CHAPTER – IV

MODERN BUSINESS PRACTICES AND TECHNIQUES, DEVELOPMENTS IN INFORMATION TECHNOLOGY AND APPLICATIONS IN MILITARY LOGISTICS

“American military must draw on new technologies and strategies in the 21st century. … We must build forces based on revolutionary advances in the technology of war that will allow us to keep the peace by redefining war on our terms. … a future force that is defined less by size and more by mobility and swiftness. That force will be easier to deploy and sustain and will rely heavily on U.S. advantages in stealth, precision weaponry and information technologies”.113

- President George W Bush, 2001

General

The spectrum of challenges of warfare has enlarge exponentially in the global prospective from conventional to nuclear over the years. The greater dynamic of instability has emerged adding to different contingencies and responses and deployment of forces over different theatres. Supporting these operational deployments and sustaining them will be complex and required integrated resources of all services strongly backed by national resources, logistics providers, civil infrastructure and best of commercial practises, processes and systems.

The emerging trend is towards a lean114, operation driven modern integrated logistics model aptly supported by information technology. It would provide forces in the battlefield with command and control systems that closely link operations with logistics, enabling logisticians to provide combat commanders with whatever, whenever & wherever they need. Information technology will provide total asset visibility to the logistician. Exploitation of Information technology in the area of logistics is readily
available in the market and with minimal modifications, can easily be adapted to the requirement of armed forces.

**Industry's changing view of logistics**, electronic commerce, automated identification technology, direct vendor delivery, load optimization, outsourcing, and smart simple design are all examples of commercial best practices that could be very useful in helping the Army achieve the RML\(^\text{115}\).

**This chapter identifies and reviews some leading and significant trends**, in emerging technologies and practices, Modern Business Practices, Management Techniques, Development in Information Technology, and particularly those relevant in our context that can be adopted by the Indian Military in our capability building.

**Modern Business Practices**

**Internet-Based Commerce.** Computer-based purchasing represents the ultimate "democratization" of the acquisition process buying decisions are made by the people who need the products. Thus in the future, DoD acquisition professionals will establish broad purchasing arrangements and negotiate favorable contract terms and prices with vendors. Purchasers can browse through a vendor's electronic catalog or enter an electronic "mall" that provides "one-stop" shopping, with access to multiple catalogs and the capability to compare products, services, prices, delivery, and payment options.

**Paper-free Weapons Systems Support.** The process of creating a paperless environment for storage of technical data, including drawings, computer – aided design models, bills of materials, manufacturing information, engineering changes, and interactive electronic technical manuals is under way. The Joint Strike Fighter Program Office now operates in a paperless environment and all business with that office now takes place digitally using Internet capabilities. The Program Manager for Combat Mobility Systems reports that cycle time for production contract awards has been reduced from 18 months to 4 months, the time to review drawings has been reduced from 2 to 3 weeks down to 3 to 12 minutes, and contract data requirements lists have been cut 81 percent resulting in an overall estimate of net cost avoidance of $1 million per year through 2004\(^\text{116}\).
Supply Chain Management. A typical supply chain addresses the flow of manpower, weapons, munitions and information to projected places of action, but an efficient supply chain would address additional activities of sourcing, procurement, collaboration with channel partners and third party service providers with organizations reducing ownership of distribution channels and materials by resorting to outsourcing.

Based on its spectrum of involvement in the Army context, an efficient chain will be top driven from the strategic level where it would address/involve the national or international private sector and industry as also central procurement agencies and depots, down to unit/forward troops.

Strategic Level. The strategic supply chain will encompass distribution planning, demand forecasting, inventory management, forward delivery and outbound operations as warehousing and transportation to customers. The integration of the civilian national infrastructure and resources. Strategic partnerships with both, the users and providers, and distributors could facilitate operational improvements, life cycle management, information flow, decisions for purchase and production towards a commitment for long term relationships.

At the national level logistics seeks a review of the is imperative for any objective change.

Integrated Supply Chain Management. A new concept viewed by The Massachusetts Institute of Technology defines integrated supply chain management (ISCM) as a process-oriented, integrated approach to procuring, producing, and delivering products and services to customers by that includes suppliers’ supplier and the customer's customer.

In recent years, supply chain management software providers and consultants have emerged as multibillion-dollar businesses.

