Overall Solution Capabilities

Increasingly, armies, navies, and air forces need software that is easy to customize so that specific partner agencies can access necessary reports and screens. For example, military headquarters may want to proactively monitor the reserves of drinking water managed by its supplier to ensure that supplies are in place for a clandestine operation.

Microsoft has identified its focus on the key pillars for Integrated Logistics Solutions (ILS) for defense. Microsoft Dynamics AX is a fully integrated business management solution with components for ILS; providing defense customers with integration, security, and ease of deployment and use. Defense command units can use functionalities for financial control with logistics, inventory, supply chain management, and enterprise asset management.
The orientation of national defense forces onto peacekeeping, often in joint operations with allies, together with pressures from cost cutting initiatives by governments, is creating a new paradigm in defense logistics systems. Now, more than ever, it’s important to gain an accurate and up-to-date picture of assets and supplies, and the mission readiness of equipment. Developments in the way armed forces operate—increasingly in multinational task forces—have created demand for more efficient logistics information systems and the need to support cross-service interoperability within defense forces through Web-driven technologies.

This white paper shows how Microsoft Dynamics business management software, supported by Microsoft commercial off-the-shelf technologies, is helping to overcome the operational logistics challenges faced by defense forces. Using open logistics systems and service oriented architecture with robust support networks, Microsoft and its ecosystem of partners make valuable contributions in supply chain management, systems logistics, and maintenance, repair, and overhaul (MRO) with supporting modules available for finance and human resources. Microsoft Dynamics products with today’s improved Web-based technologies meet the pressures posed by acute cost and time constraints with lean, agile, and highly customizable solutions.

For today’s military or civil emergency operations, often in remote and inhospitable environments, constant maintenance and repair is necessary for the frontline or expeditionary forces to perform at optimum levels. Defense forces expect their logistical systems to offer the right equipment in the right place at the right time to achieve operational efficiency. Microsoft Dynamics products are used for a wide range of logistics tasks including aircraft maintenance, ammunition supply, depot logistics systems, and supply chain management. The focus of this white paper is to explore solutions for better planning, greater automation, and improved integration of logistical systems for supply chain management, systems logistics, and MRO.
Microsoft recognizes the importance of the following criteria for logistics information systems for defense:

- Efficiency and effectiveness
- Cost, time, and adoption agility
- Unexpected operational requirements

As armed forces loosen their national ties and increasingly work in international joint operations for peace keeping, civil emergencies, or public protection, integrated logistics systems for defense are assuming greater importance. This creates new challenges to manage the work of maintaining operations abroad.

High quality support of deployed forces both at home and overseas is a major task for defense departments. North Atlantic Treaty Organization (NATO) forces originally trained for operations between conventional forces on the plains of Northern Europe, but with the end of the Cold War traditional logistics support systems have become rapidly outmoded. Often the logistics challenges are compounded by extended lines of communication in locations such as Afghanistan, Iraq, and the Horn of Africa. The operational profile of most armed forces is also changing. Smaller military capability packages are often deployed at short notice to distant locations. IT now has to support process-oriented transactions with manual interventions kept to an absolute minimum to save money, improve efficiency, and free staff for higher value work. The greatest test for vendors and integrators of defense logistics systems is how to provide customers with high quality Web-enabled solutions under pressing cost and time constraints. Microsoft is no exception. To avoid wasting money, many defense forces are seeking more efficient, integrated logistics systems that facilitate cross-service interoperability.

Indeed, system interoperability has become a major consideration as military commands develop technology solutions to meet specific logistical challenges. The IT community now offers a concept of system interoperability called Service-Oriented Architecture (SOA). While standards continue to evolve in this area, it is increasingly clear that any new technologies for integrated logistics systems must be SOA compliant from the earliest implementation. Wider acceptance of SOA paves the way for the better use of commercial off the shelf (COTS) technology which is not only cost effective but user friendly.

Ease of adoption is another consideration in the choice of integrated logistics systems that manage workflows and provide accurate and timely reports. In many defense forces, IT skills are often concentrated into the hands of a few technicians while the majority of uniformed personnel have little knowledge of advanced IT. Bert Oltmans, Director Public Safety and National Security, Microsoft Middle East and Africa, says: “Operationally, armed forces are working with a big turnover in logistics personnel. No-one stays in post longer than three years. A two-to-three month learning period for personnel to train on a complex logistical support system is not practical or affordable for most defense departments.”

