

# Government Supply Chain and Logistics: Direction for the Future

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Government supply chains must address the challenges posed by disparate operations, inadequate governance, divided programs for change and limited physical infrastructure. To achieve an optimal supply chain and logistics environment, governments must develop capital investment programs that manage both operating requirements as well as exposure to security risk. These programs should provide the physical infrastructure and competitive capacity needed for economic growth and efficiency coupled with a governance model capable of driving a sustained collaborative vision and transformation plan, a best practice-based business architecture and the command and control capabilities of fusion centers. The key to success is aligning information management to improve supply chain collaboration, synchronization and physical infrastructure integration.

The future direction for government supply chain and logistics must be to balance two sets of orthogonal objectives:

a) supporting normal, steady-state, day-to-day operations, thereby ensuring efficient flow of trade and commerce and maintaining national security; and b) enabling speedy response to disaster and emergency situations. Any vision of the future must include the ability to deliver under very complex and exceptional situations and yet meet fundamental economic and efficient operating measures. A set of complex challenges needs to be managed, including an operating environment that includes multiple, disparate entities; business processes and systems used by the various players; inadequate governance to enable collaboration; lack of centralized ownership to drive sustained transformation in an environment that demands continuous improvements to operational effectiveness; and maximum utilization of existing physical infrastructure. Success, ultimately manifested in competitive capacity, economic efficiency and growth, will be realized through collaboration among the disparate supply chain players and alignment and synchronization between their similarly disparate objectives, plans, operations, systems and data. Integrating

the various parts will allow the supply chain to meet both steady-state and surge requirements.

## Direction for the Future

To resolve and manage these complex challenges, government supply chain and logistics must follow strategic themes that transcend a single moment or period of need, strictly embrace business fundamentals and best practices, and embark on a transformation journey that seeks continuous improvement. The focus must be on embedding fundamental supporting capabilities into market-changing initiatives and critical infrastructure and applying these in a sustained manner. As in any strategic initiative, the fundamental building blocks that must be in place today and tomorrow center upon governance, supply chain best practices and business architecture. In turn, these building blocks provide the basis for collaboration, data quality, visibility and situation awareness - leading to improvements in efficiency and effectiveness. This approach for implementing the core initiatives will result in achieving truly agile business processes, recognize both long-term and immediate needs, incorporate the fundamentals into the

daily steady-state operating system and will deliver near-term results and credibility. To achieve true success in any integrated supply chain, business processes and technology must be deployed on a daily steady-state basis and not held in reserve strictly for an emergency.

Strategic initiatives in a government supply chain should center on two main objectives. The first is the building out of the critical physical infrastructure to support the capacity requirements of the future supply chain and logistics. The second involves satisfying the user community, today and tomorrow, and their needs to coordinate rather large, geographically dispersed operations and, consequently, for operations control or command and control capabilities. To achieve the optimal supply chain environment when developing infrastructure master plans, governments must formulate governance plans, incorporate supply chain best practices, and utilize the command and control capabilities of fusion centers.

### Focus on Building Out Critical Physical Infrastructure

The physical infrastructure of the supply chain and logistics function is important because it determines current capacity as well as the ability to handle growth and the addition of new capabilities to compete over the long term. The strategic initiatives centered on the supply chain of the future seek to achieve secure and effective operational performance, fully utilize physical infrastructure, attract multinational business, create local business and jobs, and reduce environmental stress. Ultimately, these initiatives are focused on realizing competitive economic growth from significant capital investments made by governments and commercial enterprises. The pathway to achieving these objectives requires collaboration and synchronization of the supply chain players.