Enterprise Resource Planning (ERP). Enterprise Resource Planning (ERP) is a strategic tool which equips the organization with necessary capabilities to integrate and synchronies isolated functions into a streamlined business process to facilitates information sharing across organizations and geographic locations and enables decision
makers to have an organization wide view of the information they need in a timely, reliable and consistent fashion.

Diverse functions as planning, purchasing, inventory management, asset visibility, demanding, supplying, replenishment (i.e. tracking of entire chain of replenishment), finance management human resource management, auditing are comprehensively addressed enabling visibility, transparency across the entire organization.

**Focused Logistics Enterprise.**

“Focused Logistics is the fusion of logistics information and transportation technologies for rapid crisis response, deployment and sustainment, the ability to track and shift units, equipments and supplies even while enroute, and delivery of tailored logistics packages and sustainment directly to the war fighter”

-Lieutenant General John J Cusick, Joint Staff Director For Logistics, 1996-98

Focussed logistics addresses a group of functions/systems to define operational capabilities for the 20-20 forces and include joint deployment and rapid distribution, information infusion, joint theatre logistics management, agile infrastructure and multinational logistics. The emphasis is on strategic lift by air, sea and commercial transportation which reduces logistic footprint while enhancing and effectiveness of deployed forces.119

Focussed logistics allows a more responsive, agile logistics support structure supported from distant bases by a greater degree decision making ability towards desirable confidence levels of the war fighters and out comes.

*The elements of this Concept relevant in the Indian Context are Logistic Data Network, Joint Satellite Based Communication, A Responsive Distribution System, A Robust Modular Force Reception Capability and Integrated Supply Chain*120

**Future Logistics Enterprise (FLE).** The FLE initiatives are framed to enable the next generation of force projection capability that confront the current and future realities of conflict and combat in the 21st century. The Future Logistics Enterprise embodies the best practices and strategies from both industry and the DOD. The FLE’s proposed policies and practices comprise extremely high payback initiatives with low risk. The
concepts and practices at the heart of these initiatives have been successfully implemented previously in both DOD and industry. The scale of change, though massive, also has precedent in global industrial transformations. These industries have not only gone through major transformations in how the entire industry operates, but are exemplified by cross-enterprise cooperation between industry competitors and cross-enterprise integration between supply chain partners. The collaborative approaches advocated by the FLE programs can have major benefits to the US economy by creating new revenue opportunities for industry. The infrastructure, technology, and services required to support FLE, will take logistics capabilities to a new level that will enable expanded business opportunities for the private sector above and beyond their business with the DOD. Sharing information with the private sector through a Total Life Cycle Management approach will net gains in research and development, reduced cost in procurement and maintenance, and improved service responsiveness.\textsuperscript{121}

**Performance Based Logistics (PBL).** Performance Based Logistics can also be define as an integrated, affordable, performance package designed to optimize system readiness and meet performance goals for a weapon system through long-term support arrangements with clear lines of authority and responsibility.\textsuperscript{122} This model involves purchases not only of weapon system or a product from a big vendor like TATA, Lockheed, or L&T but also a supporting maintenance arrangement throughout the system’s life time, the responsibility for transportation of the system to the staging areas, manufacturers and technicians or trainers, thereby enabling the military to concentrate on issues more operational. **Performance and cost objectives for programmers and planners can be facilitated through a Government** - Industry partnership by entering arrangement of support in terms of affordable and integrated performance package through its life system. The essence is thus on performance outcomes and not purchase of weapons systems/products, their parts and maintenance.

**Third Party Logistics (3PL).** A third-party logistics company is a private firm that provides logistics services under a contract to a primary manufacturer, vendor, or user of a product or service\textsuperscript{123}, and this concept extends to 4 PL and on to 7PL that can undertake turnkey projects for its clients where all services and activities are provided for under one roof. 7PL companies will be prime candidates for takeover by bigger players.
and play the role of service providers within the larger offer. Such consolidation will be seen in all areas from shipping, trucking, air cargo to couriers, ground handlers and IT services. Many others will drop out.

**E-Procurement.** The new generation of E-Procurement is a Web-based ERP (Enterprise Resource Planning) for creating and approving purchasing requisitions, placing purchase orders and receiving goods and services by using a software system based on Internet technology, e-MRO (Maintenance, Repair and Overhaul) for goods and services ordered are non-product related MRO supplies, e-sourcing for identifying new suppliers for a specific category of purchasing requirements using Internet technology, e-tendering: for sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology. e-reverse auctioning: for buying goods and services from a number of known or unknown suppliers and e-information: for gathering and distributing purchasing information both from and to internal and external parties using Internet technology.

