Title: Engineering For Change (E4C): Enhancing the Engineering for Change (E4C) Webinar Series and Appropriate Solutions Evaluation Program (ASEP)

Project Period: January 2014 – December 2014

Participating Societies: ASME, IEEE, Engineers Without Borders-USA (EWB-USA)

Principal Grantee: ASME

Date: December 2014

This document provides a report of the work completed by Engineering for Change (E4C) that was made possible by the grant of $143,000 generously provided by UEF.

Background

E4C is a global community of organizations and individuals dedicated to promoting sustainable and accessible technology-based solutions for underserved communities worldwide. Targeting the intersection between engineering and development practitioners, E4C's mission is to enable this community to serve the underserved and do its work better.

E4C's value proposition is:

- Enabling access to and collaboration among a global community of like-minded individuals
- Delivering a platform for thought leadership development in applying engineering rigor to global development
- Harvesting and curating trusted sector knowledge
- Developing innovative methods to evaluate implemented solutions for appropriateness and sustainability
- Advancing educational and professional development programming

E4C by the numbers:

- 3,700,000+ EngineeringforChange.org page views
- 807,000+ Facebook likes (comparable to Doctors Without Borders/MSF with 821,000+ likes)
- 30,000+ live and on-demand E4C Webinar Series views from over 80 countries
- 500+ original articles with 100+ major reposts
- 137+appropriate technology solutions in Solutions Library 2.0 (SL 2.0)
- 90+ humanitarian technology subject matter experts engaged in SL 2.0 development

Objectives

The 2014 UEF grant focused on developing two signature programs of E4C: the E4C Webinar Series and the Appropriate Solutions Evaluation Program (ASEP).

E4C Webinar Series
The aims of the E4C Webinar Series in 2014 were to provide an enhanced user experience and increase the size and diversity of its audience. All three were accomplished.

In May, the Webinar Series moved to the On24 platform, a best of breed webinar-hosting platform. The new platform provides improved sound quality (a frequently-cited challenge with our previous platform), social media integration, a more professional look and feel, almost instant on-demand availability of the recorded webinar (previously, it would take up to a week or more to provide the recording), and vastly improved metrics collection.

Much effort was taken to promote the webinars through social media, such as Facebook, Google Ads, and Twitter. As a result, we saw live attendance increase by 63%. Attendees also came from 27 countries that we had not previously reached. As these countries were primarily from the developing world, this is an especially important accomplishment. New countries include Burkina Faso, El Salvador, Ghana, Haiti, Mozambique, Sri Lanka, Tanzania, and more. In addition, more users are coming to E4C for their continuing education needs. 2014 saw a three-fold increase over 2013 in Professional Development Hours (PDHs) awarded.

Finally, the Webinar Series started laying the groundwork for further development in 2015. Webinar offerings were a focus of the content strategy workshops held with consulting group Misfit. As a result of the workshops, we are now working toward utilizing new and existing webinar content to create enhanced products that will increase E4C's value to its users and dramatically increase views.

Catalog of 2014 E4C Webinars:
- From Technologies to Lasting Services - Identifying and Addressing Barriers to Sustainability
- Emerging Trends in the World of Social Entrepreneurship Social Enterprises: Scaling Impact
- Advances in Household Water Treatment: Products and Standards
- Innovations in Global Maternal Health
- Agricultural Devices: Designing for Adoption and Success
- 3D Printing and Development: Impact and Challenges
- Off-Grid Technology Perspectives | The Case of the Solar Lantern
- Humanitarians in the Sky: How UAVs are Changing Disaster Response
- Emerging Markets: Top ICT4D Hardware Challenges
- WASH in Emergencies: Lessons Learned and Way Forward
- Impact Inventing: Strengthening the Ecosystem for Invention-Based Entrepreneurship in Emerging Markets
- Simple but Intelligent Solutions for People with Health Restrictions

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2014 E4C Webinar Records Set:
- **129 live attendees** for Advances in Household Water Treatment
- **Average viewer rating of 4.45 out of 5.0** for Humanitarians in the Sky: How UAVs are Changing Disaster Response
- **Live attendees from 24 countries** in Off-Grid Technology Perspectives | The Case of the Solar Lantern

Appropriate Solutions Evaluation Program (ASEP)
The ultimate goal of ASEP is to encourage the production of higher quality, fit-for-service products for communities in need and increase efficiency of the product development cycle. In 2014, the program goals included making significant progress toward developing the first-of-its-kind decision aid tool (i.e. Solutions Library 2.0), establishing supporting guidelines and processes, and online delivery of credible data and product comparison functionality. The objectives were met and yielded insights enabling further progress.

The early part of the year was dedicated to finalizing product and market research with a team of researchers and the independent consulting firm, TNO. Product research entailed literature review, interviews with designers and manufacturers of products, data synthesis, normalization and comparison development. Fourteen (14) independent Subject Matter Expert (SME) Advisers contributed to the evaluation of the product reports to ensure data credibility. The process was completed for fifty (50) products in the sectors of water, energy, agriculture and health, along with the design of the associated information architecture.

In collaboration with TNO, E4C conducted and delivered comprehensive Trend Analysis for 4 sub-sectors. The reports provide macro-level assessment of the associated market demand and supply (including end-user behavior trends, supply chain and revenue models), knowledge state (including standards and vetting methods supporting product development) and support ecosystem (including publications and journals, centers of excellence, relevant standards bodies). Furthermore, a structured process was defined to systematically gather and maintain the information and analyses.

Finally, the ASEP supported the build and deployment of a prototype decision-aid platform integrating all the data – Solutions Library 2.0 (SL2.0). Alpha. SL2.0 Alpha was released online at http://www.e4csolutions.org in August 2014 to a private test community comprised of nearly two hundred (200) stakeholders. The platform has an unique design aesthetic, high degree of functionality enabling search, filtering and comparison of products, as well as an operational content management system (CMS) for data maintenance.