The global ports and developing nations illustrate the importance, significance and risks of capital investment in physical infrastructure and business architecture. After several generations of growth, the global ports evolved into major urban and commercial centers and their original

physical limitations in geography, shallow depth and narrow navigation channels devolved into traffic congestion, environmental pollution and ineffective business operations. Developing nations are focused on commercialization and privatization and share the drivers of globalization, operational integration and job creation with the developed nations. However, as the developing nations respond to the potential of the global market, they have their own significant domestic markets to serve. The physical transport infrastructure enables, if not accelerates, the sustainable economic development of any nation. To achieve globally competitive competencies, each nation has to commit to capital expenditure programs to expand existing operations and build out capabilities for new enterprises. Whether in developed or developing nations, the objectives are and will be centered on the handling and movement of people, bulk cargo and containerization, and the major expenditures will be focused on the infrastructure for ports, mass transit and high-speed passenger rail, highways, freight rail and airports.

Any expenditure program for physical infrastructure will have to overcome traditional barriers and risks to success in operational inefficiency and cost, lack of adequate physical integration and cooperation, and bureaucracy coupled with inconsistent policies. This all presents a very deep complex picture of needs in governance, organization, technology and operations. While addressing long-term needs fulfilled by the infrastructure, each program must satisfy requirements for resources, finances, development lead time and the expectancies of leadership.

The magnitude of recent capital expenditure programs for designing and building major transport infrastructure underscores the visibility of each endeavor and the need to manage operating requirements and risk exposures. For the Port of Shanghai, the expenditure plan called for US\$13 billion to dredge and deepen the draught of the Yangtze estuary and US\$11.5 billion for Phase One of the new Yang Shan deep water port.<sup>1</sup> In Abu Dhabi, US\$10 billion was planned for the development of the Khalifa Port and Industrial Zone.<sup>2</sup> Likewise, major capital expenditure programs to

1 Hong Kong Shippers' Council, "Turning Shanghai into an International Shipping Centre." [article online]; available from [http://www.tdctrade.com/shippers/10/04ports/ports\\_01.html](http://www.tdctrade.com/shippers/10/04ports/ports_01.html); Internet; accessed 20 May 2008.

2 Tyrer, Neil. "Logistics Industry Undergoing Rapid Expansion in Abu Dhabi - An Emerging Centre of Economic Power." 5 May 2008 [press release online]; available from <http://www.freightnet.com/article/1954.htm>; Internet; accessed 20 May 2008.

