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Defense Medical Logistics Standard Support (DMLSS) System:

A Case Study of the Deployment of DMLSS Release 3.0 at Moncrief Army Community Hospital

A Graduate Project Submitted to Dr. Karin Waugh Zucker in Partial Fulfillment of the

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14. ABSTRACT

In 2001, the Defense Medical Logistics Standard Support System (DMLSS) Release 3.0 was deployed to Moncrief Army Community Hospital, the Armys test site. The goal of this project was to examine whether the deployment was done in an effective manner. Through a literature review, examination of organizational documents, and interviews with personnel at the United States Army Medical Information System Support Agency (USAMISSA) in San Antonio, Texas, the DMLSS Program Office in Falls Church, Virginia, the Joint Medical Logistics Functional Development Center (JMLFDC) in Fort Dietrick, Maryland, and Moncrief Army Community Hospital (MACH) in Fort Jackson, South Carolina, I was able to show that the deployment process for Release 3.0 was well conducted. The MACH logistical staff was mentally prepared for the change in computer systems. The staff received briefings from MACH leadership, senior Medical Command representatives, and JMLFDC staff prior to the actual deployment. Since the staff understood the system and its capabilities, the implementation of was DMLSS rapid and thorough. The training did have areas that could have been improved. There were problems during the classroom week with class scheduling and training computer capabilities, but the on-the-job training conducted by the deployment staff paid great dividends and enabled MACH to fully utilize DMLSS when the old systems were turned off. Implementation of DMLSS was well planned and executed but needed some refinement. The site visit made by that the JMLFDC staff enabled the systems hardware requirements to be identified and equipment to be ordered. The majority of the data conversion of old files was accurate but some adjusting of the new database had to be done during the deployment. Although MACH was the Armys test site for the deployment, the DMLSS system was up and running at the end of the three week deployment. While problems did arise that required alterations to the deployment plan and changes to the DMLSS program itself, the deployment was effective. The lessons learned at MACH were incorporated into the deployment plan of the DMLSS Program Office and should make future deployments even better.

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Abstract

In 2001, the Defense Medical Logistics Standard Support System (DMLSS) Release 3.0 was deployed to Moncrief Army Community Hospital, the Army's test site. The goal of this project was to examine whether the deployment was done in an effective manner. Through a literature review, examination of organizational documents, and interviews with personnel at the United States Army Medical Information System Support Agency (USAMISSA) in San Antonio, Texas, the DMLSS Program Office in Falls Church, Virginia, the Joint Medical Logistics Functional Development Center (JMLFDC) in Fort Dietrick, Maryland, and Moncrief Army Community Hospital (MACH) in Fort Jackson, South Carolina, I was able to show that the deployment process for Release 3.0 was well conducted.

The MACH logistical staff was mentally prepared for the change in computer systems. The staff received briefings from MACH leadership, senior Medical Command representatives, and JMLFDC staff prior to the actual deployment. Since the staff understood the system and its capabilities, the implementation of was DMLSS rapid and thorough.

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List of Acronyms and Abbreviations

AIS - Automated Information System

AMEDDPAS - Army Medical Department Property Accounting System

APC - Account Processing Code

C - Conversion

CAIM - Customer Area Inventory Management

CPU - Central Processing Unit

CSW - Customer Support for the Web

DFAS - Defense Accounting and Finance System

DHCP - Dynamic Host Configuration Protocol

DMLSS - Defense Medical Logistics Standard Support

DoD - Department of Defense

EOR - Element of Resource

FY - Fiscal Year

IMD - Information Management Division

IMO - Information Management Office

IP - Internet Protocol

JMLFDC - Joint Medical Logistics Functional Development Center

LOA - Letter of Agreement

LAN - Local Area Network

MACH - Moncrief Army Community Hospital

MB - Mega Bites

MEDLOG - Medical Logistics System

Mhz - Mega Hertz

MM - Materiel Management

MOU - Memorandum of Understanding

MTF - Medical Treatment Facility

OJT - On the Job Training

PC - Personal Computer

PMO - Program Management Office

QA - Quality Assurance

RAM - Random Access Memory

RF - Radio Frequency

SRIM - Stock Room Inventory Management

TAMMIS - Theater Army Medical Materiel Information System

TCP - Transfer Control Protocol

UDR - Universal Data Repository

USAMISSA - United States Army Medical Information System Support Agency

USAMMA - United States Army Medical Materiel Agency

VA - Department of Veterans Affairs

Defense Medical Logistics Standard Support (DMLSS) System: A Case Study of the Deployment of DMLSS Release 3.0 at Moncrief Army Community Hospital

Introduction

Overview of Moncrief Army Community Hospital (MACH)

Moncrief Army Community Hospital (MACH) is a medical complex, which includes a 12 story main facility and four outlying buildings. MACH serves 60,500 beneficiaries at Fort Jackson and greater Columbia, South Carolina. It is part of the Southeast Region of the Army Medical Department with Regional Headquarters located at Eisenhower Medical Center, Fort Gordon, in Augusta, Georgia. There are 786 staff members at MACH, 395 military and 391 civilian. They provide specialty care in family practice, dermatology, mental health, optometry, gynecology, and orthopedic surgery. The daily census for inpatients, including psychiatric patients, is 17. Each day 1,253 people are seen in the clinics, 1,032 lab procedures are conducted, 1,794 prescriptions are filled, and 317 x-rays are produced. The Logistics Division has assigned to it 78 officers, soldiers, and civilians. It consists of the following sections: Office of the Chief of Logistics, Supply and Acquisition, Medical Maintenance, Property Management, and Facility Maintenance. Each of these sections utilizes the Defense Medical Logistics Standard Support (DMLSS) System, in one form or another, to complete its respective missions.

Statement of the Issue Investigated

The issue to be investigated was: Was the Defense Medical Logistics Standard Support (DMLSS) System fielded in an effective manner at MACH? To determine that, the following questions must be addressed: Were the Logistics Division personnel

mentally prepared to accept the new system? Was the system implemented so as to conform to Fort Jackson business practices? Did personnel receive proper instructions on operating the new system? How were problems with the system addressed and corrected? By answering these questions it is hoped that improvements can be made in the process of deploying DMLSS to the rest of the Army.

Brief History of the DMLSS System

Military medical logistics was described in 1990 as having a "just in case" management philosophy. The basic element was the storage of large amounts of materiel at Department of Defense (DoD) locations, either wholesale depots or military treatment facilities (MTFs). The depots existed to support immediate requirements, like deployments, as well as daily demand at the DoD MTFs. Large inventories were maintained at the MTFs to ensure health care services occurred without interruption. These practices reflected a lack of confidence in the medical supply processes which were characterized by long order shipment times from depots to MTFs. While MTFs typically ordered materiel from the depots, in some cases, they ordered directly from civilian companies. No automated product or price comparison tool was available to facilitate best value procurement, and each of the DoD services (Army, Navy and Air Force) had its own automated information system (AIS) for medical logistics. One service was not able to interface or integrate with another's AIS (Wolfe, 2002). Not only was this an inefficient way of doing business, it was also expensive. Walter Reed Medical Center in Washington, District of Columbia, had 10 warehouses containing 6 months worth of medical supplies. All of the drugs could not be used, so up to $50,000

worth of expired materiel was destroyed a month (Duvall, 2003). A new way of doing business was needed, and its motto would be "just in time" logistics (Friel, 2002).

In April of 1990, a meeting was held between representatives of Army, Navy and Air Force medical logistics communities at the request of the Assistant Secretary of Defense (Health Affairs) and the Deputy Undersecretary of Defense (Logistics). These officers were instructed to look 10 years in the future and see where DoD medical logistics should be. The officers looked to the civilian community for ideas. They found that Johnson & Johnson was able to fill orders in 24 hours, while the DoD required 3 to 4 days to fill orders for its highest priority items. A Department of Veterans Affairs (VA) facility in Hines, Illinois (which received its supplies from a DoD depot located on the VA facilities campus), had a 4 day fill-time for its pharmacy supplies. Logisticians there switched to a civilian supplier located 100 miles away and started receiving supplies in 24 hours. They also found that DoD only used 4% of the medical supplies used in the nation. This disproved the argument that the large stockpiles at depots were needed for contingency operations; there were already enough supplies in the civilian inventories to fill DoD's requirements (Duvall, 2003). The group's ideas were taken back to the three services for further study. Then, in August 1990, the Gulf War deployments began.

