Inventory of Information and Communication Technology Solutions for Supply Chains

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

Ada Kwan

April 2014

Acknowledgements

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.

References

Dell, N., Crawford, J., Breit, N., Chaluco, T., Coelho, A., McCord, J., & Borriello, G. (2013). Integrating ODK Scan into the community health worker supply chain in Mozambique. *ICTD '13 Proceedings of the Sixth International Conference on Information and Communication Technologies and Development*, *1*, 228–237.

Hawkins, S., Gebre-Mariam, T., & Lassooy, E. (2009). *RPM+/SPS and SCMS in Ethiopia: An evaluation*. Washington, DC.

USAID | DELIVER PROJECT, Task Order 4. (2008). Inventory of Supply Chain Software. Retrieved February 24, 2014, from http://deliver.jsi.com/dhome/whatwedo/supplychainsys/scsysinnovations/scsysmis/scsysmis softwaresurvey

John Snow Inc. (2012). *Getting products to people: The JSI framework for integrated supply chain management in public health*. Arlington, VA.

The Rockefeller Foundation, & VillageReach. (2012). *The Framework for OpenLMIS White Paper*. Seattle, WA. Retrieved from http://villagereach.org/vrsite/wp-content/uploads/2012/03/02292012.Framework-for-OpenLMIS-Whitepaper.pdf

United Nations Foundation. (2013). Every Woman, Every Child: Recommendations to Increase Access and Use. Retrieved February 24, 2014, from http://www.everywomaneverychild.org/resources/un-commission-on-life-saving-commodities/recommendations

VillageReach, & Dimagi, I. (2013). *ICTs for Supply Chain Management in Low-Resource Settings*.

WHO AIDS Medicines and Diagnostics Service (AMDS). (2014). PSM (Procurement & Supply Management) Toolbox.

INVENTORY OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SOLUTIONS FOR SUPPLY CHAINS *

Prepared for the United Nations Commission on Life-saving Commodities for Women and Children
Recommendation 6 (supply and awareness), Outcome 1 (Good practices in supply chain management), Activity 3 (ICT solutions for supply chain)

