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Abstract

Information and Communication Technology (ICT) has contributed significantly to the socio-economic development of societies. Especially developing countries are now beginning to experience the digital service transformations that previously took place in the western world. However, very little is known about the extent to which ICTs have transformed developing countries on a macro, meso, and micro level. In fact, the current lack of knowledge related to digital service transformation in developing countries may be one reason for why ICT for Development (ICT4D) projects continue to fail, and evidently do not achieve the anticipated societal impact. This research-in-progress aims to address this significant gap in knowledge and associated societal challenge by proposing potential research pathways rooted in the meta-theoretical lens of Service-dominant (SD) logic. We put forward a novel research framework that demonstrates how SD logic may be applied to investigate ICT-enabled service transformation in developing countries, and delineate future research avenues for Information Systems scholars attempting to contribute knowledge related to this important area of interest.

Keywords ICT4D, Service-dominant logic, institutions, value co-creation.

1   Introduction

Information and Communication Technology (ICT) has transformed societies, and contributed to the socio-economic development of nations over many decades. In fact, current expectations of the transformational power of ICT are so high that governments and funding bodies continue to embark on ICT projects geared towards the advancement of developing nations (Srivastava and Shainesh 2015). For example, in 2016 alone, the developing nations, like Egypt, Indonesia, and the Philippines, spent approximately US$ 344 billion on ICT for Development (ICT4D) projects. However, despite these expectations, new acquisitions of ICT resources do not always lead to the intended meaningful improvements for developing nations. In fact, Dodson et al. (2013) and Harris (2015) demonstrated that numerous ICT4D projects have failed to achieve the expected social transformations.

To date, there are two key challenges that prevail when attempting to benefit from ICTs in developing nations. First, there is a misunderstanding regarding the conceptualization of ICT resources, and the process through which they may create value. Current knowledge is largely influenced by goods-centric thinking that considers value creation to be a uni-directional process, stemming from monetary investments in ICT resources as the input, and value (e.g. performances, productivity), as the output (Nevo and Wade 2010; Ray et al. 2005). Consequently, ICT4D projects to date mainly focus on the acquisition and deployment of ICTs (e.g. hardware, software), and thereby overlook crucial facilitating factors like users' skill or stakeholders' support. Second, extant ICT4D studies lack comprehensive and holistic analyses and explanations of how ICT adoption transforms social structure on a systemic level (Hayes and Westrup 2012). This represents a substantial gap in knowledge, because ICTs are operated in an interconnected network across multiple societal levels and systems. Therefore, ICT-enabled transformation and innovation should be considered, and investigated as, collective multi-actor and multi-system interactions (Maglio and Breidbach 2014; Breidbach and Maglio 2015). However, current studies have not yet provided such a novel perspective (Grover and Kohli 2012).

This research-in-progress paper aims to address these gaps in knowledge by proposing potential research pathways rooted in the meta-theoretical lens of Service-dominant (SD) (Vargo and Lusch 2004, 2008, 2016). SD logic provides a novel lens of human economic exchange that is rooted in service rather than physical units of output (i.e., ICTs), and has repeatedly been applied to advance knowledge at the intersection of technology and digital transformation processes. Examples include service innovation in technical contexts (e.g., Lusch and Nambisan 2015), service supply chains (e.g., Breidbach et al. 2011; 2015), or sharing economy platforms (e.g., Breidbach and Brodie 2017). As such, SD logic offers the much-needed multi-actor and multi-system perspective to that is currently missing from the literature. For one, we argue that SD logic can advance ICT4D research by broadening the perspective on actors beyond government or funding bodies. Second, SD logic improves our understanding of value co-creation in ICT4D contexts by adopting a perspective that perceives value as a relational construct that is co-created by multiple actors in a collaborative and integrative process of resource exchange. Third, SD logic acknowledges that the perception of value is uniquely determined by the beneficiary in a phenomenological and context-dependent process. And fourth, through the process of institutionalization, SD logic explains why prior ICT4D projects failed to coalesce to social system. We propose a novel research framework that propose a new perspective to study this area of interest, and thereby contribute new insights through prospective research pathways that may help to better understand the in-depth mechanism of ICT-enabled transformation in developing nations. Guided by the propose framework, the next step in our research will involve an empirical study that will take into account a broader and holistic perspective of the interplay between technology and service ecosystems' viability.

