IMPLEMENTATION OF A MIS TOOL BASED ON OPEN XML

BEHDAD BANIANI

A project report submitted in partial fulfillment of
The requirements for the award of the degree of
MSc. (Computer Science – Teal Time Software Engineering)

Centre for Advanced Software Engineering
Faculty of Computer Science and Information System
Universiti Teknologi Malaysia

MARCH 2009

To my beloved Father and Mother who are always supporting me

ACKNOWLEDGEMENT

In preparing this thesis, I have research and read many papers and articles that have greatly enhanced my understandings; I would like to thank all the authors whom have contributed to those papers and articles. I was also in contact with my working colleagues and lecturers who have contributed to my ideas. In particular, I wish to express my sincere appreciation and gratitude to my Academic Mentor and supervisor, Prof Dr Shamsul bin Sahibuddin and my industrial Mentor, Mr. Swaminathan Krishnamurthy for their guidance, advices and cities. Without their support and interest, this project would be the same as presented here.

I also wish to express my sincere thanks to all the lectures who have taught me in Centre for Advanced Software Engineering (CASE), Universiti Teknologi Malaysia (UTM) for their guidance, indulgence and patience during the course of my postgraduate studies.

ABSTRACT

The purpose of this project is to develop a MIS (Management Information System) based on Open XML standard which could be supported in Microsoft Excel Application therefore; this system can use all the Microsoft Excel features. SolonExcel provides possibility to create a template which contains layout and data model of the report. Reports are being generated by the mentioned templates, in this case customized report based on desired data and query is provided in Microsoft Excel file format which can be more customized with Microsoft Excel Application. The system is developed as a three tiers model and running over intranet. This software is not a decision maker it is just a tool to help decision makers to have a better decision.The methodology for the project is V-Model. Analyzing and development of design and requirements are done by Unified Modeling Language 2.0 also known as UML. The system was built on .Net framework platform. This software is a product of Pentasoft Sdn. Bhd.

ABSTRAK

Tujuan utama projek ini adalah untuk membangunkan MIS (Sistem Pengurusan Informasi). Sistem Pengurusan Informasi ini dibagunakan berdasarkan Piawai Terbuka XML di mana ia boleh menyokong aplikasi Microsoft Excel . Oleh yang demikian, sistem ini membolehkan semua ciri-ciri Microsoft Excel digunakan. Solon Excel menyediakan kebolehupayaan untuk mencipta pola (template) yang mengadungi susunan dan laporan model data. Laporan akan dihasilkan oleh pola (template) yang terakhir. Di dalam kes ini, laporan telah ditentukan berdasarkan data yang diperlukan dan soalan yang disediakan di dalam Microsoft Excel format fail di mana ia boleh di tentukan dengan menggunakan applikasi Microsoft Excel. Sistem ini di bina sebagai tiga baris model dan disalurkan melalui intranet. Metodologi projek ini adalah V-Model. Analisa dan pembinaan rekabentuk serta keperluan telah dibuat menggunakan Unified Modeling Languange 2.0 yang juga dikenali sebagai UML. Sistem ini telah di bina di dalam perangkaan platform .Net. Software ini adalah produk kepada Pentasoft. Sdn. Bhd.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

SRS	-	Software Requirements Specification
IEEE	-	Institute of Electrical and Electronic Engineers
SDD	-	Software Design Document
VB.NET	-	Visual Basic .NET
MS	-	Microsoft
API	-	Application Programming Interface
IT	-	Information Technology
IDE	-	Integrated Development Environment
WPF	-	Windows Presentation Foundation
LINQ	-	Language Integrated Query
ODF	-	Open Document Format
XML	-	Extensible Markup Language
ISO	-	International Standards Organization
CTS	-	Common Type System
CLR	-	Common Language Runtime
MFC	-	Microsoft Foundation Class
RAD	-	Rapid Application Development
OLEDB	-	Object Linking and Embedding Database
ODP	-	Oracle Data Provider

LIST OF APPENDICES

CHAPTER 1

PROJECT OVERVIEW

1.1 Organization Background

PENTASOFT delivers business solutions using Information, Communication and Entertainment (ICE) Technologies. We focus on strategic intent of our Customers, their people & processes, to deliver personalized business solutions.