OVERALL PURPOSE	TOOL/PRODUCT	DEVELOPER/ IMPLEMENTER/ VENDOR	IMPLEMENTATION DESCRIPTION OF TOOL/PRODUCT	COUNTRY OF IMPLEMENTATION	LANGUAGE	OPEN SOURCE / PROPRIETARY	COMMODITIES TRACKED	TECHNOLOGY	ONLINE VS. OFFLINE	LICENSE COST	CONTACT PERSON
For which domain of the supply chain is this tool/product relevant? Regulatory Policies & Procedures Quantification - Forecasting & Supply Planning Procurement Warehousing & Inventory Management Distribution Service Delivery & Utilization Supply Chain Monitoring	*What is the name of the tool/product?*	*What organization(s) is/are responsible for the tool/product?*	*What does the tool/product do and how does it work?*	*Where has this tool/product been implemented? (i.e. which countries)*	*In what language is this tool/product delivered?*	*Is the tool/product open source or proprietary?*	*What types of commodities are tracked by the tool/product in the country mentioned?*	*What technology (software application, hardware, operating system) does it use?*	*Is this an online or offline tool?*	*How much does the license cost (USD)?*	*Who is the contact person?*
Quantification (Forecasting & Supply Planning) Procurement	**AccessRH**	Reproductive Health Supplies Coalition (Concept), UNFPA (Implementer)	- AccessRH is a reproductive health procurement and information service that improves access to quality, affordable sexual and reproductive health commodities and reduces delivery times for governments of low- and middle-income countries and NGO partners. - It offers up-to-date information on contraceptive shipments through a unique website. - Support is provided by UNFPA headquarters and by the program developers, and data storage is available in-country. - The website for AccessRH is: http://www.myaccessrh.org/. Additional information can be found at: http://www.rhsupplies.org/working-groups/systems-strengthening/accessrh.html	Multiple countries (over 140)	English	Open source	Reproductive health, female condoms, implants, emergency contraceptives	Online portal	Online	Free	accessrh@unfpa.org
Inventory Management	**AutoDRV**	Westchase Consultants (Developer for the USAID	DELIVER PROJECT (JSI))	- AutoDRV collects logistics data at SDP level on a laptop during deliveries and then autosyncs the data at the central level with Top Up software. - Data storage is in-country and support is provided by Westchase Consultants.	Zimbabwe	English	Proprietary	Reproductive Health, condoms, contraceptives, PMTCT, HIV rapid test kits, malaria, TB, essential medicines	Windows / Visual Basic with a MS SQL compact database	Offline	Free	askdeliver@jsi.com
Warehousing & Inventory Management Distribution Service Delivery & Utilization	**Channel**	UNFPA (Developer)	- Channel is software that displays instant stock balances and information on impending stockouts. It acts as a computerized quantitative health supplies management tool for warehouses and service delivery points, and it can also be used for forecasting and procurement planning. - Data need to be backed up on a daily basis.	Multiple countries: Tanzania, UNFPA country offices	Multiple: English French Portuguese Russian Spanish	Proprietary	Family planning, equipment, reproductive health, maternal health, child health	Software	Offline	Free	Joseph Abraham jabraham@unfpa.org
Inventory Management	**CKS Unisolv Software**	ComputerKit Systems	- CKS Unisolv Software is a product and medical scheme data capturing software developed in AcuCobol and run on SCO Unix, Linux, Windows or Novell operating systems. - The software is interoperable with the medical aid scheme system as well as with suppliers for order processing with local support provided by CKS Namibia and data storage available in-country. - The software is low maintenance, offline with online capabilities, and cannot be customized. - The website for CKS Unisolv Software is: http://www.cks.co.za/pharmacy/index-1.html	Namibia	(not known)	Proprietary	All pharmaceuticals and related medical and personal care products	Linux, UNIX, Windows and Novell	Offline with online capability	(not known)	CKS Gauteng Head Office Tel.: +27 11 695 5300
Warehousing & Inventory Management Service Delivery & Utilization Distribution Quantification (Forecasting & Supply Planning)	**CommTrack**	Dimagi (Developer), Benefit Corporation (Developer), NGOs (Implementer), Governments (Implementer), and Public-private partnerships (Implementer)	- CommTrack is an open-source product designed to strengthen logistics management through the use of mobile technology by supporting health workers and other mobile agents who manage commodities in low-resource settings. Users are allowed to submit and receive supply chain data through multiple mechanisms, including (1) SMS, (2) feature-rich mobile applications on basic Java-enabled phones, Android smartphones or tablets, and (3) a web interface. - CommTrack is integrated seamlessly with Dimagi's suite of industry-leading tools for empowering the mobile workforce. - All data are collected on a secure, web-based server where it is protected, backed up, and immediately made accessible to supervisors and program managers through automated, pre-canned reporting and data exports. - New deployments can quickly get started by opening an account on the server, registering new users, and customizing the system for their commodities, reporting needs, and business requirements. Recurrent costs vary dramatically based on users, program, scale, and workflow. - CommTrack has been deployed at scale in multiple countries, for example, to support the Informed Push Model for family planning commodities in Senegal. It has been or will soon be deployed in India, Senegal, Zambia, Mozambique, Tanzania, and Nepal. - The website for CommTrack is http://www.commtrack.org	Multiple countries: Ghana, India, Malawi, Senegal, Tanzania, Zambia	Multiple: English French (Can be made available in many other languages as needed)	Open source	Family planning, malaria, HIV, and essential medicines	CommTrack website is built on Python/Django, PostgreSQL, CouchDB, and Apache. CommTrack mobile application runs Java on Android and J2ME on Java-enabled feature phones. CommTrack can also run over SMS using any mobile phone.	Mobile application tool with offline capabilities. The website is online; however, the mobile application remains fully functional even when completely offline.	Free	commtrack@dimagi.com
Quantification (Forecasting & Supply Planning)	**Country Commodity Manager (CCM)**	UNFPA	- Designed for use at the central warehouse level, the Channel software program requires minimal data to help UNFPA Country Offices assess their reproductive health commodity requirements, stock positions, and identify shortfalls. - CCM provides a mechanism to readily transmit each country's data to UNFPA headquarters from country offices to use in generating global-level reports for the purpose of planning, advocacy and resource mobilization. - Inputs include stock levels in the warehouse and AMC, demographic, and CPR data. Outputs include forecasting reports based on consumption and demographics. - A minimum of one-hour training is necessary.	Multiple countries	Multiple: English French Russian Spanish	Proprietary	Female condoms, implants, emergency contraceptives, magnesium sulfate, oxytocin, amoxicillin, reproductive, maternal, and child health	Customized MS Visual Basic application	Offline	Free	Joseph Abraham jabraham@unfpa.org ccm@unfpa.org
Procurement (Order Management) Inventory Management Distribution	**cStock**	Dimagi, Inc. (Developer/Vendor) for JSI R&T (Provider of expertise and requirements for development)	- cStock is an SMS- and web-based mobile system (http://cstock.jsi.com/accounts/login?next=/malawi/hsas/) used to resupply, monitor and manage community-level essential medicines as part of the Supply Chains for Community Case Management (CCM) Project that addresses pneumonia and other childhood diseases. - cStock automatically calculates resupply quantities and provides available data which help supply management, particularly by reducing the burden on staff who need to organize supplies ahead of Health Surveillance Assistant (HSA) visits. - It quickly identifies and responds to low stock levels and stockouts at the health center or HSA level and develops comprehensive quantification and supply plans based on current stock levels and calculations of consumption levels for CCM and other community-level products from the HSA level. - The user manual is available at: https://confluence.dimagi.com/display/CSTOC/User+Manual+for+cStock	Malawi	English	Open source	Essential medicines (for pneumonia and other common childhood diseases)	RapidSMS, Python/Django framework, MySQL on Linux. Mobile phones	Online	Free	Amos Misomali amisomali@jsimw.com Boniface Chimphanga bchimphanga@jsimw.com
