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Linking theoretical perspectives to analyze health information and communication technologies in Brazil

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ABSTRACT

Brazil has developed health information and communication technologies (ICT), however, to date health information systems are fragmented and endeavors to integrate them have failed. This work links two theoretical streams in order to establish a framework to assess health ICT in Brazil. The proposed framework sees ICT as the result of public policy aiming at developing technical artifacts to assist society on health issues. Moreover, this framework sets up analytical dimensions for assessing this public policy, namely democratization, effectiveness, sustainability, and synergy. It also enables the analysis of the trajectory of this public policy via the actors involved with it.

1. Introduction

Information and communication technologies (ICT) have been present in the daily activities of most economic sectors such as commerce, entertainment, public services. In line with this, in the health context over the last twenty years, countries have backed national strategies to incorporate ICT into health practices (Alvarez, 2002; Blumental, 2009; Blumental & Tavenner, 2010; Bowns, Rotherham, & Paisley, 1999; Brasil Ministério da Saúde, 2004; Gunter & Terry, 2006). However, notwithstanding efforts led by governments and private institutions, papers, pens and stamps are still very much associated with daily routines within the health sector worldwide (Gauld, 2007; Moraes & Gomez, 2007; Venkatesh, Zhang, & Sykes, 2011).

This is also the case in Brazil, where the first health information systems (HIS) emerged in the 1970s (Moraes, 1994; Oliveira & Fleury, 1989) and after three decades significant progress has been made in an effort to develop ICT for the benefit of health. In Brazil, HIS were developed by actors in both public and private sectors to meet the demands of health planning and management alike, leading the country to develop a national health ICT strategic plan (Brasil Ministério da Saúde, 2004; Moraes & Vasconcellos, 2005). However, recent attempts by the Ministry of Health (MoH) aiming to construct an Electronic Health Record (EHR) on a national level have failed (Amora & Menezes, 2009; Gaspari, 2010, 2011) and HIS produced in Brazil continue to be fragmented, limiting the use of information for the benefit of the Brazilian population (Moraes & Gomez, 2007), to name just a few of the problems that still need to be addressed.

While there are various systems and technologies being used in the Brazilian health sector and access to information is a right guaranteed by the Brazilian Federal Constitution, most citizens are not allowed to access their health records and transmit them digitally. Consequently, questions have arisen about the barriers associated with the development and implementation of a health ICT public policy in Brazil, as well as what is needed to disseminate the use of such technologies in this area.

Besides that, in recent years, the contribution of ICT to promote development has been questioned, increasing the complexity of addressing ICT issues in developing countries (Avgerou, 2010; Heeks, 2010; Walsham & Sahay, 2006). Some authors have stressed the pressing need to enhance the theoretical grounds of the ICT4D field (Avgerou, 2010; Heeks, 2010), as well as integrate theory and practice more fully in this realm (Heffernan, Lin, & Thomson, 2013; Walsham & Sahay, 2006). Thus, this work intends to improve theory in order to better understand the health ICT arena in Brazil. In line with this, after a bibliographical survey of national and international scientific journals, two theoretical perspectives stood out in the efforts of researchers to understand the dynamics of health ICT in developing countries, namely (a) European studies of HIS in developing countries,[1] and

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[1] Research into HIS in developing countries can be found in Avgerou (2010); Braa et al. (2007); Braa and Hedberg (2002); Braa et al. (2004); Heeks et al. (1999); Kimaro and Nhampossa (2005, 2007); Kossi, Saebo, Titlestad, Tohouri, and Braa (2009); Sahay, Saebo, and Braa (2013); Sheikh and Braa (2011); Walsham and Sahay (2006).

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(b) Information and Information Technology in Health, developed under the aegis of the Brazilian Sanitary Movement.[2] Each research perspective has addressed, in a different way, similar questions regarding health ICT in the Global South since the 1980s. Therefore, research regarding health ICT and development might benefit from the combination of both theoretical perspectives.

In tandem with this, this work has the objective of proposing an integrated theoretical framework that permits the evaluation of the health ICT public policy in Brazil through the articulation of the two aforementioned theoretical perspectives. On the one hand, the proposed framework defines the dimensions of analysis of the health ICT public policy in Brazil, while on the other it establishes the contextual factors associated with the success/failure of same in Brazil. In this manner, the framework aims to make it possible to assess the health ICT public policy in Brazil via the understanding of the role of each dimension and factor of the framework in the implementation and deployment of health ICT in Brazil. By using this framework it might consequently be possible for practitioners and politicians to acquire a critical perception of the importance of the framework's dimensions and factors in order to know what must be developed, improved and/or fixed to better incorporate ICT into health practices in the country. In other words, the framework might be used *ex-ante facto* to develop and assess the feasibility of a planned HIS public policy in Brazil. By the same token, the framework might also be applied *ex-post facto* to better understand the outcomes accrued from the implementation of an HIS public policy in Brazil. In essence, by using the proposed framework this work aims to answer the following research question: How can health ICT public policy in Brazil be assessed? Besides, from this framework some propositions can be inferred to be further tested via empirical studies, in order to better understand the health ICT realm in Brazil.