It was the Gulf War that drove home the need for changes. It provided dramatic demonstrations of the system's inefficiencies. There was no integrated communications channel relaying needs throughout the theater, there were "stove pipe" systems (the Army's Theater Army Medical Materiel Information System [TAMMIS] and the Air Force's Medical Logistics System [MEDLOG]) that were uncoordinated and multi-channeled (Wolfe, 2002). Only the Army's (TAMMIS) could be used for inventory

management in the field. None of the services could order electronically (Duvall, 2003). These problems led to waste. There was unnecessary duplication in stockpiling and improper utilization of transportation assets, such as trucks and planes. While the logistical mission was successfully accomplished in the war, it was done at great expense and showed a glaring need for improvement.

With the findings of the April 1990 meeting and the lessons learned in the Gulf War as the driving forces, the Assistant Secretary of Defense (Health Affairs) and the Deputy Undersecretary of Defense (Logistics) directed "the Military Medical Logistics community to develop a Tri-Service … [AIS] to be used in peace and war" (Aitkin, 1996), that is, in fixed facilities and in field units. The Defense Medical Logistics Standard Support (DMLSS) Program was created. It was headquartered in Falls Church, Virginia and had the following objectives:

- Create an integrated medical supply activity at the DoD level;
- Reduce the costs of pharmaceuticals and medical/surgical items;
- Reduce order shipment time for pharmaceuticals and medical/surgical items;
- Reduce inventory at wholesale (depot) and retail (MTF) levels;
- Reduce the time health care providers spend on medical logistics related activities; and
- Incorporate best business practices of the commercial health care industry

To meet these objectives, the DMLSS Program Office would develop two separate, but integrated, projects. They were initiating the "prime vender" program and developing the DMLSS software.

First, it was understood early on that it would take years to develop an automated information system that would incorporate the business practices of three separate

military departments and provide full electronic commerce capabilities. So it was decided to adopt a prime vendor program as a way to make a quick and significant change in the costs of doing business (Wolfe, 2002). ("A prime vendor is a contractor that is given the responsibility to manage, store, and distribute inventory or to manage and perform services or research on a recurring, frequent basis upon request of [DoD] users" [Korody-Colwell and Zucker, 2001].) It was modeled after the Vanderbilt Medical Center's prime vendor contract with Baxter Pharmaceuticals, Inc., which enabled it to achieve 24-hour turn around for its medical surgical supplies (Duvall, 2003). So, test sites were set up at three DoD medical centers and three smaller hospitals. The results were dramatic and positive.

Walter Reed reduced its 10 warehouses to 2, its cost of the supplies destroyed each month went from $50,000 to under $500, its supplies on hand shrunk from 6 months' worth to 2-3 days' with 24 hours as the new standard for resupply from the civilian contractor or the DoD supply center located in Philadelphia. Previously 60% of the dollars spent were on local purchases that could not wait on resupply from the depot. Since there was no credit card system at the time, this led to large contracting staffs. The prime vendor initiatives enabled MTFs to greatly reduce the number of contracting positions (Duvall, 2003). In time, the program was expanded to all DoD facilities and has saved hundreds of millions of dollars with no deficiencies in operational readiness noted. For the period fiscal year (FY) 1992 to FY 1996, a $154 million reduction in the cost of drugs, a $409 million reduction in inventories at the depots, and an $84 million reduction in supplies stored at the MTFs were achieved (Wolfe, 2002). It was the savings

from the prime vendor program that funded the development of DMLSS throughout the budget restricted 1990s (Duvall, 2003).

The second project was the development of the Tri-Service AIS, called the DMLSS System, to replace 13 systems currently in use within DoD. It would be broken down into four sections that would, for the first time, enable medical logistics to be managed out of one Windows ™ based automated information system. The sections were Materiel, Facilities, Equipment & Technology Management, and Wholesale Functions. Electronic Data Systems was hired as the contractor to write the programs at the new Joint Medical Logistics Functional Development Center (JMLFDC) located at Fort Dietrick, Maryland. There military experts (officers, non-commissioned officers, warrant officers and military retirees) would work with the contractor to create DMLSS. The functional area experts (e.g., a medical maintenance chief warrant officer) create documents outlining requirements and specifications, i.e., what the program must be able to do. These documents would be blended together for the three services, and the programmers would write the code that created the software. This would be constantly reviewed and improved until a working program was created (Burrhus, 2003).

Using DMLSS, logistics divisions can electronically manage their inventory, order supplies, pay bills, track maintenance schedules, track property, place work orders, and build management reports. The inventories are done with hand held barcode readers that download the information into DMLSS docking stations. The system is linked with the Defense Finance and Accounting System (DFAS) so bills are forwarded from the supplier, through DMLSS, to DFAS; and money is sent to a supplier's account without paperwork being needed. The speed of payment also makes doing business with the

government much more attractive to civilian firms. Work orders are submitted through DMLSS from employees' desktop personal computers; no longer will phone calls need to be made or paper forms filled out. DMLSS is an all-encompassing medical logistics system that has no counterpart in the civilian sector (Duvall, 2003). Coupled with prime vendor contracting, it has been so successful that it has received numerous awards. It earned the DoD Electronic Commerce Pioneer Award in 1999 for "an electronic commerce initiative that pushes the current state of electronic commerce to reduce an antiquated paradigm and demonstrates a high level of innovation and government creativity" (Johnson, 1999). In 2002, DMLSS received the DoD Business Solutions in the Public Interest Award for "combining several older computer systems and paper-based processes into a single online management tool" (Friel, 2002). It has shown its value to DoD.

Since combining the systems being used by the three different services and beginning entirely new business practices would take years, DMLSS development was planned to be done in stages and the deployment of the newly developed technology would be in three releases (Wolfe, 2002). Release 1.0 took place throughout DoD starting in 1996. It provided Facility Maintenance and Customer Support modules that contained product and price comparison tools and critical facility management functions previously done manually (Clarke, 1997). Release 2.0 was in 1998. It contained the Customer Area Inventory Management module and a second increment of the Facility Maintenance module. Hand-held, wireless, bar code devices were used to control receipts and inventories. It also contains a streamlined DFAS and electronic commerce interface (Clarke, 1997). Release 3.0 was begun in 2001, and the Army's test site was

MACH. This release contained the final part of Materiel Management and the Equipment & Technology Management module. It included "the full suite of medical logistics capabilities to include stock fund level inventory management, quality control, medical technology management, and management of readiness materiel" (DMLSS Handout, 2002). Release 3.0, "Enable[d] the services to turn off service unique medical logistics legacy systems such as TAMMIS, AMEDDPAS, and MEDLOG" (Burrhus, 2003).

So how did these deployments take place? How were they organized? Who did the training? Was the system "sold" to the staff before introduced? Were the MTFs included in the planning? Who paid for the installation and training? When were the old systems discontinued? Did the deployment of DMLSS conform to the professional literature dealing with implementation of new automated information systems?

Literature Review

Organizational Change

"Organizational change" is defined as "a continuous process that involves multiple and often incomplete transactions and uncertain future states that lead organizations to transition from one state to another (Fried and Johnson, 2001)." Changing the way an organization does business and replacing the tools that it uses to do its job is a difficult task. The implementation of prime vendor contracting and DMLSS at MACH were dramatic organizational changes. How should they have been handled?

Author Sharon Topping states, "Change has become a way of life in most healthcare organizations. Many believe that to withstand profound change, organizations must be flexible with loose boundaries and the ability to adapt and respond to the environment and its stakeholders (both internal and external). Therefore, change is the

greatest problem that healthcare executives have to face in their roles as managers and decision makers" (Fried and Johnson, 2001).

Change takes many forms, from revolutionary to incremental. "Revolutionary change" is a complete reversal of an organization's direction that involves a transformation of the structure, culture, and strategy. "Incremental change" is a series of small steps that represent adjustments to environmental changes or fine tuning of the direction of an organization. A period of ferment is a time period in which organizations test new responses to the environment by making incremental changes (Fried and Johnson, 2001). Fitting an organization's culture to one of these change strategies is a key to implementing change.

Many people in the organization will see the change as an opportunity, while others will see it as a disruption and a threat. How people view change often depends on whether they helped to create the change or will merely be affected by it. Many employees have a vested interest in maintaining the status quo. Because of this they will work actively or passively to block change. They can often become forces of inertia that obscure threats and create resistance to change in organizations. Such resistance can lead to failure of change if not properly managed. It is the fear of uncertainty that causes many staff members to view change as a loss of control and a threat to their jobs. Additional roadblocks that can serve as barriers to organizational change include: bureaucratic hierarchy and administrative systems, organizational culture, organizational history, organizational size and age, and lack of resources (Freid, 2001). Each of these roadblocks must be managed, i.e., the "change agent" that is seeking to facilitate the

changes must overcome each of them because a single roadblock can derail the change process.

