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Transitioning from Use to Effective Use of Digital Innovation Platforms for Development: An Evergreen Discussion

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Abstract

The disruptions of different nature occurring since the onset of pandemics such as Ebola & Covid19 have exposed the imperative to re-imagine digital transformation, towards a more realistic goal-oriented perspective. Public health organizations in many countries around the global south are at a crossroads, where the digital solutions at their disposal must be efficient, to address situations beyond technology adoption. Recent discussions have advocated for understanding what effective use of digital platforms is, as this would serve as a backbone between a system and the benefits it can deliver. In this research, we tackle the pressing imperative of using health information systems effectively for efficient organizational transformation. The insights discussed in this research will assist both scholars and professionals in reflecting on the digital transformation of public organizations in the global south, and the drivers behind the effective use of health information systems in fragmented economies.

Keywords

Effective Use Theory, Digital Transformation, Organizational Performance, Global South

Introduction

For several decades, we have been witnessing a dazzling surge in research on health information systems (Walsham 2020). This increase in literature within the field can be justified by the fact that organizations have understood the financial chasm that exists in the current economic and technological model (Sachdeva et al. 2017; Wyatt and Wyatt 2003). Thus, in an endeavor to mitigate costs and transform the health paradigm towards a simpler but efficient model where the patient is no longer an observer of his medical process, but rather the owner of his medical process, health systems are becoming more and more decentralized and accessible (Reis et al. 2017). Despite this transformation of the health landscape, health institutions are now confronted with another dimension of questioning, which has no bearing on the quantity of use of their systems, or the ownership of their functionalities, but rather the efficiency of these systems in responding to the requirements and achieving the expected objectives/results (Burton-Jones and Grange 2013; Burton-Jones and Volkoff 2017; Kuika Watat and Jonathan 2021). Current literature on Technology-based health systems has a strong focus on adoption (Venkatesh and Bala 2012), use (Iyengar et al. 2015; Thatcher et al. 2018), user satisfaction (Sebetci 2018). Given the multitude of studies on the use of digital technology in health and its implications at the individual and organizational levels, little is known about its effectiveness, or whether patients, health care workers, and institutions achieve their goals through its use

The literature on digital platforms for development has focused heavily on their acceptance in different environments (Burton-Jones and Grange 2013). However, with their increasing attractiveness for sustainable socio-economic transformation, the focus on their use is no longer enough for prediction over time (Venkatesh et al. 2003). The ongoing discussion in the emerging information systems literature is increasingly focused on understanding effective use of systems, i.e., a much more real experience for users, leading to the achievement of desired goals (Bao et al. 2020; Burton-Jones and Volkoff 2017). Research has shown a need for systems analysis research that targets desired outcomes by exploring

processes and behaviors around utilization. However, many questions remain, especially those related to the operationalization of the effective use, and the conceptualization of such a paradigm (Burton-Jones and Grange 2013, p. 634). This awakening has been more than ever necessary in view of the various health and natural disasters that have shaken the planet in recent years like covid19 (Wade and Shan 2020) or Ebola (Jalloh et al. 2020).

This study addresses the call for empirical research and intends to probe the causality between the effective use of a health information system and organizational performance. This project aims at developing a theoretical rationale founded on digital transformation of public organizations in the global south, through the effective use of health information systems to boost their efficiency and technological know-how. Thus, to achieve these ends, the present study will answer the following question: *How can effective use of a health information system drive organizational performance?*

Theoretical Underpinnings

The central node of the theory addressed in this research is effective use, which is formalized as the use of a health information system to fulfil the purposes for which it was designed (Burton-Jones and Grange 2013). To underpin the design foundation of this theory, one must trace its roots back to the theory of representation, which structures any information system according to three interlocking dynamics: physical, surface and deep structure (Burton-Jones and Grange 2013).

- The first dimension is physical, since it refers to a set of supporting infrastructures deployed to build the system. In our case we can list the computers used for data entry, the network architecture to connect all access points.
- The second dimension is surface/visual, as it concerns what the system represents to users. One might itemize various user graphical interfaces, dashboards, and screens that users browse through to build a visual representation of how the system behaves.
- The deep dimension focuses on the objects for which the system was designed. Consequently, it depicts the data structures and relational patterns between them.