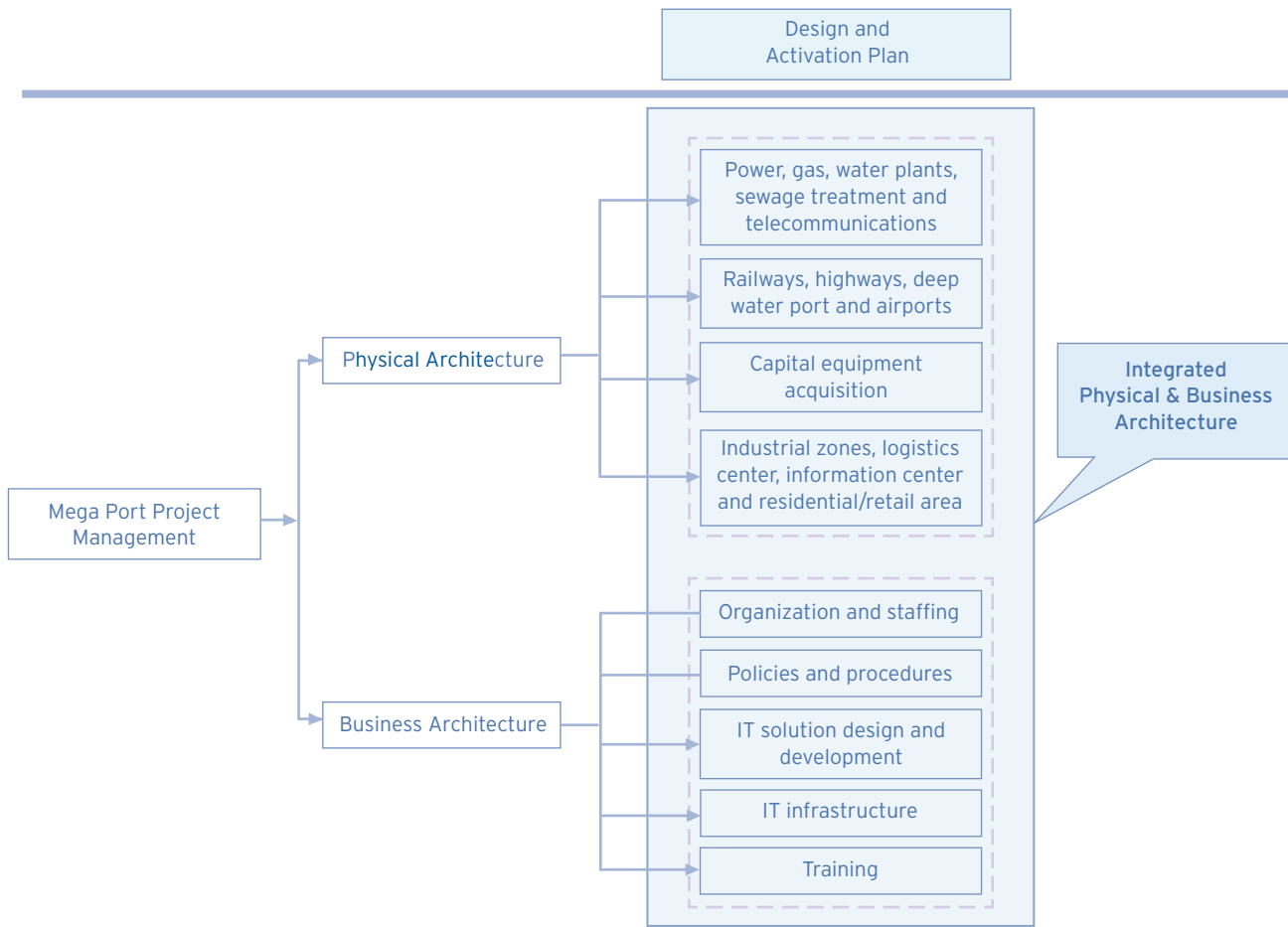
expand cargo handling capacity were announced in Canada, Vietnam and Mexico. Similarly, capital expenditure programs of US\$6.8 billion at Abu Dhabi International Airport<sup>3</sup> and US\$580 million at Hong Kong Chek Lap Kok Airport<sup>4</sup> are centered on developing and expanding aviation infrastructure and capacity to attract and accommodate growth in passenger and cargo flow. Again, given the magnitude of these expenditure programs, the entities engaged may not have more money to spend and, therefore, must anticipate and manage the risks from the outset.

Doing things right from the outset, as illustrated in **Figure 1**, centers squarely on an end-to-end composite architecture that integrates physical infrastructure and business

architecture. Historically, the emphasis in major capital projects to expand transport infrastructure has been on the physical infrastructure, not the business architecture. The preoccupation with the engineering and construction of the physical plant and application of capital equipment does not focus on how the enterprise will operate as a business. This forestalls development of organization and staffing, policies and procedures, IT solutions and infrastructure, and training.

The physical operations will lack synchronization and coordination without the parallel design and development of the business architecture and formulation or reengineering of critical processes. This raises the risk of not realizing

**Figure 1. Model for an Integrated End-to-End Physical and Business Architecture for a Major Transport Infrastructure Capital Project**



3 "US\$6.8 Billion Expansion of Abu Dhabi International Airport to be Showcased at Aviation Procurement and Finance Conference." 15 March 2007 [press release online]; available from [http://business.maktoob.com/NewsDetails-20070218033960-\\$6\\_8\\_billion\\_expansion\\_of\\_Abu\\_Dhabi\\_Intl\\_Airport\\_to\\_be\\_showcased\\_at\\_APEX.htm](http://business.maktoob.com/NewsDetails-20070218033960-$6_8_billion_expansion_of_Abu_Dhabi_Intl_Airport_to_be_showcased_at_APEX.htm); Internet; accessed 20 May 2008.