This paper is structured as follows. First, we briefly discuss the challenges ICT4D research faces today, followed by an analysis of how SD logic provides a better perspective to address those issues. We then propose a framework for studying ICT and social transformation, and conclude our article by outlining contributions and potential future research opportunities.

2   Challenges in ICT for Development (ICT4D) Research

ICT continues to transform societies and contributes significantly to the socio-economic advancement of developing nations. However, while the proliferation of ICT is considered a crucial enabler of this digital service transformation, ICT4D projects continue to fail as they do not achieve the anticipated societal impacts. The distinct characteristics of the developing countries in terms of resources availability, culture, motivations, socio-economic conditions, political situations, institutional norms and rules, for examples, (Braa et al. 1995; Sey and Ortoleva 2014; Barrett et al. 2015), warrant a different theoretical perspective to explore digital service transformations from the perspectives and

approaches applied in the western world. We argue that due to inappropriate theoretical lenses deployed in most of previous ICT4D studies, there have been various issues and challenges observed. Based on our extensive literature review on ICT4D studies, below we summarize three key challenges identified as well as major shortcomings of approaches used in prior ICT4D studies.

2.1 Conceptualization of Resources and Value in ICT4D Research

ICT4D research is largely influenced by traditional IS value research which considers resources as the source of value (see Grover and Kohli 2012). The process of value creation is regarded as a mono-directional process based on value production chain in goods-dominant logic. For instance, the traditional IS value research considers investment in ICT resources (input) will enable capabilities (process) which later improve organizational performance (output) (Ray et al. 2004). This perspective is at a certain degree not relevant to ICT4D research, as it leads to misconception that an ICT4D project is mainly about acquiring and deploying the ICT as goods (e.g. hardware, software). This issue is evidenced in prior ICT4D research which is dominated by discussions about how developing countries can catch-up with advanced technology in developed countries. Thus, it undermines the role of contextual factors which facilitate the creation of value.

2.2 Perspective on Users and Stakeholders in ICT4D Research

Prior ICT4D research studied users and stakeholders in a narrow perspective, as it mainly focused on their acceptance toward ICT. This perspective fails to consider the synergy, collaboration, and synchronous intention and commitment toward the adoption of ICT among all stakeholders across each level of social system. Thus, it leads to incomprehensive understanding of the likelihood of project sustainability (Madon et al. 2007). For example, ICT4D research needs to explore the entire stakeholders' concerns and perceptions toward ICT as well as to uncover "conflicting institutional logic" (Findikoglu and Watson-Manheim 2016) between micro-level adoption and macro-level socio-political situation (Madon et al. 2007). A nation-wide Health Information Systems, for instance, will have a higher chance of failure if it is implemented mainly for the favor of the government without a significant participation from health workers at the micro-level (Gera et al. 2015).

