

# IT for the informal sector in developing countries: A broader perspective

## Abstract

Although the informal sector's presence in the developed world is by no means meagre, the themes and issues related to information technology (IT) for this sector in the developing country contexts seem stark and deeply contrasted with those relating to the informal sector in developed countries. Solutions which attempt to exploit the potential of IT for the informal sector have thus far been either knee-jerk, ad-hoc, or have mimicked those targeted at the formal sector. However, technology tools available today can accelerate, catalyze, and go beyond the conventional straight-jacketed technology, economic, and policy solutions for the informal sector. The papers in this special issue reflect this theme and attempt to present a glimpse of the possibilities for achieving and the challenges in effecting such solutions.

## 1 | INTRODUCTION

Debates about informality have appeared intermittently in the academic literature since the late 1960s, especially in the field of economics (Gërkhani, 2004). Two reasons drive this interest among academia and policy makers. First is the very definition of the informal sector; the nature and size of the sector continues to be debated (ILO, 2014; Tokman, 2007). While one view classifies the sector into subcontracted employees, self-employed, working for one's family, and small entrepreneurs (Vanek, Chen, Heintz, & Hussmanns, 2014), another classifies it into three distinct employment categories in the informal sector, the formal sector, and domestic work sector (Bhattacharya, 2019; Martinez, Short, & Estrada, 2017). The second reason is the social, political, and economic implications of the informal sector. Governments across the world have persisted in their attempts to either embrace this sector or in non-obvious ways bring it into their macroeconomic purview largely for the purpose of labor safety, economic control, and tax compliance. Yet the informal sector has endured such attempts and may continue to do so in an increasing number of ways and forms. The conceptual relevance of the sector and its functioning are therefore significantly appealing to both academic researchers and practitioners, especially in the policy formulation arena.

The rapid proliferation of IT in the last decade or so, combined with the increasing potential benefits of such technologies on individuals, organizations, and society, demands that academic research in the IS/IT area analyzes the nature, role, and intensity of the consequences of use of such technologies on the informal sector. It is often hoped that technology support for the informal sector can bring in the much-needed increase in efficiency (Johnson & Thakur, 2015). However, the dominant focus of research in this area has been on the use, adaptation, and effects of mobile phones as communication devices. Extensive reviews of the academic literature on mobile phone use and adaptation by the informal sector and small-medium enterprises are available (Donner, 2008). The use of other information technology-based devices and/or applications including both social-media-based networking applications or professional work-related applications such as task schedulers, e-commerce platforms, payment systems, and bookkeeping applications now demands discussions in the context of the informal sector (Ilavarasan, 2019; Rangaswamy, 2019).

## 2 | PAPERS IN THIS SPECIAL ISSUE

Studies on IT for the informal sector can be classified into two central themes. The first focuses on how technology has enabled the fulfilment of traditional notions of socioeconomic development such as enhanced livelihood opportunities, access to education, healthcare, and credit. This cluster of studies has quite often seen technology as a black-box, one that is *given* and one that users buy, use, and gain benefits from. The second theme that has garnered space in the Information and Communication Technologies for Development (ICT4D) literature involves a broader view of technology use by informal sector participants, such as by drawing attention to less insular demographic and livelihood settings.

In the Hawaii International Conference on System Sciences, we invited authors to present papers as part of a workshop on IT for the Informal Sector in Developing Countries (HICSS, 2018). During this workshop, the role of information technology in aiding the progress of the informal sector and mitigating the challenges they face were discussed. A context for further exploration including theoretical approaches, potential gaps in current literature, and ideas for country-specific case studies were reviewed. Our idea of this special issue stemmed from that workshop. Extended versions of two of the papers presented at the workshop also appear as part of this special issue, apart from seven other papers. In the HICSS workshop as well as in this special issue, we aimed to bring together papers from both central themes mentioned above.

In this issue, we present nine papers, each focusing on a different facet of IT for the informal sector. While four of the papers discuss specific initiatives to create and use technology solutions for the informal sector, three others take a broader perspective and present overview frameworks for different facets of the theme, and two papers debate the state of the informal sector, questioning the assumptions about the sector's use of ICT while at the same time drawing our attention to new characteristics enabled by ICT.