Warehousing & Inventory Management	**CTC Pharmacy Module**	Elaine Baker, University Computing Center (UCC), Dar es Salaam	- CTC Pharmacy Module is a tool that stores and analyses data from clinics on antiretroviral and opportunistic infection drug dispensing and stock management. - Inputs for the system include: physical inventories; ledger entries including receipts of drugs and losses (damaged, expired, transferred to satellite facility, transferred to other unrelated facility, lost); details of batches received; information from dispensing register; information required for the report and request forms. Monthly reports from non-ordering satellite facilities can be entered. - Outputs provided by the system include: reconciliation between inventories and dispensing and ledger records; reminders on un-reconciled inventories; reminders on un-used batches with upcoming expiry dates; tools to perform calculations and produce official report and request forms for ordering drugs; tool for matching requests with deliveries; reports on trends in use of specific drugs over time; tools to link to the NACP CTC2 database to perform matching between patient medical records and dispensing records; analysis of dispensing records. - Reports can be exported to Microsoft Excel or unsecured Access files to allow manual analysis. - The CTC Pharmacy Module can be downloaded at: http://www.nacp.go.tz/nacp_ctc.php - The CTC Pharmacy Module Operating Manual can be found at: http://www.nacp.go.tz/databases/Pharm-3p2/Manual_Pharmacy_module_V3p2.pdf	Tanzania	English	(not known)	Antiretroviral and opportunistic infection drugs	Microsoft Access 2000 or above	Offline with online capability	Free	Tanzania Ministry of Health & Social Welfare, National AIDS Program http://www.nacp.go.tz/nacp_contact.php
Warehousing & Inventory Management Quantification (Forecasting)	**DHIS2**	University of Oslo (Developer and Coordinator of Open-Source Development); University of Oslo, National Ministries of Health or equivalent national agencies (Implementer)	- DHIS 2 is a tool for collection, validation, analysis, and presentation of aggregate statistical data, tailored (but not limited) to integrated health information management activities. DHIS 2 is a generic tool rather than a pre-configured database application with an open metadata model and a flexible user interface that allows the user to design the contents of a specific information system without the need for programming. - DHIS 2 is mainly used as integrated HMIS, full-country rollouts ranging from US$500,000 if supporting Ministry of Health with data collection, processing, and use at district, subnational, and national levels with data collection taking place at facility level. (Such a setup would need a dedicated HMIS team of 5 individuals at national level; 2 per subnational, 1 per district entity). - DHIS 2 and upwards is a modular web-based software package built with free and open-source Java frameworks. - The website for DHIS 2 is http://www.dhis2.org	Multiple countries (over 30)	English French Portuguese Russian Spanish Tajik	Open source	Varies by country: All commodities, tracer drugs, essential medicines	DHIS 2 is written in Java	Online and online with support for poor connectivity	Free	post@dhis2.org
Inventory Management Supply Chain Monitoring	**Early Warning System (EWS)**	USAID	DELIVER PROJECT (JSI), Focus Regions Health Project (JSI R&T), Dimagi, Inc.	- EWS (similar to ILSGateway) is a mobile health alert and reporting system for health facility levels that is designed to provide visibility into the supply chain for health commodities. - Facilities send in their stock information for tracer products every week, and this information is displayed on a web-based dashboard for managers and decision makers at the regional and central levels. - Maintenance is carried out by Dimagi on an ad-hoc basis.	Ghana	English	Open source	HIV/AIDS, malaria, family planning	Mobile phones, PostgreSQL, RapidSMS, Python/Django framework on Linux	Online	Free	askdeliver@jsi.com
Quantification (Forecasting & Supply Planning) Warehousing & Inventory Management	**HCMIS Warehouse**	USAID	DELIVER PROJECT (JSI)	- HCMIS Warehouse allows warehouse managers to track inventory, calculate replenishment for reorders, manage expired stock, capture customer demand for fulfilment and forecasting, print stock vouchers and more. - Warehouse staff are normally fully trained, and they are able to operate the system on their own.	Ethiopia	English	Proprietary	Essential medicines, chemicals, supplies and equipment	Windows	Offline with online updates	Free	askdeliver@jsi.com
Quantification (Forecasting & Supply Planning) Procurement Warehousing & Inventory Management	**Health Commodity Tracking System (HCTS)**	MDF	- HCTS is a data aggregation and reporting system, and it supports quantification, distribution, project monitoring, and generation of reports for decision making for health commodities in Ethiopia. - Support is provided by MDF from the USA. - A brochure of the system can be found at: http://scms.pfscm.org/scms/docs/papers/HACTS_brochure.pdf	Ethiopia	English	Proprietary	Various commodities	Software	Online with desktop application available for disconnected sites	Free	Gashaw Shiferaw (MIS Manager/HCTS Coordinator, SCMS Ethiopia) gshiferaw@et.pfscm.org
Inventory Management Supply Chain Monitoring	**ILMOVIL**	USAID	DELIVER PROJECT (JSI); Health District of San Marcos; Logistics Unit and Family Planning, Immunizations and Nutrition Programs of the Ministry of Health of Guatemala (MSPAS) (Implementer)	- ILMOVIL offers a way for health posts to send weekly SMS messages containing essential logistics data for 12 products related to family planning, immunizations, nutrition, and other essential medicines. - Incoming data are loaded into an Excel dashboard that then outputs standard supply chain indicators. Early warning of malaria outbreaks can be occur using statistical tools technology.	Guatemala	Spanish	Proprietary (Magpi's code)	Family planning, immunizations, nutrition, essential medicines	Mobile phones and Microsoft Excel	Online system for incoming data with offline components where data are downloaded to Excel	US$5000/year (cost for the Magpi Pro account)	askdeliver@jsi.com
Inventory Management Supply Chain Monitoring	**ILSGateway**	Dimagi, Inc. (Developer) for the USAID	DELIVER PROJECT (JSI)	- ILSGateway (similar to Early Warning System) is a mobile health alert and reporting system for district and health facility levels that is designed to support and strengthen the ILS by expanding the accessibility to and visibility of logistics data and improving the use of logistics data for supply chain decision making. - Survey conducted among 29 ILSGateway users had the following findings: 93% felt that it improved their diligence in conducting a stock count on time; 93% indicated they were more likely to submit their report and requisition forms to the district on time as a result of the alerts provided by the gateway; 45% of facilities indicated an increase in tracer product availability through use; and 88% of 17 district respondents said the tool has increased management attention of a list of 20 reproductive health commodities. - The tool is an integrated logistics system with interoperable features intended for future development. - Dimagi provides remote support from Cambridge, Mass., USA on an ad-hoc basis, and data storage is cloud-based. - The website associated with this product is: http://www.ilsgateway.com/	Tanzania	English	Open source	Family planning, malaria, essential medicines	Mobile phones, PostgreSQL, RapidSMS, Python/Django framework on Linux	Online	Free	askdeliver@jsi.com
