Chapter 10
Managing Seven Dimensions of ICT4D Projects to Address Project Challenges

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ABSTRACT
A large number of ICT for development (ICT4D) projects experience a variety of challenges, especially when conducting field research with disadvantaged communities in developing nations. Using cluster analysis, this chapter identifies the six most common factors associated with a majority of ICT4D project challenges, and depicts the inter-relationship between these factors and over 100 distinct challenges reported by existing literature. In addition, based on the secondary analysis of 380 research artifacts in the ICT4D literature, this chapter proposes ways to manage the scope, time, costs, quality, human resources, communication, and risks for addressing ICT4D project challenges. Findings inform researchers of best practices for conducting ICT4D research with disadvantaged communities in developing nations.

BACKGROUND
Projects which (a) design information and communication technology (ICT) solutions for disadvantaged communities, (b) test ICT prototypes with disadvantaged communities, (c) deploy ICT solutions in disadvantaged communities, or (d) assess the impact of ICT solutions on the development of disadvantaged communities in developing nations are known as ICT4D projects (Potnis, 2014). A large number of ICT4D projects experience a variety of challenges, especially when conducting field research with disadvantaged communities in developing nations. In addition, most ICT4D projects have limited resources, including time and money, which are often subjected to identified or unforeseen risks.

ICT4D researchers are always in search of systematic guidance for addressing project challenges. As a result, a number of studies published by top journals in the ICT4D area, including IT for Development (e.g., Krauss, 2013; Krishna & Walsham, 2005; Madon, Reinhard, Roode, & Walsham, 2009; Walsham & Sahay, 2006, etc.), IT and International Development (Abraham, 2006; Anokwa et al., 2009; Medhi

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& Toyama, 2007, etc.), *Electronic Journal of Information Systems in Developing nations* (e.g., Touray, Salminen, & Murso, 2013), *International Journal of ICT and Human Development* (e.g., Mathur & Sharma, 2009; Rahman & Ramos, 2013), and books or book chapters (e.g., Chib & Harris, 2012; De, 2012; Krishna & Madon, 2003, Vaidya, Myers, & Gardner, 2013, etc.), discuss the challenges associated with ICT4D field research at great length. This multidisciplinary guidance available for conducting ICT4D field research equips researchers collecting, analyzing, and reporting data in multiple formats from the field.

However, this guidance is not systematic or structured. As a result, it requires significant experience or a relevant academic background for interpretation and application. For instance, a team of computer scientists (Brewer et al., 2006) advise researchers to “plan hard but remain flexible.” But how does one remain flexible in ICT4D field research? What exactly does it mean to plan hard in the context of ICT4D projects in developing nations? Also, there hardly exists any theoretical foundation of the guidance for addressing ICT4D project challenges, which makes the problem worse for researchers with no prior experience or training.

This study proposes applying project management principles to address ICT4D project challenges. Project management is a scientifically designed approach for managing scope, time, cost, quality, human resources, communications, and risks related to a variety of projects. Table 1 presents seven project management principles (PMP) and related activities.

However, PMP, which are codified by standards, tools, and techniques, cannot be applied “as is” to address ICT4D project challenges since PMP rely extensively on assumptions of economic rationality. For instance, increasing profit margins and controlling cost factors are the two prime objectives of PMP, which are typically not the goals of ICT4D projects; scaling, sustainability, and benefiting disadvantaged communities without undesired outcomes are typically the goals of ICT4D projects. There are fundamental differences in some of the goals of PMP and ICT4D projects. Due to the differences in the business environment in developing and developed countries (Roztocki & Weistroffer, 2011), PMP grounded in the West cannot be applied “as is” in the developing world. Hence, it becomes necessary to customize PMP for addressing ICT4D project challenges.

This chapter addresses the following two research questions: (A) what are the factors responsible for ICT4D project challenges? And (B) how can PMP developed in the West be customized to address the challenges experienced by ICT4D projects in developing nations?

The next section synthesizes various ways to customize PMP for a variety of development projects aiming to create social, economic, and human development in developing nations. The following section presents study findings. The concluding section discusses key contributions, limitations, and implications of this study.

**GUIDANCE TO CUSTOMIZE PMP IN DEVELOPING NATIONS**

Typically, researchers serve as project managers for ICT4D projects. Hence, irrespective of their personality and training they should be able to manage seven dimensions of ICT4D projects in order to address project challenges. ICT4D researchers could learn from the following observations and advice for customizing PMP for development projects in developing nations.

The operating conditions in the developing world as characterized by contextual factors make traditional PMP in the developed world less appropriate and applicable (Blunt, 1992). These contextual