

A Literary Review of Distribution Based Logistics in Operation Iraqi Freedom

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Abstract

A well-executed Distribution Based Logistics DBL system also provides more flexibility and is typically more responsive than a supply point model. DBL system has good in-transit visibility of supplies and a solid logistical situational awareness. It also requires adequate lift capacity balanced across distribution segments, seamless transfer of loads at distribution nodes, and load configuration aligned with distribution node capabilities. It is important that these distribution segments and distribution nodes are always connected, or the DBL system loses its reliability and flexibility. This paper reviewed and analyzed the DBL used in Operation Iraqi Freedom.

Keywords

Distribution based logistics, defense logistics, supply reliability, in-transit visibility

1. Introduction

Operation Iraqi Freedom (OIF) is known to be one of the largest logistics and supply efforts from the very beginning of the conflict in March 2003 [1]. When OIF began \$14.2 billion, which accounted for over half of the initial budget of \$28.1 billion, was used to setup operating support [1]. As part of the effort to dispel the Cold War notion of “more is better”, the Army has worked on a revised distribution-based logistics system. This Distribution Based Logistics (DBL) system was chosen to be used in OIF [2]. The DBL system did not operate as smoothly as expected when US troops first entered Iraq. There were several issues that had to be addressed including lack of logistics personnel, poor asset visibility, poor communication, and an insufficient supply of transportation assets. However, overtime the Army has continued to redefine the distribution process and has improved the tools that are being used in order to make the DBL system more effective.

2. Initial Logistics in Operation Iraqi Freedom

2.1 Lack of Combat Service Support Personnel

It was clear in the beginning of OIF that the Department of Defense (DoD) lacked the distribution capability to deploy and manage large quantities of supplies and equipment in theater [1]. One main underlying cause that contributed to the distribution issues in OIF was the lack of combat service support personnel in theater [1]. A large number of combat service support units are reserve units and require about 90 to 120 days to mobilize and deploy [2]. To avoid training units during the December 2002 holiday season, the decision was made to delay some mobilizations [2]. For this reason, “most Army and Marine Corps logistics personnel and equipment did not deploy to the theater until after combat troops arrived and major combat operations were underway” [1]. By the time

combat service support personnel arrived in theater, buffer stocks of food and spare parts in many units were depleted, and meals-ready-to-eat (MRE) stocks in support warehouses were down to less than a day [2]. This resulted in a crippling start for the DBL system in theater during OIF.

2.2 Poor Asset Visibility

A secondary cause that contributed to the distribution issues at the start of OIF was the poor asset visibility throughout the supply chain. Asset visibility is crucial to the success of a DBL system in theater. Lack of an accurate demand forecast, as well as real-time information, contributed to insufficient national war reserves, insufficient replenishment capabilities, and insufficient funding which all played a role in the shortage of key repair parts [3]. As the pace of stability operations increased beyond expectations in the summer of 2003, the major distribution center supporting OIF was overwhelmed by the demand that was being received [3, 4]. One source stated that, "It took nine months for the Defense Logistics Agency to gain funding approval, increase capacity, and work off the backlog" [3]. At one point the backorder rate for these key repair parts jumped as high as 35 percent of all orders [3]. The backlog was finally relieved in February 2004 [2]. This was just one incident among many that proved that the Army would need to re-evaluate their asset visibility within their DBL system. While the DLA was working on catching up on backorders and obtaining a more accurate demand forecast, the Department of Defense (DoD) was trying to come up with a way to keep track of all assets. At the start of OIF the DoD was not able to effectively track all assets to, from, and in-transit within Iraq [5]. As a result, the DoD looked towards the help of Radio Frequency Identification (RFID) tags. RFID tags are tags that can be placed on individual items, cases, or pallets and contain information that can be read by an RFID reader. RFID tags generally contain a microchip that has a serial number that is unique and identifies the object on which it is placed, and may also contain additional important product information. During OIF the U.S. Central Command issued a policy requiring the use of RFID tags in theater, whenever feasible [5]. Although tracking assets in theater using RFID would ideally provide the visibility and tracking that was needed to improve the logistics system, the use of RFID tags fell short of expectations [5]. DoD personnel and military personnel lacked the training and the equipment needed to effectively operate using an RFID system [5]. Many units in theater did not have access to the DoD's logistics and asset visibility systems, and those that did found that their systems were not capable of transmitting data over the required distances [5]. These problems resulted in the RFID tags being used in a non-uniform and inconsistent manner [5]. Though there were instances where the newly adopted RFID system did prove to be effective, it did not provide complete asset visibility throughout the entire supply chain.