This work is organized in the following manner. After this introduction, the second section presents an overview of the Brazilian scenario on health ICT. The third and fourth sections review the scientific literature that has emerged from research into HIS in developing countries and on Information and Information Technology in Health, respectively. The fifth section articulates the aforementioned theoretical perspectives and proposes an integrated framework for HIS analysis in Brazil. Finally, in the sixth section, some concluding remarks are presented.

2. The Brazilian scenario on health ICT: an overview

In Brazil, the first HIS appeared in the 1970s within the social security health system in existence at the time. In the 1980s, HIS were developed to control the billing submitted by health providers accredited by the Brazilian National Institute of Social Security (INAMPS) (Moraes, 1994; Oliveira & Fleury, 1989).

At that time, the social security system excluded minorities, such as the unemployed, informal workers and the elderly, while centralized management did not take into account the local and regional realities in the country. Hence, in order to challenge the prevailing model in the 1980s, the Sanitary Movement championed a political campaign for the universal right to health. This campaign was called the Brazilian Sanitary Reform, which culminated in the implementation of the Unified Health System (SUS), the current base of the Brazilian health system (Fleury, 1997).

In Brazil, the Federal Constitution of 1988 granted the right to health assistance for all citizens and also defined a health system based on the principles of decentralization, comprehensive healthcare, community participation, and private health assistance (Brasil, 1988).[3] Thus, according to the SUS premises, public health management should be shared by federal, state, and municipal entities while the tenets of private health management are intended to be based on the principles of health insurances.

Besides, the Federal Government is meant to develop the general planning of health assistance in Brazil while states and municipalities are in charge of the regional planning, as well as the implementation of health actions, such as outpatient care, hospitalization, vaccination campaigns, and the promotion of healthy habits. Moreover, commissions in charge of convening policies and actions accrued from sundry health management actors and levels were created, namely the Tripartite Interagency Commission (CIT) – encompassing the federal, state, and municipal levels – and the Bipartite Interagency Commission (CIB), comprising states and municipalities.

In addition to this, actions on health assistance are discussed with the population by means of health councils and conferences, the former being present at federal, state, and municipal level and counting on the joint participation of managers, workers, and the population in general. The private health sector also takes part in this debate via the National Agency for Supplementary Health Services (ANS), which is the regulatory agency set up by the Brazilian Government under the aegis of the Ministry of Health, which operates nationwide to regulate, standardize, control, and inspect the private health insurance and plan sector in Brazil.

Along with the SUS, the National Health Information System was established, the organization of which fell to the Ministry of Health (MoH), in partnership with states and municipalities. The IT Department of SUS (Datasus) was created in 1990 to administer this arrangement. Decentralized management, which is a basic premise of the SUS, oriented actions aiming to provide HIS at the regional and local levels. Thus, Datasus began to produce HIS to support the actions of state and municipal health secretariats.[4]

In the light of the range of existing HIS in Brazil and the necessity to standardize information, the MoH launched the National Health Card project in the late 1990s (Cunha, 2002; Moraes & Vasconcellos, 2005). This project sought to create a national registry of citizens, aggregating the information present in various HIS used in Brazil, thereby providing an ICT platform to support Electronic Health Records (EHR). However, few results have been effectively attained to date (Brasil Conselho Nacional de Secretários de Saúde, 2011).

In the early years of this century, regulatory agencies in the health arena were established in Brazil, namely the National Regulatory Agency for Private Health Insurance and Plans (ANS) and the Brazilian Health Surveillance Agency (ANVISA). The ANS introduced new governance in the management of supplementary health, regulating operating activities and private health service providers. In addition, ANVISA started to regulate the commercialization of products and services subject to sanitary vigilance. Thus, the agencies came to command ICT activities within their areas of expertise.

Also in the early years of this century, the first actions pursuing a more holistic view of health information were introduced. These actions culminated in 2004 with the publication of the National Policy on Information and Information Technology in Health (PNIIS) at the 12th National Health Conference (Brasil Ministério da Saúde, 2004). By providing a legal framework, the PNIIS became an important benchmark in the development of health ICT in Brazil, as it defined the national strategic vision. Thus, guidelines and actions designed and established responsibilities for government actors and civil society. However, since the publication of PNIIS hardly any of its propositions have effectively been implemented. In 2013, over eight years since the publication of the PNIIS, many of the 19 strategic action proposals never moved beyond the drawing board stage.

[2] Research addressing the Brazilian Sanitary Movement can be found in Cavalcante and Vasconcellos (2007); Moraes (1994, 2002); Moraes and Gomez (2007); Moraes and Vasconcellos (2005); Moraes et al. (2009); Vasconcellos et al. (2002).

[3] The history of the creation of the SUS is available in Brasil. Ministério da Saúde. Secretaria de Gestão Estratégica e Participativa (2006) and Fleury (1997).

[4] The history of Datasus' creation and development is available in Ferraz (2009).