We concentrate on the Financial Services Industry and specialize in: Insurance Software and Services.Deep domain knowledge and focused approach to the Industry have enabled us to adopt business oriented approach to successfully address the pain points of our Insurance customers. As a result we have earned respect as one of the very first companies who could combine business knowledge as well as technology to develop innovative and effective, user-friendly Insurance Solutions.

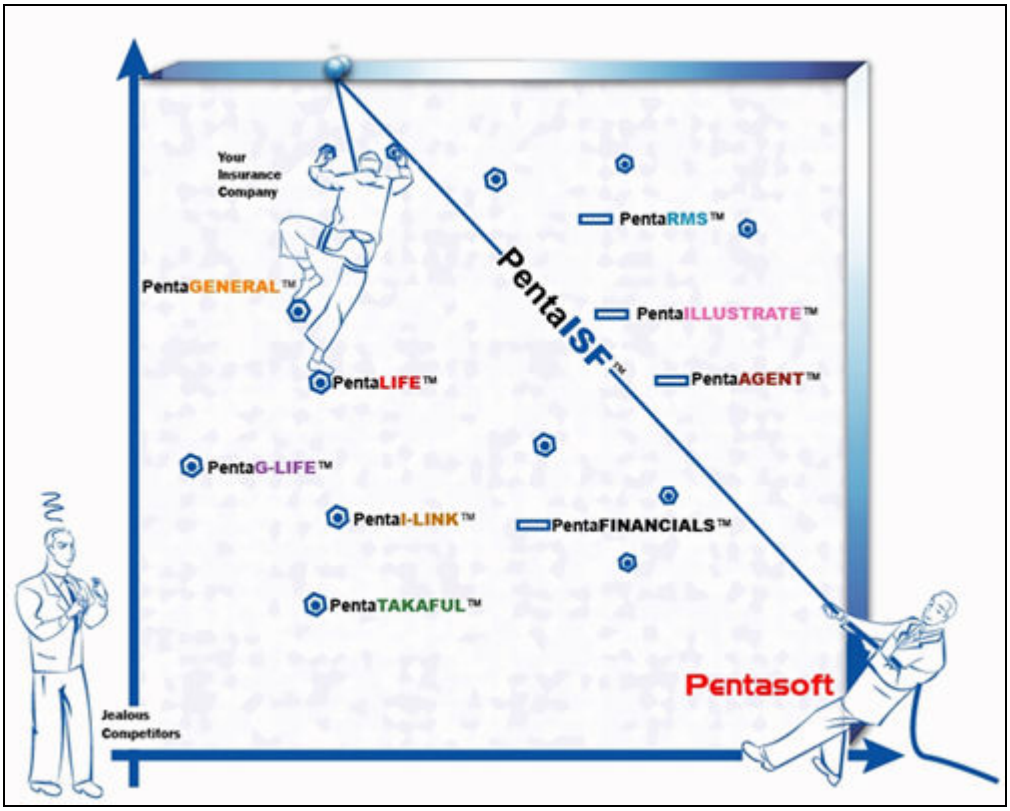


Figure 1-1 List of Pentasoft products

Pentasoft Integrated Insurance Solution (PentaISF) serves as a single solution for all lines of Insurance business; Life, Group Life, Investment Linked, General and Takaful (Islamic Insurance). The proven Insurance solutions have been implemented successfully at several customers' sites, internationally.

1.2 Mission and vision

The mission is to "Prosper our Customers using ICE Technologies"(Information, Communication and Entertainment). Pentasoft prospers its customers by empathizing with them, and by assisting to generate value for their ventures. Pentasoft strongly believe that if the Customers prosper, Pentasoft will prosper along with them.

"Enrich to be Rich" is the vision Pentasoft enriches itself, the Colleagues, the Partners, thereby enriching the Customers.

1.3 Corporate Structure

At Pentasoft, teams are organized into molecules to deliver a specific tasks. The competencies required for each team are specified. Number of such competencies needed is determined.