4 "Hong Kong's Airport Gets US\$580 Million for Expansion," 15 March 2007 [press release online]; available from [http://goliath.ecnext.com/coms2/gj\\_0199-5165214/HONG-KONG-S-CHEK-LAP.html](http://goliath.ecnext.com/coms2/gj_0199-5165214/HONG-KONG-S-CHEK-LAP.html); Internet; accessed 20 May 2008.

the benefits of a very costly capital expenditure program, particularly where inefficient procedures are not attractive to the global market and preclude effective emergency response and national security. The overall effectiveness of any physical infrastructure and its highly visible capital expenditure program will be enhanced by the business architecture.

### Support a Business Architecture of the Future

The lead time to develop the business architecture is similar to the lead time to develop the physical architecture. Therefore, the approach and plans for building in the business architecture should be developed at the outset of the overall infrastructure project.

When responding to the complex challenges of the government supply chain and developing the core strategies for building out the capacity requirements of physical infrastructure and attendant operations control, expectancies and standards that ensure success must be established. The risks of failure are best managed by insisting from the beginning that business fundamentals are built into each initiative. Collaboration, integrating operations and sharing data are essentially assumptions of what is required. The development plan and specifications for each initiative must include a comprehensive work breakdown structure that addresses the entirety of business architecture, which represents the target for a complete business solution and satisfies the needs for sharing high quality, timely data that, in turn, enables effective cooperation and integrated operations.

This comprehensive vision of a business solution is further enhanced by having sufficient flexibility and extensibility to incorporate changes in sector-specific technologies and emerging and proven best business practices. In this vein, several best practices that enhance data visibility in the supply chain are of note. Providing the highest data quality available immediately enhances collaboration so that each entity is confident in data provided by other players within the supply chain. Beyond standardization, applying edge technology and service-oriented architecture (SOA) capabilities reduces data entry errors and real-time data acquisition yields higher quality data, efficiency and, therefore, heightened reliability. Edge technologies, such as radio-frequency identification (RFID), global positioning

systems (GPS) and real-time location systems (RTLS), are proven to sense immediate unique identity, status and location without human interface. Again, unique personnel identity is a key component of the comprehensive business solution for data visibility. Of particular note, identity management capabilities have also been proven as a tool to control access to critical operations and use of equipment. SOA enables a multi-source, multi-user environment but with single entry of data. Likewise, established techniques for modernizing information technology (IT) applications exist that yield improved data processing and quality. Further, advances in network connectivity enable real-time data transmission and utility. As established in the operations control for emergency response, visualization provides dramatic display of data and visual and audio inputs to enable efficient decision support. All these best practice capabilities should be specified and built into a comprehensive, integrated business solution path for the government supply chain and logistics.

### Develop Governance Plans

Developing plans for government supply chain practitioners and their needs for command and control or building out the capacity requirements of physical infrastructure begins with governance. It is necessary to implement a mechanism for bringing the disparate supply chain players together to collaborate, assuring that business fundamentals and best practices are incorporated and motivating continuity on the transformation journey. Governance is fundamental to effectiveness and success.

Strategic governance may be observed from the viewpoint of varying degrees of directive or participative organizational models. A governance model may compel compliance with mandates, policies and operating commitments and serve as a medium for continuous process improvement and sharing lessons learned. Or, the same ends may be achieved through cooperation, collaboration and communication. Quite simply, the vision pursued is either imposed or shared. Ultimately, the key to success is having all the players engaged from the beginning and satisfying their needs to know several key pieces of information: What's coming? Why are we doing it? What are the benefits and how will it make our experience better? It is not enough to highlight regulatory requirements, risk of security failures and

emergency or disaster response needs. To drive major strategic supply chain undertakings, benefits must be communicated that link business and operations effectiveness with effective security, emergency response and recovery. To achieve transparency between the users, operational providers and systems support, there has to be continuous participation and collaboration manifest in regular cross-discipline meetings and open communications on milestones, deliverables and results, as well as needs to modify and correct.

