

MARCH 4, 2010

# BRIDGING THE RELEVANCY GAP

AN INNOVATION-DESIGN METHODOLOGY FOR VALUE ENGINEERING  
THE REDESIGN OF VACCINE COLD CHAIN TRANSPORT CONTAINERS

PREPARED FOR

2010 CONFERENCE ON  
HEALTH & HUMANITARIAN  
LOGISTICS

## AUTHORS

1. Michael F C Moreland, SEEDR L3C
2. Victoria M. Gammino, Global Immunization Division, US Centers for Disease Control & Prevention
3. Sue Gerber, Global Immunization Division, US Centers for Disease Control & Prevention
4. Scott Wellman, SEEDR L3C

## ABSTRACT

The authors developed a design methodology for global-development value innovation through the redesign of the long-range cold box and short-range vaccine carrier, as defined by the WHO Performance Quality Safety (PQS) guidelines. The authors' critical-point analysis of the vaccine cold chain revealed these containers have the lowest function-to-cost proposition and greatest dependence on end-users.

The objective was to maximize the containers' function-to-cost value by empowering the design process to overcome common challenges in global deployment, such as linguistic and cultural diversity, variations in user education and training levels, limited program resources, and a range of terrain and climate conditions.

The methodology integrated a sequence of design and engineering best practices modified to bridge the "relevancy gap" among engineers, designers, and users. It focused on introducing new technologies and user-experience strategies to conform with global supply chain product requirements. It included a baseline audit, design-element teardown, a series of

multidisciplinary, cross-sectoral expert forums, literature review, container performance data collection, a survey of sixty-one end users from twenty-two countries identified through snowball sampling, field interviews, and a simulation of the economic and public-health impact of design variations.

The process revealed previously uncontextualized behavioral patterns and failure points, connected the designers to a global sample of users, and facilitated user input and simulation and survey data to drive decision making.

The authors integrated the resulting body of work with the WHO PQS guidelines to form a framework for parameterizing the engineering and optimizing the function variables. The results revealed opportunities for poka-yoke behavior-shaping elements, and potential methods for orthogonal system integration.

The authors are using the framework to create a prototype field-test protocol and explore opportunities to redesign other PQS products.

## KEYWORDS

value engineering, vaccine, innovation design, transport containers, design strategy, humanitarian, logistics