2.3 Explicating Social Structure in ICT4D Research

Though recent ICT4D studies have acknowledged the importance of explicating social structure of developing countries, it is still unclear how ICT transforms the social system holistically. Recent studies have identified the unique components of social structure in developing countries (Barjis et al. 2013) such as culture, perception, political motives, or institutional rules (Sey and Ortoleva 2014). For examples, Madon et al. (2007), Puri et al. (2009), and Hayes and Westrup (2012) focused on exploring contextual factors and processes across all societal levels to propose an integrated strategy for ICT adoption. However, these studies have limitations in repeatability as they explored the phenomena using general approaches that heavily relied on researchers' experience and subjectivity (evaluation studies, participatory, and contextualist respectively). Gao's study (2007) emphasizes the importance of multilevel of analysis to better understand multi-actors' perspective toward nation-wide ICT infrastructure in China. This study, however, did not take into account the societal transformation and impact in its investigation as it mainly focused on standardization of technology. While Brown and Thompson (2011) has looked into socio-technical impact following ICT adoption, the study is somewhat limited because it was restricted to policy maker (macro-level) as the primary driver of institutional factors (top-down). Since the study did not significantly explore the firms' concerns as the micro-level actors (p. 339), it neglected the bottom-up institutional reproduction that may be occurred in a complex social system (Aanestad and Jensen 2011).

3 Service-dominant (SD) Logic as a Novel Analytical Lens

SD logic (Vargo and Lusch 2004, 2008, 2016) is a meta-theory which was originally used to study the holistic and systems' perspective of the market (Chandler and Vargo 2011), and later was extended to the phenomena of the society (Akaka and Vargo 2015, p. 460). In general, SD logic views society as an interconnected network of resources-exchanging actors to co-create value, which removes the restricted perspective of dyadic provider-consumer relationship. For over decade, SD logic has not only transformed marketing research, but also has substantially reconceptualised the fundamental principles of other disciplines, such as public administration (Osborne et al. 2016), conflict and social movement (Skålén et al. 2015), and information systems (Alter 2010). In ICT4D research, SD logic also has become increasingly useful as an analytical lens (Barrett et al. 2015). For instance, it helps the stakeholders in orchestrating the resources required to minimize service disparity (Srivastava and

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Shainesh 2015). However, it has not reached its full potential since prior studies mostly are engaged with a narrow context or simple actors' relationships (Akaka and Vargo 2015).

SD logic is built upon five axioms, which are used to study a theoretical construct called service ecosystems (Vargo and Lusch 2016). Service ecosystems are defined as *a complex, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation* (Vargo and Lusch 2016, p. 10-11). Within the context of ecosystems, SD logic views service as the fundamental basis of exchange (axiom 1). The beneficial impact (i.e. *value)* is regarded as *co-created* outcomes resulted from multi-actors' practices enactment, rather than proposed by or intended to only one actor (e.g. government) (axiom 2). It implies that value can only be created when the resources are integrated with other resources, hence every owner of other resources are also resource integrators (axiom 3). Since integrating resources depends on other stakeholders, value is determined by the context which explains why different contexts may exhibit different outcomes (axiom 4). Last, from SD logic perspective, the structure of social system is depicted as *institutions* which drive, coordinate, and facilitate value co-creation (axiom 5). The next subsections formulize SD logic views related to ICT and social transformation. Each subsection is elaborated based on axioms 1, 2, 3, 4, and 5 respectively.

3.1   SD logic View on Value

SD logic views value as co-created outcomes resulted from multi-actors' participation (Vargo and Lusch 2016). This implies that all actors in the social systems might gain and contribute to value consciously or unconsciously (Vargo and Lusch 2008, 2016), according to the constellation of resources that are involved during the moment of resource integration (Edvardsson et al. 2011). This is currently more relevant in studying ICT-enabled transformation because it is now operated in an interconnected network across multilevel social systems rather than a standalone application system. This perspective also has an implication to ICT4D that the value is relational and mutually co-created, rather than proposed by or intended to only one actor (e.g. users in remote area, government or policy makers). Further, it also reforms prior ICT4D research (or general IS value research) that sees value as a mono-directional process that adapts value production chain from goods-dominant logic (Grover and Kohli 2012).

