E-commerce System For Pharmaceutical Products

A project submitted to the Graduate School in partial fulfillment of the requirement for the degree Master of Science (Information Technology), Universiti Utara Malaysia

By
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ABSTRACT (BAHASA MALAYSIA)

ABSTRACT (ENGLISH)

The purpose of this project is to develop a prototype e-pharma catalog application for pharmaceutical products in Malaysia. The e-pharma website provides on-line ordering pharmaceutical products services to customers. Other services include on-line counselling from recognize pharmacists, information about drugs and health care, addresses of health centres throughout Malaysia, pharmaceutical education etc. Besides that, there are health calculators such as Body Mass Index (BMI) calculator, calories calculator etc. There are four main functional modules in the e-pharma business model. They are view information module, on-line ordering module, advertising module and pharmacists consulting module. This project uses the Web Page Development Methodology (WPD) as the development methodology. Finally, this project discusses some flaws, constraints and recommendations for the future development.
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CHAPTER 1

INTRODUCTION

In the beginning, the World Wide Web (WWW) is primarily used for accessing information from a network of servers, which serve as a repository of data. While today, the electronic commerce (e-commerce), such as on-line banking, shopping and stock trading are rapidly gaining popularity and acceptance. According to International Data Corporation (IDC), electronic commerce markets will grow to $176 billion by the year 2001. This revolution has dramatically changed the way organizations conduct business with its consumers and with each other using Information Technology driven process.

The Internet, with inherent features like easy access, real-time information, and low cost, is a natural driver for commerce solutions. Further, companies enticed with the promise of the following competitive advantages (but not limited to) are undertaking electronic commerce projects for better customer service and support; better forecasting of customer needs for goods and services; broader market reach; improved profit margins through automated supply chain management; increased efficiency and accuracy through automated order-processing, inventory control, billing, shipping and more;
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BIBLIOGRAPHY


Information on the Internet. URL:

http://www.mitretek.org/hiti/showcase/documents/criteria.html


http://www.hpmg.com/Provider_Login/PhysicianPracticeManagement.htm

URL: [www.irt.org/articles/js155/index.htm](http://www.irt.org/articles/js155/index.htm)