Figure 1: U.S. Army soldiers offload supplies on March 31, 2003, at an undisclosed assembly area in south central Iraq.

2.3 Poor Communication

A third contributor to the distribution issues in the beginning of OIF was the overall poor communication. Solid communication is a necessity when operating a DBL system; in order to have solid logistical awareness incoming and outgoing communication must be available. Good communication ensures that commanders are aware of the status of distribution flows and they are able to resolve any distribution flow issues that may arise. As OIF began there was poor communication between the Army and the U.S. Defense Logistics Agency (DLA) on how to consolidate shipments stateside [3]. The configuration of consolidated shipments being sent from the Continental United States (CONUS) by the DLA was poorly suited for the design of the theater distribution system [2].

A result of this lack of organization and communication between the Army and DLA resulted in a heavier workload in theater [3]. As orders arrived in theater they had to be re-sorted and repackaged several times before they could be distributed, which caused frequent delays [6]. As these orders were sent out to multiple units in different locations there were times when units had already relocated, and this resulted in lost shipments or shipments being sent to the wrong unit [3]. Unfortunately at this time outgoing communication was just as poor as the incoming

communication. For troops in theater this meant the inability to order spare parts while on the move which were needed to repair equipment [3]. Some units made do by circumventing normal supply channels to keep the equipment in ready condition, while other units were forced to rely on pre-positioned parts in Kuwait to perform repairs [3, 1]. Although pre-positioned equipment was available and did offer some relief, it was not adequately configured to match the needs of all units [6]. Therefore some units were forced to resort to cannibalizing vehicles for necessary spare parts (tires, tank tracks, helicopter spare parts, and radio batteries) [6].

2.4 Insufficient Supply of Transportation Assets

Meanwhile, an insufficient supply of transportation assets also contributed to the distribution issues in the beginning of OIF. Even after supplies were received and re-sorted in theater, there were further delays in distributing supplies to forward units due to a limited amount of transportation assets [1]. The limited amount of transportation assets can be traced back to two main causes. The first cause was the lack of combat service support personnel at the beginning of OIF. The second cause was the absence of a complete, detailed theater distribution plan [2]. A lack of combat service support personnel in theater at the beginning of OIF also meant a lack of cargo trucks which could be used to transport supplies. However, once the material handling equipment and cargo trucks were available in theater to distribute the supplies, the demand on these transportation assets still resulted in a truck shortage [1]. At one point, “the inventories of repair parts held by major combat units shrank to less than ten percent of the parts needed to repair broken equipment” [3]. This secondary truck shortage that took place once combat service support personnel arrived is thought to be the result of changes in the deployment plan and the number of trucks that were ordered to be used in theater [2]. During the planning process, truck companies were often treated as individual elements [2]. Since there was no comprehensive theater distribution plan to show how each truck element would ultimately be used, the result was to cut these elements [2]. This might have been avoided had there been adequate integrating tools available for planning, so that individual distributions plans could have been viewed as one complete, comprehensive theater distribution plan across all levels of operation [2].



Figure 2: A supply specialist readies the lifting straps on a HEMMIT cargo truck

3. Improvements to Logistics in Operation Iraqi Freedom

3.1 Defining and Redefining the Distribution Process

The Army began making changes to its distribution system towards the end of the first year of OIF. The primary focus of logistics in theater has shifted to include not only distributing the right equipment at the right time, but also using a seamless integrated system that stretches from the national level to the individual soldier, “factory to the foxhole” [1]. The phrase “more teeth, less tail” is being heard more and more as the Army continues to redefine and transform its logistics concepts and reduce its logistical footprint in theater.