Take an example on a problematic ICT4D initiative caused by lack of coaching, frequent power outage, or workers' job uncertainty (Gera et al. 2015; Sahay 2016). It suggests that the value of ICT can only be created when multiple actors and beneficiaries are included in manifesting the initiative. It also emphasizes that the value of ICT is not represented by how advanced the feature, hardware, specifications are. Consequently, the narrow perspective which considers the users as the main and solely determinant of successful adoption of ICT is no longer appropriate. Though contextual factors, such as culture and government policy, have been recognized in the literature, they are usually just acknowledged as supporting factors in value creation, unlike SD logic which considers them as sources of resources that enable value creation. Another implication from SD logic is that value is positioned as the central perspective in the transformation process in which the stakeholders' resources are involved.

3.2   SD logic View on Resources

Though SD logic also acknowledges resources as the source of value, it does not consider value as an output of processing those resources (i.e. goods). SD logic emphasizes the role of network structure to remove restricted role of 'producer' (resource owner and value provider) or 'customer' (recipient and consumer of value). With SD logic, all actors have a potential role to become providers and consumers simultaneously since it relies on resource integration and exchange activities (axiom 1) and considers social and economic actors as resource integrators (axiom 3) (Vargo and Lusch 2008).

This view offers a better perspective to ICT4D in two ways. First, it improves ICT4D research by broadening the sources of resources. While prior research tends to restrict the origins of resources to government or funding bodies, SD logic expands the perspective that the resources can be originated from public sources (e.g. communities, state-owned companies' CSR), private sources (e.g. insurers and foreign investors), or other entities (Vargo and Lusch 2011). Therefore, the sustainability of ICT4D project will not solely depend on the continuity of the funds, but also how the supports from other stakeholders. Second, it refines goods-oriented perspective of ICT that sees it as resources of competitive advantage. As discussed earlier, this traditional perspective might lead to misconception as it simplifies that merely acquiring ICT (e.g. hardware, software) will improve the condition in developing countries. Conversely, SD logic argues that knowledge and skill (i.e. operant resources) have a more crucial role in today's dynamic world (Akaka and Vargo 2014). SD logic also clarifies that

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ICT do not only serve as tangible or physical resources (i.e. operand resources), but can also be intangible resources. For instance, the role of ICT in the telemedicine system is regarded as an operant resource that facilitates exchange of clinical knowledge and patient's condition information.

3.3   SD logic View on Users and Stakeholders

SD logic views value to be uniquely determined by the users and stakeholders. SD logic emphasizes the importance of use and context. From SD logic perspective, actors in a service ecosystem do not gain value solely from exchanging the resources. Instead, they gain value based on their benefit from using it (so-called *value-in-use*). This premise is important as it distinguishes the service from goods where the value is represented by purchasing cost (so-called *value-in-exchange*). This view is relevant to ICT4D. For example, when an NGO grants a set of internet kiosk facility, the grantees (e.g. community) have not yet acquired the value according to the amount of the grants used to acquire such facility. Instead, they gain value based on their benefit from using it (i.e. *value-in-context*) where they integrate it with other resources including knowledge and skills to transform their life. Consequently, an ICT4D initiative should be viewed beyond the intention (e.g. perception) to introduce new technology but also how it contributes to the transformation of the social context as well as how other stakeholders provide resources to ensure project sustainability. This view also offers a better perspective to ICT4D as it explains why the same ICT might create different outcomes in different context (e.g. districts, nations).

3.4   SD logic View on Social Structure

SD logic acknowledges the role of institutions in service ecosystems to explain the structural change occurrence (Vargo and Lusch 2016). Social structure is defined by institutional theory as institutions; humanly devised rules, norms, and values, establishing a social structure that drives or constrains the organizations or individuals' lines of action (DiMaggio and Powell 1983; Scott 2008). These organizations or individuals are regarded as actors who enact the routine of actions as practices (Orlikowski 2000). In service ecosystems, a series of interrelated rules, norms, and values across multilevel contexts defines the notion of *institutional arrangements* (Vargo et al. 2015), adapting Herbert Spencer's viewpoints that the social systems are a series of institutional subsystems. Institutional theory also explains the process of ICT adoption through the notion of *institutionalization*, including its contributing factors such as institutional pressures and organizations' isomorphism (DiMaggio and Powell 1983; Scott 2008).