The first two papers of the special issue present glimpses of an ongoing debate relating to IT for and in the informal economy. Bhattacharya (2019) in his paper titled "IT solutions for the informal economy in developing economies: What can one expect?" critiques the common myths about the informal sector while placing forth two significant competing perspectives about the sector: firstly, the notion that informal businesses can be a transition stage in the course of development as informal labor migrates to the formal urbanized economy; and secondly, the perspective where the informal sector is seen as a means of survival for the poor who are typically, for reasons of skill and access, excluded from the formal sector. Bhattacharya also suggests the need to question fundamental assumptions regarding the role of IT in the informal economy, one that assumes the stance of efficiency-aiding while relegating the challenges that it imposes on the skills demanded from the labor in the sector to the background. Rangaswamy (2019), in her paper titled "A note on the Informal Economy," identifies an alternate "informal" where, in the internet-fueled gig economy, freelancing actors who are also technically skilled professionals form the new segment of informal workers apart from the gamut of service providers relating to technology including those who repair and upgrade ICT devices. Rangaswamy contends that these have compounded informality in the context of businesses and work practice in general. These may well help fulfil the long-standing demands of the informal workforce in attesting greater recognition to their presence and contribution to the economy of different nations, especially the developing and emerging economies.

In "The Use of ICT in the Informal Recycling Sector: The Brazilian case of RELIX," Coelho, Hino, and Vahldick (2019) described the Relix project in Northeast Brazil, which promotes cultural and educational interventions for recyclable waste picking. The project provides a mobile application to connect the local population to waste pickers. Not surprisingly, the authors show us that the app could not single-handedly promote any meaningful changes in the lives of people. Despite this, the app was able to help waste pickers and the population to connect, and the article describes how ICT can improve working conditions and create more innovative and equitable environments.

The paper by Uduji, Okolo-Obasi, and Asongu (2019) titled "The impact of e-wallet on informal farm entrepreneurship development in rural Nigeria" focuses on the impact of Nigerian government's mobile e-wallet subsidy programme for farmers in rural communities. The topic is significant given the socioeconomic role mobile technologies continue to play for rural and farming communities in developing countries. Based on a survey, the study argues that the success of e-government mobile money subsidy for rural farmers depends on their mobile network access and ICT literacy. The paper therefore calls on developing country governments to promote mobile network access for farm entrepreneurship in rural communities.

An approach to understand the benefits that ICT can provide the unbanked is also dealt with in the paper titled "Computing for Social Good: Supporting Microfinance Institutions in Zambia" by Wakunuma, Siwale, and Beck (2019). They investigate the link between ICTs, micro-finance institutions (MFIs), and provision of social goods for the unbanked in Zambia. Specifically, the study finds out whether ICT in MFIs leads to social goods, defined as the broader benefits for communities beyond immediate economic advantages for firms and their customers. The topic is relevant given the growing ICT potential for financial inclusion for the unbanked in rural communities in the developing world. Using evidence from interviews, the paper argues that beyond direct economic gains of increased revenues and reduced costs, ICT in MFIs can promote proximal access to financial services and improved living conditions for remote and rural communities.

Digital divide is the focus in Siqueira, Souza, and Barbosa's (2019) article on "Using a Digital Divide Index among Enterprises in the Context of Public Policies in Brazil," where the discussion presented is the relevance of an index capable of measuring digital divide among small and medium enterprises (SMEs) and its importance in the context of public policies. In Brazil, and we could extend this argument to the developing world, the digital divide mainly affects microenterprises and SMEs. The classification of informal, micro, and small enterprises can largely vary in different countries and world regions, but an ICT indicator of digital divide among these enterprises can be useful for managers leading public policies for economic development.

Ilavarasan's (2019) paper "Present and future of use and impact of Information and communication technology in the informal microenterprises: Insights from India" extends the focus on digital divide and argues, based on the Indian case, that usage of information and communication technologies (ICTs) in informal microenterprises in the developing world is still in the nascent stages. The informal microenterprises have not (yet) received the desired and expected impact of ICTs. The authors argue that the future pathways of linkage between ICTs and informal enterprises can be reshaped by the emerging automation technologies, an avenue for future studies.