According to Lt. Col. (P) Ray Mason, the special assistant to the deputy chief of staff for logistics, “The objective is to get as much combat force on the ground as you can, with an appropriate level of logistics to support those soldiers and combat systems” [1]. The Theater Provided Equipment initiative was introduced in order to reduce bottlenecks within the DBL system, and the in-transit visibility of assets within the system was improved by using a Movement Tracking System. The Army has also been able to reduce the overall logistical footprint of the Army in theater through the use of contractors and an integrated system that will connect all levels of operations. It is important in developing an integrated system that physical demand and cultural demand are both taken into account [1].

3.1.1 Physical Demand

Reducing the amount of physical demand is extremely important in developing an integrated system. Physical demand in general is anything that is consumed by the soldier [1]. Physical demand includes, but is not limited to, fuel, ammunition, and repair parts [1]. The focus is to try and reduce the footprint of supplies and inventory that is

cumbersome to transport, and takes up space in theater. “Reducing the need for inventory reduces the requirement for containers and vehicles, for personnel to operate them, for personnel to maintain the vehicles and support the operators, and so on [3].” Technology is often a key contributing factor in reducing the physical demand [1]. For example, fuel consumption can be reduced by switching from wheeled vehicles to track vehicles [1]. Meanwhile, ammunition requirements can be reduced by “increasing precision, improving targeting systems and sensor-to-shooter capabilities, and [using] common calibers” [1]. Food and water, which are also classified as physical demand, require frequent usage of transportation assets and an adequate amount of storage space in theater. The amount of food being shipped into combat zones has been decreased by increasing the caloric content of each field ration [1]. The space that is needed to store these field rations has been reduced by reducing the size of the packaging of each ration [1]. During OIF, it was determined that soldiers prefer bottled water, as a result potable water-bottling plants were constructed on U.S. military bases in Iraq [6]. After being completed, five water-bottling plants were able to produce enough bottled water in one month to take the place of 3,100 trucks that had previously been required to transport water [7]. As a result, shipping costs were reduced and flexibility was increased. The Army was able to “adjust production levels and rapidly change the distribution schedule to coincide with requirements [7].”

3.1.2 Cultural Demand

Cultural demand describes a thought process, and cannot be easily reduced just by applying technology [1]. According to Mason, “The cultural issue is a confidence factor. We have to convince the commander on the ground that when he needs it, we’re going to get it to him” [1]. The goal is to move away from the Cold War notion of supplying large-scale forces over extended periods of time [3]. Many commanders, however, lack confidence in the DBL system and the system’s ability to deliver the right goods to the right location, at the right time. When the desired equipment or supplies are not delivered on time, duplicate orders are often placed which adds unnecessary orders to a system that is already operating behind scheduled. As a result, commanders begin to stockpile supplies and keep more on hand than what is actually needed [1]. The mentality according to Mason has become “if some is good, then a lot more must be better. I can see it, touch it, and I know it’s there when I need it” [1]. The logistic system in the Army is working to find a balance between ‘Just In Time’ logistics, which is used in the commercial industry, and ‘Just In Case’ logistics, which has become the basis of the cultural demand [1]. The balance between the two has been referred to as ‘Time Definite Delivery’. Providing supplies to a combat zone at the precise time that they are needed by using Just In Time logistics would pose a high level of risk; however, Time Definite Delivery poses a lower risk level by providing units with supplies on time and far enough in advance for the unit to continue being effective [1].