Requirements Definition

Integrated defense logistics is a multi-faceted discipline. It concerns, for example, personnel, materials, non-durable goods, and medical care. Microsoft Dynamics addresses the challenge to keep these assets in mission-ready condition by categorizing logistics systems into four main process pillars: Budget Planning and Financial Management; Sustainment, Fulfillment and Supply Chain; Enterprise Asset Management; and Financial Evolution. This forms a comprehensive solution to manage workflow efficiently. These core functions are underpinned by overall solution capabilities such as the ability to customize the software for the specific needs of a client and to modify user interfaces.

Key pillars for Integrated Defense Logistics

Budget Planning and Financial Management → Procurement and Acquisition, Sustainment, Fulfillment and Supply Chain → Enterprise Asset Management → Financial Evaluation

Financials: Sustainment, Logistics
Budget Planning and Financial Management

Logistics processes start with the creation of a financial budget and then a material budget, which can go through stages of collaboration and review before final approval. Procurement of materials has to be measurable against approved budgets. Sometimes this budgetary information is held in a financial management system, which is not connected to the logistics system. Key requirements include:

- Operational and material needs
- Formation of budgets
- Consolidation of material budgets
- A complex and iterative approval process
- A material plan cascading down through the chain of command to unit level
- Execution of the plan

Procurement & Acquisition, Sustainment, Fulfillment, and Supply Chain

Supply chain management is concerned with the business processes needed to ensure goods and people are in the right place on time—with the supplies needed to fulfill core operational tasks. These activities start with the purchase-to-pay business processes involving detailed procurement and acquisition of goods and services. Sustainment, fulfillment, and supply chain enhance the ability of defense clients to know what is available, where or when. It supplies the tools to accurately control the processes for warehouse and depot management activities including:

- Requisition management
- Purchasing
- Contracts with suppliers
- Inventory management
- The movement or transfer of goods through safe zones and controlled zones
- Vehicle tracking
- Fuel, food, or material consumption
- Transport and distribution

Enterprise Asset Management

Enhanced partner capabilities allow complete enterprise asset life cycle management (EAM), which is a key requirement of the ILS, particularly to ensure life saving and necessary military equipment is working and appropriately serviced. This may involve integration to supplies systems, NATO systems for item classification, codification, and detailed bill of materials information.

Systems logistics involves establishing and executing policy directed at the acquisition, disposition, and maintenance of material resources required for operational units to complete their work. MRO is the common industry term for software suites to manage maintenance processes for operational equipment, with the capacity to react to uncertainty. Key requirements include:

- Complex MRO capabilities
- Acquisition and planning of assets
- Logistics, movement, and tracking of assets
- Visibility of shared resources
- Easily accessible documentation and specifications
- Repair mechanism
- Quality control processes and procedures
- Disposal procedures

Financial Evaluation

Financial Evaluation provides on time and accurate reporting of financial information, from the logistics supply system, to the financial systems for defense clients. In most cases, these control systems are not the same so integration is required. Increasingly, defense forces need financial data that can be easily analyzed by performance indicators so personnel can evaluate yesterday and today, while planning future spend requirements. Key activities include:

- Ease of access to evaluate actual figures compared to budget
- Accurate reporting by command and defense unit
- Spend approval and payment to suppliers for the correct material delivered
- Controlled approval of increased use of contractors in defense
- Reconciliation, avoidance of duplication
- Detailed financial management reporting
- Detailed budget management and control
Microsoft Dynamics makes reliable information available for planning process-oriented transactions and controlling resources with cost effective solutions. The technology helps defense forces and their contractors fulfill their missions, while saving time and money. It is designed for multinational strategic partnerships, scaling to thousands of users across diverse systems.

Microsoft continues to focus on the deployment of its technologies for ILS with a technology platform that is fully integrated.

