Expense Analysis page ...................................................................... 46
25. CBR Analysis ................................................................................ 47