Dr. Topping suggested that focusing on the human resources aspect of change management is a key to success. Encouraging open communication between employees and management is important. People must feel they can express their opinions and concerns without repercussions. When openness is established done early in the planning process, acceptance of the change goes more smoothly. She also suggests winning over internal and external stakeholders. These power groups may include white collar and blue-collar employees, federal agencies, or consumer groups. The use of a "champion" is a key to persuading the stakeholders. Champions are prominent or well respected members of the group that have influence over other members. Convert them to your side, and they can bring others with them. Another method is building teams that assist in the planning and implementation of the change. By using teams, you involve employees in the process, which allows them to prepare psychologically for the change. Some resistance to organizational change is inevitable, so accommodating it should be part of the implementation plan from the beginning (Fried and Johnson, 2001).

Ginter, Swayne, and Duncan discuss developing organizations that embrace change by building an adaptive culture, i.e., "… one that allows for reasonable risk taking, builds on trust and has a willingness to allow people to fail, and exhibits leadership at all levels." In an organization with an adaptive culture, everyone, regardless of position, is encouraged to initiate changes that are in the best interest of customers, employees, and managers. The fear of failure is reduced by tolerating creative efforts to make the organization a better place to work and more responsive to stakeholders. The

authors believe that an adaptive culture must already be in place before changes to the organization can happen. In fact, it should be in place before changes are planned. They specifically mention information technology as an area where people need to be willing to adapt because of the need to frequently upgrade and replace hardware and software. Employees must trust that their managers will be seeking more efficient and cost effective products that will not hinder their ability to do their jobs, but will enhance it. A free flow of information that builds understanding and acceptance is a key to creating this adaptive culture (Ginter et al., 1998).

Organizational change is introduced in Longest, Rakich, and Darr's book with the following quotation, "Change is inevitable and the future is uncertain." To them organizational changes are made because managers perceive a performance deficiency in their areas of responsibility. To address this deficiency, managers must understand how to be change agents.

Longest, Rakish, and Darr break the management of change down into tasks. Each task must be successfully accomplished before an organization can move onto the next one. The first task is for managers to recognize situations that require an organizational change. Then, they must identify the nature of the change needed. These two tasks are related and can be triggered by various pressures for change, such as improvements in technology.

Once the nature of the change is identified, steps must be taken to ensure effective planning for implementation. These steps include: developing alternative changes to be considered; choosing the alternative to be implemented; shaping a general approach to

making the change; and developing the techniques to build support for the change and minimize resistance to it.

The implementation of an organizational change is accomplished through three additional tasks: unfreezing the status quo; introducing the change; and refreezing the organizational change. First, managers must disrupt the status quo and prepare those involved for change. Then they must insert some concept, practice, or thing into a situation to modify the organization's purpose, culture, tasks, technologies, personnel or structure. Lastly, managers must refreeze the organizational situation in its new form to provide stability and durability of the change in the organization.

The management of organizational change does not end with implementation. Managers who have the most success evaluate the results of change and use the information obtained to continue improvements. The tasks are to compare results with what was planned, to explore the reasons for differences, and to use this information to inform and guide future changes.

The model of Longest, Rakish, and Darr emphasizes that managers' tasks are sequential. If any are skipped or done poorly, then managers are not adequately playing their important role as change agents and the entire process is jeopardized (Longest et al., 2000).

"Health services are facing continuous and fundamental change. An expanding technology, changing consumer expectations, limited resources, and an unrelenting need for adaptability challenges our prevailing assumptions of rationality and predictability in the provision of health services (Shortell and Kaluzny, 2000)." The authors stress that

there are different types of change. Each presents a different challenge to those involved in the change process, and each requires a different strategy to overcome it.

"Technical change" is a modification in the way the normal activities of the organization are carried out. The changes may vary in focus, cost, and potential impact and include a range of modifications in tasks and alterations in structure, such as new computerized patient records or new clinical protocols. While these changes are being implemented, routine activities are carried on. Operations may be changed but remain consistent with the overall mission and goals of the organization. Proper implementation of technical changes requires input from those intimately involved to make them effective.

"Transitional change" focuses on altering the organizational mission and goals but not the essential work processes in the organization. In these situations, the technology and basic structure are already in place, the major focus is to change the mission of the organization. These changes in mission occur infrequently but are associated with increased stress and trauma since the missions and goals of an organization are often identified with some powerful internal or external stakeholders.

"Transformational change" is the most dramatic form of change. This includes change to the structure and processes of the organization and to the mission and objectives that the organization exists to fulfill. Changing an outpatient clinic to a full service hospital would be an example of this kind of change. Transformational changes are rare, but when they do occur they typically involve a great deal of controversy.

Shortell and Kaluzny describe four stages of change: awareness, identification, implementation, and institutionalism. "Awareness" is the initial stage in which

individuals recognize that there is a gap between what the organization is currently doing and what it should be doing. This awareness can come from internal or external sources, both of which have influence over how the organization operates. "Identification" is the second stage, and it involves an attempt to address the discrepancies noted in the previous stage. This may occur at various points in the organization. The critical challenge is to ensure that once solutions to these discrepancies or inconsistencies are identified, they are quickly implemented, which is the next stage, "Implementation." The last stage, "Institutionalization," involves the integration of the change into ongoing activities of the organization. Implementation without internalization results in a gap between organizational practice and evaluation, often manifesting itself in employee discontent (Shortell and Kaluzny, 2000).

Successfully dealing with people and their concerns is a key to facilitating change according to Paul Wojciak. He groups people into categories (Evil Nayser, The Yes Man, The Moray Eel, and Wendy Whiner) determined by their attitudes and actions during the change process. By understanding individual traits in people you can better formulate strategies to lead them through change.

The "Evil Naysayer" has something negative to say about every aspect of the change. He or she is probably a long time employee with great knowledge about the way things are currently done and fears losing status in the organization. Taking the time to explain the importance of the changes and how the new system works can make the Naysayer an ally in the process.

The "Yes Man" agrees with everything you say but has no constructive input, often because of a lack of self-confidence. If managers can broaden this individual's

knowledge of the needed change and build his or her confidence, they may have a vigorous ally to facilitate the process.

"The Moray Eel" is a senior member of the organization and one who generally chooses to have limited involvement with the change but who can veto weeks' worth of work in an instant. The only way to placate the Eel, who is operating out of ignorance and fear of the change, is to get him or her more involved in the change process so he or she has a stake in a successful implementation.

"Wendy Whiner" is the person who says, "I haven't got time for this nonsense, I've got a job to do." By educating Wendy so she perceives the change as needed, you can break down her resistance to the new way of doing business. "People don't resist change, they resist being changed" (Wojciak, 1997).

The author ends his article with the following with three key rules. First, recognize that no one likes change and that you must work on positive ways to overcome the resistance that will be out there. You must identify and recruit change agents to help address the problems that change creates. Second, communication is key. "Communication is the common reference point. If a good, solid network of communication isn't established, the ability to both properly set and follow up on expectations won't exist" (Wojciak, 1997). Third, keep the implementation plan as simple as possible. Always remember that people make things happen in an organization. Without their clear understanding of the new system, and their desire to implement what they believe is an improvement, the change will be ineffective (Wojciak, 1997).

Planning for Change

Austin and Boxerman provide a description of the process they say must happen in the implementation of a new automated information system. This description provides a guideline organizational leaders may use in planning for change.

New equipment will be required to implement some systems. If it is necessary, the requirement can range from complete installation of a general-purpose computer network to the relatively simple addition of new workstations to an existing system. Whatever the magnitude of the requirement for equipment, ordering and installation must both be carefully planned. Good space planning is always required. In some cases, renovation and/or site preparation will be required.

For information systems being implemented by in-house staff, planning for the development of applications programs is part of the implementation process. However, most systems in healthcare organizations use applications software from vendors. In those cases, some in-house programming may still be required to build interfaces to other applications or change network configurations to accommodate the new software.

A task that is sometimes overlooked in planning is database preparation or modification. Some health information systems will require that one or more of the organization's data files be converted from manual form to electronic storage in the computer. Other systems may require modifications to an existing electronic database to make it compatible with the new system.

No health information system should be put into operation without being completely tested. This testing should be carefully planned to determine whether specific goals and objectives for the information system have been met and should cover all

aspects of the new system in as realistic an environment as possible. Elements to be tested include system objectives, computer and network hardware, software, training of operators, accuracy of costs estimates, and adequacy of system documentation.