Microsoft Dynamics AX provides strong features to manage:
- Financial management and reporting
- Supply chain and logistics
- Purchase-to-pay process
- Inventories and parts ordering
- Integrated scheduling capability for parts
- Tools, machines and human resources
- Advanced bill of materials management with national stock number capability
- Comprehensive reporting
- Complete asset life cycle management

Supported by interoperable Microsoft technologies, Microsoft Dynamics products provide the capacity for integration and exchange of data from disparate systems, using supply chain features for total asset visibility, reducing inventory, managing procurement and warehousing costs, and monitoring budgets with robust business intelligence and reporting.

The latest solution offers rich and powerful capabilities to help organizations streamline processes, reduce operational costs, manage compliance and drive informed decision making across the organization. Microsoft Dynamics solutions offer a similar look and feel to other, familiar Microsoft products, such as Microsoft Office, and work well in combination with these solutions. Designed with a focus on the roles and role centers that deliver an individualized, task-based user experience, Microsoft Dynamics allows key users to easily customize and automate processes based on their own preferences and work style. That means less training and reduced development time.

Microsoft Dynamics products stand out from other business software management solutions because of their:
- Increased flexibility, making them easily customizable and highly scalable
- Advanced technology, which supports the requirements of a growing business
- Global solutions, including depth and breadth of experience
- Integration with existing IT investments
- Ability to connect and interact with ease
- Ease of administration
- Familiar user interface similar to other Microsoft products

**Service Oriented Architecture:** Organizations need to connect processes, people, and information both within the organization and across organization boundaries. SOA is an architectural style that helps meet these demands. Microsoft Dynamics has made investments in Web services and other SOA technologies across product lines to help customers take a “Real-World” approach to SOA. Real-World SOA is about taking a pragmatic approach to systems integration where time-to-value is much more immediate. Microsoft Dynamics AX greatly simplifies real-world SOA projects since core service orientation capabilities are built not only into the Microsoft Dynamics products but also into its native infrastructure - Microsoft technologies like SQL Server, BizTalk Server, SharePoint Services and Office SharePoint Server. In addition to Microsoft Dynamics Web services, the core capabilities of service-orientation are complemented with connectors, adapters and server-based solutions that support seamless integrations.

**Integration with existing IT investments:** Microsoft Dynamics AX enhances interoperability with Microsoft products, and offers integration options with other systems.

**Layered architecture facilitates customization:** Microsoft Dynamics technology is built with a layered architecture—developers can customize one layer without altering the functions of other layers. This saves time and money when adapting an existing solution to new operational requirements.

**Modular deployment options:** Defense customers often require the flexibility to add new features incrementally rather than deploy end-to-end solutions from the start. The architecture of Microsoft Dynamics makes it easy to add new functionality in stages leading to cost effective use of technology.
Business intelligence reporting: The built-in business intelligence and reporting features in Microsoft Dynamics solutions help improve decision making. They make it easy for defense customers to perform queries, create reports, analyze data, and share conclusions.

Familiar graphical user interface (GUI): Many users experiencing Microsoft Dynamics for the first time are immediately reassured by the familiar look and feel of the GUI. This helps to increase the speed of user adoption and eliminates the need to spend time and money on specialized personal development training courses.

Roadmap: Microsoft Dynamics AX has a published road map and Microsoft is committed to ongoing investment to ensure the solution meets the needs of organizations globally. For specific industries, this includes a focus on public sector and defense. Microsoft has a commitment to support all current releases for 10 years from their release date.

Strong partner ecosystem: Microsoft Dynamics AX is supported by a broad network of solution and implementation partners. The Microsoft partner network is already global and growing fast. Microsoft Dynamics AX has more than 2,000 partners and 12,000 customers worldwide.

Horizontal integration between allied defense forces or units engaged in combined operations is essential if information is to be shared in a timely way. Through Enterprise Portal in Microsoft Dynamics AX, other depots, military units, suppliers, and defense staff can gain direct access to relevant information from personalized Web portals through the Internet. This helps to cut transaction costs and connects different units regardless of time zone or geographic location.

The functionality of Microsoft Dynamics AX can be increased through integration with other systems such as Office SharePoint Server 2007. Using SharePoint technologies, users can create portals for visibility into reports and workflow processes. Defense forces can also offer suppliers visibility into their supply chain from the loading points to the warehouse, and on to the delivery destinations.