The next paper by Tabassum, Kulathuramaiyer, Harris, and Yeo (2019) titled "The Indirect and Intangible impacts of a Telecentre on a Rural Community" focuses on indirect and intangible impact of telecentres on nonusers in Bario, a rural community in Malaysia. This focus is significant given the limited ICT infrastructure and literacy level in developing country rural communities. Drawing on Sen's capability model for human development and qualitative impact methodology, the paper provides insights on how telecentres can promote connectedness, belongingness, social ties, and psychological empowerment for nonusers.

We conclude the special issue with Kaba's (2019) paper titled "Identifying an analytical tool to assess the readiness of aid information and communication technology projects" where he presents an interesting conceptual analysis of readiness to successfully implement IT projects targeted towards creating benefits and aiding the informal sector in developing countries and the factors that are important in assessing such readiness. The paper presents these in the context of aid-projects in Africa where policy makers and implementers can use the factors recommended to increase the likelihood of success in such IT projects.

Some broad questions continue to interest information systems researchers in the area of informal sector. What is the nature of use of IT by the informal sector? Are IT applications enabling greater chances of survival, increasing efficiencies and effectiveness of the informal sector? Can IT help socioeconomic *development* of the people employed in the informal sector? Will the increasing availability and access to cost-effective IT applications encourage the informal sector to equip themselves with higher capabilities? Do participants of the informal sector fear that adopting IT tools and platforms will force formality on them?

### 3 | SOME FUTURE DIRECTIONS

The universalist best practice view of information technology for development has been questioned by one stream of literature in the area, which argues for a more context-sensitive approach to understanding the drivers for and consequences of adoption, use, and adaptation of information technology-based tools and applications by individuals and organizations in developing countries (Avgerou, 2010). In further emphasizing the need for a contextualized approach to understanding, studying, and promoting technology use by actors in the informal sector, we need to draw upon some basic tenets from the academic literature in development economics and other socioeconomic disciplines of thought. One such fundamental understanding is the notion of the informal sector as a stop-gap arrangement, providing people with an opportunity to accumulate skills while allowing prospective employers to use the opportunity to screen potential employees and assess their ability (Cano-Urbina, 2016). A second related aspect, which may help abstract the affordances offered by ICTs for the informal sector and their adaptation, is that of technology use beyond utilitarian purposes such as entertainment, gaming, and other forms of leisure (Arora & Rangaswamy, 2014). Technology taken to the masses through the presence of the "mobile-shop-around-the-corner" (Lugo & Sampson, 2008) and the slow and gradual reframing of users who otherwise see themselves as nonusers (Oreglia, 2014) help accelerate this. Taken together, these two tenets help us understand the potential for using ICTs, especially mobile-based application platforms, as a means of supporting informal sector participants in enhancing their capabilities, access to resources, and productivity while at the same time refraining from attempting to view technology as a means of forcibly converting the informal to the formal.

A vast majority of the literature, barring a few exceptions, on information technology use by the informal sector attempts to understand the phenomenon through arguments that compare the possibilities that IT offers formal organizations in their quest for efficiency, profitability, and growth, drawing upon them to see potential parallels for the informal sector. The fundamental frames prevalent in the informal sector, on the contrary, are small scale, social embeddedness and reciprocity, which demand altogether different perspectives than those usually applied to the formal organization. In a similar tone, theoretical lenses that are predominantly created for IT adoption and use in the formal organizational environments cannot suffice to abstract the nuances that exist in the contexts of the informal. The inadequacies of these seem starker when one attempts to articulate the finer details of technology appropriation, such as those visible in Coelho et al. (2019) when they talk about technology app as a link between the waste pickers and the population in Brazil, although it is unable to transform their lives in any meaningful way, or from the complementarities whose presence is seen to be essential in order to ensure that beneficial effects of ICT are felt, as is seen in Uduji et al. (2019) in the use of mobile phones by rural farmers in Nigeria. A means of resolving this inadequacy is to draw from diverse theories such as those from human development as has been highlighted in Tabassum et al. (2019) where the authors use Sen's Capability Approach to understand the impact of telecentres in Malaysia.

