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Exploring a Complexity Framework for Digital Inclusion Interventions

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Abstract

The current global scenario of technology change and social change make necessary to rethinking the vision and methods employed by governments, development agencies and private sector to impulse socioeconomic development through the adoption and application of Information and Communication Technologies (ICT). We pose that the availability of computing and telecommunications infrastructure, highly converging devices for Internet access and content suited to the population needs and idiosyncrasies are not enough to accomplish long-term socioeconomic development. This paper suggests that non technology-centric programs are necessary to effectively achieve sustainable digital inclusion projects, particularly in remote and underserved populations. This new perspective, encompassing strategies for social action with grass roots participation including technology adoption programs and a strong component of moral leadership may contribute to turn ICT into successful development engines. Furthermore, we argue that the confluence of Digital Convergence with social and environmental phenomena is creating new divides whose multifactorial nature can be analyzed using the principles of complex adaptive systems.

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1. Introduction

A new scenario is emerging where ubiquitous and unlimited connectivity fuelled by broadband and mobility convergence, together with other societal, cultural and economic factors contribute to redefine the nature of the Digital Divide. We adopt in this paper a conceptualization of the Digital Divide as a multidimensional phenomenon, conceived as a process more than a condition, regarding the adoption, application and appropriation of digital technology and content to support socioeconomic and cultural development of a social group or region. In this respect, we acknowledge that this conceptualization allows the consideration of different intertwined “divides” that coevolve and interact in a dynamic and complex fashion requiring the development of epistemic and conceptual frameworks to acquire an integrated approach toward the understanding of the implications and impact of digitalization in society.

There have been significant efforts during the last two decades to define indicators to estimate the Digital Divide among nations, regions and social groups. The first attempts considered primarily parameters of technical nature related with access to computers and Internet connectivity. Though these technical parameters gave an initial indication of the magnitude of such divide, they did not provide a complete picture of its dimension and context. Before the spread of the Internet and the explosive penetration of wireless technologies, telecommunications infrastructure, measured by telephone density (number of fixed telephone lines versus population) was an important development indicator. The application and adoption of ICT in the social fabric and the emergence of Digital Convergence required the consideration of new elements to define with more precision the status of the Digital Divide in a particular region. In a dynamic and increasingly complex world scenario, under the influence of globalization, digitization and convergence, we pose that the development of effective digital inclusion programs requires a departure from a technically centric framework of the first generation of digital inclusion projects^{1,2}. Though it has been acknowledged that community participation and the understanding of the socio-cultural dynamics of the population are crucial to reduce the Digital Divide, nevertheless, technical determinism has been still a dominant force^{3,4,5}. We propose that national and regional agencies in charge of defining and implementing the agendas for digital inclusion, -particularly in rural and underserved communities- consider comprehensive social action plans conducive to connect ICT with community prosperity^{6,7}. Furthermore, governance and other factors as equity and moral leadership become more and more important to create successful projects for digital inclusion, i.e., human factors more than technology define the long-term sustainability of digital inclusion programs. Aspects regarding trustworthiness and an active morality must become the foundation for all leadership if true progress is to be achieved^{8,9}.

Recent developments regarding wireless penetration and adoption in communities around the world corroborate the relation of ICT and socioeconomic development. In this respect, the International Telecommunications Union (ITU) considers that ICT are key to achieve the 17 goals of the 2030 Agenda for Sustainable Development¹. Comprehensive regulatory initiatives and the understanding of market dynamics and customer preferences have contributed to expand the use of mobile technologies in practically all endeavors of society. Those service providers that have been able to understand the users’ requirements and contexts have at the same time propitiated development opportunities not explored before.

2. The need of a new approach

Many governments in developing countries include in their discourse the importance of digital inclusion as an enabler to improve the socioeconomic condition of the less privileged and underserved populations. When the efforts are mostly focused on provision of connectivity and content delivery, without clear strategies and vision for moral and sustainable development with community participation, the projects do not reach their real potential, neither they contribute to empowering the population to achieve higher levels of prosperity in their transit toward a knowledge and creative societies; a paternalistic pattern of development persists.

Wireless penetration and broadband Internet infrastructure have led to the creation of platforms for implementing relevant and pertinent applications of ICT with great potential for development (ICT4D)¹⁰. We reiterate that in order

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