The final aspect of implementation of a system is completion of all documentation. This needs to be included in the plan from the beginning to ensure it is carried out. Documentation should be a continuous process carried out during all phases of the system project. Just before putting the system into use, the project team should do a final check to ensure that the documentation is adequate for effective maintenance of the new system (Austin and Boxerman, 1998).

Additionally, the chief executive officer and other senior managers must assume responsibility for planning and controlling the development of effective information systems to serve their organizations. This cannot be completely delegated to technical personnel. Delegation can lead to poor acceptance of new technology by managerial staffs can be a major barrier to full integration of the system into the organization (Zelic et al., 2000). Management must also ensure that careful planning precedes all decisions on acquisition of software and hardware and that well established principles and procedures are followed in the analysis, design, and implementation of systems (Austin and Boxerman, 1998).

Training for Change

A workforce must be adequately trained to use new technology. Without adequate training, the new technology will not be utilized to its full potential and the organization will not get the greatest possible benefit. Deciding which computer system to purchase or create equates to only 20% of the success during implementation, while

preparing the workforce to accept the new system and training your personnel on its effective use accounts for 80%. (Bettini, 1997) So how should training be conducted in an organization? When should it start? When should it end? What makes it effective?

Healthcare organizations are dependent on individuals to help them accomplish their organizational tasks and goals. James A. Johnson writes about how these individuals range from those with little formal training and education to highly skilled and educated professionals who are engaged in very complex tasks and decision-making. To maintain quality and continue improvement, an organization must have a training plan for its workforce. This training, whether reinforcing skills personnel already have or introducing new ones, is what keeps a modern healthcare organization viable and competitive in this constantly changing world. Having a formal educational program also is a bedrock for creating a capacity to change. People grow used to learning new ideas and procedures. "One of the most salient approaches to improving our health delivery system is investing in people" (Johnson, 2001).

Johnson says there is a difference between training and education, although in most organizations the terms are used interchangeably. For him, training primarily focuses on the acquisition of knowledge, skills, and abilities. Knowledge is a byproduct of both remembering and understanding information. Skills are general capacities to perform a task or set of tasks, often gained through experience. Abilities are capabilities to perform based on experience, social or physical conditioning or heredity.

Education is the development of general knowledge related to a profession but not necessarily designed for a specific position within that profession. The introduction of a

new process or system would require both training and education depending on what job a person performs in the organization.

Eight training principles, forming a training cycle, are discussed by Johnson.

1. Identify the types of individual learning strengths and problems and tailor training around them.
2. Align learning objectives to organizational goals.
3. Clearly define program goals and objectives at the start.
4. Actively engage the trainee to maximize attention, expectations, and memory.
5. Use a systematic, logically connected sequencing of learning activities so that trainees can master lower levels of learning before moving onto higher levels.
6. Use a variety of training methods.
7. Use realistic job relevant material.
8. Allow trainees to work together and share experiences.

Additionally, trainees are more apt to remember concepts, terms, skills, etc. if they hear or say them more than once, are able to practice, can immediately implement them in their own setting, and are encouraged and rewarded for using or trying the new method (Johnson, 2001).

Another concept that Johnson discusses is called “organizational development” as a way of educating employees about changes. Its techniques include survey feedback, confrontational meeting and coaching. The idea is to work through the natural resistance to change. Success is, “in part a result of [organizational development’s] philosophy of participation and mutuality and its belief in the value of knowledge at all levels of the organization. [Organizational development] empowers participants in the change process

by involving them in the process and by encouraging their commitment to the desired change" (Johnson, 2001). Educating employees, exchanging knowledge, and accepting feedback are all ways that new ideas are embraced by organizations.

An extremely important part of implementing a system is training the personnel who will operate and use it. For systems designed and implemented in-house, training plans should be drawn up by the project team, and team members should take responsibility for coordinating and conducting the training sessions. If systems are purchased from commercial firms, the company will usually include initial training as part of the contract. Training is critical when a system is installed and should include general orientation for top management and more specific training for first-line supervisors and direct users of the system. There has been considerable difficulty with many information systems in the first months of operation because operating personnel were not properly oriented and trained in advance (Austin and Boxerman, 1998).

Building enthusiasm and buy in to change is a key part in the education of leaders. Patrick Bettini discusses three ways that this is done, "First Cut Education," "Detailed Education," and "Ongoing Education."

First Cut Education is done early in the change process and educates key leaders on how the new processes will work, what they consist of, how they operate, how they will be able to manage effectively, and what will be required to implement and use them properly. Ideally, these newly educated leaders will become enthusiastic supporters who will assist in the implementation of the changes. They in turn will brief and inform their employees on what the system is about and why it is needed, preparing the workforce to accept the new system.

Next comes Detailed Education. This technically specific training is provided to all people involved in using the new system. The object is to provide essential knowledge in all of the areas of the new system, such as scheduling, inventory management, billing, etc. When personnel are educated on how to effectively utilize the new system, they will quickly lose their resistance to the changes being made, allowing it to be fully integrated into the organization's culture.

Ongoing Education happens as the system is being installed and as it is being used. It involves a continuing effort to upgrade the staff's awareness of and skills with the system. By improving performance of the individual tasks being done with the system, the overall value of the system to the company increases. Ongoing Education reinforces initial education and is necessary for new employees and employees new to their jobs.

Bettini stresses that education, at all levels, is the key to accepting change and enabling your investment, the new system, to be effectively utilized. Training and education are the vehicles that make implementation of change successful for any organization (Bettini, 1997).

Implementing Change

Developing an effective implementation plan is as important to an organization as is developing a good automated information system. Brian T. Zimmer feels the project must be broken down into "manageable chunks." People must be assigned responsibility for these chunks, and a time line for the completion of tasks must be created. The training portion of the plan needs to begin as soon as possible and run simultaneously with implementation. Training should be in two forms. The first should focus on basic

system training for all employees. The second should involve simulating the technology under various business conditions. Many companies find it is easy to buy new technology but then find that they do not possess the necessary skills in-house to configure it to their organization and train their personnel. This must be thought out during the implementation-planning process (Zimmer, 1999).

When implementing a new automated information system (also known as "cutover"), there are, according to Zimmer and Smith, three different approaches that can be used. They are the "Big Bang," the "Step by Step," and the "Parallel Paths."

The Big Bang approach refers to implementation at a predefined changeover date, when all of the old machines and systems are turned off and the new one is turned on. This approach can be traumatic, particularly if the technology being implemented is complex or far reaching. It is appropriate in disciplined environments, when the new system is simple, or where existing conditions are so problematic that immediate benefits must be realized even if it means taking great risk.

The Step by Step approach is taken when a project is so large or complex that it makes sense to implement it in steps. This approach is popular in organizations that are not desperate for a new system and can take time in implementing it "to bite of and chew a piece at a time." The down side of this approach is that it may delay the benefits of the new technology. In fact, it is important to make sure that the project is not equivalent to and endless staircase where the end is never reached.

The Parallel Path approach is similar to the Step by Step approach except that the old and new technologies run in tandem until the new technology becomes fully functional. At that point, the old technology is turned off and removed. While a very

safe approach, its major drawback is the amount of resources it takes to maintain two different systems at the same time. Few organizations can afford it (Zimmer, 1998). This approach is not recommended by most experts. Because as Hutchins succinctly explains, “If you try to build your widget the new way while allowing the old way to remain in place, the workers will find a way to let you think they are using the new system while actually using the old one” (Hutchins, 1999).

The number and seriousness of problems that managers have with cutover is usually a good measure of the type of job done in development, training and installation. The fewer problems that arise, the better job they did involving the entire organization in the new systems creation and implementation (Zimmer, 1999).

Implementing a new system is done best when the planning, control, and execution are accepted by the senior leaders as well as the users of the new system. The project’s success hinges on the people involved, as well as on the new technology to be utilized.

Deployment of DMLSS to MACH

DMLSS Release 3.0 includes the Stockroom and Readiness Inventory Management, Equipment and Technology Management, and Assembly Management modules. Hardware and software license allocations are based on a site-sizing algorithm that takes into account clinic visits and expenditure of medical supply dollars. With the deployment of Release 3.0, old systems (TAMMIS and Army Medical Department Property Accountability System (AMEDDPAS)) were shut down and DMLLSS became the sole medical logistics system for MACH.

