Inventory of Information and Communication Technology Solutions for Supply Chains

Prepared for the United Nations Commission on Life-saving Commodities for Women and Children

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Introduction

For the United Nations Commission on Life-saving Commodities for Women and Children (hereafter referred to as "the Commission"), the ability of countries to predict, forecast, and manage the 13 essential commodities along their supply chains is critical to the success of saving the lives of the millions of women and children who die every year from preventable deaths. Additionally, optimizing in-country supply chains to reduce losses related to overstocking, waste, expiration dates, damaged commodities, and inefficiencies can protect program investments and strengthen health systems to better deliver health services to the women and children who need them the most.

For areas around the world once inaccessible to health services, two recent trends provide new ways to rethink how supply chain capabilities, such as tracking and monitoring, can be improved.. First, there is a large variety of information and communication technologies (ICT) which are now available to support commodity management and improve the speed and visibility of data. Second, access to mobile and wireless connectivity is increasing globally. With these two trends reshaping the possibilities for improved management of health commodities, supply chain managers are shifting away from paper-based supply chain management systems and exploring appropriate-technology solutions to meet supply chain data management needs.

The details included in this report serve to complement the inventory spreadsheet, which contains a catalog of ICT solutions for supply chains. The objective of the inventory is to assist countries in selecting a supply chain tool by reviewing the ways in which existing ICT solutions have been already implemented in different countries. The following sections describe how to use the inventory, resources on how to select an ICT tool or product, and ways forward.

Using the Inventory

The inventory lists ICT tools/products that were identified through a scoping exercise, which included a review of grey and white literature, interviews with individuals at institutions involved in developing and implementing ICT tools/products for supply chain management, and existing databases of tools/products.[a] Each column within the inventory is described below. It is important to mention that 27 other tools/products were identified but were not catalogued in the inventory because of lack of comprehensive information for the categories below.[b] Additionally, some of the same tools/products are implemented in different countries in different ways and under different local names, which is shown in the inventory.

- *Overall Purpose* – For which domain in the supply chain is this tool/product relevant?

  Supply chain domains have been identified (See "Recommendation 6, Outcome 1: Good Practice in Supply Chain Management, Challenges and Barriers along the In-country Supply Chain" document). Figure 1 shows the different domains: regulatory policies and

[a] These databases included: USAID | DELIVER PROJECT's Supply Chain Software Inventory (USAID | DELIVER PROJECT, Task Order 4, 2008); VillageReach and Dimagi, Inc.'s Lessons Learned: ICTs for Supply Chain Management in Low-Resource Settings (VillageReach & Dimagi, 2013); and WHO/AMDS's PSM Toolbox (WHO AIDS Medicines and Diagnostics Service (AMDS), 2014).

[b] These 27 ICT tools/products are listed at the bottom of the inventory.

procedures, quantification – forecasting and supply planning, procurement, warehousing and inventory management, distribution, service delivery and utilization, and supply chain monitoring. In the inventory, other related supply chain domains are also listed if applicable for a certain tool/product.

Figure 1. Domains of the supply chain identified for Recommendation 6, Outcome 1

- *Tool/Product* – What is the name of the tool/product?
- *Developer/Implementer/Vendor* – What organization(s) is/are responsible for the tool/product?
- *Implementation Description of Tool/Product* – What does the tool/product do and how does it work?
- *Country of Implementation* – Where has this tool/product been implemented?
- *Language* – In what language is this tool/product delivered?
- *Open Source/Open Access/Proprietary* – Is the tool/product open source, open access, or proprietary?
- *Commodities Tracked* – What type of commodities are tracked by the tool/product in the country mentioned?
- *Technology* – What technology (software application, hardware, operating system) does it use?
- *Online versus Offline* – Is this an online or offline tool?
- *License Cost (USD)* – How much does the license cost in US dollars?
- *Contact Person* – Who is the contact person?
  For further inquiries on each tool/product, a contact person or email is provided.