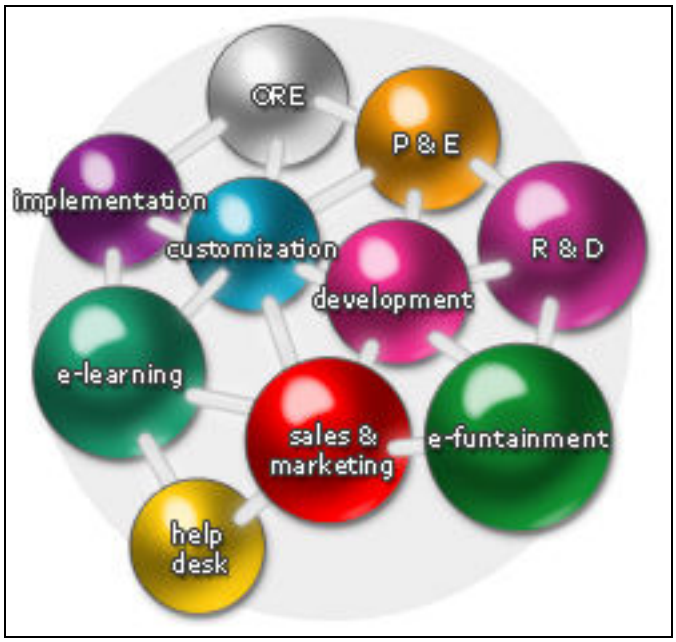


Figure 1-2 figure of Pentasoft structure

Individuals are then identified by matching their knowledge, expertise, and experience with the competencies required. They may operate locally or remotely.
The teams are known as molecules and every required competency is known as atom. The activities performed by the molecules are managed by schedules.
Individual schedules are governed by master schedules.

1.4 Core Business – Products and services

Core, Common and Specific as the three layers modeling the business enable full integration of the end-to-end solution. As a result of integration and process-

orientation, all essential functions necessary for the workflow in an insurance company have been incorporated into the software. Furthermore, this unique framework allows us to combine the flexibility of incorporating special features required by individual companies with the permanence of steady common functions needed in all lines of insurance business.

Pentasoft understands the needs of insurance customers and are determined to make their business grow with technology. We put in tremendous effort to understand our Customer's business challenges, suggest improvements to business processes, and most of all, work as partners. The solution allows continuous product devolvement and most importantly, reduced reliance on Pentasoft as the entire system is parameterised. *PentaISF*™ is designed for insurance companies *to* manage its operations end-to-end efficiently and with a lean team. It is in essence a one-stop-solution which will provide value for a composite insurance company.

1.4.1 PentaISF

Pentasoft has developed a comprehensive, integrated software solution for the insurance and takaful industry - PentaISF™

PentaISF™ is process-oriented and integrated application software suitable for all lines of insurance business.

ISF™ stands for “Insurance Solution Framework”. It is referred to as a framework because it is set up as a three layer system:

- At the core of PentaISF™ stand the policy holder and the channel database followed by two layers of functions.
- All common functions across the various lines of insurance business are separated from the
- Functions specified for each individual insurance product.
-