Expanding upon this collaborative environment for the government arena, there should be consistency in the policy framework shared by federal, state and local entities and coordination among their finite investment resources. Given their intersecting and interwoven operations, government and commercial enterprises must work together. By setting national standards, commercial and government entities need only invest once in a strategic transformation initiative. With participation and collaboration, agreements can be struck on what information will be shared and what will not and, in turn, business rules can be formulated that maintain data security and privacy. Building on both acknowledged similarity and standardization will enable alignment of operations, security, emergency and disaster response objectives that benefit national, state, local and commercial stakeholders.

Once a collaborative initiative is launched, operational governance should include fully developed multi-year and annual plans and centralized, coordinated oversight for funding and prioritization for related functional projects. In turn, high-level expectancies and standards should be promulgated to assure supply chain best practices and fundamental business architecture considerations are embedded into the project requirements and deliverables. Similarly, IT governance should embrace full visibility into IT spend and resources, information management providing overall direction and guidance for all development and acquisition, and technology management assuring infrastructure selection enabling interoperability and planned asset renewal.

### **Implement Supply Chain Best Practices**

While business best practices are key to the success of the future direction of the supply chain, the single most

critical best practice in any supply chain is data visibility. Given the geographic dispersal and complex handoffs that occur in the supply chain, multiple exposures for operating, safety, emergency and security incidents are likely. In order to achieve continuous matching and assessment of all the variable supply chain elements and to enable decision support for immediate response and recovery actions, supply chain players must be able to have visibility into every aspect of the supply chain. This includes identifying what the origin and destination of a shipment are and how and where the shipment was loaded and consolidated, if during its journey the shipment was diverted or part of a movement experienced breakdown or intrusion. Visibility is also needed for how a man is matched to his equipment, what he is handling, where he is, who else is in proximity and to whom is he handing off, what has happened before, what is happening now and what could happen. Visibility of people, assets, shipments and incidents is essential to success in the government supply chain and is the essence of achieving effective operations, emergency and disaster response and national security.

### **Provide Necessary Tools and Capabilities to End Users**

The need for tools enabling situation awareness in critical operations is most important. Every day, in every supply chain and logistics entity around the world, in the midst of disparate operations and complexity, managers conduct morning operating situation (OS) meetings to determine such things as what was accomplished in the previous 24 hours, what incidents occurred and which are still open items, what is scheduled today, what is the disposition of assets and people, and the action plan for that day. The challenge is to synchronize these network plans, operations, technologies and data to accomplish two objectives: manage, monitor and deliver supplies and services to citizens, service providers and warfighters; and enable adaptation and response to alerts and recovery from daily operating events and catastrophic incidents. Overcoming the challenge of synchronization will enable operations control or command and control capabilities to mobilize and coordinate resources by fusing disparate business operations and data. Ideally, operations managers would have a real-time view for situation awareness anytime and anywhere.

Effective operations control is the result of a comprehensive and synchronized business architecture augmented by best practices. In turn, the outcome is integrated operations and user success. As illustrated in **Figure 2**, the government supply chain and logistics provide end-to-end multi-service capabilities which are connected by a complex network of entities, functions, processes and technologies. Command and control must provide capabilities for personnel, asset and event visibility, predictability, adaptability and reliability to achieve the dramatic economic, efficient and effective outcomes from synergy and rapid response. Visibility enables knowing who and what is on hand, on order, in transit, what the condition is, what the immediate and future supply needs are based on history and current requirements, and what the maintenance needs are based on usage or condition analysis rather than just scheduled intervals. Adaptability allows automatic real-time response to local, imminent demand signals. Reliability provides assurance that decisions are based upon the most timely and accurate data.

