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ONLINE CUSTOMER SERVICE:
HEAVY EQUIPMENT LEASING DOT COM

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ONLINE CUSTOMER SERVICE:
HEAVY EQUIPMENT LEASING DOT COM

A thesis submitted to the Graduate School in partial fulfillment to the
requirements for the degree Master of Science (Information Technology),

Universiti Utara Malaysia

by

Chua Meng Sung

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ABSTRAK (BAHASA MALAYSIA)

Kenderaan pembinaan berat adalah digunakan dalam bidang pembinaan, perlombongan, pembalakan, kitaran semula, perhutanan dan industri perjalanan. Walau bagaimanapun, syarikat atau kontraktor yang terlibat dalam perniagaan pembinaan menghadapi masalah yang sama, iaitu pemerolehan kenderaan berat. Kekangan yang dihadapi adalah seperti masalah kewangan, kesukaran untuk memilih pembekal yang tepat, penghantaran tepat pada masa dan senarai pilihan yang terhad serta proses penyenggaraan yang kompleks. Keadaan begini menyebabkan kebanyakan syarikat tidak mampu untuk memiliki kenderaan berat yang diperlukan. Justeru itu, projek ini menekan pada dua aspek utama iaitu syarikat pembinaan kecil atau sederhana boleh mempunyai pilihan lain selain daripada membeli peralatan berat tersebut, yang mana melalui penyewaan-pajak melalui Web. Disamping itu, untuk memastikan kejayaan pada perkhidmatan penyewaan-pajak melalui Web, sistem yang dibangunkan mestilah berupaya untuk menarik perhatian pelanggan dengan membekalkan maklumat yang tepat, antaramuka pengguna yang menarik, penjenamaan imej korporat, memberi sokongan bantuan pada pelanggan semasa serta mengumpulkan maklumat personal pelanggan. Projek ini menggabungkan pelbagai perisian seperti Personal Web Server, Microsoft Visual-InterDev, Microsoft SQL Enterprise Manager, Adobe Photoshop, Ulead-Cool 3D, Macromedia Flash, Macromedia DreamWeaver serta pengaturcaraan Web seperti Active Server Page (ASP), VB-Script, Java Script dan Java Applets.

ABSTRACT (ENGLISH)

Heavy construction equipment is used for the construction, mining, aggregate, recycling, forestry and road building industries. However, contractors or companies that are involved in the construction business face the same problem, which is the heavy equipment acquisition constraint. The constraint refers to the expensive price, searching for the right vendor, the right prices, on time delivery, limited variety of choices, and tedious maintenance job for the heavy equipment purchased. Most of the small and medium size companies cannot afford to buy this heavy equipment. Overall, this project emphasizes on two major aspects, which is small and medium size construction companies can have another option instead of purchasing the equipment, but by leasing it. A part from that, to ensure the success of Heavy Equipment Online Leasing Service, the system developed must be able to attract the customer attention in terms of providing adequate information, attractive graphical user interface, corporate image branding, supporting existing customers, gathering information and subscription service. This project combines multiple software such as Personal Web Server, Microsoft Visual-InterDev, Microsoft SQL Enterprise Manager, Adobe Photoshop, Macromedia Flash, Macromedia DreamWeaver and web- programming language such as Active Server Page (ASP), VB-Script and Java Script, Java Applets whereby to enhance/extend the Website appearance and features.

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Chapter One: Introduction

CHAPTER ONE: INTRODUCTION

1.0 Background

To many people, the term electronic commerce sometimes shortened to e-commerce means shopping on the Internet called World Wide Web (the Web). Although shopping on the web is expected to exceed \$800 billion by 2003, electronic commerce is much broader and encompasses many more business activities than just Web shopping. Some people and businesses use the term electronic business (or e-business) when they are talking about electronic commerce and electronic business. Although the Web has made online shopping possible for many businesses and individuals in a broader sense, electronic commerce has existed for many years. For decades, banks have been using electronic funds transfer (EFTs, also called wire transfers), which are electronic transmission of account exchange information over the private communications networks.