The guiding principle for a successful DMLSS 3.0 release is for each service to accept responsibility for its implementation and sustainment. Responsibilities are as follows: the Program Office purchases the hardware and software and sends contractors to install the new equipment, the JMLFDC staff monitors the system and works to fix any deficiencies, and the United States Army Medical Information System Support Agency (USAMISSA) provides one of its two deployment teams to instruct the staff on the system. Each team is led by a captain and has subject matter expert non-commissioned officers that act as instructors. USAMISSA also provides a Help Desk for sites to call for assistance and to voice concerns (Duvall, 2003).

The following information was obtained through interviews with MACH logistical staff members (Ms. Smith, Mr. Leidy, SSG Andreis and CPT Peacock) and from an after action review written by personnel of the Logistics Division. It is a description of the process used to deploy Release 3.0 to MACH.

In 2000, the Commander and Chief of Logistics volunteered MACH to be the Army test site for Release 3.0. The deployment took place from 18 June to 5 July 2001. The USAMISSA teams were not yet functioning, so a team from JMLFDC was created to conduct the deployment. Preparations for the deployment began during the winter of 2001. The Chief of Supply and Acquisition was sent to Tyndall Air Force, Florida base to observe a DMLSS Release 3.0 in operation. Although MACH had DMLSS Release 1.0 and 2.0, they were only being used in the operating room and pharmacy and then only to access the supply catalog.

A site survey was done approximately 6 months prior to the deployment. During the survey, a schematic was done detailing where computers, printers, and drops were

located and where new ones had to be installed. This was also the time where release 3.0 was being "sold" to the staff. For example, a medical maintenance sergeant major from Medical Command came to brief the medical maintenance shop on the benefits of switching to DMLSS and briefings were conducted by the site survey staff on the integrated logistical capabilities of DMLSS. Nonetheless, there was still some resistance by people who had used other systems, such as TAMMIS, for many years. "I'll retire before I learn a new system" was what one long time employee said.

After the site survey was conducted, the data were converted. Old stored data were reformatted and moved from the current system to the new one. The conversion was ineffective in many areas since the JMLFDC team wasn't entirely sure of what was needed from the old TAMMIS and AMEDDPAS systems (the historical information that the new system would need to order supplies and track property wasn't completely transferred over). New equipment arrived -- printers for barcodes, hand held barcode readers, and computers. Training schedules were created for the classroom portion of the deployment training. Privilege levels within the DMLSS, the authorization of who is allowed to do what in the system, were also assigned at this time. In addition, it was decided that the two classrooms on the 9th floor would be used for the DMLSS training.

The deployment began on 18 June 2001 and lasted for 3 weeks. Week 1 was mainly for installing the new equipment, setting up the rooms for training, and getting the educational database functioning. Week 2 was for classroom instruction. The first two days of classes were for the entire Logistics Division, with general overviews on what DMLSS could do. Since the instructors had only two classrooms to work with, the personnel were rotated through on a tight schedule. Most people did not attend all

classes, but only those that pertained to their specific job. Some sections (e.g., medical maintenance) split their staffs, half went to class in the morning, half in the afternoon. This enabled them to continue providing services to the facility. At the beginning of Week 3, the old systems were turned off and DMLSS was activated—a Big Bang. This week was devoted to on the job training, with the staff trying to conduct normal business operations using DMLSS and the deployment team there to coach them through and correct any system problems. Each of the interviewees (Andreis; Leidy; Smith, 2003 and Peacock, 2002) stated this was the most beneficial part of the deployment process. After the deployment team left, the personnel at the DMLSS Help Desk responded to numerous inquiries and greatly assisted the staff in making DMLSS fully functional.

Many issues, discussed more fully in Appendix A, came up during the 3-week deployment and in the months that followed. Since this was a test site, problems were to be expected. The lessons learned here, and at the next site to have DMLSS 3.0 deployment, Brooke Army Medical Center in San Antonio, Texas, will enable future deployments to go much more smoothly and efficiently.

Discussion

How did the deployment at MACH compare with what the experts described? Were the employees mentally prepared for the change? Was the training properly conducted? Was the implementation well planned and executed?

Anticipating Change

The staff at MACH knew that change was coming years before it happened. This was not planned but was a side effect of the long development and piecemeal deployment of different releases. Since no downsizing of the workforce was projected, the employees

did not fear that the new system was being brought in to reduce staff. There was resistance to the change since many employees had used TAMMIS and AMEDDPAS for over a decade and did not want to change their routines. The Logistics Division had two champions of the new DMLSS system who helped overcome such resistance. One was the Chief of Logistics, who volunteered MACH as the test site, and the other was the Chief of Supply and Acquisition, who was sent to see a fully operational system at the hospital at Tyndall Air Force Base. These two officers became the driving force for implementation. They briefed and explained the new system to their staffs and demonstrated what it could do and how it would improve the division. Subject matter experts, such as the sergeant major from MEDCOM, came in and reinforced their message. The hospital leadership was dedicated to the change and sufficient resources were provided to make the change as smooth as possible. Early focus on mentally preparing the workforce enabled a rapid acceptance of DMLSS and an effective deployment.

Moncrief passed through the four stages of change (Awareness, Identification, Implementation, and Institutionalization) described by Shortell and Kaluzny. The need was recognized (the Awareness stage) not by MACH staff but by the senior medical logistics staffs in the three services who sought to have one all encompassing logistics system for DoD. The MACH leadership saw it as good for the organization, and, consequently, worked to complete the fielding of the system as soon as possible. Identification was done by the Chief of Logistics when he recognized the shortcomings of having multiple logistics systems in his facility. Simplification and increased efficiency would come with one system that would encompass all areas of logistics in

one. Implementation will be talked about more fully in following paragraphs, but it was done well, especially considering that MACH was the first organization in the Army to receive release 3.0. Institutionalization is ongoing, but the staff now has a strong understanding of the system and is passing that knowledge onto new employees. This makes DMLSS part of the culture and no longer the "new" system, but the regular and accepted system that makes it possible for employees to do their jobs.

Training For Change

Preparing the workforce to utilize a new computer system is 80% of what makes a system's deployment successful. Since the training that took place at MACH was the first for the entire Army, it was not as good as it could have been, but it was effective enough that the system users were able to do their jobs and quickly become experts with Release 3.0.

Bettini's First Cut Education, Detailed Education, and Ongoing Education were all utilized in the implementation. First Cut Education was done when actions were taken to educate the leadership of the division on DMLSS (e.g., sending the Chief of Supply and Acquisition to an Air Force hospital to view a working system) and, in turn, the leadership briefed their staffs. This was part of the "selling" of the system. It also helped the leadership picture what the end state needed to be and enhanced their planning for the implementation.

Some shortcomings were found in Detailed Education. In week 2 of the MACH deployment, classroom instruction was given to the staff by the deployment team. In some cases the wrong people were sent and those who should have been sent were not. This stemmed from the classes not being tailored to the practices at MACH. The

instructors needed to have studied the business practices of MACH more closely to understand what staff members needed what instruction. Also, the computers used for training in the classrooms needed to have a better database and more memory. Their limitations made the classes ineffective for everything but the introduction of modules. The on-the-job training that took place was much more effective than were the classes. It enabled instructors to guide employees through the exact steps they needed to conduct their jobs. More than once, however, problems arose with the system forcing instructors to stop teaching to make corrections with the database. This wasted valuable time.

"Ongoing Education" is being done informally with current employees instructing new ones, with an additional visit (in January 2003) by the USAMISSA deployment team whose members provided instruction, and now with ad hoc DMLSS classes being provided in San Antonio by USAMISSA personnel. Regularly scheduled courses with set curricula are being developed. When these are completed, new employees will receive a thorough course of instruction before they assume their duties.

Education, at all levels, is the key to accepting change and enabling an investment, like the DMLSS system, to be effectively utilized. Training and education were the vehicles that made implementation of DMLSS 3.0 successful at MACH. Improvements were needed but, with the lessons learned, future deployments can be even more effective.

Implementing Change

Austin and Boxerman's phases of implementation (equipment acquisition, database preparation, system testing) give a guide for evaluating the MACH deployment. The DMLSS system was provided to MACH by the DMLSS program office, along with

additional equipment like personal computers, barcode printers, hand held inventory terminals. The site visit done by the deployment team led to the creation of diagrams of the system layout for the facility and a list of the equipment needed by MACH. Any additional local area network drops were installed prior to the first week of deployment and the new equipment was installed in the week prior to the beginning of training. It was a good plan and enabled the staff to train and function effectively once the new system was turned on.

