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Designing sales data mart system for ease of analysis and developing data mining model to enhance the promotional strategies for Gamma Pizza hut

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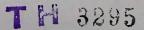
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Dissertation submitted to the Faculty of Information Technology, University of Moratuwa, Sri Lanka for the partial fulfillment of the requirements of the Degree of Master of Science in Information Technology.

November 2016



### Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been duly acknowledged in the text and a list of references is given.

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Dedication

# THIS THESIS IS DEDICATED TO MY PARENTS AND MY SISTER SHANTHIPAA FAMILY AND BROTHER SHATHULAN FAMILY

### Acknowledgement

It is a great pleasure to me thanks the many people who made this thesis possible.

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#### Abstract

Making effective business decisions with the data is the key to succeeding in today's competitive environment. Organizations are now looking to improve their decision-making ability with their current data, but unfortunately operational systems have limited features and various ad-hoc reports for same data. This unsatisfactory & frustration lead the managers and IT industry to find new level of applications. These applications focused on ease of analysis on the single screen to make effective decisions at the time and mining techniques help to generate new business opportunities by providing prediction of trends and behaviors as well as discovery of previously unknown or hidden patterns.

The DSS/BI systems should have more analyzing features and structured data. But current OLTP data and its database design not give much more analyzing power. In order to that OLAP architecture has built from various database vendors to make to use by DSS /BI systems. The developing of a data warehouse database and Data Mart database with suitable schema and approaching with relevant architecture is make a foundation for DSS/BI systems

The Data warehouse database makes on available history data as possible of getting last update record. The fact and dimension structure are used when designing database schema for Data Warehouse. ETL process generate a data to warehouse from various data sources. The Data Marts are used for holding various subject areas like sales, purchase, production, finance, etc. But here only considering about sales and delivery data only. The Data Cube Technology (OLAP technology) is used for end user to viewing data with various dimensional and drill-down drill-up processes within the application.

Finally those data are used to mining frequent patterns, Associations and Correlations between items in menu orders by using apriori algorithm (Microsoft Association algorithm) and forecasting Predictive sales for each item by using ARIMA algorithm (Mircosoft Time Series)

The data warehouse solution can be made from by integrating various database technologies in the middle; those technologies include SQL Server Management Studio (SSMS), SQL Server Integration Services (SSIS), SQL Server Analysis Server (SSAS), SQL Server Report Service (SSRS) and SQL Server Data Tools for Visual Studio used to create Analyzing project and Data mining project. C# language, DMX and MDX queries are used to build the simple mining application.

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## List of Abbreviations

- **BI Business Intelligence**
- DSS Decision Support System
- KDD Knowledge Discovery Data
- ARIMA Autoregressive -- Integrated moving average
- MDX Multi Dimensional Query
- DMC Data Mining Query
- OLAP On Line Analytical Processing
- ROLAP Relational On Line Analytical Processing
- MOLAP Multidimensional On Line Analytical Processing
- HOLAP Hybrid on Line Analytical Processing
- ETL Extract, Transform, Load
- SSIS SQL Server Integration Service
- SSAS SQL Server Analytical Server
- SSRS SQL Server Reporting Service
- BIDS Business Intelligent Development Studio
- DLL Dynamic Link Library