UNIVERISTI UTARA MALAYSIA

MsC IT Project

A study to improve warehouse operation management in SME in Saudi

Arabia.

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A THESIS SUBMITTED TO THE FACULTY OF ARTS AND SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIEREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

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Abdulrazaq Mohammed Ali

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Author,

Abdulrazaq Mohammed Ali

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About the Author

Abdulrazaq Mohammed Ali, who has been involving various kind of coursework projects since he joined University Utara Malaysia in January 2006. joined Degree Program which is and he has chosen Networking as his major on September 2006. After four years as a student of University Utara Malaysia, he became more independence, motivated, and accustomed to many difficult study problems. He feels very grateful that the lecturers of UUM are very helpful and friendly. He has gained his precious time with the lecturers, and friends around here. However, this is the last project to be completed by the author as he will be leaving for another level of life soon. The author somehow has chosen this particular project topic as it is considered one of the challenging fiels, secondly the author hope to apply the concept learned throughout the years to be utilized in his project. The author hopes that his initial idea will be success.

If you have questions, doubts or comments, the author can be reached via ab-razaq@hotmail.com

A study to improve warehouse operation management in SME in Saudi Arabia.

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Abstract: Warehouse management consider as one essential part of the supply chain management. That actually is acting as a backbone, starting from orders and receives goods from the suppliers up to the next stages in the supply chain from releasing and delivering the goods to the customers. Warehouse management plays a very important role in the daily running business flow. In today's global business environment, computer systems are involved in business process providing quality products and efficient services are vital to staying competitive. Companies must eliminate inefficiencies, monitor productivity, and continually improve their operational performance in order to keep pace. In past, warehouses were managed with traditional processing techniques before computers and technologies were introduced to global markets business. Stockholders used to traditionally manage their business processes such as inventory, warehouse, shipping etc...

The sole purpose of conducting this research is to improve the warehouse management tools used in our present time, warehouse management software development industry and the techniques that could improve the warehouse management in the organization. The author believes that the warehouse management shall be categorized as an IT field as much as a business field and a good alignment between both these fields will lead any organization to their success.

Keywords: warehouse Management system, SME

Chapter 1: Introduction

1.1Background Research

In today's global business environment, being efficient and providing quality products and services are vital to staying competitive. Companies must eliminate inefficiencies, monitor productivity, and continually improve their operational performance in order to keep pace.

A warehouse management system is initially a system to control movement and storage of materials outside and within a warehouse, the role of WMS is including order management, stock management and indexing management, financial management and delivery services. Warehouse management system is all about managing cycle of processes, start from entering products information into the system, organize products into the warehouse, processing customer orders, control the overall payment processes, receiving the orders at the warehouse, then prepare and assemble the goods for the customer. Finally, either passing up the goods to the customer or delivering the orders to the customer's physical address. (IntelliTrack, 2005)

Warehouse Management Systems (WMS) emerged since the earliest computer systems which were allowed simple storage location functionality in the last decade. Today WMS systems can be standalone or part of an Enterprise Resource Planning (ERP) system and can support complex technology such as Radio Frequency Identification (RFID) and WLAN (Aquilano, 2001). However the basic principle of the warehouse system has remained the same, which is to provide information to allow efficient control of the movement of materials within the warehouse.

Dr. Al-Otaibi (2004), king Saud declared that Saudi market facing the global market challenges "Saudi Arabia is facing today consequences of global business and open markets, where e-Business is considered as a prerequisite for organizational competitiveness. E-Business is a challenging field due to many technologies that it involves. It is an essential requirement for modern organizations to have effective Information Technology (IT). IT status, position, barriers, and trends need to be evaluated before measuring its effectiveness.

The contents of the thesis is for internal user only

References

Text-Books References:-

- Chase, Aquilano and Jackobs (1998), Production and Operations management, manufacturing and services, (8th edition), United States of America, McGraw-Hill Companies.
- J.R Tony Arnold (1996) Introduction to Materials Management (Second edition), New Jersey, Prentice Hall.
- 3. -Lindau, R. and Lumsden, K.; The use of automatic data capture systems in inventory management; International Journal of Production Economics; 1999; Vol. 59.
- -Manthou, V. and Vlackhopoulou, M.; Bar-code technology for inventory and marketing management systems: A model for its development and implementation; International Jo
- 5. Richard J. Tersine (1994) Principles of Inventory and Materials Management (Fourth edition), New Jersey, Prentice Hall.
- 6. -Trunk, C.; Using bar codes for warehouse control; Material Handling Engineering; 1994; Vol. 49(10): p. 48-52.
- -Yao, A.C. and Carlson, J.G.; The impact of real-time data communication on inventory management; International Journal of Production Economics; 1999;

Internet References:

- Accounting.net, warehouse management productivity [online] Available at: (http://www.infotechaccountants.com/forums/showthread.php?t=4261) [Accessed: 29-7-2009)
- Alan McDonald, Increasing warehouse productivity (online) (cited 28-7-2009) Available at: http://www.forteindustries.com/whitepapers/Increasing%20Warehouse%20Productivity.pdf)
 [Accessed: 29-7-2009)
- Alex Yu (2008) [Online]. Available at: http://www.creative-wisdom.com/teaching/assessment/alpha.html [Accessed: 10 9- 2009]
- Alexandre Rodrigues, (2008) Business-IT Alignment and Organizational Maturity. [Online].
 Available at: http://www.pmforum.org/library/tips/2008/PDFs/Rodrigues-4-08.pdf [Accessed: 19- 9- 2008]