**Distribution Based Logistics.** This is an operational logistics concept that must have velocity and precision as its prime drivers vis-à-vis supply mountains to facilitate easy management and responsive support to war fighters across a theatre of operations. This concept uses the pillars of visibility, capacity and control; visibility of the real time environment, situational understanding, supported war fighting units, their requirements and intent, the logistics capability and constraints, infrastructure, material systems, inventories, transportation resources, training and implications.

The supporting organizations at theatre and strategic levels provide situational awareness at all levels, capacity, domain of material systems, inventories, infrastructure and Private Vendors.

**Sense and Respond Concept.** Sense and Respond Logistics is a transformational network-centric concept that enables effects-based operations and provides precise, agile support. It predicts, anticipates and coordinates actions that provide competitive advantage spanning the full range of military operations. Sense and Respond Logistics provides “Source to End Of Chain” network of resources and
capabilities and delivers War fighters need for combat through adaptive, responsive, real-time, demand and support networks.

**Framework of Military Application.** The Sense and Respond framework is based upon several core competencies which has the potential and application for exploitation by our Army.

- **Design Organisations as Adaptive System.** Today’s battlefield environments are increasingly unpredictable and susceptible to rapid changes. Under Sense and Respond concept, an efficient system can integrate all functions and also have the ability to adopt to new principles, competencies and accountabilities.

  This concept can integrate several military organizations across the battlefield, and enable a comprehensive and speedy response. The commanders intentions, guiding doctrines and a suitable distribution capability/network can allow its leaders to respond quickly ensuring greater flexibility and risk management.

  The changes in logistics planning since Operation Desert Storm depict a shift toward sense and respond logistics. First, stockpiles of supplies were reduced from 60 days of supply during Operation Desert Storm to 5 to 7 days of supply kept on hand during Operation Iraqi Freedom¹²⁸.

  Sense and Respond is a viable concept that needs to be rapidly adopted in response to the diverse military challenges of the 21st century.

**Precision Logistics.** Precision Logistics envisages establishing a system that provides full dimensional, rapid, accurate and timely logistics support at the right time, right place and right amount through information technology application, scientific organisation of logistics structures and adoption of modern management means.

**Outsourcing.** Outsourcing refers to utilizing resources, on payment basis, of another organisation to secure services and products, for which one would otherwise employ one’s own resources, inducing manpower. The outsourcing of non-core competencies is a recognized best practice. The reasons for outsourcing logistics functions include lower costs, a streamlined labor force, access to top personnel, and
cutting-edge technologies. According to the Outsourcing Institute, 85 percent of companies now outsource work they used to do in-house. Outsourcing expenditures are expected to reach $121 billion by the year 2000, according to the International Data Corporation.  

Armies around the world are adopting outsourcing as a strategic management tool with a view to optimize teeth to tail ratio. This involves restructuring of organisational activities which facilitate delegation of ownership, administration and operation of an administrative process to an external service provider.

“PW Senger, author of : Corporate Warriors: The Rise of Private Military Industry”, explains companies that cover functions of warfare at every level from tactical combat to mundane logistics that was once limited to State militaries. The experiences of 1991 Gulf War saw one operative for 50 troops, the 1991 Yugoslavia conflict saw one operative for every ten and the 2003 Iraq War PMC is comprising largest forces after the military. The dynamics of change in the supply and demand aspect witnessed down sizing of the US military to 2/3rd of its formal size, was followed by BRAC closure followed by privatizing military functions. The distinction between soldiers and civilians is breaking down and the integration of specialists handling sophisticated weapons and technology systems has increased enormously. According to Pentagon report, Saddam was destroyed with 1/4th the forces used in the Gulf War.

Halliburton, US with its other offices in outsourcing, grossed US $ 30-60 Billion from the Iraq War, a amount three times/2.5 times Americas cost for the entire Gulf War.

Logistics Civil Augmentation Program (LOGCAP). This concept, started in the late eighties by the United States Army, is an extremely comprehensive programme that provides contingency support from civilian contractors to augment the US Army force and its forces by Private Military companies.  