The distinction between the informal sector in the developed and the developing countries is often not accorded sufficient importance (Gërkhani, 2004). This distinction is relevant for a meaningful discussion on the potential of ICT for the informal sector, given that the primary reasons for the very existence of the informal sector in these two contexts differ, "possibilities for growth" in the developed and "survival" in the developing world. Interestingly, while some informal sector initiatives, especially those that are bordering on the formal and informal, lend themselves well to such forms of theoretical abstraction, others that are more fragmented and scattered in their efforts to adapt ICT-based applications do not. We therefore see the need to draw upon innately interdisciplinary lenses to help information systems researchers grasp the true nature and evolution of technology use appropriation and through that the changing nature of the informal sector itself.

Priya Seetharaman<sup>1</sup>  
 Maria Alexandra Cunha<sup>2</sup>  
 John Effah<sup>3</sup>

<sup>1</sup>Management Information Systems Group, Indian Institute of Management Calcutta, Kolkata, India

<sup>2</sup>Escola de Administração de Empresas de São Paulo Fundação Getúlio Vargas (FGV), São Paulo, Brazil

<sup>3</sup>University of Ghana Business School, Accra, Ghana

#### Correspondence

Priya Seetharaman, Management Information Systems Group, Indian Institute of Management Calcutta, Diamond Harbour Road, Joka, Kolkata - 700104, India.  
 Email: priyas@iimcal.ac.in

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**AUTHOR BIOGRAPHIES**

**Priya Seetharaman** is currently an Associate Professor of Management Information Systems at Indian Institute of Management, Calcutta. She is a Fellow of IIM Calcutta (Ph.D.). Her primary research areas include Adoption, Use and Evolution of IT in Organisations, IT Governance, Healthcare IT and IT in the Developing Countries Context. She has published in journals including Technological Forecasting and Social Change, Journal of MIS, Information & Management, Computers in Human Behaviour and Online Information Review among others. Her papers have also appeared in proceedings of the various leading information systems conferences including ICIS, AMCIS, HICSS, ECIS, ACIS, DSI, etc.

**Maria Alexandra Cunha** holds a Doctorate degree in Business Administration from São Paulo University (USP) and she is a Professor at Escola de Administração de Empresas de São Paulo (Sao Paulo Business School), Fundação Getulio Vargas (FGV), where her line of research is information technology management. She has been leading academic research and professional projects in ICT governance, e-government, e-governance and e-democracy, and initiatives on computerization in governments. More recently, her research interests are in ICT for development and in the area of smart cities. Her research has appeared in journals such as Information Polity, Information and Organization and Information and Software Technology, apart from others. She is a member of editorial boards of multiple Brazilian academic journals in Business Administration. Alexandra has been active in promoting information systems research in Portuguese especially research from and focused on Latin America. She was earlier the coordinator of the ADI (Information Management) division of the Association of Graduate Studies and Research in Management (ANPAD) in Brazil.

**John Effah** holds a PhD in Information Systems from the University of Salford at Manchester. He is the immediate past Head of Department for Operations and Management Information Systems at the University of Ghana Business School in Africa and Ag. Director of Institutional Research and Planning for the University of Ghana. Prior to joining the University, he worked as a Senior ICT consultant with Deloitte & Touche. John's research interests include technology entrepreneurship, e-business and technology-related challenges in developing countries. John's prior research has appeared in Information Technology for Development; Journal of Enterprise Information Management; Electronic Journal of Information Systems in Developing Countries; Journal of Internet Banking & Commerce, among others. John currently serves as an ICT consultant for the Government of Ghana on ICT Policy and Planning, advising the National Development Planning Commission on ICT related issues. He is the lead consultant for Ghana's ongoing long-term ICT Planning and Policy Development. John also serves as ICT consultant for the National Accreditation Board for Higher Education in Ghana and the Institute of Chartered Accountant of Ghana.