- Al-Mutlaq United, Wireless warehouse solution (online) (cited) Available from URL: http://www.almutlaqunited.com/solutions warehousemanagement.html [Accessed: 15-7-2009]
- 6. Ann L Casebeer and Marja J Verhoef (1997).[Online]. Available at: http://www.phac-aspc.gc.ca/publicat/cdic-mcc/18-3/d e.html/ [Accessed: 29 -9-2009]
- ASDBC (2008) technical feasibility. [Online]. Available at: http://asbdc.ualr.edu/technology/commercialization/technical feasibility.asp [Accessed: 28 8- 2009]
- 8. Aquilano (2001), Emerging Technologies in supply chain management (online) Available at: http://www.idii.com/wp/kom_wms_justification.pdf [Accessed: 30-7-2009]
- Evren SAHIN, Yves DALLERY, impact inventory data recorded inaccuracies (online) (cited 30-7-2009) Available from (http://www.rfidconvocation.eu/Papers%20not%20presented/A%20literature%20review%20on%20th e%20impact%20of%20inventory%20data%20record%20inaccuracies.pdf)
- Free-dictionary (2008) information system. [Online]. Available at: http://www.thefreedictionary.com/information+system
 [Accessed: 9-9- 2009]
- 11. Frankie Meehan (1998) An essay about technological change .[Online]. Available at: http://www.geocities.com/frankie-meehan/TechChange.htm [Accessed: 22 -8- 2009]
- 12. IntelliTrack, warehouse system (online) (cited 10th Jun 2009) Available from http://www.intellitrack.net/warehouse_management_system_wms.asp[Accessed: 10t-6-2009]
- 13. Kendra Van Wagner (2008) What Is Reliability. [Online]. Available at: http://psychology.about.com/od/researchmethods/f/reliabilitydef.htm [Accessed: 28-7 2008]
- 14. Kom International (2004), Warehouse Management System Cost Justification

 Document (online) Available at http://www.idii.com/wp/kom_wms_justification.pdf
 [Accessed: 30-7-2009]
- 15. Kaizenlog (2006) Historical background of WMS. [Online]. Available at: http://www.webpronews.com/expertarticles/2006/09/06/the-historical-background-of-human-resource-management [Accessed: 3 -8-2008]

- 16. Larry Haskett (2006), Wireless Warehousing's Real Driver (online) Available from http://www.unstrung.com/document.asp?doc_id=90481[Accessed: 30 -8-2008]
- 17. Mahboob Bin Mohammed, Ministry of Foreign Affairs, Kingdom of Saudi Arabia, Reduces Stock Distribution Time by 80% (online) Available from http://www.oracle.com/customers/snapshots/ministry-of-foreign-affairs-kingdom-of-saudi-arabia-financials-snapshot.pdf) [Accessed: 14 -9-2009]
- 18. Mutlaq B. Al-Otaibi and Rasheed M. Al-Zahrani (2004), Current Information TechnologyTrends in Saudi Organizations (online) (cited 30-7-2009) Available from (<u>http://colleges.ksu.edu.sa/ComputerSciences/Documents/077-088%2802%29%20Current.pdf</u>) [Accessed: 5 -8-2009]
- 19. Nasir Ayub, Wireless warehouse solution (online) (cited 15th July 2009) Available from < URL: http://it.toolbox.com/blogs/wms-essentials/the-benefits-of-investing-in-a-wireless-warehouse-management-solution-wms-19761>
- 20. Paul A. Strassmann(1998) What is Alignment? .[Online]. Available at: http://www.strassmann.com/pubs/alignment/ [Accessed: 4-9 2009]
- 21. Pc magazine (2008) information system. [Online]. Available at:

 http://www.pcmag.com/encyclopedia_term/0,2542,t=information+system&i=44963,00.asp

 [Accessed: 14 -8- 2008]
- 22. Quick MBA (2007) competitive advantage. [Online]. Available at: http://www.quickmba.com/strategy/competitive-advantage/ [Accessed: 29 -7- 2009]
- 23. Ruhe, G.; Momoh, J(2008) Strategic Release Planning and Evaluation of Operational Feasibility .[Online]. Available at: http://ieeexplore.ieee.org/Xplore/login.jsp?
 url=/iel5/9518/30166/01385887.pdf?temp=x [Accessed: 18-8-2009]
- 24. Saeed Alzahrani (2009), Saudi community and revolution of IT (journal) Available from http://www.alriyadh.com/2009/07/19/article445708.html [Accessed: 26-7-2009]
- 25. TECSYS Company' (2003), Warehouse Management System Cost Justification Document (online) Available from https://www.304.ibm.com/tools/cpeportal/fileserve/download6/16760/cost_justification.pdf?contentid=16760 [Accessed 23-7-2009]
- 26. TMC (2009), Saudi Arabia Information Technology Report (journal) (cited 30-7-2009) Available from http://www.tmcnet.com/usubmit/2009/06/25/4244277.htm [Accessed 23-7-2009]

- 27. Warehouse management system-wikipedia (online) Available from

 http://en.wikipedia.org/wiki/Warehouse_Management_System [Accessed 23-6-2009]
- 28. Warehouse Management System (online) (cited 12th Jun 2009) Available from

 (http://www.inventoryops.com/warehouse_management_systems.htm [Accessed 18-6-2009]
- 29. Wireless warehouse solution (online) Available from:

 http://www.p21.com/commercecenter/so-wireless-warehouse.html [Accessed 11-6-2009]
- 30. Warehouse Management System (online) (cited) Available from (
 http://www.inventoryops.com/warehouse_management_systems.htm)
- 31. The wireless warehouse (online) (cited Available from (http://www.oracle.com/oramag/profit/02-nov/p42apps wire.html)