From the Guest Editors

Selected Papers from ICTD2009

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This special issue of *Information Technologies & International Development* presents selected papers from the 3rd International Conference on Information and Communication Technologies and Development (ICTD2009), held in Doha, Qatar, at the Carnegie Mellon University campus, April 17–19, 2009. The conference follows the earlier ICTD2007 held in Bangalore in December 2007 (with select papers published in *ITID,* Volume 5, Issue 1), and the inaugural ICTD2006 held in Berkeley, California in May 2006 (with select papers published in *ITID,* Volume 4, Issue 1).

ICTD is the premier series of interdisciplinary scholarly conferences on the use of ICTs for development, spanning the technical and social science domains. The call for papers for ICTD2009 solicited full papers for review, and attracted 250 submissions. Using a double-blind peer-review process that engages three reviewers—one with deep expertise about the subject matter, another with broad background in the area, and one drawn from an altogether different discipline—the submissions were narrowed down to 19 papers selected for oral presentation at the conference, and another 27 chosen as full papers for poster presentation.

From these papers, a further selection of nine papers was made after the conference—on the basis of review comments, scores, and editorial re-review—with the opportunity for authorial revision. These revised papers were then submitted to a further double-blind review and revision process using different reviewers, from which the seven papers presented here were finally selected.

We have arranged them, very roughly, to follow an ICT lifecycle, from innovation through adoption, and on to use and impact, though the papers often span several of these issues.

We begin with two papers that describe the design and piloting of innovative solutions to some key development problems. G. Ayorkor Korsah, Jack Mostow, M. Bernardine Dias, Tracy Morrison Sweet, Haijun Gong, Sarah Belousov, and M. Frederick Dias present field study results of an automated reading tutor deployed for school children in Accra, Ghana. The technology was taken from a cognitive tutor developed for U.S. school children, and it worked with minimal tweaking for teaching English in Ghana, running on computers typically available in such regions (not state-of-the-art), a measure which addresses some concerns about technology deployment. Over the four months of the study, the tutor was used with three sets of children from different types of schools: private, middle-income students; public, low-income students; and the last set, children with only informal schooling. The improvements were highest in the middle set of children, speculatively due to the already reasonable skills held by the first set going in to the experiment, and to the difficulties in using the tutor for the

third set. In addition to technical analysis, the authors highlight many of the relationship-building and design challenges in fielding such technologies.

Sheetal K. Agarwal, Arun Kumar, Amit Anil Nanavati, and Nitendra Rajput present a design and field deployment results for a voice-based content generation and navigation system that uses mobile phones and is intended for rural users. This study addressed a key challenge that many have identified but few have solved: how to convince the majority of a population to not just become users of ICT, but creators of ICT content. They used mobile phones which were widely available as their interaction medium and interconnected these into a server and system housed at their research lab. The usability study was quite large, logging more than 6,000 users over a nine-month period. The design was not fully end-user driven, with voice-kiosk operators and domain specialist experts creating or managing some of the content. End-users did create content in the form of advertisements. The system ran successfully from both an uptime and usability perspective (addressing the design), as well as from a consumer demand perspective. Even without much training or advertising by the partner NGO (the Byrraju Foundation), the word-of-mouth buzz led to exponential growth in usage, mirroring the famous "hockey-stick" graphs associated with the Internet.

We then present two papers that deal, in very different ways, with factors that impact the adoption of ICTs. Joyojeet Pal looks at a factor that has been "hidden in plain sight": the portrayal of ICTs in the mass media. ICT4D researchers to date have been so familiar with the technology that they have dismissed or ignored such portrayal. It has thus been absent as a research topic. But for yet-to-be, would-be, and recent users of technology, the representations of ICTs in the mass media—particularly the images of ICT users—are likely to have a strong shaping effect on their adoption motivations, expectations, and choices. Pal demonstrates this through analysis of Indian cinema, showing how ICTs have increasingly intruded onto the silver screen, associated with aspirational roles—including for women—and as powerful tools for cinematic heroes. Causal evidence chains are absent as yet, but there is a plausible line from here to the aspirational and omnipotential values ascribed to ICTs in rural surveys.

