

The Potential of ICT for Development: Vision and Implementation in TEMACC-Ethiopia

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To enable sustainable development, the use of information and communication technologies (ICT) is advocated by the United Nations. This vision of promoting the advancement of disadvantaged communities through ownership of appropriate technology is concretized in model projects and related research. Challenges include bridging the cultural, resource and technology gaps, carrying out North-South cooperation at eye-level and making solutions sustainable in communities.

TEMACC (Technology Enabled Maternal and Child healthCare), a research project funded by the Austrian Partnership Program for higher Education and Research (APPEAR) from January 2017 to March 2020, was conducted by the Johannes Kepler University, Linz, Austria and the University of Addis Ababa, Ethiopia.

The aim was to explore the potential of ICT for improving healthcare access and quality for mothers and children in rural areas. Target groups were mostly illiterate mothers, little educated health extension workers (HEWs) assigned to health posts, and clinical practitioners working in health centers. The focus was on health education of mothers, facilitating work and education of HEWs, and communication between mothers, HEWs and health centers. In a pilot project carried out in the rural area of Butajira, the Ethiopian partners conducted field research, requirements collection, prototyping, software design, implementation and deployment. The Austrian partners provided guidance and project coordination.

We consider ICT for Development an interdisciplinary field, its research space unfolding in three dimensions: IT-enabled community intervention/empowerment; contextualized IT-system design; and IT-mediated knowledge enhancement. Viable approaches and methods need to relate these dimensions.

In TEMACC, community intervention was guided by collaborative ethnography focusing on cultural practices around information artifacts to obtain software requirements in response to information needs. Software development was based on participatory design, prototyping, version-oriented development, and iterative cycles of design-critique-reflection.

The result is a comprehensive ICT-platform supporting primary healthcare. An Android app for mothers, based on image and voice, offers basic knowledge about pregnancy, birth, postnatal and newborn care, and reminds of dates for checkups or the expected delivery. A web-based system for HEWs on tablets or mobile phones enables access to health-related information, communication with health centers and case histories of mothers and newborns. The clinical application system supports work processes in health centers, facilitates case-based cooperation with HEWs, health bureaus and local hospitals, and helps less educated medical personnel to consult specialists.

Knowledge processes arise in participatory design, community training and in self-organized learning when adopting technology. They are mediated by digitized healthcare contents in digital libraries, excerpted from public documents. Content design involves compiling small information-rich texts, simplifying language, and adapting information to the local culture.

TEMACC ended in a one-year intervention study with highly promising results in the target community. It also serves as model project to promote capacity building in Software Engineering and Development Informatics in Ethiopia. Sustainability will be the main objective, when the project is hopefully continued as TEMACC+.