Database preparation required converting data files from TAMMIS and AMEDDPAS to DMLSS compatible ones. There were also additional data files, e.g., quality assurance files, that had to be added. Since there were over 10 years of data files, the amount of data to be converted was large. Time should have been spent selecting information that would be needed and not converting "garbage" files. Overall, the conversion went well, though additional work in accessing stored information had to be done during the actual deployment.

The entire system was tested once it was turned on and the old systems were turned off. With the deployment team and staff working together, problem identification was quick and could be documented or corrected immediately. Testing the system in this way did take away from training when the deployment team had to leave students to work out problems.

The switch over to the new system does not fit neatly into one of the approaches (Big Bang, Step by Step, and Parallel Path) discussed by Zimmer and Smith. The DMLSS deployment had features of all of them. The DMLSS deployments extended over several years and might be considered to have been Step by Step. Release 1.0 and

2.0 were already in place at MACH, but once 3.0 was operational, all the old systems were finally permanently cut off, a Big Bang action. The deployment was also like a Parallel Path approach because Releases 1.0 and 2.0 were in place for years while TAMMIS and AMEDDPAS were also being utilized. Because the old business practices could still be used, early DMLSS releases were ineffective. This experience probably accounted for the final Big Bang implementation.

Considered in its entirety, the deployment process was effective. It got new technology into the field and available for use in a timely manner and with a trained workforce capable of utilizing the system's full potential.

Developing the Formal Deployment Plan

In December 2001, the DMLSS Program in Falls Church, Virginia, released its DMLSS Site Implementation and Fielding Plan. The document deals with installation and implementation of Release 3.0 to MTFs. Each of the steps in the plan was either tested at MACH or discovered due to a deficiency found in the MACH deployment. Without the experiences gained at the MACH test site, improvements could not have been made to the process and this new plan could not have been developed (Duvall, 2003). The Implementation Plan is presented in Appendix B.

Conclusion

The DMLSS 3.0 deployment has been a success, not only for MACH, but also for the Army as a whole. MACH has a single system that manages logistics throughout its facility (one that is unparalleled in civilian organizations), and the Army has learned a more effective way to deploy its new system to the rest of its facilities. While the deployment process at MACH was far from perfect, each mistake added to the base of

knowledge and helped improve planning for future deployments. DMLSS 3.0 is putting military medical logistics at the forefront of the industry in the 21st century.

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Appendix A

MACH After Action Review[1]

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Pre-Conversion

Issue- Road to Conversion [C] Checklist

Discussion- A clear timeline and assignment of responsibilities would make preparation and execution considerably smoother. During the months leading up to conversion, we knew that there were things that we should be doing to prepare, but did not know what or how. We also did not know who was supposed to do the work.

Recommendation- The MTF should be provided with a checklist, at least 2 months from conversion, that lays out exactly what should be done to prepare. Prioritize the list into actions that must be taken and those that would improve the system but are not a requirement. It should establish milestones that should be reached in the time period prior to the team arriving on site (e.g. C -60 days prior: Identify all computer systems that will be operating DMLSS 3.0). These milestones should be related to those that the conversion team are following themselves (e.g. C -45 days prior: Perform Site Survey Visit). This would help in coordinating fielding preparation, identifying the people who are involved etc. The most important feature of this would be to plan and identify actions that should be taken to clean up data in the legacy systems.

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[1] This is the after action review of the deployment of DMLSS 3.0 to MACH. It was prepared by CPT Michael Peacock, based on comments by the Logistics Division staff at MACH and was originally entitled "DMLSS 3.0 Conversion, After Action Review, Stockroom Inventory Management Module." The format has been modified slightly.

Issue- Data Validation

Discussion- Over the years, TAMMIS has accumulated large quantities of records that are no longer used. The multitude of garbage records creates a large burden on the conversion, validation and any corrections that will be required. With DMLSS, when you delete a record, it remains in the MTF catalog, it just doesn't appear in any customer catalogs. This means that the record is not truly deleted. All of these records slow down searches and cause confusion.

Recommendation- The MTF needs to get rid of all of the garbage data in the Legacy system. Time also needs to be spent cleaning up the data in the system. This clean up should go beyond the actions mandated by the conversion team. The MTF should begin reviewing all of their [sic] stock records, customer records and Sources of Supply records at least 3 months prior to conversion. The focus should be on deleting records without recent use (a record not used within the last 2 years is a reasonable benchmark, but consider deleting items not used in the last year). By deleting these records before conversion, the MTF will make post-conversion validation and clean-up considerably easier to handle. Items that are not deleted need to be reviewed for correctness and completeness. The conversion team should identify, by Legacy System record type, which data fields will be transferred into the corresponding DMLSS record. The MTF should then, at a minimum, ensure that those fields are complete and correct. It is much easier to delete a record and build it as needed later than to try to work huge lists during post-conversion clean up.

Cleaning up these records should have been completed prior to the DMLSS 2.0 fielding. The result of not doing it was that all of the junk data converted into the

DMLSS database. Since this is, apparently, the same database used for 3.0, it may require deleting the records from both TAMMIS and DMLSS 2.0 before conversion. Some method of doing this clean up should be developed between the TAMMIS and DMLSS team, and it should require as little work on the MTF as possible.

Issue- Pre-conversion Actions

Discussion - The site survey/preparation process should be broadened. Many problems that we experienced could have been prepared for if the conversion team had a good understanding of our business processes.

Recommendation- Include the JMLFDC subject matter experts on the survey team. These people should find out exactly what each person's daily routine consists of, what processes or systems are used in the specific MTF etc. This will allow them to plan for both the classroom and on-the-job training by keeping both the system processes and the MTF business processes in mind.

The survey team should also have the capability to test the hardware and infrastructure of the facility. In this way they will be able to identify issues with the RF LAN [Radio Frequency Local Area Network], IP Subnets [Internet Protocol Subnetworks], required LAN drops etc.

Issue- MTF Preparation

Discussion- The MTF did not have clear guidance or a set of duties in preparing for the conversion. Some actions were taken on our own which paid off. There are other actions that, in hindsight, should have been taken.

Recommendation- The following actions should be taken prior to conversion:

a. 100% Inventory- This painful process paid off by ensuring that the on-hand quantities and values carried over were as correct as possible. It also relaxes the learning curve by eliminating several more processes that must be mastered immediately. As our yearly inventory was approaching, we decided to conduct it in TAMMIS, because we were already familiar with it.

b. Begin using the . . . handheld terminals [HHT] for several months before conversion. Becoming familiar with the HHTs and the RF [radio frequency] controller issues used in inventory management ahead of time will reduce training requirements as well.

c. There is a change to the Unit of Issue/Unit of Measure methods in DMLSS 3.0. This change requires the item managers to verify and correct conversion factors in each catalog record. Not doing so will create inventory and Prime Vendor problems. MTFs should begin combining the Unit of Issue/Unit of Measure records at least 1 month from conversion, if possible. This will prevent the item managers from having to clean everything up immediately after conversion.

d. Prior to conversion, the MTF should set up an informal, internal training session. Bring all of the branch personnel together and show them the system, what it looks like, what changes have been made, what it does etc., just to familiarize them with what to expect. This will help the new users prepare themselves for the training.

e. Get access to the trial conversions of your database a couple weeks prior to the actual conversion. Have the item managers look through records for a few minutes every day. They may be able to identify problems like vendor number errors, lost data etc.

f. Coordinate a visit to the site of the previous fielding in order to get an idea of what the system does. Bring key people.

g. Ensure that the Prime Vendor is very involved in your conversion. Try to ensure that their people most knowledgeable with your account are available during this time period.

Week 1 - Computer Training

Issue- Ensuring that the right people go to the right class.

Discussion- Even though both the MTF and JMLFDC team tried to exchange duty descriptions and class itinerary/focus [, the] assignment of which classes each person needed to attend is not a solid process yet. Based on the daily duties and class descriptions provided, many people were assigned to classes that they did not need, or, more importantly, missed classes that they did need. The bulk of this confusion rests in the fact that the instructors did not know how this particular MTF operates, and we did not know how the system operates.

Recommendation- As discussed previously, having a functional expert visit the MTF and learn daily duties and processes will provide some continuity when developing the training schedule. Requirements can be made to fulfill the functional needs of the users. This should be a major focus of the site survey.

Week 2 & 3- On the Job Training [OJT]

Issue- Maintaining focus

Discussion- The OJT training is, by far, the most important aspect of the fielding. It should be a carefully planned event, complete with training schedule, priorities of work, critical tasks etc. The team worked really hard during this 2 weeks. Unfortunately, most

of the time seemed to be spent fixing conversion problems as opposed to conducting the kind of deskside training that was needed. The training that the users received usually took the form of short, quick sessions focused on answering a pointed question. The instructor would then have to return to the more important task of fixing a software or hardware problem. This is not to say that the training was not worthwhile. When the team left, each person felt that they knew the steps needed to do their jobs. However, in the following week, we realized that we were not familiar enough with the system to handle anything other than the simplest of procedures. I have to say that the support that we have received telephonically from the team has been excellent.