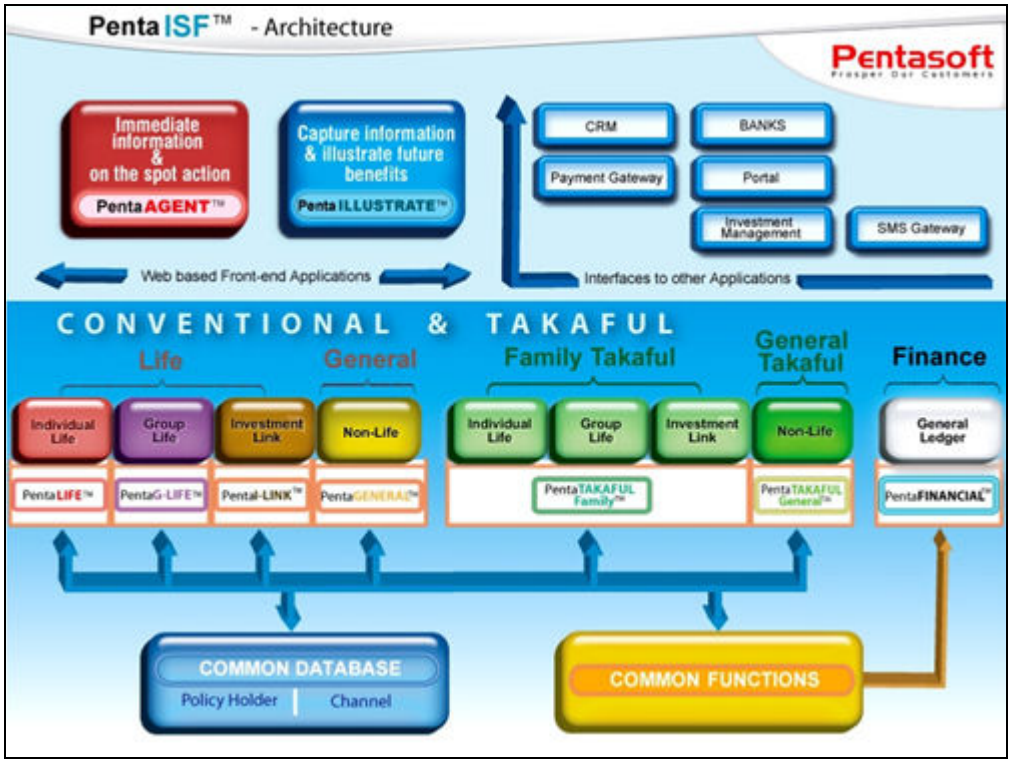


Figure 1-3 PentaISF Architecture

PentaISF™ was designed to adapt to the rapid changes in the insurance industry. It is a robust and flexible system developed and running on the world's favourite database in the financial industry. Oracle was one of the first to come to the market and is the only successful relational data base management system that was and still remains popular. Being very marketing-oriented Oracle is extremely quick in incorporating evolving new open technologies as well. As solution developers we ensure our customers won't be tied down to a company that does not continually enhance its products. Technology wise, it is an innovative and proven solution that employs Oracle database and development technology, proven client-server deployment architecture, and uses OPEN and de-facto standards.

1.4.2 PentaLIFE

PentaLIFE© is the Solution for Life Insurance Companies. It is a comprehensive customer based solution which comprises complete e2e business processes of traditional life insurance.

Taking today's business challenges that the insurance industry is facing into consideration PentaLIFE© is ideal for automating and managing the front-end operations in a Life Insurance Organisation and furthermore provides multi-language, multi-currency, and multi delivery system functionalities.

1.4.3 PentaI-LINK

PentaI-LINK© - is a component of PentaISF™ (Insurance Solution Framework) it is a complete e2e solution for Unit Link Administration needs of Life Insurance Company.

PentaI-LINK© - Investment Linked Insurance Solution helps insurance companies manage their life operations as well as the policy holders' Investment Portfolios.

With the flexible “Plan Wizard” insurance companies can create their Investment Link Insurance products such as a Single Premium Investment Plan, Yearly Renewable Flexible Plan, Investment Linked, Annuity Plan, Group Investment Linked Insurance Plan and Investment Plus Endowment Plans.

1.4.4 PentaTAKAFUL

PentaTAKAFUL© is a comprehensive system designed to manage the insurance activities in an Islamic way. The solution is flexible to accommodate the different views of Syariah in different countries. Especially with the now growing acceptance of Takaful Insurance globally.

PentaTAKAFUL© is one of the leading Takaful Solution on the market.

We are not just software developers. We have the business knowledge. We are continually researching and developing new ways of improving and delivering our solutions. To seize these business opportunities and meet the challenges of the Takaful industry a strong and flexible IT foundation that supports the organization's business needs is required - The key to running a successful insurance company is operational efficiency and customer service.