AX Maintenance, Repair and Overhaul

Maintenance, Repair and Overhaul (MRO) also referred to as Enterprise Asset management (EAM) is a functionally rich system that offers management of operational and maintenance functions as well as control of assets. Asset visibility helps the military view and manage all activities related to assets, asset maintenance, and MRO inventory. Item managers, production controllers, project leaders, and maintenance supervisors can use MRO to manage physical assets, determine asset expenditure, forecast and schedule assets for maintenance, and retire assets at end of life. Inventory managers use the toolset to manage purchasing and inventory levels. MRO keeps a complete record of actual repair work done—materials used, people involved, and other critical data. It also allows for the reporting of injuries and dangerous occurrences. Field inspections and incident data are best captured in an MRO portal to provide a Web-accessible way of reviewing historical data.

With the use of these functionalities, Microsoft partners are addressing key MRO and EAM solution requirements for parts ordering, advanced bill of materials management, electronic technical data, reporting, and complete asset life cycle management for Maintenance, Repair and Overall.
Why Microsoft Dynamics for Defense Logistics?

Core System Capabilities
The new release of Dynamics AX has a number of new features to support customers and partners in the defense space. The following illustrate the core capabilities:

Role Center
The Role Center is a Microsoft SharePoint Web Part page. The Role Center provides the landing page for users when they access the business application. It shows the key information needed to carry out the particular role of each user.

In addition to creating their own templates, users have access to over 30 Role Centre templates shipped with the release of Microsoft Dynamics AX.

Unified Workflows
Microsoft Dynamics AX supports full user defined workflow capabilities providing greater productivity benefits to streamline tasks within the defense organization.

A unified work list of notifications from the workflow system can prompt users from different parts of the business application.

Users of the application can perform actions such as approvals, or find more information directly from the unified work list.
Rich Analytics Information
With Microsoft Dynamics AX, rich analytical information is displayed on the role center for more effective monitoring and decision making.

Localization Capabilities
Microsoft Dynamics AX has advanced localization capabilities for companies to run in a single instance. With new languages continually introduced by Microsoft, the local system can be accessed in another available language if required by the user.

Supply Chain and Logistic Management
Microsoft Dynamics AX allows users to manage supply chain and defense logistics and material structure. This can be organized into sites, units and warehouse locations to reflect a defense command structure for logistics support, providing visibility and accuracy at the bin location, with control on batch, serialization, and key warehouse management parameters.
Why Microsoft Dynamics for Defense Logistics?

Core System Capabilities

Transaction Analysis
Microsoft Dynamics AX permits dimensional analysis of transactions categorized by department, unit, or key performance indicator.

Advanced Grouping
Microsoft Dynamics AX allows the creation of item grouping and sub-grouping.

This is a useful configuration for NSN (NATO/National Stocking Number) classification and is used to configure and extend NSN item setup, cross reference and configuration.
When integrated with the Microsoft stack of technologies, Microsoft Dynamics tools provide end users with high quality defense logistics solutions that meet strict cost and time constraints. Scalable architecture, ease of integration, and user friendly interfaces, are the defining characteristics that help Microsoft deliver lean and agile open systems. Building on this framework the Microsoft ecosystem of partners around the world is achieving success with a wide range of integrated logistics solutions.

Microsoft technology in defense logistics is recognized for its flexibility and resilience. Although the Bundeswehr (the Federal Defense Force of Germany) is working towards a single integrated defense logistics software solution, its technical advisory team in Ghana took a different view. It has recommended a solution based on Microsoft Dynamics AX using its logistics and maintenance modules for re-equipping the Ghana armed forces engineer regiment and maintenance workshop in West Africa. Per Jakobsen, Director at Microsoft Gold Certified Partner Axdata Ghana, says: “When we have successfully implemented this project, it will most likely be extended to include all the armed forces in Ghana—funded by Germany.”