Thus, effective use of a health information system entails the enactment of three heterogeneous affordances: the user's transparent interaction with a system to afford accurate representations of that system, leading to informed action (Burton-Jones and Grange 2013, p. 644). This scenario is referred to as an *affordance escalation*, as enabling each higher level of affordance is contingent on the release of the lower tiers. *Transparent interaction* denotes the closeness of a user's accessibility to various system representations unimpeded by the system's surfaces as well as its physical infrastructure (Recker et al. 2019). The formalization of this construct is tied to ideas found in various research literature on technology acceptance, namely accessibility and perceived ease of use. In our scenario, we exemplify this by discussing ways of aggregating elements of a health dashboard to enhance decision-making and information management in a health emergency situation. *Representational fidelity* refers to "the extent to which a user is obtaining representations from the system that faithfully reflect the domain being represented"(Burton-Jones and Grange 2013, p. 642); this construct evinces a connotative alignment with the theory as it yields a sense of fidelity, not as a predicate qualification of the system, but instead as an attribute of the system in operation (Burton-Jones and Grange 2013). Informed action refers to "the extent to which a user acts upon the faithful representations he or she obtains from the system to improve his or her state"(Burton-Jones and Grange 2013, p. 642). Consistent with the two preceding components, informed action serves as a trigger and updater of effective use of a system. This stance enables to explore distinctive traits, to foresee the representations to be unleashed and activated, as well as the supportive forces that reinforce these representations. Assessing the organizational performance of information systems is hardly an effortless exercise, considering the growing complexity of these systems. Organizational performance is therefore a critical topic for public organizations, as it opens doors to many different sorts of opportunities. Performance itself refers to a number of drivers, such as the system's latency, ease of use of the technology by users, and even the reliability of the resulting information (Miller and Doyle 1987). We argue that if a health information system delivers on key performance metrics, it has the capacity to serve as an invaluable enabler for the organization in achieving its objectives.

The Effective Use Theory is technology-theoretic, as its components are molded to apply to any information system. Consequently, its operationalization across a range of scenarios and constraints is gaining momentum in the literature. Lauterbach et al. (2020) brought the theory to the forefront to tease out the existing entanglements between the banking system and its associated workflows, uncovering that the core challenge may instead lie in the co-dependency between systems and tasks. Burton-Jones and Volkoff (2017) functionalized the theory in a healthcare circumstance as a nexus of causative forces that refers to consistency, thoroughness and thoughtfulness in action. In a market-based socialist economy, effective use theory has indicated that effective use of health information systems is shaped by core constructs like self-efficacy, quality of information & system, and management support, which, incidentally, heightens self-efficacy for women, but less so for men (Yang et al. 2021). In a chaotic environment, the theory of effective use has been idealized with evaluative attributes pertaining to immediacy, readiness, and promptness (Bonaretti and Piccoli 2019).

In the conceptualization of a phenomenon, it is of utmost priority to forge a nomological legitimacy, which points out the degree of exactness of concepts and their assessment, grounded on theoretical schemes and premises (Straub 1989). Benbasat and Zmud (2003) accentuates how necessary it is to use a system to experience the transitions, implications and effects: that is a core philosophy of the *nomological network*. This observation is fulfilled in the theoretical approach developed by William and Ephraim (2003), which introduces a causality connection at multiple degrees of impact between system use and the effects generated by it.

