

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT

EXPLORING OF WIRELESS TECHNOLOGY TO PROVIDE INFORMATION SHARING AMONG MILITARY, UNITED NATIONS, AND CIVILIAN ORGANIZATIONS DURING COMPLEX HUMANITARIAN EMERGENCIES AND PEACEKEEPING OPERATIONS

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Natural as well as man-made disasters have become commonalities of daily life in recent decades for a large portion of the world's population. This growing trend reflects the worldwide proliferation in recent years of Complex Humanitarian Emergencies (CHEs) and peacekeeping operations. Humanitarian emergencies and peacekeeping operations are a complex mix of related activities that require the combined efforts of the United Nations (U.N.), military, International Organizations (IOs) and Non-Governmental Organizations (NGOs). Given the nature and similarities of their missions, there is an ongoing need for these organizations to have access to accurate, current, and comprehensive information about field conditions and each other's movements. In several of the CHEs and peacekeeping operations of recent years, a recurring problem has been poor communication due to inadequate equipment, non-compatibility of equipment, and a non-standardized communications infrastructure. This thesis explores the impact and possible benefits that wireless technology can provide to help bridge the communication gap that exists among the U.N. and the NGOs who participate in CHEs and peacekeeping operations.

KEYWORDS: Wireless Technology, United Nations, International Organizations, Peacekeeping Operations, Non-Governmental Organizations, International Organizations, Complex Humanitarian Emergencies

METRIC METHODOLOGY FOR THE CREATION OF ENVIRONMENTS AND PROCESSES TO CERTIFY A COMPONENT: THE NRL PUMP

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Information superiority has many components. Of critical importance is information security. Over forty years ago, when information security for computer based systems was initially discussed, the military leadership looked for general purpose, high-assurance, multi-level secure (MLS) computers and software. Information is compiled at various data sensitivity levels, but it also incorporates low-level data with high-level data to provide the necessary information at the system high-level being evaluated. What is the best way to get the low-level data to the high-level system/user without compromising the high-level system?

One proposed solution is the Naval Research Laboratory's (NRL) Network Pump (NP) to prevent unauthorized information flow between computers of different security levels. To incorporate the NP into

INFORMATION TECHNOLOGY MANAGEMENT

the DoD infrastructure it is necessary to get the NP through the hurdle of Certification and Accreditation (C&A). The NRL has produced and provided many useful documents for the C&A of the NP, but the key requirement for Certification and Accreditation is the creation of a Protection Profile and an understanding of the DITSCAP requirements and process. This thesis creates a Protection Profile for the NP along with a draft Type SSAA for Certification and Accreditation of the NP.

KEYWORDS: NRL Pump, Protection Profile, DITSCAP, Common Criteria, Trusted Guard, EAL5, Type SSAA, Certification and Accreditation, Multi-level Security (MLS), Information Assurance, Network Pump, Data Pump, Covert Channels, High Assurance Component

THE MOBILE AIRCRAFT MAINTENANCE OFFICE CONCEPT FROM A WIDE AREA PERSPECTIVE

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As mobile computing becomes more ubiquitous, through the use of very capable mobile computing devices and broadband wide area wireless data networks, naval aviation maintenance has an opportunity to extend the reach of the Naval Aviation Logistics Command Management Information System (NALCOMIS) to fielded aircrew, maintenance technicians, and maintenance supervisors supporting out of local area operations. The combination of the new mobile technologies and the wireless Internet make modern Mobile Business (m-business) initiatives possible, but ushers in a host of new problems and issues that are radically different from those experienced with traditional fixed electronic business (e-business) projects. This thesis examines the concept and components that comprise m-business, details wide area data over cellular technologies, and identifies problems and issues unique to m-business initiatives. Scenario-based Use Cases will be employed within the Unified Process (UP) framework to develop the three major artifacts of the UP's inception phase: the project's vision, a Use Case model, and a supplemental specification containing functional and non-functional requirements for an aircrew mobile aircraft maintenance application. The results of this study can serve as the foundation for the development of a complete mobile aircraft maintenance office.