Inventory Management	**Integrated Patient Management System**	(South African vendor)	- Integrated Patient Management System is an interoperable drug management and dispensing information system used by district hospitals with a networking infrastructure that supports a centralized database with in-country data storage. - Issues surfaced from the system regarding human resource capacity, reliability (i.e. bandwidth issues when connecting to the Government Data Network) and privacy and data security features (i.e. patient data confidentiality, authenticity of system-generated prescriptions, and electronic data interchange across different hospitals without manual forms and electronic signature), but the government through the Ministry of Communication Science and Technology is developing a legal framework to provide guidance on use and applicability of electronic data. - Maintenance is centrally managed.	Botswana	(not known)	Proprietary	Family planning, HIV/AIDS, malaria, tuberculosis commodities	Windows	Offline	(not known)	(not known)
Regulatory Policies & Procedures Quantification (Forecasting & Supply Planning) Procurement Warehousing & Inventory Management Distribution Service Delivery & Utilization	**Introduction to Procurement and Supply Management for Pharmaceuticals**	UNDP (Developer)	- The Introduction to Procurement and Supply Management for Pharmaceuticals is an 8-hour online course. It was developed to help participants acquire the basics on procurement and supply management, learn more about health products, and improve management skills related to procurement and quality assurance processes. - The website for this online course is: http://www.sifylivewire.com/undp/	Multiple countries	English	(not known)	HIV/AIDS, vaccines, malaria, reproductive health, tuberculosis commodities	Online portal	Online	Free	volker.welter@undp.org
Inventory Management	**Inventory Management Assessment Tool (IMAT)**	CPM/ Management Sciences for Health (Developer)	- IMAT is a tool made for evaluation (and does not replace the need for operational monitoring in a warehouse) that comes as a computerized spreadsheet in Excel and includes instructions, a data collection form, analysis guidelines, recommendations, and a graphical display of the indicator results. The tool is useful for calculating a baseline for inventory management and conducting follow-up evaluations in warehouses. - IMAT guides the user through a process of collecting data on the physical and theoretical stock balance and duration of stockouts for a set of up to 25 frequently used products. - IMAT calculates indicators, analyzes the results and identifies strategies for improving recordkeeping and stock management practices. - The tool was implemented at a functioning warehouse that required a user-friendly instrument designed to collect and calculate indicators of effective inventory management. - Training is not required, but training can be provided by MSH for a cost. - The websites including the English and French versions of IMAT are: http://erc.msh.org/newpages/english/toolkit/imat_eng.xls and http://erc.msh.org/toolkit/toolkitfiles/file/IMAT_Fr.xls"	Haiti	Multiple: English French	(not known)	Laboratory, reproductive health, supplements, HIV/AIDS, malaria, tuberculosis commodities and medicines	MS Excel workbook, 200 KB	Offline	Free	cpm@msh.org
Procurement (Order Management) Warehousing & Inventory Management	**Inventory Management System**	(local vendor)	- Inventory Management System tracks daily inventory transactions and then generates handover forms, issue reports, stockbook reports and inventory reports (which can be exported to Microsoft Word documents or Excel file formats) for central level and district and regional warehouses. - Support is provided by the local vendor, Logistics Management Division (LMD), and the USAID	DELIVER PROJECT. Data storage is available in-country.	Nepal	(not known)	Proprietary	Family planning, vaccines, acute respiratory illness, nutrition, malaria leprosy, tuberculosis commodities and essential drugs	Windows/.NET Framework and MS SQL Server	Online	(not known)	(not known)
Regulatory Policies & Procedures Warehousing & Inventory Management	**Inventory Tracking Tool**	Management Sciences for Health (Developer)	- The Inventory Tracking Tool is used for when a tool is needed to help initiate the process of managing antiretroviral drugs and supplies, or a supply chain program in general, but cannot support a full operation. - It has quick set up and is fast to learn with easy customization to work in other diseases. - The tool comes equipped with various reports to support management decisions. - Inputs include an inventory of HIV/AIDS medicines and supplies, list of all sites that receive supplies, funding agencies / donor information and a listing of ART regimens. Outputs include a wide variety of reports based on the information entered into the tool, such as received, received, issues to sites, issues to site organized by funding organization, stock on hand, etc. - Minimum requirements are: Pentium-based processor, 256 MB RAM, 500MB hard disk space. - Five days of training is generally needed (costs need to be discussed with MSH), which includes time for data conversion, training, and go-live support. Discussions with MSH staff are required prior to planning implementation. Time requirements may be adjusted based on the situation at each site.	(not known)	English	(not known)	Laboratory, medicines, reproductive health products, supplements, HIV/AIDS commodities	MS Access application, 8 MB	Online	Free	cpmsoftware@msh.org
Quantification (Forecasting & Inventory Management) Procurement Warehousing & Inventory Management	**KEMSA eMobile**	Fintech Kenya (Developer) in coordination with KEMSA and cDC Foundation Kenya (Implementers)	- Commodity tracking suite of applications accessible through mobile phones that allows monitoring, ordering, tracking, and evaluation of medicines for health facilities and programs in the country that are supported by the Ministries of Medical Services and Public Health - The system is interoperable with the LMIS and provides information for decision makers at the health facility level and other stakeholders - The KEMSA eMobile website is: http://kemsa.co.ke/index.php?option=com_content&view=article&id=66&Itemid=153 and the user guide is available at: http://kemsa.co.ke/pdfs/KEMSA%20e-%20Mobile%20User%20Guide.pdf	Kenya	English	Proprietary	Essential medicines	USSD, a basic GSM technology that works on any GSM device	Offline with online capabilities	(not known)	KEMSA Head Office Nairobi Mobile GSM: 0726 618 520/1/784/785, 0733 606600
Quantification (Forecasting & Supply Planning) Warehousing & Inventory Management	**Kujua Analytics**	Medic Mobile (Developer)	- Kujua Analytics is an interoperable platform for better data visualization, which is designed to help partners track operational progress and program impact and managers to produce aggregate reprts for easy analysis and decision making. - It automatically pulls complex data for stock monitoring (and logistics monitoring for two non-supply-chain-related activities) from KujuaLite and creates visualizations that include a myriad of charts, graphs and maps. - The platform can run on laptops, netbooks, tablets, smartphones, and uses new database technology. - Support is provided by Medic Mobile, and so far the only issue that required additional support was related to the need to change the drugs in the program. - The only issue arising with maintenance occurred when additional support was needed when drugs needed to be changed in the system. - The website for Kujua Analytics is: http://medicmobile.org/tools/kujua-analytics/ - Additional remarks about the tool can be found at: http://medicmobile.org/2013/06/25/announcing-kujua/	Multiple countries	English	Open Source	Stock monitoring (and logistics monitoring for two non-supply-chain-related activities)	Apache's CouchDB software, and runs locally on Windows, Mac OS or Linux machines	Online (and paper information can be uploaded)	(not known)	Marc Abbyad, Product Manager marc@medicmobile.org