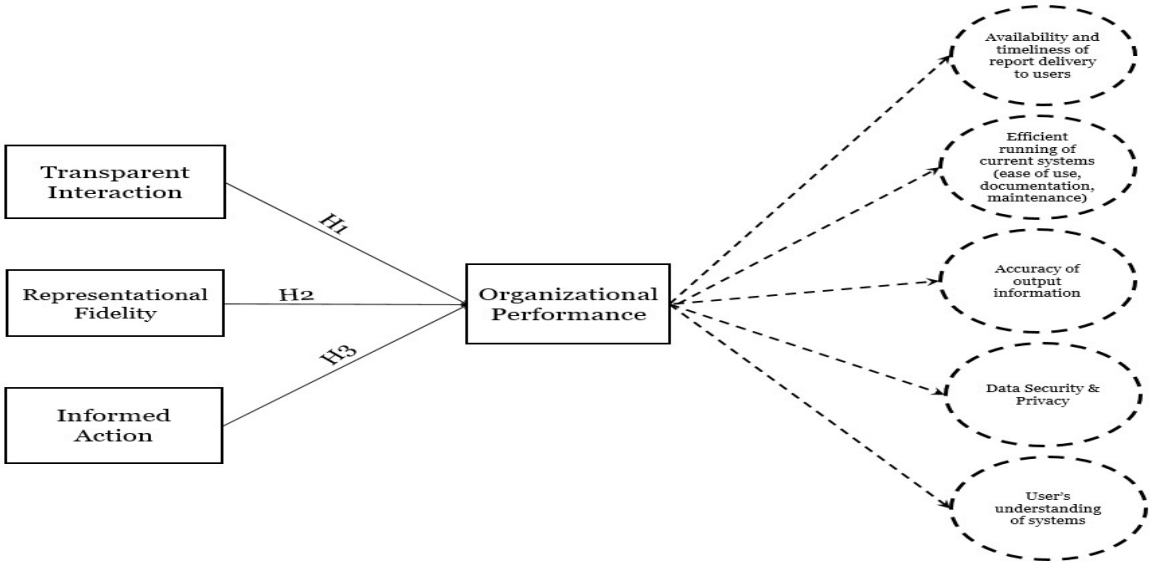

Figure 1. Research Framework

Methodology

To address our research question, this study will build on a mixed methods design approach, blending components of quantitative and qualitative methodologies. Furthermore, to provide deeper clarity on the thematic area under investigation, this research will engage in a two-dimensional strategy: first an exploratory analysis, and then a statistical analysis (Ågerfalk 2013; Kuika Watat et al. 2022).

The exploratory round will include in-depth and semi-structured consultations based on a careful selection of participants. The purpose of the discussions would be to get an idea of the theoretical scheme developed, in relation to the existing and dynamic phenomena around the research environment. The information gathered in this round will be merged with the findings of the documentary analysis to reach an optimized theoretical picture, which best captures the research environment (MacKenzie et al. 2011). Furthermore, the joint development of these steps will also allow for a better polishing of the measurement elements, by discarding the abstract points. In this exploratory stage, the requirements as presented by Phillips (1981) will be adhered to when selecting participants. Based on the key information

sought, the research will concentrate on profiles of interest, such as those at the heart of the decision-making process, and who follow the utilization process of the system. The focus on resource participants for this research enables us to circumvent the issue of elite bias (Myers and Newman 2007). In this research we will make use of the modelling concept, whereby codes will be formulated and clustered in line with the methodological outlook. Using the information obtained, we cluster the data by topics, and codes will be mapped to each piece of information. This will enable us to pinpoint key recurring trends and thus best visualize main opportunities and challenges (Goldkuhl 2019).

Upon completion of the qualitative assessment phase, a survey questionnaire will be administered in order to gauge the theoretical scheme and hypotheses outlined in the study. The survey questionnaire will also enable us to address the various shortcomings detected during the exploratory phase. Statistical analysis will consist of surveying key individuals using the District Health Information Systems (DHIS2) at the Ministry of Public Health in Cameroon. We will develop survey instruments, and then a pre-test will be performed based on the field's strategic vision, and the individuals who will be identified. Thereafter, a pilot examination will be undertaken to ensure the adequacy of the measurement items, and the sustainability of the core analysis instruments. The use of structural equation modeling in this stage will provide an opportunity to test the robustness of our structural model. The advantage of using such an analysis is that it accommodates the random sampling biases intrinsic to behavioral studies.

Conclusion

This research aims to contribute to the body of knowledge on the pressing imperative to reshape information systems from an objective and realistic perspective, especially in fragile and low economic contexts. In practice, there is a growing tendency for systems to be at odds with organizational objectives, and distant from the interests for which they were developed. Health information systems in most low-income countries are praised for their widespread use and acceptance in various fields of activity. This technological drive for adoption at all costs and at any price is sometimes the source of technological vacuum witnessed when understanding at what strategic and operational level organizations have gone through transformation or languished as a result of the introduction of an innovation. It would therefore be necessary for organizations to effectively use systems made available to meet constraints of various kinds. By doing so, organizations will convert their business flows by seeing innovation not as a buzzword, but more as a lever that expedites achievement of results and reduces bottlenecks.

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