Selected Logistics Functions Provided by Army Units and Contractors During Operations Desert Shield and Desert Storm

The US Army’s sole provider LOGCAP 3 contract, which provided food, housing and fuel for U.S. troops worldwide, generated lots of controversy because government
audits of the sole supplier’s (Halliburton-KBR) work were unable to fully account for millions of dollars or justify all charges to the Pentagon’s satisfaction.

To address perceived problems of LOGCAP 3, the Army awarded the follow-on contract, LOGCAP 4, to 3 companies – KBR, DynCorp and Fluor – who compete for task orders.

The LOGCAP 4 contracts are indefinite-quantity/indefinite-delivery contracts with 1 base year and 9 option years. Each contract has a maximum value of $5 billion per year. This allows the Army to award a total annual maximum value of $15 billion and a lifetime maximum value of $150 billion. The 4th in a series of Logistics Civil Augmentation Program (LOGCAP) contracts awarded since the late 1990s, LOGCAP 4 was awarded based on a procurement strategy that employs multiple contractors to deliver services, instead of using a single contractor as in the past. Planning support and performance functions have been split among different contractors to allow the Army to manage the number and scope of LOGCAP actions. The 3 performance contractors compete for individual LOGCAP task orders. In addition, the Army selected a 4th contractor, Serco-North America, to provide planning support, essentially monitoring the 3 other contractors. This structure introduces competition into the contracting process and allows the Army to manage the LOGCAP task orders more effectively.132

The types of services to be delivered under LOGCAP 4 include:

- supply operations, such as the delivery of food, water, fuel, spare parts, and other items;
- field operations, such as dining and laundry facilities, housing, sanitation, waste management, postal services, and recreation activities; and
- other operations, including engineering and construction, support to communication networks, transportation and cargo services, and facilities maintenance and repair.

**UK Army.** Until 1980, a key tenet of UK defence policy was that MoD and the armed services provided directly all the services for which they were responsible and owned the main resources necessary to provide these services. In 1983, Defence Secretary
Heseltine introduced a dynamic approach that “henceforth ... the only work which is carried out within our defence support organisation should be that which is essential for clearly proven operational reasons, or where there is financial advantage for the taxpayer.”

In British Defence Forces, outsourced services include catering, transportation, security of installations. Under its Public Private Partnership, civilian contractors are invited to invest in a facility, operate it and charge the military for it’s use to recover their cost over a period of time.

In China, the PLA and General Logistics Department (GLD) are making progress toward privatizing procurement, transportation, and building construction and maintenance. To fix the shortfall for the time being, the PLA bought enough lift assets from Russia to move a division’s worth of personnel and supplies to any province in mainland China and to remote parts of the world. Their long-term solution includes synergising the civilian sector defense industry to produce enough lift capability to move three corps by 2012.

Israeli Defence Forces (IDF). This project as part of their initiative to outsource the revamping of the inventory is to make it more efficient, of high quality and cost-effective communications solution. A key part of the project will be performed in a development area, as part of the Israeli Government's policy to develop industries in the periphery, providing employment for dozens of local residents.

Decision-makers in the IDF have determined that the Medical Corps (MC) would outsource the primary care services required by career soldiers to a skilled civilian health care provider, in an attempt to improve efficiency, quality and “image” of the MC care system, while controlling expenses. Outsourcing of medical services can serve as a model to military corps worldwide.

The future of Logistics Outsourcing in India is positive and enlarging. The use and spread of IT, including ERP, warehouse management system (WMS), tracking systems and net-based data exchange – will be inevitable and rapid. Alliances, joint ventures and mergers with multinationals or larger Indian logistics providers, will evolve
or dissolve on required basis as and when required, companies will form alliances and break away when no longer required.

**Developments in Information Technology & Applications**

**Information Management**\(^{138}\)

Once the plan is complete, the hardest part then comes into effect, and that is the execution phase. If an organisation or agency has prepared itself properly, then this may not be a significant emotional event. But if it has not, then the staff is in for some long days and nights. Just like in the planning phase, the organisation has to clearly recognize how the primary staff and the other agencies will disseminate information and fuse data between its own organisation and other agencies to maintain situational awareness, as well as a staff focus and synergy.

This is best handled with the establishment of a Fusion Cell, whose main purpose is to correlate, integrate, and distribute data that can provide the organisation pertinent information that contributes to command and control of the operation. Therefore, the unit must establish a process to handle the input and output of data to facilitate information management. The process identifies the three components in the information management process consisting of the Organisational Outlook, Organisational Information Flow, and Information Flow Elements.

