Technology to Improve Logistics Decisions

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MIT Supply Chain Management Program
Panel: Technology to Improve Logistics Decisions

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Example: Technology in Crisis

- **Purpose:** Needs assessment data collection as a demand signal for supply chains
- **Technology:** PDA survey uploaded daily
- **Implementation**
  - Questionnaire developed in collaboration with Clusters
  - 12 teams with 3 Haitian surveyors per team
  - Training and pilot before active collection
  - 288 site visits each 4 week period (6 days/wk)
  - At each site, survey 18-21 Households (randomly), Key Informant, and Health Center
    - 61 household questions
    - 40 key informant questions
    - 18 health center questions

- **Sites selected purposively**
  - Camps in earthquake-affected areas
  - Communities near camps
  - Outlying areas in which IDPs have settled

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PaP Weekly Snapshots: Shelter Indicator: Access to Waterproof Roof

Shelter situation has improved since March

Source:
Ms Amanda Schiff, Ms Erica Gralla
Dr Douglas Jones, Dr James Evans,
Dr Marc Zissman
(MIT Lincoln Laboratory)

Dr Louise Ivers
(Harvard Medical School, Partners in Health)

Briefing to the CSC
4 May 2010

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PaP Monthly Snapshots: Shelter
Indicator: Access to Waterproof Roof

Population:
sample mean of the 41 camps visited each month

Descriptive Statistics:
• Median
• 25-75 percentiles
• Outliers

Source:
Example: Technology in Crisis

- **Purpose**: Needs assessment data collection as a demand signal for supply chains
- **Technology**: PDA survey uploaded daily

- **Impact**
  - Raw data posted daily
  - Simple analysis for weekly briefing to sponsors
  - Deeper analysis of trends in hindsight

- **Improvement**
  - Plan for and automate data cleaning
  - Plan for and automate analytical process
  - Identify decision makers and create analytical “artifacts” for communication
  - Incorporate other assessments and data such as crowdsourcing to provide a comprehensive demand signal for supply chains
Example: Technology in Operations

- Purpose: improve warehouse space utilization
- Technology
  - Consumption data in Electronic Medical Records
  - Forecasting and simulation model in Excel
# Forecasting/Simulation Model Snapshot

**Source:** Heberley, C. and Hoover, M.  MIT Master's Thesis, 2010.

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Demand Forecasting Analysis


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Order Policy Analysis

Results of simulation model

Warehouse Volume (cubic meters)

Emergency Procurement Costs

L – Lead Time in months
R – Review period in months

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Technology in crisis
  - Focus: rapid demand signal and operating picture
  - Leverage various data gathering technologies
    - Traditional: surveys, assessments, satellite imagery
    - New: crowdsourcing, sensors, mobile phone polling
  - Focus on technology that turns data into demand/supply information
    - Automation
    - Interpretation
    - Communication

Technology in operations
  - Focus: robust supply chain design and management
  - Leverage various development paths
    - open source (e.g. OpenMRS, Helios Foundation, Sahana)
    - proprietary (e.g. AidMatrix, Llamasoft, Microsoft, SAP)
  - Move towards interoperability: standards (e.g. NetHope)
  - Plan and budget for implementation: process tools, customization/configuration, training, hosting architecture, offline synchronization
  - Select considering long-term support: commercial services, “Red Hat” for open source