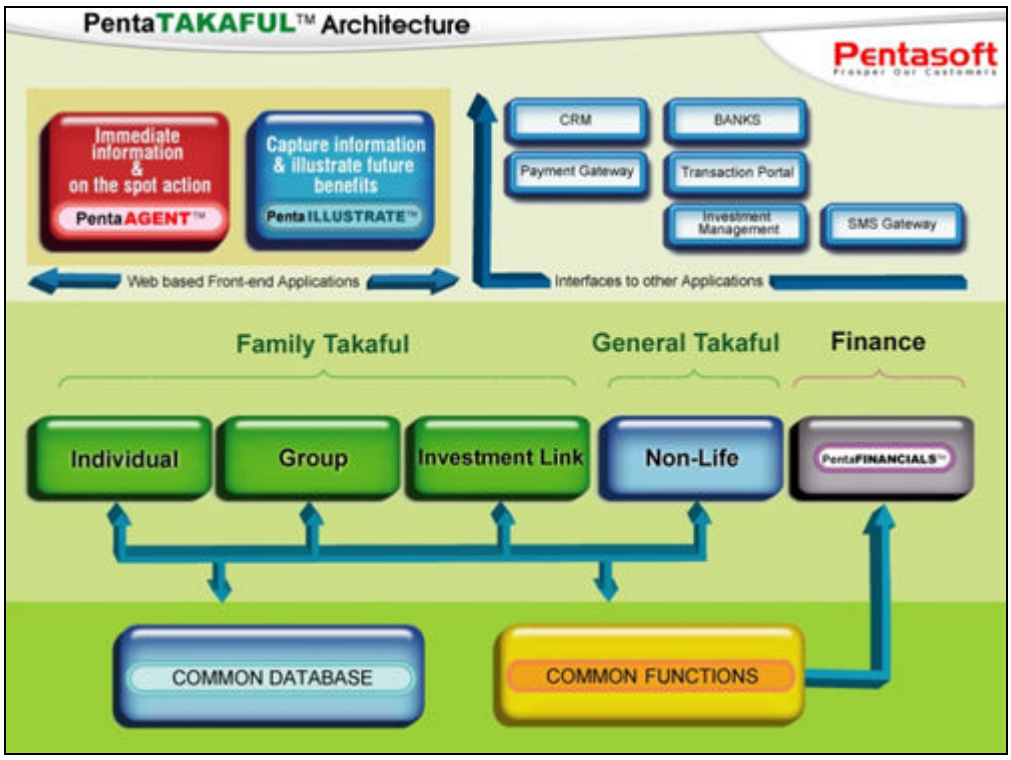


Figure 1-4 PentaTAKAFUL Architecture

PentaTAKAFUL© enables your customer service to be most efficient and serve policyholders at one-point of service regardless what function is desired.

1.5 Company's Recognitions

MSC Malaysia Capability Development,Deloitte's Asia Pacific Technology Fast 500 Award, 2004.As one of the fastest growing company in the Asia Pacific Region, Pentasoft has been honored with the Asia Pacific Fast 500 Award, for the second year in succession.

The judgment was made by one of the most prestigious consulting group - Deloitte, through this award program that rates the most dynamic and fastest growing companies from all over the Asia Pacific Region.

Brief about Deloitte's Asia Pacific Technology Fast 500 Award, 2004,The Deloitte's Asia Pacific Technology Fast 500 award is a ranking of fast growing technology companies in Asia Pacific such as Australia, China, Hong Kong, India, Indonesia, Japan, Macau, Malaysia, Philippines, New Zealand, Singapore, South Korea, Taiwan and Thailand. It includes all of technology, from Internet to life sciences, computers to semiconductors. It includes both public and private companies. The program is part of a truly integrated global program recognizing the world's fastest growing and most dynamic technology companies.

Outstanding ISV (Independent Software Vendor) of the Year Award,Pentasoft has also been recognized by its business partner, ORACLE for exhibiting an outstanding performance as an ISV in 2003, Malaysia.

Asia Pacific ICT Award,Pentasoft has won the 2003 MSC Asia Pacific ICT Award (APICTA) - Merit Award for its Integrated Insurance Solution Framework – PentaISF.

1.6 Problem Statement

Financial and insurance systems are possessing mass of information and data which are highly valuable for management and decision makers, but these data should be in right direction to be useful other than this it could be distractive and complicated and might cause wrong business target aiming. Although most of the financial systems have reporting system as well but because of being complex and vast varied of circumstances of the financial aspects, it is always a major need to have a flexible and dynamic system could consume these system data and provides reports which meet the user criteria.