To be successful, a command and control operation must satisfy criteria in virtualization, visualization and scalability. From the perspective of virtualization, a command and control operation should not be dependent on brick-and-

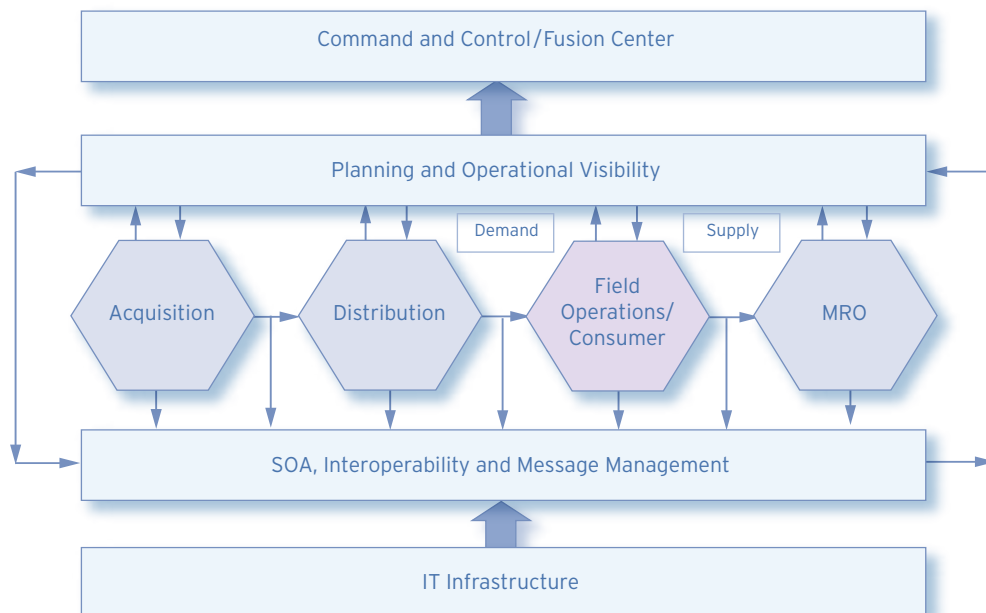
mortar facilities, but rather should be accessible anytime, anywhere. Visualization should enable dramatic display of fused disparate operations data, video and audio and provide effective decision support for successful response and recovery. Command and control should be scalable to accommodate not only local daily operations such as ports and first responders, but also expansive, dispersed geographic operations and the surge activities for national mobilization and global expeditions.

All these command and control capabilities and criteria for success must come together in a unified manner. The path to integrated operations and technology begins with recognizing the complexity of the environment but, then, focusing on the operating similarities in the government supply chain and responding to cultural sensitivities. Then, in a collaborative manner, establish unified objectives, initiatives and a single point of authority and accountability. Then, proceed to consolidate communications and converge operations control to coordinate multiple supply chain and logistics operations.

### Approach Going Forward

The quest for interoperability in government operations needs to be neither unrealistic nor endless. Supply chain

**Figure 2. Command and Control Model for Multi-Service Operations in the Government Supply Chain**



players can agree to set the mission bar at a comprehensive integrated operations level and then begin with established best practices and proven innovative solutions that are woven into a migration plan they can adhere to for more than the tenure of a single leadership team. This again underscores the need for continuity through sustained governance, policy formation and adherence, and focus on practical outcomes. In the government supply chain and logistics space, set the vision for process and system evolution with a tangible operating plan, focus on achieving near-term, value-adding results and building credibility, and then proceed with succeeding phases of adaptation and transformation.

The complex, competitive and changing government supply chain and logistics environment requires a cohesive strategy and new capabilities. To this end, all the supply chain and logistics players must communicate and collaborate to ensure the capacity of physical infrastructure and to coordinate and deliver integrated operations. In order to achieve this end, supply chain and logistics operations must be supported by an integrated IT platform that enables a multi-source and multi-user environment and provides integrated data flow and data aggregation, business intelligence, mission-critical data visibility and, above all, forward-looking command and control capability. Ultimately, the value of this strategy will be evident in the operational economy, efficiency, effectiveness and success of the supply chain and logistics players. ■