The Bundeswehr also selected Microsoft Dynamics AX for a new depot-level logistics system working with Microsoft Gold Certified Partner LogicaCMG, the second largest European-listed IT services company by market capitalization. Jens Elstermeier, Team Manager, NATO and International Defense, LogicaCMG, says: “The project was part of a holistic approach within military logistics for voucher-less picking to improve the flow of materials and information at the depot. It involved a barcode system to help create stable, efficient, and transparent logistical processes and substantially reduce throughput times.” Completed in just nine months, the new software automated several steps in the process including issuing receipts for goods. Previous failures in stockpiling and stock transfer were eliminated by ceasing the previous practice of manual registration. By using Microsoft Dynamics AX, shipping goods was no longer dependent on individuals using spreadsheet software. Moving to a unique wireless scanner and barcode solution better met the security requirements of the German armed forces.

Electronic Data Systems—a Hewlett-Packard company experienced in all areas of defense services and military solutions delivery—is deploying Microsoft Dynamics AX for the Logistics Information System for the Ministry of Defense, Republic of Macedonia. This implementation is a joint project by the United States and Macedonia. Microsoft Dynamics AX functionality will be used for material forecast and planning, requisitions, purchasing and supply contracts, inventory and warehouse management activities, logistics, asset management, and management information reporting. The Logistics Information System will automate supply, maintenance, and transportation functions, and provide inventory transparency and management to more than 40 Ministry of Defense and Army units, resulting in efficiency and cost savings. The project will also significantly increase compatibility and interoperability with NATO logistics systems and codification procedures.

LogicaCMG has also used Microsoft Dynamics AX with the Microsoft BizTalk Server orchestration layer to manage an ammunition supply system for another large NATO defense force. The project is a complete life cycle management system for ammunition covering stock management, purchasing and procurement, configuration management, and quality control. The combination of BizTalk Server and Microsoft Dynamics AX provides a solution that offers both standardization and visibility into information resources, while at the same time ensuring that military units maintain their flexibility and agility. BizTalk Server not only extends that visibility across operations and the supply chain, but also provides real time insight into critical processes, helping soldiers and technicians to respond to issues before they require escalation.

In France, Technofan, part of the Safran Group, which supplies equipment for military aircraft (Dassault) and civil aviation (Airbus) looked like an unlikely business partner for Microsoft. SAP and Baan (now owned by Infor Global Solutions) were already implemented at Technofan, and Lawson Software was a contender. Advisers Ernst & Young considered that Microsoft Dynamics AX would be an appropriate solution as Technofan could integrate easily with the solution. Microsoft Dynamics AX succeeded with the request for proposal because of its low total cost of ownership for the customer and a long-term commitment of support from Microsoft Gold Certified Partner Ares.
Microsoft Dynamics AX is the business management software of choice used at the European Defense Agency (EDA). The EDA works to promote an integrated approach to Europe’s defense capability and collaboration in areas such as procurement, research, and technology. Users can access all applications through SharePoint Server 2007, which also acts as an environment where EDA employees and defense officials from participating countries collaborate on projects. The decision to work with Microsoft technology was based on several factors, including its tight integration with other line-of-business applications used by the agency.

In supply chain management, the Netherlands-based Supreme Group operates on five continents with more than 7,000 employees. It has more than 50 years experience in delivering customized supply chain and other services solutions in demanding environments. The group—which provides food, fuel, logistics, and other services to the military and commercial groups operating in areas of conflict including Afghanistan—replaced its business management software with Microsoft Dynamics AX. It is now expanding its implementation to include greater functionality in more countries using the product for financial, management, advanced warehousing, projects and services, fuel management and food service.

Each day, the Supreme Group serves 250,000 meals to customers around the world. It also organizes and executes on-time full delivery of around 75 million liters of aviation and ground fuels each month in some of the most dangerous war zones. The company works for highly demanding clients such as the Ministry of Defense in the United Kingdom. Guarav Kumar, Director of Information Technology for the Supreme Group, says: “Our application was not flawed, it was just meant to serve the needs of much smaller organizations. Our IT staff weren’t able to enhance the application with the necessary functionality, employees grew disillusioned, lost confidence in IT systems, and turned to excessive manual use of spreadsheets for maintaining logistical information.”