1.6.1 Current Situation

PentaISF is a strong back office Insurance Solution with a vast functionality and tight integration. Most of the business logic is written in Oracle-PLSQL and is consumed in Oracle Forms and Oracle Reports. There are almost 1500 reports which are generated from system based on the scenario. All these reports were developed using Oracle Reports. If any changes required by the business user, this need to be raised as change request to Pentasoft development team, this follows the change request process. This involves an intervention of oracle report developers to get the letters modified and move it to production.

- There was no dynamic report based on databases regarding the content.
- There was no customization for reports provided by the systems regarding the layout.
- There was no privilege management for reports usage.
- There was no compatibility to Microsoft products such as Microsoft Office products.

Foundation (WPF) to improve the user interaction could be another part of the wish list.

REFERENCES

[1] Frederick C. Mish.*Merriam-Webster's Collegiate.* Merriam-Webster. 2003

[2] Avdesh Gupta, Avdesh Gupta Anurag Malik, Anurag Malik.*Management Information Systems*. Firewall Media. 2005

[3] O'Brien, J.*Management Information Systems – Managing Information Technology in the Internetworked Enterprise*. Boston: Irwin McGraw-Hill. 1999

[4] Kumar N. *Management Information System*. Anmol Publications PVT. LTD. 1995

[5] Uche Ogbuji. *Thinking XML: The XML decade,Principal Consultant*. Fourthought Inc. http://www.ibm.com/developerworks/library/x-think38.html. 2006

[6] Tim Anderson (2004). *Introducing XML*. http://www.itwriting.com/xmlintro.php

[7] Erik T. Ray. *Learning XML: [creating self-describing data]*. 2nd edition. O'Reilly. 2003

[8] IDA. *TAC approval on conclusions and recommendations on open document formats*. http://europa.eu.int/idabc/en/document/2592/5588. 2004

[9] ECMA. *TC45 - Office Open XML Formats*. http://www.ecma-international.org/memento/TC45.htm.

[10] Wouter van Vugt. *Open XML The markup explained*. OpenXMLDeveloper. 2007

[11] Larry Osterman. *Why no Easter Eggs?*. http://blogs.msdn.com/larryosterman/archive/2005/10/21/483608.aspx. Retrieved on 2006-07-29. MSDN. 2005

[12] IBM. *New To Rational*. http://www.ibm.com/developerworks/rational/newto/. IBM. 2002

[13] Microsoft. *analyzing requierments and defining Microsoft .NET solution architecture*. Microsoft press. 2003

[14] Craig. *The V-Model; The value of quality and testing*. http://www.betterprojects.net/2007/07/v-model-value-of-quality-and-testing_02.html. 2007

[15] D. W. Walker. *Computer Based Information Systems: An Introduction*. Pergamon. 1998

[16] Michael Keeble Buckland. *Information and Information Systems*. Illustrated. Greenwood Publishing Group. 1991

[17] Lee Ratzan. *Understanding Information Systems: What They Do and why We Need Them*. Illustrated. ALA Editions. 2004