The recognition of the role of institutions in SD logic (Vargo and Lusch 2016) helps ICT4D research as it provides two guidelines in studying ICT and social transformation in developing countries. First, it emphasizes the interplay between ICT and social structure, widely-known as the dualism of interdependent agency and structure (Desanctis and Poole 1994). The structure is built by a set of rules and configuration of resources (Orlikowski 2000, pp. 406–407), which is continuously and recursively rebuilt by human's practices (i.e. agency), where ICT can be facilitator or even part of such new structure (Desanctis and Poole 1994). Second, it emphasizes the process of institutionalization, of which existing social structure needs to learn to adopt an ICT intervention based on institutional pressures and actors' legitimacy (Mignerat and Rivard 2009). It explains why prior ICT4D project failed to coalesce to social system. This failure, from service perspective, is defined as value co-destruction (Echeverri and Skalen 2011; Plé and Cáceres 2010), caused by actors' misuse of the resources either accidentally or intentionally that create an imbalance within the ecosystem (Frow et al. 2016, pp. 31–33).

4   Proposed Research Framework

Figure 1 presents the research framework to study the process of complex social transformation following ICT adoption. It provides a high level processual view on transformation that gives us a different proxy in examining the success/failure of ICT4D project which is mostly measured in the mainstream IS research based on the extent of use or organization's productivity. In this study, the social transformation is delineated through the process of institutionalization which is driven or constrained by institutional pressures and actors' legitimacy. During the process, some institutional works (creating, breaking, and maintaining institutions) occur from which the new rules, practices, and configuration of resources to improve value are continuously and recursively reproduced until they are fully institutionalized. If the transformation is successful, new institutions are formed, indicated by new resources configuration and practices of value co-creation as well as new rules and norms which are synergized across all social levels. Otherwise, the state of the ecosystems will stay within the loop until a balanced state, either successful or failed, is reached. During the transformation

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process, there is also a possibility that some value may be co-destructed and institutional logic between social levels (macro, meso, and micro) may be conflicted resulting in a high risk of project failure. Guided by SD logic, the process of transformation is examined through value co-creation by key actors involved, resources reconfiguration, and institutional rules at macro, meso and micro levels. This will offer us the most elementary level of the ecosystems (Breidbach and Maglio 2015) as well as a relational view of actors' relationship (Lusch and Nambisan 2015) so the in-depth mechanism of transformation is observable. The proposed framework also implies the exploratory nature of our study which tends to explicate the process rather than to identify variance (Markus and Robey 1988).
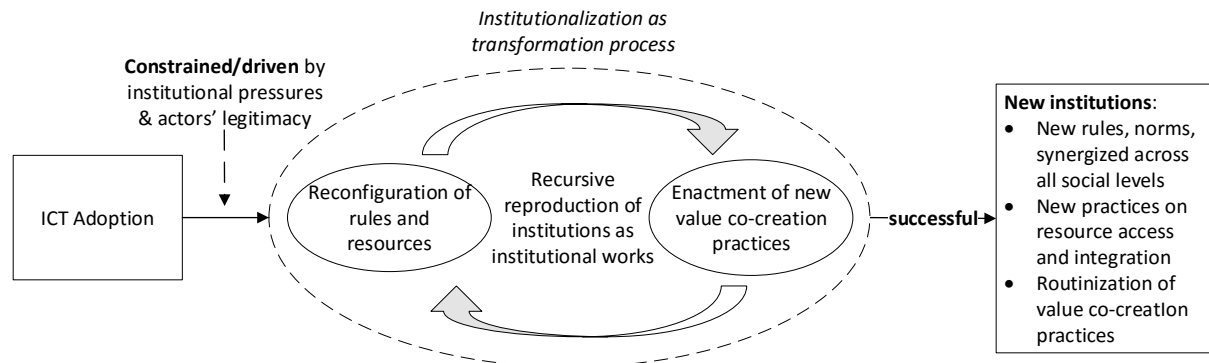