INVENTORY OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SOLUTIONS FOR SUPPLY CHAINS *

Prepared for the United Nations Commission on Life-saving Commodities for Women and Children
Recommendation 6 (supply and awareness), Outcome 1 (Good practices in supply chain management), Activity 3 (ICT solutions for supply chain)

OVERALL PURPOSE	TOOL/PRODUCT	DEVELOPER/ IMPLEMENTER/ VENDOR	IMPLEMENTATION DESCRIPTION OF TOOL/PRODUCT	COUNTRY OF IMPLEMENTATION	LANGUAGE	OPEN SOURCE / PROPRIETARY	COMMODITIES TRACKED	TECHNOLOGY	ONLINE VS. OFFLINE	LICENSE COST	CONTACT PERSON
Quantification (Forecasting & Supply Planning); Warehousing & Inventory Management	Kujua Lite	Medic Mobile (Developer)	- Kujua Lite is an open-source web application that allows managers to send and receive messages or forms through SMS or Mukuvu SIM applications, which allows it to have a variety of data input options from low-end feature phones to web forms on smartphones or direct data entry within the application. - Aggregate reports can be produced for easy analysis and decision making. - Kujua Lite is currently being optimized for three priority use cases (disease surveillance, stock monitoring and service monitoring), but can be applied to a wide range of communication and data collection activities. - It is built on Apache's CouchDB software with the web storage limitations and runs locally on Windows, MacOS or Linux machines, including laptops, netbooks, tablets or smartphones, and uses new database technology to provide scalability, flexibility, and interoperability. - It can effectively act as an information and communication hub for any health facility and contains a number of different deployment options based on the connectivity of the local context, ranging from a completely distributed, local installation (requiring no Internet connection to receive the data from reporting units) to a fully hosted, web-based version that can be accessed anywhere in the world. - Support is provided by Medic Mobile. The website for Kujua Lite is: http://medicmobile.org/tools/kujua-lite/ - Additional remarks about the tool can be found at: http://medicmobile.org/2013/06/25/announcing-kujua/	Multiple countries	English	Open source	Stock Monitoring (and logistics monitoring for two non-supply-chain-related activities)	Apache's CouchDB software, and runs locally on Windows, Mac OS or Linux machines	Online (and paper information can be uploaded)	(not known)	Marc Abbyad, Product Manager marc@medicmobile.org
Regulatory Policies & Procedures	LAPTOP (SCM training)	RHSC, People that Deliver (Developers)	- LAPTOP (SCM training) serves as an information clearinghouse on professional development opportunities for health community managers in developing countries. - It includes courses that focus on the development of practical skills that have the potential to result in more professional management of public sector supply chains and thus in improved product availability across the country. These materials include classroom-based courses and workshops, self-directed distance learning programs and degree programs. - The website for LAPTOP (SCM training) is: http://www.rhsupplies.org/resources-tools/laptop.html	Multiple countries	Multiple	(not known)	Information, education and communication; behavior change and communication	Online portal	Online	(not known)	ssacher@jsi.com
Quantification (Forecasting & Supply Planning); Warehousing & Inventory Management; Distribution; Service Delivery & Utilization	Logistimo	Logistimo (Developer/Vendor)	- A hosted web service for supply chain management, Logistimo allows anyone with a mobile device - agnostic to hardware profiles to network contexts - to optimally participate in the supply channel. - Other functionalities of the service include inventory tracking, order management, credit management, vehicle tracking, workforce behavior monitoring, workflow handling, demand forecasting, replenishment optimization, quality monitoring, network expansion, routing and scheduling. - There is a 5-10 day deployment cycle which includes surveys and process modelling, data cleaning and conversion, configuration, user acceptance testing, documentation of SOPs and user manuals, training of trainers, and deployment. It can be cheaper than open-source options. - 24/7 call and email support and continued monitoring of logistics are provided by Logistimo. Logistimo also handles all web hosting (CPU runtime, data storage, transmission channels and SMS gateways). - The website for Logistimo is: http://logistimo.com	Multiple countries: Haiti, DR Congo, India, South Sudan	Multiple: Creole English French Hindi Spanish (and can be customized for any language as needed)	Proprietary	Essential medicines, emergency drugs, surgical tools, diagnostics, vaccines, family planning and reproductive health commodities, cold chain equipment, and laboratory samples	Java/Google App Engine, Amazon web services/Heroku Postgres, HTML5, Android, J2ME	Online	US$3 per month per facility or US$36 per year per facility. (Can be discounted at scale and can also offer pricing per transaction)	Arun Ramanujapuram arun@logistimo.com
Warehousing & Inventory Management	MACS WMS	MACS Software (Developer)	- MACS WMS is software used at the central warehouse level for warehouse management issues, such as inventory, ordering, issuing, receiving, putting away, dispatch and finances. - The software is interoperable with Sage and data storage is available in-country. - Support is provided by the MACS team through an online portal.	Multiple countries: Cote D'Ivoire, Guyana, Mozambique, Uganda, Zambia	English	Proprietary	Various commodities	Windows	Online with offline capabilities	(not known)	(not known)
Quantification (Forecasting & Supply Planning); Inventory Management; Service Delivery & Utilization	Missionpharma Inventory Lite (M.I.L)	Missionpharma (Developer/Vendor)	- Easy-to-install and easy-to-use software, MIL gives necessary information to manage stock and resupply and to get consumption data at final destination levels. Implementation costs are determined from country to country. - MIL manages pharmaceutical products with the possibility to trace expiry date and batch numbers. - It produces reports on stock level, consumption data and packing lists. - Missionpharma sends an email concerning each delivery to users who can then download the data for each delivery into the database. This process updates the inventory. - The data sent by email includes the following information: (a) unique serial number per carton, (b) weight and volume of each carton, (c) list of products per carton, (d) quantity per product, (e) pharmaceutical form, (f) number of tablets / capsules / ampoules per packing unit, (g) batch number of each product, (h) expiry date per product batch, (i) special storage condition per product, (j) item code number. - Output data include: (a) stock control, (b) stock level, (c) re-supply date, (d) reporting on consumption, (e) pick and pack sheets, (f) proof of delivery. - Minimum system requirements are: Windows XP, Pentium III 500Mhz, AMDAthlon or equivalent. 128MB RAM. - One day of training on the software is required.	(not known)	Multiple: English French	(not known)	Laboratory, Medicines, Reproductive health products, Supplements; HIV/AIDS, Malaria, Reproductive health, TB	Software	Online	(not known)	Bo Birk bb@missionpharma.com
Quantification (Forecasting & Supply Planning); Procurement; Warehousing & Inventory Management; Distribution; Service Delivery & Utilization	mSupply	Sustainable Solutions (Developer/Implementer)	- mSupply is a fully functional pharmaceutical supply chain management tool that helps manage supply chains from the tender process through warehouse management to dispensing or distribution at even small aid posts and health centres. - Deployment has several options: full server-client on a network, stand-alone on a single computer, or cloud-based over the internet. mSupply also comes in a mobile version for use on tablets or smartphones in small stores or aid posts. - Sustainable Solutions provide all support and maintenance, and typically, customers vary in the level of support they need. Remote support is available by telephone, Skype, email and remote access. Sustainable Solutions maintains customers' installations using remote access software but can also arrange site visits for both support and maintenance if required. - The website for mSupply is: http://msupply.org.nz/	Multiple countries: East Timor, Ghana, Gambia, India, Kiribati, Nauru, Nepal, Nigeria, Solomon Islands, South Sudan, Sudan, Tanzania, Tonga, Tuvalu, United States, Vanuatu, Zambia.	English French (Can be used to use in almost any language)	Proprietary	Contraceptives, lab supplies, malaria, HIV/AIDS, and other pharmaceutical and non-pharmaceutical commodities	Windows XP/Vista/7/8 or Mac OS. Mobile version will run on iOS, Android, Windows Phone	Online and offline options	Approximately US$350 per concurrent user (one-off cost). Prices are available here: http://msupply.org.nz/pricing/	info@msupply.org.nz