Resources on how to select an ICT tool/product

Identifying needs within different contexts and finding the appropriate solution

Selecting an ICT tool or product requires identifying context-specific needs. Lessons learned from other programs that have leveraged ICT as a platform for managing supply chains suggest that implementers must first identify all end users of the system (VillageReach & Dimagi, 2013). With all the different types of end users in mind, implementers must decide on what is desired

from the system in terms of data quality, the number of data points of interest, how frequently data must be entered, initial and ongoing training sessions, and data collection issues. The implementers must also think through these aspects in the context of existing and/or paper-based information and communication channels along the supply chain. Additional resources for deciding how to apply ICT for supply chain management include:

- *ICTs for Supply Chain Management in Low-Resource Settings* by Village Reach and Dimagi, Inc. (VillageReach & Dimagi, 2013). http://villagereach.org/vrsite/wp-content/uploads/2013/07/Lessons-Learned-ICT-for-Supply-Chain-2013-2.pdf
- *Getting Products to People: The JSI Framework for Integrated Supply Chain Management in Public Health* by John Snow, Inc. (John Snow Inc., 2012). http://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=11907&lid=3
- *Integrating ODK Scan into the Community Health Worker Supply Chain in Mozambique* by Nicola Dell et al. from the Proceedings of the Sixth International Conference on ICT and Development (Dell et al., 2013). http://dl.acm.org/citation.cfm?id=2516611
- *The Framework for OpenLMIS White Paper* by VillageReach (The Rockefeller Foundation & VillageReach, 2012). http://villagereach.org/vrsite/wp-content/uploads/2012/03/02292012.Framework-for-OpenLMIS-Whitepaper.pdf
- *Computerizing Logistics Management Information Systems: A Program Manager's Guide* by the USAID | DELIVER PROJECT (USAID | DELIVER PROJECT Task Order 4, 2012). http://deliver.jsi.com/dlvr_content/resources/allpubs/guidelines/GuidImplCLMIS.pdf

Ways Forward

The success of using ICTs for supply chain management relies on the effectiveness of the procedures and processes that support the supply chains for essential commodities. Similarly, the integration of ICTs can exacerbate existing gaps in the supply of commodities. To provide a framework for this, John Snow, Inc. (JSI) has described the common evolution with three sequential phases towards achieving an integrated public health supply chain (John Snow Inc., 2012):

- *Ad hoc phase* – describes countries that have no formal procedures for the operation of a supply chain
- *Organized phase* – describes countries that have implemented standardized supply chains that run on basic and established roles and procedures
- *Integrated phase* – describes countries that have supply chains running with involved people, functions, levels, and entities that collaborate and trust each other

Often before arriving at the integrated phase, countries will have several independent systems of varying complexities in place. This approach without overlap can be redundant and inefficient, since different systems are likely to capture similar information. Effective strategies to move parallel systems towards integrated systems include encouraging collaboration and cooperation amongst the various implementing partners. As was done in Ethiopia, recognizing the need and establishing ways for integration can occur in workshops followed by the creation of data protocols (Hawkins, Gebre-Mariam, & Lassooy, 2009). In their report, JSI further describes how to move from the ad hoc phase to the organized phase, as well as move from the organized phase to the integrated phase (John Snow Inc., 2012).

- *Moving from ad hoc to organized –*
    - Assess current system using process mapping, network optimization, and costing analysis
    - Undertake technology assessments to improve information for decision making
    - Employ system design process for all logistics functions and products using segmentation analysis
    - Roll out system, including logistics training and dissemination of job descriptions, standard operating procedures, and supervision guidelines
    - Perform regular quantification of commodities
- *Moving from organized to integrated –*
    - Create a logistics management unit and establish central level technical groups and committees
    - Professionalize supply chain managers
    - Optimize performance with analysis and design tools
    - Introduce flexible schedules and sources
    - Strengthen automated processes for data aggregation, analysis, and sharing
    - Generate and publish routine logistics reports
    - Develop performance-based management plans with indicators and incentives

VillageReach and Dimagi, Inc. have developed a set of recommendations for migrating supply chain management programs from paper-based to ICT enhanced systems. Two such considerations are to establish core functionalities ahead of scale-up and consider the sophistication (or breadth of applicability) of the tool (VillageReach & Dimagi, 2013). Extra efforts related to initial supervision, training, capacity building, and feedback loops are needed to coordinate the workflow changes.

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