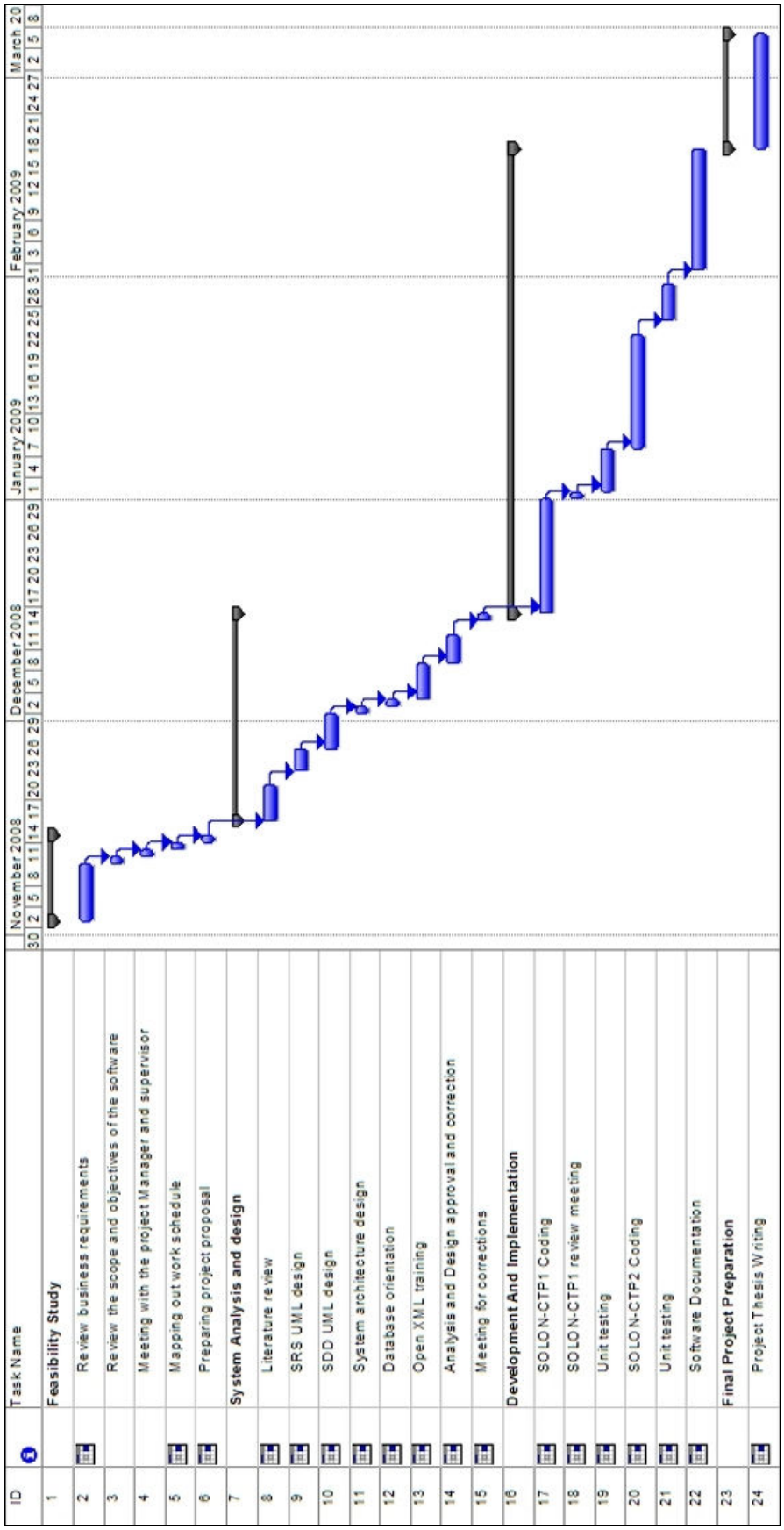
[18] Gunther Lenz, Thomas Moeller. *.NET: A Complete Development Cycle*. Illustrated. Addison-Wesley. 2003

[19] Alvin Bruney, *Professional VSTO 2005: Visual Studio 2005 Tools for Office*, John Wiley and Sons, 2006

[20] Jesse Liberty, *Programming C#*, 4, O'Reilly, 2005

Appendix A

PROJECT GANT CHART


ID
Task Name
November 2008
December 2008
January 2009
February 2009
March 20
1 Feasibility Study
2 Review business requirements
3 Review the scope and objectives of the software
4 Meeting with the project Manager and supervisor
5 Mapping out work schedule
6 Preparing project proposal
7 System Analysis and design
8 Literature review
9 SRS UML design
10 SDD UML design
11 System architecture design
12 Database orientation
13 Open XML training
14 Analysis and Design approval and correction
15 Meeting for corrections
16 Development And Implementation
17 SOLON-CTP1 Coding
18 SOLON-CTP1 review meeting
19 Unit testing
20 SOLON-CTP2 Coding
21 Unit testing
22 Software Documentation
23 Final Project Preparation
24 Project Thesis Writing