Figure 1 Process of ICT-enabled transformation in developing countries

5   Discussion, Contributions, and Future Research

This study has proposed a novel framework that demonstrates how SD logic may be applied to better understand the process of ICT-enabled transformation in developing countries. The notion of service ecosystems offered by SD logic to depict the social levels within the context may also provide a holistic perspective of ICT-enabled transformation process. However, while this approach seems to be promising, it is currently still in an abstract and conceptual level that needs further assessment and empirical exercises (Aal et al. 2016; Edvardsson et al. 2011; Koskela-Huotari et al. 2016). Thus, irrespective of the context, the key avenues for future research in studying ICT and complex ecosystems are clear. For example, little is known about how each social level within ecosystems works and interacts to institutionalize the ICT. Or, in a similar manner, if we depict institutions as a social structure of ecosystems, how is the value co-creation of ICT viewed from institutions' lens (Vargo and Lusch 2016)? Prior studies also tend to focus solely on the actors' motives on value co-creation, where the notion of ecosystems is merely a context or partition the level of analysis with no further investigation or explanation of its whole structure, such as symbol, norms, and rules (Beirão et al. 2017; Pinho et al. 2014).

As the next steps, we plan to conduct an in-depth case study in the context of nation-wide Health Information Systems in Indonesia. Guided by the research framework proposed, we plan to explore resources, value co-creation practices, and institutional changes related to the context of HIS adoption in Indonesia. Healthcare sector is regarded as a fruitful context in service literature (Berry and Bendapudi 2007) which "in dire need of improvements" (Danaher and Gallan 2016, p. 1). Further, the context of HIS in Indonesia, which is currently undergoing a major transformation through a nation-wide e-Health program, provides a rich phenomenon on both ICT and the service ecosystems. The empirical study will involve an in-depth single case study and the case of the HIS implementation is considered a revelatory case (Yin 2014). Key actors from two different districts (including districts' government, hospitals, and clinics) currently implementing District Health Information Systems (DHIS2) will be interviewed. Besides interviews, observations and analysis of relevant documents will be conducted during the data collection stage that will span over 6-8 months. Qualitative data analysis suggested by Miles et al. (2014) will be deployed. A multilevel analysis is employed in this study to enable an in-depth exploration of the transformation process on micro, meso and macro levels within the service ecosystems.

This study offers two potential contributions. First, it extends prior ICT4D research by unfolding the impact and transformation of socio-technical ecosystems following ICT adoption. Using SD logic, this study will provide rich insights into how to optimize and escalate the impact of ICT from merely one side of actor (e.g. central government) to multiple actors (e.g. health staff) in a multilevel span of social context. Second, this study will offer an empirical contribution by providing rich description and analysis of the interplay between technology and ecosystems' viability. While prior studies have

explained the inter-level interplay of value co-creation practices (Beirão et al. 2017; e.g. Pinho et al. 2014), it lacks explanation on the trade-offs between actors' new activities (i.e. practices) and ecosystems viability (Beirão et al. 2017, p. 245). In ecosystems, new practices might be associated with value co-destruction (Skålén et al. 2015, pp. 261–262) where the actors misuse the resources that create an imbalance within the ecosystem (Beirão et al. 2017; Frow et al. 2016). Further, this study will offer an empirical contribution on the role of ICT in innovation in ecosystems (Breidbach and Maglio 2016), which is conceptually argued as extensive but lacks empirical examples (Lusch and Nambisan 2015). Finally, the context of developing countries offers a unique opportunity to inform the service literature, as the current knowledge is mainly constituted from the context of developed countries (Barrett et al. 2015).

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