**Logistic Information Management System**\(^{139}\)

As with many large organisations, EU recognises the advantages that being able to work in a standard way brings. EU and NATO nations will use a Logistic Information Management (LIM) concept that couples available information technology with logistic processes and practices. The Logistic Information Management will focus on identifying logistic information requirements that meet the EU nation’s needs. Implementation of this concept should reduce management and support costs, the logistic footprint and logistic support delivery time. It should also enhance the efficiency and effectiveness of multinational logistic support\(^{140}\).
EU and NATO nations have numerous users requiring executive, managerial and operational logistic information. To be effective, logistic information systems must facilitate the delivery of the right information to the right people at the right time with the right information security protection. The Logistic Information Management should cover all logistic functions and will interface between these functions and other functional areas as required. NATO logistic systems need to be interoperable with both existing and emerging national systems. Interfaces with industrial systems should also be considered where practical and cost effective. Nations should develop and implement information systems and structures that support the Logistic Information Management. NATO logistic information systems must comply with NATO agreed information management policies, standards, infrastructure, procedures and protocols.

Logistics Functional Area Services (LogFAS). Five systems were developed within the Logistics Functional Area System (LogFAS) to service the logistic and movements’ communities within NATO. LogFAS 6.0 consists of different application programs sharing a common database (LogBase):

The programs that use LogBase are:

- Allied Deployment and Movements System (ADAMS). A movement and transportation analysis, planning and management system.
- ACE Resource Optimisation Software System (ACROSS.) A munitions and equipment stockpile planning and optimisation system.
- Logistic Reporting Tool (LOGREP). A logistic reporting system to allow users to comply with the requirements for BI-SC L.

These applications consist of a number of separate software modules, each of which provides a distinct functionality, interfacing, database maintenance planning support, reporting, simulations, etc. Some of these modules are common to more than one LogFAS 6.0 application prototype. Movement Planning Process and the ADAMS System. The Movement Planning Process follows the guidelines of operational planning. ADAMS can be used to standardise, deconflict and speed up the entire movement planning process. ADAMS system consists of seven modules, that is Log FAS Data.
Management Module (LDM), Geo Manager Module (GeoMan), Deployment Planning Module (DPM), Deployment Display Module (DDM), Sustainment Planning Module (SPM II), General Deployment Module (GDM), and Effective Visible Execution Module (EVE).

**Databases of Record vs. Web Services**

The Logistics Web Services concept will allow logistics managers across the distribution network to exercise Command and Control (C2) over logistics and other support capabilities based on the unit’s established priorities. The mission, structure and functional applications of a logistics web service platform integrates existing functionality into an overall single access capability for the end user. This model supports the migration to a service-oriented architecture, as well as to a web page portal. It further expands the unit commander’s role to synchronize and integrate logistics and other support activities in their area of responsibility (AOR)\(^{144}\).

**Automation**

**Concept**

The concept of automation support to military operations refers to the use of an automated system consisting of parallel computers, workstation computers, and servers integrated within a network used to create, store, retrieve, and disseminate information. Obviously, the main purpose to automate functions within the military process is to increase quality and productivity of information, reduce time and cost, increase flexibility, eliminate human error, or make up for personnel shortage.

**Decision Support System.**

Advances in IT have made it possible for supply chains to quickly adapt and respond to security environment and conflict scenarios. Automation of logistics stakeholders and their networking would usher in a single data model and standardized item definitions resulting in a seamless, end-to-end, real-time view across the functions and a single “version of the truth” to support rapid, confident decision-making at all levels. Of all the fields of logistics activity, inventory management offers, perhaps the
The greatest scope for full-scale application of Information Technology based solutions. The interconnectivity and interoperability all parts of the logistic community into one network of shared situational awareness and unified action.\textsuperscript{145}

A grid system of logistic support may be more effective to support short duration high intensity wars. Enterprise resource software’s like ERP can be utilized to interlink stocking echelons directly to vendors as Ordnance Factory Board(OFB), Public Sector Units (PSUs) with Central Ordnance Depots(CODs)/Regional Ordnance Depots(RODs) to ensure timely forecasting, real time monitoring and IT enabled services help locate all items that are in storage, in progress and in transit -- anywhere, anytime with the view to lessen the tendency to hoard and stockpile making a leaner and efficient system by Total Asset Visibility.