E-commerce also assisted the heavy construction businesses to acquire their heavy equipment by leasing and without actual purchasing. A web page is used as an interface for the customer/business contractors to access the related information. Leasing is the ideal way to buy almost any business equipment or asset today. A large percentage of all business equipment purchases are actually *leasing transactions*. Think of leasing as a way for you to have the profitable use of an asset *without the hassles that come with ownership*. Lease is a binding contract between the owner (lessor) and the user (lessee), which conveys the right to use equipment for a specified period of time. Payments for this use are made on a well-defined rental

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References

Alan, B (March/April 2001) STRATEGY LEADERSHIP: Digital Strategies For The New Economy V.29, No 2, p.4

Brown, Jeanette (1995) Leasing companies promote benefits, Computer Reseller News, 1/9/95 Issue 612, p34, 2/5p

Corson, Raymond (1999), Internet Commerce, 21-March-99

Source: <http://filebox.vt.edu/users/rkorson/e-commerce.html>

Doyle, B.G (2000) Leasing options are an accountant's dream, Caribbean Business, 11/09/2000, Vol. 28 Issue 44, p51, 1p

Equipment Finance And Management Center

Source: <http://www.gecfsolutions.com/equipment/>

Equipment Leasing Through MobiLease Meets Critical Business Needs

Source: http://mobilease.com/equipment_leasing/

Extricity Software and eLease Partner To Provide Online Leasing Services for Net Market and Enterprise Customers Business Wire, 04/03/2000

Forcht, Karen A (1996) Doing business on the Internet: Marketing and Security Aspects, Journal of Information Management and Computer Security, V.4, No. 1-5 1996, p.3

Heavy Equipment Supplier

Source: <http://www.explorer-software.com/equipda.htm>

Heinen, Joseph (1996) Internet Marketing Practices, Journal of Information Management and Computer Security, V.4, No. 1-5 1996, p.7

Jennifer, Gable (2000), Customer Service on the Net: Improved or Inefficient?

Source: <http://www.msb.edu/faculty/culnamm/EC/Briefings/gablej.html>

Johnston, Robert D. (1995) Fleet leases acquire vehicles with low capital outlay, Caribbean Business, 8/3/95, Vol. 23 Issue 31, pS3, 4/9p

Karl, Erwin (1996) A new service of information brokers; online consulting, Journal of Information Services and Use V.16, 1996 No. 1-4, p.149

Krumenaker, Larry (August 1996) Business Without Browsers, Internet World p.60

Leasing Your Equipment And Trucks Is Smart And Easy

Source: <http://www.moneysourceinc.com/source/leaseadv.html>

Liddy, Carrie (1996) Commercial Security On The Internet, Journal of Information Management and Computer Security, V.4, No.1-5 1996, p.47

Mackay, Jackie (1996) The Internet Is Good For You, Journal of Information Services and Use V.16, 1996 No. 1-4, p.141

Noble, Rick (1994) Using The Internet For Input and Output, Journal of Information Services and Use V.17, 1997 No. 1-4, p.52

Patel Ahmad, Portilio Eloy (1999) Design Methodology For Secure Distributed Transaction in Electronic Commerce, Journal of Computer Standard & Interfaces, V.21, p.5-18. No.1 -5

O'Brien, Jennifer (1998) Leasing a solid sales tool, Tech Data says. Computer Dealer News, 11/09/98, Vol. 14 Issue 42, p8, 1/2p

Perry, James T & Schneider, Gary P (2000), Electronic Commerce, Canada: Course Technology-ITP Publisher.

Torode, Christina (1997) AT&T capital leasing offers financing for its e-commerce, Computer Reseller News, 07/14/97 Issue 745, p73, 1/4p

Waymire, Richard (1998), SAMS Teach Yourself Microsoft SOL Server 7.0 in 21 Days, United States Of America: Library Of Congress Catalog

Wright's, Peter (1998), Beginning Visual Basic 6, Birmingham (UK): Wrox Press Publication.