KEYWORDS: Mobile Business, M-Business, M-Commerce, Mobile Computing, Wireless Computing, Third Generation Wireless, 3G, Data Over Cellular Networks, Mobile Aircraft Maintenance

AN XML-BASED KNOWLEDGE MANAGEMENT SYSTEM OF PORT INFORMATION FOR U.S. COAST GUARD CUTTERS

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This thesis describes the development of a prototype application, which collects, manages, and distributes knowledge gained by Coast Guard cutter crews making port calls throughout the world. The system uses XML technologies in server/client and stand alone environments. With a web browser, the user views and navigates the system's content from a downloaded file collection or from a centralized data source via a network connection. Users add and modify content with Hypertext Markup Language (HTML) forms using their existing network connections. Client-side data access and navigation, as well as data storage, is performed using non-proprietary standards developed by the World Wide Web Consortium (W3C) and the Internet Engineering Task Force (IETF).

The prototype application's purpose is to fulfill the strategic goal of achieving superiority of maritime domain awareness over the areas in which the Coast Guard operates. The need for this application is based

INFORMATION TECHNOLOGY MANAGEMENT

upon the lack of specific information from currently available reference publications, the absence of a system to distribute port call knowledge, and the data bandwidth limitations of cutters at sea. The need for knowledge retention aboard cutters is elevated by shortened crewmember assignment lengths due to the stressful and arduous duties of life at sea.

KEYWORDS: Knowledge, Knowledge Management, XML Database, Extensible, XML, XPATH, XSLT, XML Schema, XQuery, XLink, XPointer, XInclude, CSS, HTML, XHTML, DOM, JavaScript, ASP, Internet Explorer, MSXML, Coast Guard, USCG, Cutters, Personnel, Navigation, Ports, Locations, Experiences

WIRELESS LAN EXTENSION

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The proliferation of laptop computers within an organization, combined with an increasing need to mobilize the labor force, have fueled the demand for wireless networks. Until recently, wireless technology was a patchwork of incompatible systems from a variety of vendors. The technology was slow, expensive, and used for mobile applications or environments where cabling was impractical or impossible. With the maturing of industry standards and the deployment of lightweight wireless networking hardware across a broad market section, wireless technology has come of age. Lowered prices and interoperability have attracted many organizations to the idea, especially in the retail, financial, education, and health-care fields. The availability of wireless networking and wireless Local Area Networks (LANs) can extend the freedom and mobility of a network user, solve various problems associated with hard-wired networks, and even reduce network deployment costs in some cases.

This thesis provides an introduction to wireless LAN technology and the wireless LAN design for the Software Metrics Laboratory at the Naval Postgraduate School, with particular emphasis on the communication requirements and protocols for the implementation of the wireless LAN extension to the existing wired LAN.

KEYWORDS: Wireless Local Area Networks, WIFI (802.11b), Access Point, Wireless Interface Cards, Software Metrics Laboratory, Wireless LAN Standards

IMPLEMENTING E-GOVERNMENT: A CASE STUDY OF IMPROVING THE PROCESS FOR TRANSFERRING CONVENTIONAL AMMUNITION AMONG THE MILITARY SERVICES

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While the Internet and related advances in communications technology provide significant opportunity for the federal government to vastly improve the delivery of information and services, success ultimately depends on government managers effectively redesigning industrial age processes for the information age. This thesis is intended as a guide for government managers interested in redesigning processes for the information age. Using a case study of a Department of Defense process for transferring conventional ammunition among the military services (cross-leveling), improved intra-governmental efficiency and effectiveness is demonstrated by employing best practices in business process redesign. After providing an overview of the existing cross-leveling process, each stage of Business Process Redesign is discussed and

INFORMATION TECHNOLOGY MANAGEMENT

applied to the cross-leveling case. Activity Based Costing and Knowledge Value Added are used in evaluating the existing process and for providing a measure of process improvement. Using a three-tier architecture, a prototype application was constructed to help visualize the redesigned process and demonstrate the underlying technology. The concepts and processes used in the cross-leveling case study can be easily applied to other government processes.

KEYWORDS: Electronic Government, Electronic Commerce, Business Process Re-design, Ammunition, Cross-leveling, Army, Case Study