**Automated Warehousing.** Automated warehouses as in Singapore Armed Forces are envisaged to improve operational logistics efficiently by deploying modern warehouse technology together with improved processes. The design is to be based on multi-storey warehousing architecture, focussed on maximising the efficiency of land use. Essential features of an automated warehouse envisaged are automated storage and Retrieval Systems (ASRS), a fully computerised system, pallet and bin storage are fundamental to this concept.

**Maintainability.** In the trends of Embedded Diagnostics and Prognostics, Nano and Automotive technologies assist while Diagnostics while Prognostics provide information to alert the operator for potential or future problems. Sensors directly embeddable are able to measure a wide range of critical systems and wirelessly convey data in real time to make immediate tactical decisions and for automated logistics activities.

**Robotics.** Robotics has the potential of enhancing Logistics Survivability using applications as Unmanned logistics platform to carry equipment and ammunition, Unmanned vehicles for evacuation of battle casualties from high risk areas, in combat. Capabilities as Stand off IED disposal, proof firing of ammunition, Remote clearance of unexploded ordnance and Physical Security using portable barriers add significantly to logistics survivability.
Radio Frequency Identification (RFID).\textsuperscript{146} RFID enables synthesis and integration of end-to-end information of service inventories include those in transit on a common, networked and seamless capability accessible across the battlefield environment which was only limited in information within the theatre and beyond adversely impacting the Commander’s decision making and exercising best options in combat. Typical logistics related applications of RFID envisaged in Defence Forces are Supply Chain Management, Asset Management, Warehousing Management and Asset Visibility, Access Control and Equipment Management.

Logistics Information Grid. Establishing and Managing an Information Grid is imperative to provide battle awareness for both operations and logistics. Logistics resources are interconnected by a robust communications and an information network empowering the Commander in his decision making using real-time visibility across not just the services but also the national resources.

Developments in Information Technology have indeed been a catalyst to a paradigm shift in precision, visibility and near real time information across battle zones and locations regardless of distance and time. Networked connectivity will be the key to optimising functional efficiency and capability building in logistics’ readiness.

As Bill gates has to say,

Our goal is to deliver a streamlined, Twenty-first century systems environment [comprising] IT capabilities that work seamlessly together to support effective and efficient business processes and operations.\textsuperscript{147}

- Robert M. Gates, 06 Jan 2011
References

113 President George W. Bush, Statement to the US Naval Academy Commencement, 25 May 2001

114 Reducing the logistic burden for the Army after next, Doing more with less, The National Academies Press, 1999, Washington DC, Commission on Engineering and technical systems,


120 Dr David A. Anderson and Major Dale L Farrand, Article and Internet Downloads : http://www.almc.army.mil/alog/issues/JulAug07/log_revolution.html


122 Kate Vitasek and Steve Geary of Supply Chain Visions Performance – Based Logistics : Redefines Department of Defense Procurement


124 E-Procurement, from Wikipedia, the free encyclopedia http://en.ecommercewiki.info/fundamentals/market_places/e_procurement
Reducing the Logistic burden for the Army after next,


Maj Michale F Hammond, sense and respond Military Logistics in a global security environment, Army Legislation Sep Oct 2008

Larry Smith, Commercial Logistics Best Practices for the Revolution in Military Logistics,


Outsourcing primary medical care in Israeli defense forces: Decision-makers’ versus clients’ perspectives, Health Policy, Volume 78, Issue 1, 22 August 2006, Pages 1-7

Outsourcing of primary care: satisfaction level in the Israeli Defense Forces. Magnezi R, Kedem R, Reuveni H, Source Military Health Services, IDF Medical Corps,

LTC James H Anderson, “Cotton”, pg 167
139 Article New milestone in NATO Logistic Information Management System, Béla Réger, Miklós Zrínyi National Defense University, Hungary krt. 9-11, H-1091 Budapest, Hungary reger.bela@zmne.hu

140 Ibid Pg 99

141 Ibid Pg 99


143 Ibid, 100

144 LTC James H Henderson, The Science and Art of Military Logistics, 152,

145 Comptroller and Auditor General of India Report, 2000, Chapter 8, Para 8.3, 1


147 DOD financial reform hinges on IT Business IT systems critical for audit readiness, officials testify, By Amber Corrin Jul 29, 2011