I believe the main contributor to this distraction is a lack of distinction between instructors and fixers. The same people that were supposed to be training, were also responsible for coordinating for changes, fixes and crisis control.

At the same time, the MTF users had a difficult time staying focused on learning. After being shut down for a week, there were a lot of customers coming in needing help. These interruptions were tough on the people trying to learn.

Recommendation- What should occur is a slow, repetitive teaching method that builds in complexity according to the abilities of the student. The instructor needs to remain with the student until all functions have been explained. They should have the time to teach the whole process, and action/reaction of the system, not just the step-by-step procedures. In order to accomplish this, a line should be established between the roles of the team members. Isolate instructors from the requirements to deal with problems. This may require more functional experts on the SRIM/CAIM [Stock Room Inventory

Management/Customer Area Inventory Management] processes. It may also require more time on station.

Depending on the MTF, they may want to consider going to limited customer hours during this time period. Having distraction free training time set aside will help the students.

Issue- Customer Support for the Web (CSW) Training

Discussion- This module basically replaces Reorder Lists and Credit Card request forms. Although the CSW module is available in version 2.03, we never had a real good understanding of how it works and how to incorporate it into the business. This was still true when the fielding team arrived and began training. The result was that the training classes set aside for this module were mostly empty.

Recommendation- The CSW portion of the training should be planned better all around, but mostly by the MTF. The MTF needs to learn the functionality of the module and how it will fit into their supply system before the fielding. Develop a plan on how to utilize it and where, then make it mandatory for the affected customers to attend the training. At the same time, the MTF and fielding team should coordinate, as one of their critical tasks, to have the systems put in place, with customers loaded, before the end of the second week of training; that will allow time for the fielding team to provide follow-up training.

Data Conversion

Issue- Record Overload

Discussion- When the system information was converted, it generated hundreds of new records that required action in the Pending Actions Inbox. For instance, apparently the entire QA [Quality Assurance] Message database from USAMMA [United States Army

Medical Materiel Agency] is dumped into the system. DMLSS will check all On-Hand records against QA Messages to see if any match. Those that do match must be processed, forwarded to the areas that the items are stored etc. Those without matches must be individually worked by typing in a completion date. Working all of these lists requires a lot of manpower. Other lists like this are the new MTF Catalog Items and the MTF Catalog Item changes. Both of these can consist of several hundred records that must be individually worked.

Recommendation- Every effort needs to be made to clear all of these records without having to review and alter each one. For instance, build a script that will complete all QA messages with no on-hand quantities, or approve all catalog record changes caused by UDR [Universal Data Repository] updates and other acceptable reasons. There is enough data clean-up to worry about without creating more.

System Issues

Issue- Clean Up

Discussion- The conversion caused several unexpected issues that had to be worked or are still in progress.

Recommendation- Be aware of the following issues:

- Many Prime Vendor numbers did not convert properly. The Vendor Number field in some of the records had a garbage number (the number that does not match anything), [and] some had incomplete numbers. Item Managers must validate for accuracy each record before sending the first order.

- Manufacturers Numbers did not transfer correctly. This affected the credit card sources. Also, none of the source telephone numbers or account numbers were transferred.

- Not all locations were transferred correctly. Some were set to a default of "None".

- Ensure that all Standing Order contracts are assigned a current FY Document Number. If it is assigned a number from the previous FY, DMLSS will not allow an increase in available funds. In the past, we prepared the subsequent FY contracts before the end of the current FY pending authorization of funds. Therefore it was assigned a current FY Doc Num.

- The conversion somehow created a "Default" location on all Customer Catalogs for one customer. This location was assigned leveling and on-hand balances.

. . .

Issue- Complexity

Discussion-The first impression by the users is that the system is very complex. There are many more steps to complete simple processes. Too many steps are dependent on something else occurring first. There is too much jumping around from one screen to another in order to follow and complete the steps in the required order. Another complaint is that it generates more paper than TAMMIS.

Recommendation- Much of the perception of complexity may be a result of unfamiliarity with the system. Some of it may be related to the linking of information fields discussed previously. . . .

Issue- RF LAN

Discussion- The RF LAN in this facility was not functioning properly with the DMLSS software, not sure if it is a hardware or software problem. The conversion team attempted to fix it, but was not familiar enough with the system.

Recommendation- Someone should check the system prior to conversion, or have someone available who can fix problems. The RF capabilities should be demonstrated and operational prior to the end of the OJT.

Hardware/ Network Issues

Issue- Coordination with IMD [Information Management Division]

Discussion- The fielding, from a Network Administrators point of view, was very reactive. There were a multitude of last minute issues that could have been taken care of prior to conversion. Some examples:

- Need for additional IP addresses for unplanned equipment or requirements.
- Installation of additional software, TCP [Transfer Control Protocol] /IP [Internet Protocol] Drivers, hardware.
- Confusion between the requirements for Static vs DHCP [Dynamic Host Configuration Protocol] IP addresses.
- Printer drivers finding their way through Subnets.

These last minute details created a lot of frustration and held up a lot of work unnecessarily.

Recommendation- The DMLSS team should assign 2 - 3 knowledgeable people to take care of issues like those above. The team should coordinate for those individuals to be assigned System Administrator rights.

The JMLFDC team requested that they be assigned these rights, but because of network security regulations, the request has to be routed through to the correct approval authority, this will take time. It is in the best interests of both the DMLSS team and the MTF Information Management Division to coordinate for this approval well ahead of the scheduled conversion dates. The best course of action may be for a blanket approval to be granted at MEDCOM, and sent to all MTFs.

Issue- CPU [Central Processing Unit] Requirements

Discussion- When assessing the capabilities of the CPUs within the MTF, the computers in the training room were overlooked. Two systems did not meet the minimum requirements. This resulted in a last minute change to the training plan.

Recommendation- Ensure that all system are included in the hardware review. Re-evaluate the minimum system requirements for DMLSS Users and Training room systems. 200Mhz [Mega Hertz] with 64MB [Mega Bites] RAM [Random Access Memory] will run the program, but not very well. Especially when trying to open a report or conducting catalog searches.

Appendix B

DMLSS Financial Issues[2]

[There were multiple issues that rose from DMLSS financial transactions. Following is are the major issues that existed with the configuration of the financial interfaces.]

Summary Financial Transactions (Identified: Aug 2001)

DMLSS uses a financial logic that summarizes all financial obligations occurring for each APC [Account Processing Code], during a daily cycle. It recognizes all transactions for that APC, rolls up the total dollar values, and will send them out as a summary transaction under the last document number in the series. The main issue is that the individual or root obligations are not accounted for. Only the last document number, the summary obligation, will appear, and that will be for a dollar amount that exceeds the amount of the disbursement generated by DFAS, based off of the vendors electronic invoices. At the same time, the other document numbers will appear in the . . . [finance system] as disbursements, but will not match up with an obligation under the same document number.

Element of Resource [EOR] (Identified: Sep 2001)

Obligations are not being allocated to the correct EOR, 31xx (Equipment), for equipment items. Originally this was thought that involve just credit card purchases, but it has been found to effect every equipment purchase. When the Due-ins are created, an obligation

[2] This is the financial after action review of the deployment of DMLSS 3.0 to MACH. It was prepared by CPT Michael Peacock, based on comments by the Logistics Division staff at MACH and was originally entitled "Information Paper." The format has been modified slightly.

goes out under the S570 (LOG FUND) account with a 26ER . . . EOR. When the item is received, cost reallocations are supposed to be sent which will move the obligation to the customers account and change the EOR to 31XX. As far as the local staff can determine, no obligation has been reallocated to the customers APC under the 31xx EOR. After further research, it has been found that two obligations have been sent to the . . . [finance system], one for 26ER/S570, and the other for 31EJ/S570. Apparently, the system is double-obligating the LOG Fund account.

Catalogue Prices (Identified: NOV 2001)

A code problem of some kind is preventing DMLSS from properly picking up price changes that are sent to the system whenever a log in occurs. DMLSS is receiving the price changes sent by the vendors, but is apparently using an old price when sending out its obligations to DFAS. This issue is being worked by the DMLSS team, and should be nearing completion.

