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Information Technology as a Force Multiplier in Operational Logistics

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The government of India announced the New Logistics Policy (NLP)-2022 on September 17, 2022 duly considering and incorporating the advancements in Information Technology (IT) having global impact. Talking in military context, the revolutionary changes in the nature of modern warfare coupled with improvement and systematisation in resource planning have assumed greater significance, especially for the armed forces. These advancements have been prompted by the magnitude of the security challenges of the 21st century underscoring a compelling need to respond more rapidly & decisively thereto.

Today's military policies are based upon operational inputs, force capabilities, resource availability and logistical effectiveness. In case of today's warfare, the logistics management becomes a complex science, being extremely specialised owing to the high costs involved and the inherent lengthy supply lead times directly impinging upon operations. These complexities emanate also from the technological diversities of weapon systems operating over the entire spectrum of the armed forces of the day.

With the changing landscape of warfare, the battlefield environment of the future is likely to be characterised by the following:

(a) Short, intense conflicts and surgically focused strikes.

(b) Operations against apprehension of use of nuclear weapons and Weapons of Mass Destruction (WMD) by the adversary.

(c) Effective use of night vision devices.

(d) Increased transparency of the battlefield.

(e) A high-intensity and high-tech war, possibly non-linear initially but having potential to be a multidimensional air-land-sea warfare.

(f) Strikes into deep enemy territories with increased surveillance using weapon delivery platforms.

(g) High rate of attrition.

(h) Tactical interdiction.

(i) Enhanced mobility and manoeuvrability.

Therefore, the key elements of logistics activities relevant to any operational scenario would be:

(a) Foresight.

(b) Anticipated preparation, planning, deployment & diversions.

(c) Flexibility.

(d) Economy of effort.

(e) Military-Civil Interactions.

(f) Integrated logistics operations with asset visibility at all levels.

Considering the above, an all-enveloping e-platform would, therefore, be an inevitable need of the hour to define as to which echelons of logistics command & control should be created or altered to facilitate effective logistics support to the fighting forces in the theatre of operations, which happens to be as diverse as ours.

Concept of IT-Enabled Operational Logistics

With an aim to facilitate smooth air operations, the armed forces, especially the Air Force has to evolve and sustain an excellent Enterprise Resources Platform (ERP). The system has to operate amidst an effective interface between the logistics intelligence data and field logistics support in terms of critical spares for the smooth conduct of air operations. The military materials management revolution with IT as a force multiplier needs to be supplemented by simultaneous advances in the operational fields of command, control, communications, computers, intelligence, interoperability and surveillance and reconnaissance (C^4I^2SR), accompanied by enhanced lethality & precision of weapon systems.

However, the element of IT in use in the armed forces materials management has to migrate to the integration of global asset management with real-time transit logistics in the theatre of

operations. The Materials Management system needs to be more meaningful and operations-oriented with the ability to closely monitor the inter and intra-theatre movement of equipment and combat formations. The manifestation of today's armed forces' resolve to fine-tune their materials management functions, needs to be guided in the direction of sustaining an operationally effective logistics infrastructure in the theatre of war.

The requirement, therefore, would be to understand as to what the war fighters need, how to share a common operating picture, how to maintain real-time asset visibility and In-Transit Visibility (ITV) and how to maximise the effectiveness of the distribution logistics apart from accurately configuring the loads to optimise the material handling and economic utilisation of the aircraft fleet.