Regulatory Policies & Procedures; Warehousing & Inventory Management; Distribution	mTRAC - Monitoring Essential Medicine Supply Using Mobile Phones and RapidSMS	UNICEF, FIND Diagnostics, Uganda Ministry of Health (Implementers)	- mTRAC allows health workers to send government reports and other data related to mapping facility stocks (such as for essential medicines) by SMS. (Currently, facilities spend US$2 per month to run mTRAC). - It uses RapidSMS to deliver information transparently and offers accountability mechanisms for the drugs so that unnecessary stockouts can be avoided. One of the accountability features is an anonymous hotline where individuals are able to report problems or detail their experiences. - The Ministry of Health receives real-time information on medicine stocks, and district health offices are able to successfully lobby the National Medical Stores for resupply based on their ability to present reliable and timely data.	Uganda	English	Open Source	ACT (anti-malarial drug)	RapidSMS	Offline with online capability	Free	(not known)
Inventory Management	National Stock Status Database (NSSD)	USAID	DELIVER PROJECT (JSI), Ministry of Health (Implementers)	- NSSD is a database system that aggregates SDP and central-level data for reporting family planning, malaria, and essential medicine information to the Ministry of Health headquarters. - The system is interoperable with references from a repository from Supply Chain Manager. - Support is provided by JSI's technical support team based in Washington, DC through electronic communication and data storage is available in-country. Maintenance is conducted monthly by the Ministry of Health and USAID	DELIVER Project.	Malawi	English	Proprietary	Family planning, malaria, essential medicines	Windows / MS Access	Offline	Free	askdeliver@jsi.com
Quantification (Forecasting & Supply Planning); Warehousing & Inventory Management; Distribution; Service Delivery & Utilization	Openboxes	OpenMRS, Partners in Health	- Openboxes is a supply chain management system for commodities in health facilities where purchasing can be initiated, stock movement can be tracked, discrepancies between international and domestic shipments can be recorded, inventory in multiple locations can be tracked, cycle counts and inventory adjustments can be made, stock history can be viewed, clinicians can do requisition stock from point-of-use locations, consumption and forecasting reports can be fun, dashboards can be configured. - Automatic database migration via Liquibase and multiple database synchronization using SymmetricDS if Internet is unstable. - The website for Openboxes is: http://www.openboxes.com	Multiple countries: Haiti, Rwanda	Multiple: English French Spanish and others	Open source	(not known)	Dependent on Eclipse IDE for Java EE Developers, Java 1.6, Grails 1.3.7, MySQL 5.5+, Tomcat 6 or 7 (optional for dev environment)	Online with offline capabilities	Free	Openboxes info@openboxes.com
Quantification (Forecasting & Supply Planning)	OpenEMR	-	- OpenEMR offers patient and pharmacy management support for all commodities at the district hospital and health center levels. - The system is not currently interoperable. - Support is provided by the local office in Rwanda, and data storage is available in-country. Maintenance is conducted by locally trained staff. - The OpenEMR website is: http://open-emr.org/	Rwanda	Multiple	Customizable	Various commodities	SQL	Online with offline capabilities	Free	OpenEMR support: http://open-emr.org/wiki/index.php/OpenEMR_Professional_Support
Inventory Management; Distribution; Service Delivery & Utilization	OpenLMIS: eLMIS and SELV	OpenLMIS community, USAID	DELIVER PROJECT (JSI), Tanzania MoHSW, VillageReach, PATH, ThoughtWorks Inc., Zambia MoH and MSL	- OpenLMIS is a highly scalable, web-enabled logistics management information system that supports (1) requisition-based and informed-pull-based replenishment, (2) multiple supply points or warehouses, (3) multiple programs with products segmented by program or shared across programs, (4) the ability to organize health centres into different groups which can operate on different reorder cyles with different approval processes, and (5) the ability to have individual facilities function both as a health service provider as well as a supply depot for other facilities. OpenLMIS also provides access to: (1) accurate, timely, and routine consumption data, including stockouts, (2) real-time logistics management capabilities covering point of origin to point of consumption, and (3) data exports for demand forecasting, capacity planning, and modeling based on consumption. - eLMIS captures information from all electronic systems like SMS for Life, ISL Gateway (JSI), CTC Pharma Database, as well as electronic process approvals and "smart" requisitioning processes. - Implementations of OpenLMIS: "eLMIS" in Zambia occurred through a country-led collaborative requirements development process. In Tanzania, their "eLMIS" implementation of OpenLMIS (which followed and most recent experience from Zambia) has proven to be an effective and sustainable electronic logistics management information system. It ensures that adequate quality and quantities of health commodities (vaccines, medicines and diagnostic supplies) are always available at the point of service to meet patient demand. - OpenLMIS: SELV is a version of OpenLMIS configured to support an informed push vaccination delivery system for four provinces in Mozambique. SELV provides delivery personnel with information on how much vaccine they need to pack for their trip and how much to deliver to each facility, then supports collection of data from each facility visit including initial stock levels, quantity delivered, cold chain information, and immunization coverage data. SELV is integrated with Tableau for extensive reporting. A tablet-based version of SELV, which can be used to deliver drivers while in the field, has also been trialed and will be refined in a future version. - Developed and supported by a community-led, open standards, open-source	Multiple countries: Mozambique, Tanzania, Zambia	Multiple: Bengali English French Portuguese Spanish Swahili (Additional languages can be added via a configuration file)	Open source	Various commodities	OpenLMIS is built on the Java Enterprise Platform using the Spring Framework and Angular JS. Reports are built in Jasper.	Reliable web server running the Java Enterprise Platform (such as Apache Tomcat). A relational database such as Postgres or MySQL. Clients need a computer with a web browser. Supported browser are Firefox version 18 or higher, Internet Explorer version 10 or higher, and Chrome version 26 or higher	Free	askdeliver@jsi.com eLMIS: Pavel Mtanga (NACP/Ministry of Health) paveldfm@gmail.com SELV: Sarah Jackson (VillageReach) sarah.jackson@villagereach.org