[The team at JMLFDC that wrote DMLSS attempted to include each of the three Services business practices in the program. The Army practices were not fully understood and therefore problems arose once DMLSS was implemented. Since August 2001, numerous “patches” or corrections in the program code have been made. As of January 2001, these patches have corrected the shortcomings.]

Appendix C

The DMLSS Site Implementation and Fielding Plan, Section 4: Implementation and Fielding Tasks[3]

4.1 Site Preparation

Preparing the site for Release 3.0 deployment begins approximately 5 months before site activation. During site preparation, the DMLSS deployment team works with the Service deployment teamwork to inform site personnel of all pertinent aspects of Release 3.0. Deployment teams also work with site personnel to identify and perform the activities required to prepare the site to receive the release.

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[3] The DMLSS Program Office published this DMLSS Site Implementation and Fielding Plan in December 2001. It spells out, step by step, what each agency and command needs to do when DMLSS 3.0 is deployed to an MTF. Please note that the format (e.g. indentation of paragraphs, spacing, etc.) has been modified slightly.

The implementation effort begins with site preparation at least 5 months before the scheduled deployment. During these 5 months, the service deployment team informs site personnel of DMLSS functions and explains the new business practices that will effect the site's day-to-day operation.

Implementation is a three phase effort. First, the site survey determines how best to implement Release 3.0 components at the site. Second, site activation includes upgrading the server and client PC hardware and software, installing Release 3.0 applications, creating a production database, and training site personnel to use DMLSS properly. Third, post-activation tasks include doing a quality survey and providing follow-up functional support. Each of these parts has many subcomponents that must be accomplished to achieve a successful implementation.

4.1.1 Educating Site Personnel

The Service deployment team initially contacts the site no later that 5 months before the scheduled activation, providing site personnel on site with information about Release 3.0 and its functionality.

4.1.2 Converting Site Legacy Data

The data conversion contractor performs an initial conversion of the site's legacy data to assess the readiness of the data to be converted to the DMLSS Release 3.0 database. Potential sources of legacy data include TAMMIS and AMEDDPAS . . . After extracting legacy data and converting the data to a Release 3.0 database, the contractor prepares a detailed set of discrepancy reports. The Service deployment team reviews the reports and prepares to brief site personnel on the results during the site survey.

. . .

4.1.3 Completing the Pre-Site Survey Questionnaire

Before the pre-site survey conference call, the site completes a pre-site survey questionnaire. . . . Because the questionnaire focuses on technical issues, a representative from the site's Information Management Office (IMO) is most suited to complete the questionnaire.

4.1.4 Conducting the Pre-Site Survey Conference Call

The pre-site survey conference call, which occurs 1 to 2 weeks before the site survey, serves the following purposes: [to] establish a common understanding of survey requirements and schedule activities, [and to] identify major issues that might affect the deployment. The pre-site survey conference call includes the following participants: materiel manager, equipment manager, bio-medical branch chief, resource manager,

facility manager, IMO . . . , DMLSS deployment team . . . , [and the] service deployment team.

. . .

Site personnel who plan to participate in the pre-site survey conference call should review the DMLSS Site Implementation and Fielding Plan. . . .

4.1.5 Conducting Database Conversion

The technical contractor and database conversion contractor convert the database in 2 to 3 days. . . . At a minimum, one conversion must be performed during site activation. Additional database conversions can be performed at any time between the site survey and the site activation at the request of the Service deployment team. Additional conversions can determine the extent to which legacy system data must be modified to obtain a valid, operational DMLSS database after the final conversion.

. . .

4.1.6 Conducting the Site Survey

The site survey . . . addresses both the functional and technical aspects of implementation. The general approach to the survey is to develop a plan for the functional implementation, collect data on resources available in the target areas, and then develop a fielding strategy based on the functional plan and the available resources.

The site is surveyed 3 to 5 months before the scheduled activation. . . .

. . .

The survey should accomplish the following: determine how Release 3.0 components are best implemented at the site from a functional standpoint; educate site personnel on the necessary preparations for implementation . . . ; identify functional and

technical issues that might affect the implementation and identify people responsible for following up on the issues . . . ; and identify space and equipment that is needed to support training requirements, including the location of the training server, training rooms. . . .

. . .

4.1.7 Completing the Memorandum of Understanding or Letter of Agreement

After the site survey, the Service deployment team produces a memorandum of understanding (MOU) or letter of agreement (LOA) . . . [which] identifies the responsibilities of the site, the Service team, the DMLSS P[rogram] M[anagement] O[ffice], and the technical contractor during the pre-activation and activation phases of deployment. The MOU or LOA is submitted to the site for signature within 3 weeks of the conclusion of the survey . . . [and will include] the Equipment Placement Form, an Action Item List, and a Target Configuration Spreadsheet.

. . .

4.1.9 Identify and Assign Roles to Site Personnel

[Before activation, the MTF identifies roles to assign to those who will be using it.] . . . Although the DMLSS server upgrade retains user accounts, the accounts do not receive automatic access to client applications. Administrators for each application . . . need to assign roles and inherent access privileges to users before they start using the system. Identifying users and their levels of privileges before the activation contributes to the efficiency of onsite activation. . . .

4.1.10 Certify Site Readiness

The Service deployment team certifies readiness for release 3.0 activation. If, however, the site is not progressing satisfactorily approximately 4 weeks before activation, the Service deployment team recommends one of the following actions to the DMLSS PMO: proceeding as scheduled, postponing activation, or canceling activation. The DMLSS Program Manager then decides which action to take.

4.1.11 Pre-Configuring New Equipment

The DMLSS Program [Office] provides new PCs [personal computers], printers . . . [other] equipment to support deployment. . . . [Information gathered during the site survey] determines guidelines that the site survey team uses to identify the quantity of equipment provided to a site according to its size and needs.

. . .

4.2 Site Activation

During site activation, the . . . deployment teams, in conjunction with site personnel, issue DMLSS Release 3.0 applications to site personnel according to their job functions. The activation includes upgrading the server and target client . . . software, installing Release 3.0 applications on selected client PCs, . . . creating a production database, and training site personnel to use the applications.

The duration of the site activation and size of the activation team varies depending on the MTF size. The target duration for onsite activation is 3 weeks.

4.2.1 Facilities

The site provides a work area for the activation team. The work area should be large enough to accommodate four to five individuals and should include at least one network drop, a table or desk, and a telephone that can be used to call external numbers.

. . .

4.2.2.1 Coordinate Site Activation Process

Service deployment representatives ensure that . . . [communication between the groups involved in the activations remains effective]. Standard activities include a kickoff meeting, daily status meetings, and a closeout meeting. At a minimum, meetings are attended by Service deployment representatives; the DMLSS activation team; and site points of contact from logistics, facilities, finance and systems. Topics discussed at the meetings include the activity schedule, implementation status, and open issues.

4.2.2.2 Conduct Final Database Conversion

Going live with Release 3.0 depends on successfully converting the database. . . .

For the first step of the conversion process--validating the MM portion of the Release 3.0 database--the Service deployment team assists site personnel with printing new shelf bar code labels. Site personnel then distribute and post the labels throughout the MTF before going live with the M[ateriel] M[anagement] portion of the database.

. . .

4.2.2.5 Prepare for and Conduct Training

During activation, Service deployment representatives bear primary responsibility for training, including scheduling and instructing the courses. Service deployment representatives also assist the technical contractor in setting up the training room

equipment. The technical contractor installs the training server and sets up and breaks down . . . the training areas. The site provides adequate space and furniture to support training, access to the MTF LAN for each training area, and IP addresses for all training-related equipment requiring connection to the LAN.

. . .

[Activate Client Personal Computers, Install Printers, Grant User Privileges]

[To activate the PCs with DMLSS, they must first be prepared for DMLSS installation and then the program must be loaded onto the harddrive. The contractor works with site logistics personnel to determine the site-preferred approach to printing DMLSS client-based print requests. The site supports printing from its network printers, and the technical contractor supports printing from printers hosted on the DMLSS server. To save time during activation, site personnel should have their user roles for the DMLSS system determined before the deployment team arrives.]

. . .

4.3 Post Activation

[Two weeks after activation, local personnel complete "a quality survey" on the release 3.0 implementation process. Follow-up functional support and on-site training are provided by the service deployment team. Training at Service-level schools is also provided. A Help Desk, located in San Antonio, Texas, provides assistance to MTFs 24 hours a day, 7 days a week. There will be monthly catalog updates to the Universal Data Repository are provided through the DMLSS System Administration Tool that automatically updates user systems when they log into DMLSS each day.] . . .