Future Perspective of IT-Enabled Operational Logistics in Indian Armed Forces

While the Indian army uses the Computerised Inventory Control Project (CICP), the Indian Navy uses the Integrated Logistics Management System (ILMS), and the IAF showcases heavy reliance upon the Integrated Materials Management On Line System (IMMOLS) for its logistics operations. Considering the terrain peculiarity scenario wherein the Indian armed forces operate, the shape of a comprehensive operational logistics character needs to be achieved through certain additions to the existing MM systems of the Indian armed forces, as under:

(a) Radio-Frequency Identification (RFID) in Wartime Scenario: Operation Enduring Freedom (OEF) was the largest support effort that the US military had ever undertaken in modern times. The RFID technology was widely used by United States Central Command (CENTCOM) forces in Afghanistan during OEF. The improvement in visibility of assets was considered a Key Result Area (KRA) during OEF more than what was visualised during the Gulf War. The RFID tags which were used extensively in OEF as well as Operation Iraqi Freedom were instrumental in providing better asset visibility to the field commanders. The RFID application by US forces greatly reduced the distribution process timelines and significantly enhanced the ITV. In OEF, the US forces had applied the same tactics to keep track of all battlefield logistics movements. RF tags were placed on all items of supply in a satellite-enabled tracking eco-system providing constant visibility.

(b) RFID for Peacetime Materials Management: Besides war, the RFID can be effectively utilised in peacetime too. In India, this technology is already in use by a number of major corporate players e.g. Maruti, Tata Steel and Nestle. Blue Dart courier service, one of

the best-acclaimed logistics services countrywide, besides other logistics service providers in India, makes effective use of similar technology aiming at real-time tracking of consignments moving from one destination to another. Possibilities for peacetime utilisation of IT-enabled logistics blended with RFID in Indian armed forces, especially IAF, are as under:

(i) RFID-Enabled Warehousing: RFID tags can be installed atop storage bins/racks in the warehouses, with the hand held readers used by the warehouse in-charge.

(ii) RFID-Enabled Issue Process: Tag reader antennae are to be installed at the entrance of the stores to record issue and ensure the movement of stocks out of the storehouse only under proper authority.

(iii) RFID-Enabled Stock Updation: With the integration of RFID, a Store-in-Charge would be able to update the location by just clicking a button. With every issue, the stock status thus automatically gets updated.

(iv) RFID-Generated Auto Triggers: Automatic updation of stocks would indicate the stocks falling to critical levels and auto-generate the provisioning reviews/replenishment demands on respective supply agencies.

(v) RFID-Enabled Receipt Process: All incoming consignments need to be tagged with an RFID tag containing relevant details of the item e.g. description, denomination of quantity, price, source of supply, technical details etc. Each item synchronised with RFID on receipt will be updated on the main server.

(vi) RFID-Enabled Inventory Tracking: Inventory is tracked as it moves out of the warehouse to the consignee's destination. This would be achieved by pasting RFID-enabled labels on consignment.

(vii) RFID-Enabled Inventory Management: A warehouse in-Charge, through handheld RFID readers, should be able to automatically update his stocks via RFID server in near real-time with every issue. This will enable the RFID server to have

updated inventories 24x7, which, in turn, would greatly help a logistics manager in realistic material planning.

(c) RFID-Enabled In-Transit Visibility: Similarly, it is also possible to enable the Logistics vehicles with RFID. The vehicles could, preferably, be closed container trucks. This can be modified to be RFID-enabled with a tracking device i.e. an integrated RFID reader (Satellite-linked GPS). This device would automatically synchronise the vehicle's location in near real-time to the RFID server. The RFID tag on the vehicle can also have various additional sensors like humidity, temperature, light, and pressure etc. This would help in knowing the exact status of the consignment inside the container through various parameters while in transit. Automatic alerts shall be raised when any of these parameters change due to any change in the condition of the consignment while in transit. These alerts can be tracked at all times by a centrally located domain server. The use of technology will provide total visibility of assets even during transit, the benefits in terms of reduced time cycles of vehicles to and fro their designated path, and increased visibility inside the vehicles for future planning/diversions.

(d) Broad Utility of RFID in Indian Military Context: The nature of warfare has undergone a complete transformation in the last two decades or so. Inter and intra-sector mobility of the forces has become the biggest logistical challenge for a strategic commander. With battlefields becoming more transparent than before, it becomes imperative for a Tactical commander to track each move of his forces. This apart, the free flow of weapons, ammunition and spares into the theatre of war is another big challenge for a logistician. The lethality of punch that a weapon system can deliver is proportionally related to the degree of efficacy of just-in-time battlefield supply chain management.