3.2 Contractors

Contractors from the United States and Iraq have also contributed to the reduction of the Army’s logistics footprint in Iraq. Kellogg Brown and Root (KBR) holds the largest military logistical support contract, and employs over 50,000 contractors [8]. Maintenance contractors from the US, such as KBR, are often used in garrison instead of Army military maintenance personnel [3]. The contractors are not required to maintain a minimum level of common military skills, and this allows them to spend all of their time on maintenance tasks [3]. Contractors typically have a higher level of experience and skill as well, and can achieve a higher level of productivity by focusing their full attention on maintenance and repair [3]. In addition to providing maintenance support, US contractors provide assistance in meteorology, carpentry, and food services [8]. According to an interview with Major Anthony Ford, the Army has begun using a program known as “Iraqi First” to employ Iraqi contractors which also reduces the amount of Army logistics personnel that are required while in theater. Field Services, such as laundry services and abolition services, are contracted out to vendors in Iraq with the lowest bid. In order to qualify as an Iraqi vendor, the business must be 51% owned by Iraqi citizens. The Iraqi First program also has several additional benefits including reducing the overall distribution costs, strengthening the economy in Iraq, and protecting the soil in Iraq. Overall distribution costs are directly related to the amount of supplies and Army personnel that are present in theater. As this number is reduced, the distribution costs are also reduced. By creating jobs in Iraq for Iraqi vendors, the Iraqi First program helps to stabilize and strengthen the economy in Iraq. Although Iraqi vendors are allowed to create subcontracts, strict guidelines must be followed. The US military must be careful to protect the soil while in theater in order to avoid fault for improperly disposing of hazardous material. The Iraqi First program protects the soil in Iraq by contracting abolition services to Iraqi vendors, so that the hazardous waste can be properly disposed of according to regulations.

3.3 In-Transit Visibility

Fast and reliable information throughout the supply chain is necessary for an effective DBL system [3]. Real-time information gives up-to-date details about when and where resources are needed, any changes that may develop during transit, and notification that a shipment has been received [3]. The Army is continuing to try and increase the overall effectiveness of RFID technology in theater. RFID technology systems have been improved, and are being used effectively on a small scale [6]. It has been suggested that the Army should begin incorporating RFID technology during stateside training, so that troops can be adequately trained before being expected to operate RFID systems in theater [6]. In the meantime, there are other systems that have been incorporated in order to provide vital real-time information while in theater. The Army has begun using a Movement Tracking System which has been very helpful in increasing in-transit visibility by monitoring the location of vehicles and cargo within theater [3]. An increase in in-transit visibility helps to provide much of the real-time information that is extremely important to reducing inventory. The Movement Tracking System also increases flexibility by allowing logistics leaders to reroute vehicles on short notice if necessary [3].

3.4 Theater Provided Equipment

During the beginning of OIF each unit brought with them all of the equipment they would need during their deployment. This included large armored vehicles, such as Abrams tanks and HMMWVs, and other support equipment that had to be specially shipped. According to an interview with Major Anthony Ford, all of this equipment that each unit was required to bring added to the distribution bottle-neck that already existed in ports and rail stations that were receiving supplies in theater. As a result, the Theater Provided Equipment (TPE) initiative was designed to reduce the strain on the distribution system, as well as reduce cost and make sure that units have the necessary equipment that is needed when they deploy [9]. The TPE initiative directed the units that were leaving Iraq to leave equipment in theater that could be used by the new units that were arriving [9]. Armored vehicles, individual soldier body armor, and equipment used to identify improvised explosive devices (IEDs) were all included in the list of TPE [10].



Figure 3: HEMMIT cargo trucks were just one vehicle among many on the list of Theater Provided Equipment

4. Conclusion

This study covers the use of distribution based logistics in Operation Iraqi Freedom. In the beginning of OIF several factors contributed to the poor performance of the DBL system including poor communication, poor asset visibility, and a shortage of combat support service personnel. Reports have concluded that overall distribution efforts were kept within minimally sufficient levels, so that forces were able to conduct operations as planned [2]. “No direct operational consequences from a supply shortfall have been identified, in terms of either a mission failure or a changed course of action, however, the level of risk rose above the comfort level of combat commanders and the troops” [2]. After the first year in theater, the Army began making changes to increase the effectiveness of the DBL system, while also focusing on reducing the logistical footprint of the Army in theater. The Army has worked to find a balance between Just-In-Time Logistics and what has been referred to as “Just-In-Case Logistics”. In order to achieve this, the Army has continued to implement new logistics concepts and planning tools that will lead to a fully integrated system across all levels of operations.

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