Highly efficient warehouse management is vital to the company’s success. Defense customers require visibility of stock in warehouses, strict controls on inventory, transportation safety, and documentation and monitoring of business processes. “In a remote location such as Kabul, it is essential to have a system that can manage and control the expiry data rotation for perishable stock,” says Kumar. “We also needed a system that could handle product life extensions when those extensions were sanctioned by the customer.”

In choosing Microsoft Dynamics AX, the Supreme Group was mindful of choosing a product with a solid roadmap laid out for the future. Kumar says: “Both the Oracle and SAP systems were impressive, but they had limitations, especially from a warehouse management and operations perspective. And on the financial side they seemed more complex and less user friendly than the Microsoft Dynamics AX solution. We also appreciated that this solution had Microsoft supporting it with a clear roadmap for the next five to 10 years.”

Initially working with Microsoft Gold Certified Partner CIRCON Circle Consulting, the Supreme Group deployed the solution in 2007 in Germany, Switzerland, and the United Arab Emirates (UAE). By the second quarter of 2009, the group had extended Microsoft Dynamics AX to handle supply-chain management, advanced warehousing, projects and services, fuel management, and food service in Bosnia, Kuwait, Afghanistan, Switzerland, the UAE, and the United Kingdom. Additionally, it uses SQL Server 2005 data management software as well as the online analytical processing (OLAP) features in SQL Server 2005.

Technology alone will not cut maintenance and repair cycle time. In MRO, Microsoft and its Gold Certified Partners Tectura and Intercim have joined together with NGRAIN Corporation of Canada to introduce an SOA-based solution designed to reduce the pain points in cycle times and cut costs for military maintenance and repair. The solution using Microsoft Dynamics AX addresses parts ordering, integrated scheduling, bill of materials management, electronic technical data, reporting, and asset life cycle management. Called AX-MRO, the toolset has been deployed in several scenarios where there is pre-existing business software management or a need for a “regional” or divisional system to supplement it. AX-MRO integrates easily as a departmental “spoke” to extend an existing “hub” system. These scenarios map directly into the structure of many defense forces’ maintenance depots around the world.
As a contractor to the United States Department of Defense, CALIBRE, a technology and management services company, needed to comply with strict performance standards for defense contracting. Working with Microsoft Gold Certified Partner RSM McGladrey, CALIBRE adopted Microsoft Dynamics SL to improve visibility into project and financial information. “The open architecture and ease with which Microsoft Dynamics SL can connect to other Microsoft technologies made it a good choice for CALIBRE,” says Tom Burtner, Director of IT Consulting at RSM McGladrey.

BMI Defense Systems designs and manufactures protective equipment for the United States military. In 2008, the company won the contract to ship a gunner platform and restraint system in direct support of operations in Iraq and Afghanistan under the Mine Restraint Ambush Protected Vehicle Program. BMI Defense worked with Microsoft Gold Certified Partner SIS to implement Microsoft Dynamics SL for accounting, supply chain, and manufacturing. The solution helped BMI Defense demonstrate to the United States government its direct and indirect costs for the new contract. Traci Gholson, Vice President of Finance, BMI Defense Systems, says: “With Microsoft Dynamics SL we can plan product shipments with much greater accuracy, which not only saves us money but helps us save lives by getting our protective equipment to the soldiers on the frontline faster.”
The armed forces must be ready at all times to carry out their tasks in expeditionary missions in a controlled way. A lack of the right quantity of ammunition, food, or spare parts in conflict situations must be avoided at all costs. Microsoft Dynamics products make it easy to improve overall process management for defense logistics and in doing, have the capacity to transform organizations at a strategic level.

The Supreme Group attributes its growing reputation in supply chain management for defense customers to its adoption of Microsoft Dynamics AX. “In fact, we’ve undergone a paradigm shift,” says aKumar. “We’ve been transformed from a task-oriented business working in isolation to a strategic organization with responsive data processing.”

The cost effective open standards solutions for integrated logistics systems in Microsoft Dynamics technology have been put to the test many times in battle hardened condition. They have proved effective in reducing wastage, unnecessary spares, and inefficiencies in inventory control among other benefits, and most importantly, helped to save lives and achieve operational success.

For more information visit www.microsoft.com/defense or email defence@microsoft.com

Conclusion
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