It is imperative that goods and personnel carriers moving into the battlefield be fitted with RFID Tags atop containers/vehicles whereas their readers can either be fitted at designated transit routes or scattered over the theatre of war. To achieve this, RF tags are to be placed on the complete range of items. This infrastructure can be used in a satellite-enabled tracking system providing high level of visibility to the logistics managers at all echelons of the logistics hierarchy. It would ensure the locations get updated on the server as soon as the transport carrying the goods passes through the pre-decided routes.

(e) Global Assets Visibility in Military Materials Management: Global visibility of assets would ensure the availability of real-time data to a logistics Manager. Besides, the end user in the field, with network-centric materials management tool at the click of a button would know as to where would his requirements be available. The future migration to a user with a handheld terminal/laptop having satellite phone connectivity would render him in a better position to place an online demand on his immediate logistics source, besides knowing as to where else the required stores are available. He then can raise a demand directly on the source instead of getting into the rigmarole of finding out availability. This would lead to global stock always being visible. In case of NIL/inadequate stock at a unit, option would be available to an indenter to transcribe inability directly to the echelon showing balances. This would not only streamline the supply chain but also ensure that surpluses at one point offset critical shortages at the other. Besides with handheld terminals and laptops, the end user would always be able to quickly requisition his requirements from a known and confirmed source. It would, in turn, reduce his downtime for unserviceabilities to a fairly large extent, apart from leaving him free to concentrate upon enhancing the punch of his armour.

Broad Prospects for Indian Armed Forces Logistics Amidst New Logistics Policy-2022

The Indian Armed Forces can leverage various logistics techniques in alignment with the New Logistics Policy-2022 to enhance operational efficiency. Embracing modern technologies, such as real-time tracking systems, can optimise supply chain management, allowing for better visibility and control over the movement of men & material.

Automation in the procurement processes can streamline acquisitions, reduce lead times, and enhance resource allocation. Integration of artificial intelligence and predictive analytics can aid in forecasting material requirements, thereby facilitating a proactive logistics planning.

Furthermore, the adoption of cloud-based logistics solutions can enhance data accessibility and collaboration among different branches of the military with due regard to the tenets of security. Formulating and implementing a logistics command structure under the theatre command can improve coordination and responsiveness, fostering the efficacy of joint operations across the entire spectrum of armed forces.

The use of GPS-enabled vehicles and drones for logistics transportation can expedite the delivery of critical supplies in challenging terrains. Additionally, investing in renewable energy

sources for transportation and storage has the potential to perfectly align itself with the sustainability goals outlined in the new logistics policy.

Capacity-building through regular training programs by reputed agencies, especially the Indian Institutes of Management (IIMs) and Indian Institute of Foreign Trade (IIFT), would ensure that personnel are well-versed in the latest logistics techniques. Collaboration with private sector partners for expertise in logistics management and infrastructure development can further enhance the military logistics capabilities.

Conclusion

Considering the above, it can safely be assumed that the road ahead is clear, leading to a future scenario wherein the last man in the chain i.e. a combatant on the battlefield, would be able to requisition his requirements just by the click of a mouse on the handheld terminal/laptop. A field commander would have a much clearer & constant visibility of his assets amidst inter and intra-theatre mobility. Amidst recent dynamics of geopolitical scenario resulting into India gradually assuming the status of a global power, there is every possibility of Indian Armed Forces operating in various roles across the national boundaries.

If that is the future perspective, then the concept of operational logistics would become a reality by transforming itself into a real-time war-oriented weapon of e-logistics. We can positively state that a comprehensive and technology-driven approach, coupled with strategic partnerships in terms of training, will empower the Indian Armed Forces to meet the challenges of modern warfare in line with the objectives of the New Logistics Policy 2022.