SL2.0 Alpha: Product Page

The SL2.0 Alpha early adopters stress-tested the proposed framework (concept), approach (UX) and content utility. Feedback was collected via scenario questionnaires and phone/in-person interviews. To date feedback has been overwhelmingly positive, demonstrating both the feasibility and utility of SL2.0 and setting the stage for a comprehensive evaluation and refinement the platform design for integration with E4C2.0.

<u>Outcomes</u>

E4C Webinar Series
- **New E4C Webinar Series platform**: enhanced features provide improved user experience, more professional appearance, and easier metrics collection.
- **Increased live attendance**: live attendance **grew 63%** in 2014 with an average of **87 attendees per webinar**.
- **Expanded global reach**: attendees from **27 new countries** attended E4C webinars live in 2014. The Webinar Series has now reached live viewers in a **total of 88 countries**.
- **Growing value as a continuing education resource**: the average number of Professional Development Hours (PDHs) awarded per webinar has **tripled over 2013**. An average of **30+ PDHs per webinar** were distributed in 2014 vs. 10 in 2013. In total, the Webinar Series has awarded **550+ PDHs** since inception.
- **Overall impact of the program**: E4C webinars have now been **viewed over 30,000 times**, either live or on-demand.

Appropriate Solutions Evaluation Program (ASEP)
- **Deployed a unique decision-aid platform prototype:** Solutions Library 2.0 (SL2.0) Alpha launched with product data, Trend Analysis and integrated feedback mechanisms. The platform design was considered a welcome departure from traditional approached and received favourable feedback. Alpha is built to support revisions based on the testing outcomes, data scaling and integration into E4C2.0
- **Established structured processes**: for gathering, validating and maintaining up-to-date information on the platform
- **Verified platform utility:** Testing of the Alpha platform with the Early Adopters community of nearly 200 indicated the value of both the ASEP development methodology and data credibility and utility. Laid the foundation for development of the scaling strategy for both the program and platform.
- **Demonstrated program value:** The ASEP has attracted a robust network of subject matter experts. ASEP Steering Committee Members have demonstrated a high degree of engagement (working with E4C since June 2012) and commitment (all members indicated interest in continued participation). In 2014, the program engaged 14 new SME Advisors and drew interest from potential collaborating organizations such as the Alliance for Clean Cookstoves, Maternova and USAID's Global Development Lab.

A full detail of the allocation of the $143,000 is included with this narrative report as a separate attachment.

E4C is extremely grateful to UEF for its continued support of our signature programs. After several years, these programs are now starting to bear significant fruit and have widespread impact. We look forward to taking E4C to the next level in 2015 with the help of our UEF grant.

APPENDIX

Engineering for Change Solutions Library 2.0: Alpha Product Set

Energy

Product Name	Technology category
Bornay Inclin 600	Wind turbine
Rutland 910 - 4 Furlmantic Windcharger	Wind turbine
Portable Biogas Plant	Biogas plant
NETPRO 50-100kw Biomass power plant	Biomass plant
Biomass Gasification Power Plant	Biomass plant
MBSA Biogas plant	Biogas plant
T1 Turgo	Micro Hydro System
Watter Buddy	Micro Hydro System
Solectic Plug and Play	Solar Home System
Trony Sundial TSL02	Solar Home System
Selco 50W Solar Home System	Solar Home System
Bright Box 2 solar home system	Solar Home System
SunKing Pro	Solar Lantern
D Light S10	Solar Lantern
ToughStuff models (LED Rechargeble Desk Lamp Kit)	Solar Lantern
Nuru Light	Solar Lantern
Barefoot Power models (Powerpack 5W)	Solar Lantern
Nokero N200 and other models	Solar Lantern

Agriculture

Product Name	Technology category
Groundnut Lifter/Inverter MODEL: ABGL/2 -TWO ROW	Harvester
Xinpeng Peanut Harvester	Harvester
Piteba Oil Expeller	Oil Expeller
Alvin Blanch Oil Expeller Press XP100	Oil Expeller
Universal Nut Sheller	Sheller
Alvan Blanch Model GS100 Groundnut Sheller	Sheller
Alvan Blanch Model SD 22-(X) Solar Drier	Drying System
Sunworks solar food dryer	Drying System
Thermogenn Cooler	Cooling System
Zeer Pot	Cooling System

Water

Product Name	Technology category
iDE Rope Pump	Hand Pump
Elephant rope pump	Hand Pump
SDS (SDS-T-128) Submersible Pump	Submersible Solar Pump
Shurflo 9300 Series Pump	Submersible Solar Pump
CT Filtron Ceramic Water Purifier	Ceramic Water Filter
Nazava Water Filter	Ceramic Water Filter
iDE/Hydrologic Rabbit Ceramic Water Purifier	Ceramic Water Filter
LifeStraw Family 1.0	Membrane Filter
Tata Swach	Membrane Filter
EAWAG Gravity-Driven Membrane (GDM) Technology	Membrane Filter

Health

Product Name	Technology category
Self adjusting eyeglasses - Eyejusters	Optical Lenses
Adspecs	Optical Lenses
OneDollarGlasses	Optical Lenses
Jaipur Foot and below knee Prosthesis	Artificial Limbs
Polypropylene Prosthesis	Artificial Limbs
Low Cost wheel Chair	Wheelchair

Rough Terrain Wheelchair	Wheelchair
Rough Rider Wheelchair	Wheelchair
Leveraged Freedom Chair	Wheelchair
D-Rev Brilliance	Phototherapy Device
DtM Firefly	Phototherapy Device