Procurement; Warehousing & Inventory Management; Distribution	ORION@MSH	Management Sciences for Health (Developer); Supply Chain Management System (SCMS) Project	- ORION@MSH is a pharmaceutical management system that has multiple levels of security and can hold information for site procurement, sales, tendering, inventory, warehousing, and accounting (including client, stock, supplier, medicine / supply information, etc.) at district, regional, or central hospitals or warehouse / CMS levels that manage procurement, inventory and distribution. - A huge variety of reports can be generated from the system and exported as Excel files across multiple users for multiple-site data aggregation. - The base software uses pharmaceutical management best practices, as well as industry best practices and standards. - Orion incorporates tested procedures for ensuring effective management of pharmaceuticals and medical supplies, particularly in resource-limited settings. - The system is complex and involves both hardware and software. Training is required, lasts 10-12 weeks, and includes a pre-installation information gathering trip, installation, and training on the system. - The software was piloted at the Pharmaceutical Procurement Service of the Organisation of Eastern Caribbean States in 2004. - Minimum system requirements include: Windows 2000 Server OS, 1GB Pentium IV Processor, 40GB hard drive, 1GB RAM, CD-ROM drive, Internet connection (high speed preferred) - Support can be provided by the project management office in Washington, DC - The system can be accessed through the Management Sciences for Health website	Multiple countries: Caribbean (St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Dominica and Grenada), Côte d'Ivoire, Ghana, Haiti, Nigeria, Tanzania, Zambia	Multiple: English French	Proprietary	Laboratory, medicines, products, supplements, consumables such as HIV test kits and essential medicines for HIV/AIDS, malaria, reproductive health, tuberculosis	ORACLE-based computer program Windows	Online	US$9,000 per site (obtained through MSH)	cpmsoftware@msh.org
Inventory Management; Procurement (Order Management); Quantification - Forecasting & Supply Planning	PASIGLIM	Ministry of Health, UNFPA and European Community	- PASIGLIM is an automated LMIS at the central and district warehouse, regional and district hospital, and health facility levels. - The system is interoperable with a quantification module for inventory management and control. - Support is provided by the central office to district and regional levels by email, telephone calls, and visits. The USAID	DELIVER PROJECT also helped improve communication by providing mobile Internet USBs, which were used to submit information and improve communications when there were problems with the software. - Maintenance is conducted on a monthly basis by commodity managers at each level (hospital, district, and regional or SILAIS). - Data storage is available in-country.	Nicaragua	Spanish	Proprietary	Family planning, HIV/AIDS, essential medicines, malaria, tuberculosis and HIV test kits	Windows / MS Access	Online	Free	(not known)
Quantification (Forecasting & Supply Planning); Procurement; Inventory Management; Distribution	PipeLine (PipeLine 5.1, most recent version; PipeLine 5.0, 2010 version; PipeLine 4.0)	USAID	DELIVER PROJECT (JSI)	- PipeLine is a desktop software tool that helps program managers plan optimal procurement and delivery schedules for any type of health commodity, and monitors orders throughout the supply chain with databases created specific to each country context. - PipeLine is able to generate reports (extremely useful for resource mobilization or presentation of information to stakeholders), estimate future product needs, and perform as a program planner for policymakers, product supplies and donors. - Software also enables preparation of logistics-based forecasts, shipment planning, calculation of procurement quantities and estimation of the value of shipments (but does not include information on expiration dates or batch numbers for any product). - In Honduras, PipeLine plans optimal procurement and delivery schedules for health commodities and monitors orders throughout the supply chain and is monitored at the central level through the National AIDS Program & National Family Planning Program. Support is provided by the SCMS Project and data storage is available in-country at the National AIDS Program and National Family Planning Program office. - In Madagascar, PipeLine stores logistics data (consumption, stock, stockout periods, etc.) and offers procurement planning options. Support is provided by the USAID	DELIVER PROJECT field office and data storage is available in-country at the Ministry of Health's Family Planning Department and at PSI's Madagascar headquarters. - In Rwanda, data supports procurement and order management of all commodities in Rwanda; procurement planning and pipeline monitoring in Uganda and Zimbabwe; and tracks procured shipments and delivery schedules of commodities, forecasting, and quantification from central warehouses in Nepal. - Version 5.0 (updated from 4.0) offers new fields in the software and users are able to describe and display details of shipments and consumption of health commodities for any type of product in generated reports. - Version 5.1 is centred in three additional languages, resolves issues experienced	Multiple countries: Côte d'Ivoire, Ethiopia, Guyana, Haiti, Honduras, Liberia, Madagascar, Malawi, Nepal, Nigeria, Rwanda, Uganda, Zimbabwe, Tanzania, Zambia	Multiple: PipeLine 5.1 English French Portuguese Spanish PipeLine 4.0 Arabic	Proprietary	Laboratory, malaria, medicines, family planning and reproductive health products, supplements, HIV/AIDS, fluoronazole, PMTCT, diagnostics, condoms, contraceptives, tuberculosis	Windows / MS Access	Offline	Free	askdeliver@jsi.com
Quantification (Forecasting & Supply Planning); Inventory Management; Distribution	Quantification techniques	UNFPA	- Quantification Techniques assists countries in strengthening their forecasting and quantification capacities and distribution to increase access to prioritized essential life-saving maternal health commodities.	(Currently being finalized)	English	(not known)	Prioritized essential life-saving maternal health commodities	Microsoft Word Microsoft Excel	(not known)	(not known)	Kabir Ahmed kahmed@unfpa.org; Sukanta Sarker sarker@unfpa.org
Quantification (Forecasting & Supply Planning)	Quantimed	Management Sciences for Health, several NGOs and US government (Implementers)	- Quantimed provides forecasting and cost estimations by facilitating calculation of pharmaceutical needs (e.g. Volume of medicine and medical supply items and costs) for general health services or specific health programs at central, regional, and district levels. - Users may employ one or more quantification methods - past consumption, morbidity (including scaling up patterns), and proxy consumption - in response to expertise and available data. The tool is designed to improve the accuracy of order planning and budgeting by providing a systematic approach to organizing and analyzing data. - Quantimed facilitates the calculation of commodity needs using either a single method or a combination of any of the three primary quantification methods: past consumption, morbidity patterns, and proxy consumption. - The program also includes an option for scaling up morbidity-based estimates, which is useful for growing programs. Depending on the availability of data, Quantimed can be applied at a single health facility, a national disease-specific program, or a group of geographic or administrative areas. - Its practical utilities are evident in the areas of order planning, training, and supply management, and the program allows the measurement of economic consequences of purchase and medicine-use patterns. For the policy maker, Quantimed shows the budgetary consequences of both individual medication purchases and those by therapeutic class. Quantimed can also directly relate medicines to priority health problems and disease patterns through the analysis of standard and usual treatments. - Approximately four days of training are needed for the Quantimed tool, general quantification issues, as well as quantification issues specifically related to HIV/AIDS treatment, MNCH, or other specific areas if applicable. - A national quantification exercise requires approximately 10 working days of time by a consultant and a local counterpart who possess the required skills: competency in data entry, a clinical background (or access to clinical advice), and an understanding of both procurement and quantification practices.	Multiple countries: Angola, Botswana, Burma, Cameroon, Côte d'Ivoire, DR Congo, Ethiopia, Guyana, Haiti, Kenya, Lesotho, Malawi, Mozambique, Nigeria, Rwanda, South Africa, Swaziland, Tanzania, Uganda, Vietnam, Zambia, Zimbabwe.	English (French in progress)	Open access	Essential medicines, HIV/AIDS, malaria, reproductive health, supplements, HIV/AIDS, opportunistic infection medicines, STI treatment, Expanded Programs for Immunizations	Microsoft Windows, MS Access	Offline	Free	CPM Software cpmsoftware@msh.org; Alternate contact: Kyle Duarte kduarte@msh.org