Far from this "soft" and cultural perspective, Faheem Hussain and Rahul Tongia are also interested in adoption of ICTs, but they focus on deliberate choices of technology by strategists and managers, basing guidance on cost-benefit estimations. They combine two different methods: cost estimations based on a series of detailed calculations, and effectiveness ratings drawn from a panel of ICT4D experts. Put together, these can then produce a set of innovative charts which provide a graphical summary for practitioner or decision-maker use. Their cost-effectiveness rankings cover a range of technologies and information services that are of value to rural populations. They find that face-to-face and community radio are the most highly-rated across these services. However, significant value is attached to Internet-enabled information centers, and to the possibilities of hybrid solutions that combine the capabilities of various technologies.

Our next two papers look at the uptake and use of ICTs. Michael L. Best, Dhanaraj Thakur, and Beth Kolko examine the contribution of user-based subsidies to the impact and sustainability of telecenters in Kyrgyzstan, undertaken through the USAID-funded eCenter project. The user subsidies, in the form of coupons for both training and free or subsidized Internet access, are meant both to help the financial viability of the telecenters, and to bring in new users and create greater social impact. Based on a range of data-gathering methods (spanning site visits, examining usage logs, interviews, surveys, etc.), the authors find greater evidence of the former, and while there is some (perhaps temporary) increase in utilization, they find limited evidence for social impacts. Here, they suggest that modifications such as targeted subsidies (e.g., toward women) might be required.

Michael L. Best is also co-author of the second paper in this grouping, with John Etherton, Thomas N. Smyth, and Edem Wornyo. In this paper, the focus switches from telecenters to that other mainstay of the ICT4D world, mobile telephony. The authors studied the use of mobiles in post-conflict Liberia by interviewing 85 users in both an urban and a rural setting, seeking to examine the motivation and uses of a mobile phone under a uses and gratifications approach, combined with Q-methodology analysis (which allows for deeper analysis of comparative or rank-centric data). The Liberia study finds user perspectives for mobiles as productivity enhancers, means of connectivity to family and friends, essential business tools, technological curiosities, and sources of personal security. This study does not indicate a mobile as a "stylish object," especially not in rural areas.

Our final paper, by Subhash C. Bhatnagar and Nupur Singh, turns to the last component of the ICT4D lifecycle: development impact—an issue much talked-about but still too-little researched. They pick a key ICT4D application, e-government, and present one of the first systematically-analyzed, multi-case studies of impact. The results are fascinating and likely to be widely cited, and their framework approach is likely to be widely replicated. Though careful with their caveats, they provide clear evidence that e-government in developing countries—at least in their focal nation, India—is working. It has reduced both the number of visits required to government offices and the waiting times, and it is thus saving citizens money. It is leading to better service quality and fewer errors. Perhaps most notably, e-government is reducing the number of bribes paid, striking at the heart of a key governance failure in developing countries and helping to improve citizen ratings of governance. Not surprisingly, over 90% of those surveyed prefer computerized government to manual government.

The papers presented here show continued innovation in our field: both technical innovation delivering new ICT solutions to development problems, and research innovation delivering new evidence that will enable better ICT4D program and project design. Above all, they show how ICTs are unequivocally making a beneficial contribution to development.

It is no wonder, then, that the ICT4D field continues to grow, with an estimate (http://ict4dblog .wordpress.com/2010/02/08/ict-for-development-research-size-and-growth/) that ICT4D research output is expanding by nearly 40% per year, with several hundred academics and several thousand PhD researchers worldwide working specifically on ICT4D topics. They work alongside thousands of staff in donor agencies, national governments, and private firms who occasionally contribute to scholarly and research outputs. Several thousand more academic staff, particularly in business/management and informatics, undertake occasional research in the field.

The ICTD conferences and their associated journal special issues in *Information Technologies & International Development* provide a key center point for this expanding field, and we hope you enjoy and value these chosen papers. It has been a long and sometimes strenuous journey from our first conference call to this special issue, but a journey that we have enjoyed and valued. We could not, of course, have done it alone, and we close by once again thanking all those involved with the ICTD2009 conference, not least Dr. M. Bernardine Dias, the Conference Chair, and the whole editorial and review team who have assisted us with this special issue.

Managing Editor's note: Both Guest Editor Rahul Tongia and Editor-in-Chief Michael L. Best recused themselves from participating in the selection and review processes that involved the articles they co-authored.