INVENTORY OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SOLUTIONS FOR SUPPLY CHAINS *

Prepared for the United Nations Commission on Life-saving Commodities for Women and Children
Recommendation 6 (supply and awareness), Outcome 1 (Good practices in supply chain management), Activity 3 (ICT solutions for supply chain)

OVERALL PURPOSE *For which domain of the supply chain is this tool/product relevant?* Regulatory Policies & Procedures Quantification - Forecasting & Supply Planning Procurement Warehousing & Inventory Management Distribution Service Delivery & Utilization Supply Chain Monitoring	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? (i.e. which countries)*	LANGUAGE *In what language is this tool/product delivered?*	OPEN SOURCE / PROPRIETARY *Is the tool/product open source or proprietary?*	COMMODITIES TRACKED *What types of commodities are tracked by the tool/product in the country mentioned?*	TECHNOLOGY *What technology (software application, hardware, operating system) does it use?*	ONLINE VS. OFFLINE *Is this an online or offline tool?*	LICENSE COST *How much does the license cost (USD)?*	CONTACT PERSON *Who is the contact person?*
Quantification (Forecasting & Supply Planning) Procurement	RH Interchange	RHSC, managed by UNFPA as part of AccessRH	- RH Interchange is a free, web-based tool that coordinates orders and shipment of contraceptives through the Internet. - Information available on the website is up-to-date and represents data from shipments worth over US$1 billion across 140+ countries. - The website for RH Interchange is: http://rhi.rhsupplies.org.	Multiple countries	English	Open access	Female condoms, implants, emergency contraceptives, reproductive health products	Online portal	Online	Free	Technical questions, reporting issues with the data: rhi-admin@unfpa.org Requests for support with RHI reports: rhi-supply@unfpa.org
Quantification (Forecasting & Supply Planning) Procurement (Order Management) Warehousing & Inventory Management	Sage, Sage BusinessVision, Sage L500, Sage Pastel	Sage Group	- Sage is software that manages inventory and can interface with MACS Warehouse Management Software. Support is provided by the SAGE Group team, and data storage is in-country (Cote D'Ivoire, Liberia, Uganda). - Sage BusinessVision manages stock status and controls sales figures for commodities managed by PSI at the central level (PSI Madagascar headquarters). Data storage is available in-country at PSI headquarters (Malawi). - Sage L500 is a software that facilitates medical supplies and distribution at the central level with financial systems integrated. Support is provided by New Age based in Mauritius and data storage is in-country (Rwanda). - Sage Pastel is used for billing, inventory and accounts payable. Support is provided by a consultant, and data storage is in-country (Nigeria).	Multiple Countries: Cote D'Ivoire, Liberia, Malawi, Nigeria, Rwanda, Uganda, Madagascar	Multiple	Proprietary	Essential medicines, HIV/AIDS, malaria, tuberculosis, drugs and medical consumables, and in some countries all commodities	Windows with a SQL server	Online with offline capabilities	(not known)	sage@pinnacle-online.com
Inventory Management Procurement (Order Management) Quantification (Forecasting & Supply Planning) Dispensing	SICIAP (Automated Control and Information System)	Centro de Información y Recursos para el Desarrollo (CIRD)*	- SICIAP updates hospital interventions in real-time, records consumption data from SDPs, automatically calculates resupply quantities and reports over-supply quantities for redistribution. - The system interfaces with SICIAP-MEP. - Support is provided by UMBRAL, and data storage is in-country.	Paraguay	Spanish	Proprietary	Family planning, HIV/AIDS	Software	Online	(not known)	(not known)
Quantification (Forecasting & Supply Planning)	SICIAP-MEP	Centro de Información y Recursos para el Desarrollo (CIRD)*	- SICIAP-MEP is a forecasting module for SICIAP that uses the consumption data to extrapolate for underreporting and stockouts. It calculates funds needed and recommends rationing based on ABC and VEN analyses to maximize funds. - The system interfaces with SICIAP. - Support is provided by UMBRAL, and data storage is in-country	Paraguay	Spanish	Proprietary	Family planning, HIV/AIDS	Software	Online	(not known)	(not known)
Quantification (Forecasting & Supply Planning) Distribution Warehousing & Inventory Management	SIGMED	medICT	- SIGMED is an integrated drug supply chain management system that offers transparency for medical stores and warehouses, and has resulted in improvements in higher client satisfaction for health care services. - Data exchange between central and regional stores once a day through FTP, email. - SIGMED can be linked with financial packages like ACCPAC and FoCaMed (ARV forecasting tool). - Distribution and sales is based on FEFO (first expired/first out) principle that batch management and expiry data management are key features of stock management - Inputs include (a) commodity-related inputs, such as medicines (essential drug list), medical supplies, laboratory reagents, dental products (b) suppliers, (c) customers, (d) transaction-related information, such as tenders, purchase orders, receipts, sales, etc. Outputs include: (a) transaction reports, (b) stock positions at central or regional level) and (c) management information reports. - Implementation costs are approximately €30,000 - 50,000. After one year, annual maintenance costs are usually 20% of license costs. - Minimum system requirements include: A Windows 2000 Server OS, SQL server, 1GB Pentium IV processor, 40GB hard drive, 1GB RAM, CD-ROM drive, network connection, visual basic front end; Crystal Reports Report generator. - Implementation time lasts 9-14 weeks, which involves (a) defining customization requirements (1 week), (b) customization (4-8 weeks), (c) installation of SIGMED (server, clients), (d) migration of historical data (1 week), (e) testing and training of key users (1 week) and (f) training of end users (2-3 weeks). Interface with financial/accounting system is an option (3-4 weeks).	Multiple countries: Mali, Malawi	English	Proprietary	Laboratory, medicines, reproductive health products, supplements, HIV/AIDS, malaria, tuberculosis	SQL-based database software	(not known)	€5,000 per site	info@medict.nl
Warehousing & Inventory Management Service Delivery & Utilization	SMS for Life	Tanzania Ministry of Health and Social Welfare, Novartis, Medicines for Malaria Venture, Swiss Agency for Development, Vodacom, PSI Tanzania, Vodafone, IBM, RBM Parnership Secretariat	- SMS for Life uses mobile phones, SMS messages, and an electronic mapping technology that allows all health facilities to provide weekly comprehensive stock counts to each district management team. Data captured from the messages was available through a secure website requiring login information, which could be accessed through the Internet. - The SMS for Life Tanzania Pilot Project Report can be found at: http://www.rbm.who.int/docs/SMSsummaryReport.pdf	Tanzania	English	Open source	Malaria treatment	Mobile phones	Offline tool with online components (dashboard)	(not known)	Jim Barrington SMS for Life Program Director
Quantification (Forecasting & Supply Planning) Procurement Warehousing & Inventory Management Distribution Service Delivery & Utilization	Supply Chain Manager	USAID	DELIVER PROJECT (JSI)	- Supply Chain Manager monitors comprehensive logistics and operations data to provides information from central, district, regional, and facility levels for decision making at the country level. This is not a system for warehouse management and does not capture information on expiry dates, but can be linked to inventory control software for significant enhancements. - Inputs include facility reports with information on initial stock levels, receipts, issues and adjustments for all products during each reporting period. - Outputs include data on national stock status, consumption trends, current stock volumes and stock volume necessary for upcoming resupply period. - Processes requisition and orders and tracks levels of commodities at SDPs - The system interfaces with MACS WMS through .csv files, and data storage is in-country at the Logistics Management Unit. - The system can only be used when each facility receives products from one supplying facility. All facilities must report completely and on the same schedule. - Minimum requirements include: Pentium II class or higher, CPU PC with Microsoft Windows 95/98/-NT/2000 100 MB of hard disk space, 32 MB RAM Super VGA monitor (800 x 800) and PPM laser printer. - First line of support is provided by the Medical Stores Limited (MSL) IT helpdesk or data officers. Software-related issues and bugs are escalated to JSI Zambia and Washington, DC developers, and hardware issues are handled by MSL IT staff. - Five days are required for training on country-adapted software. Approximately 20 days would be needed to facilitate software implementation. Technical assistance can be very costly during customization and roll out. - Maintenance is conducted by a database administrator at least once a month.	Multiple countries: Liberia, Madagascar, Malawi, Rwanda, Uganda, Zambia	English	Proprietary	Laboratory, medicines, reproductive health products, supplements, HIV/AIDS, essential medicines, malaria, tuberculosis	Windows / MS Access SQL server	Offline	Free	askdeliver@jsi.com
Order Management	Top Up	Westchase Consultants (Developer) for the USAID	DELIVER PROJECT (JSI)	- Top Up captures SDP logistics data and provides informational reports on logistics to partners. - Top Up is used to generate data for forecasting and can interface with AutoDRV. - Support is provided by Westchase Consultants, and data storage is in-country. Maintenance is conducted by Westchase Consultants only when there's a problem.	Zimbabwe	English	Proprietary	Condoms, contraceptives, PMTCT, HIV rapid test kits, malaria, TB, essential medicines	Windows Server 2008	Offline	Free	askdeliver@jsi.com
Procurement Warehousing & Inventory Management Distribution	Warehouse Management System	Costa Oriental Logistics & Distribution	- Warehouse Management System provides inventory control for contraceptives at the central warehouse level. - Support is provided by USAID	DELIVER PROJECT, and data storage is in-country - Maintenance is conducted by in-house experts.	Paraguay	(not known)	Proprietary	Contraceptives	Windows/Visual Basic, MS SQL Server and Crystal Reports	Online	(not known)	paraguay@costaoriental.com

* Other ICT tools/products were identified but did not have enough information for inclusion into the inventory:

ChileCompra *(Government of Chile, Chile)*; **Customer Resource Manager (CRM)** *(Supply Chain Management System Project, Côte d'Ivoire, Haiti, Nigeria, Zambia)*; **Descartes Data Integrity Services** *(Descartes)*; **DHIS 1.4** *(Health Information Systems Programme, Zambia)*; **Electronic Dispensing Tool** *(MSH, Haiti)*; **End-Use Verification** *(JSI)*; **Epicor 9** *(Tanzania)*; **Facility Register System** *(InSTEDD, Rwanda, Tanzania)*; **InfoMaker** *(Sybase, Inc., South Africa)*; **Inventory Management Software** *(Yellow Digital PVT, Ltd, Nepal)*; **LAMIS** *(Axios Group, Nigeria)*; **LHPMIP LMIS** *(SCMS Project, Nigeria)*; **LMIS** *(local vendors, Nepal, Pakistan)*; **LMIS Manager** *(Tawanda Chifamba, local consultant, Burkina Faso)*; **MEDSAS** *(local vendor, South Africa)*; **Napier** *(Napier Healthcare, Rwanda)*; **Nootro Depot** *(South Africa)*; **PDSX** *(Vuna Healthcare Logistics, South Sudan)*; **ProQ** *(USAID | DELIVER PROJECT, Zambia)*; **RxSolution** *(MSH)*; **SALMI** *(Sistema de Administracion Logistica para Medicamentos o Insumos, Bolivia)*; **SANTIA** *(Santia)*; **SmartCare** *(CDC, Zambia)*; **SMS for Life** *(Ghana, Kenya)*; **SNUS - Sistema Nacional Unico de Suministros or National Unified Commodity System** *(Botswany)*; **SQL server-based software** *(Social Marketing Company with help of a local vendor, Bolivia)*; **Supply Chain Information Portal (SCIP)** *(Bangladesh Government Ministry of Health and Family Welfare, Bangladesh)*; and **Web-based LMIS** *(local vendor, Nicaragua).*