Adoption of Health Information Exchange by Small Clinics: An Institutional Perspective

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Abstract

The growing use of health information technology has also led to an increase in the adoption and use of electronic health information exchange (HIE). While large hospitals and healthcare systems have been at the forefront of implementing HIE, little is known about the state of adoption by small clinics, a large but little researched group. Using the institutional perspective we propose examination of the environmental coercive, normative, and mimetic pressures from government, patients, affiliates, peers, and IT vendors on small clinics to adopt HIE.

Keywords

Health Information Exchange, HIE, institutional perspective, environmental factors, technology adoption, healthcare, small clinics.

Introduction

Health Information Exchange (HIE) is a network enabling platform that facilitates electronic sharing of clinical health information among providers and healthcare organizations. Health information that is shared, or exchanged, among healthcare entities provides a comprehensive clinical view of a patient, enabling coordination of care among providers. HIEs are based upon standards for interoperability, security, and patient confidentiality, and are operated by public agencies, private organizations including vendor consortia, and public-private collaborations. The potential benefits of using HIE have propelled efforts at the national, regional, and state levels to promote their use. Despite the growth in adoption of HIEs, significant challenges still remain (DesRoches et al. 2013; Vest et al. 2010).

A scan of the academic literature shows overwhelmingly that HIE literature is mostly prescriptive and descriptive in nature. Further, current literature on HIE focuses largely on HIE adoption among larger hospitals. A critical gap exists in our understanding of how smaller clinics adopt HIEs. It is important to address this gap for the following reasons: (i) In order to realize the national mission of a health information highway, it is important that HIE is adopted by both larger hospital systems as well as numerous small clinics. The American Medical Association 2012 Physician Practice Benchmark Survey reports that nearly 60 percent of all physicians work in practices with fewer than 10 physicians (Kane et al. 2013). Unless these small clinics embrace HIE and actively use them, it will not be possible to create a truly integrated health information highway across the nation. (ii) Since smaller healthcare organizations lag in the adoption and use of EHRs, and do not have the resources of a larger organization (Fontaine et al. 2010; Lorenzi et al. 2009; Reardon et al. 2007) (Fontaine et al. 2010; Lorenzi et al. 2009; Reardon et al. 2007), it is most likely that they lag in their HIE adoption efforts as well. Knowledge of HIE adoption and use by larger healthcare organizations may not be applicable to smaller ambulatory (out-patient) clinics. Calls have been made for better understanding of health information systems issues, including adoption (Agarwal et al. 2010) among small clinic settings. (iii) Small clinics greatly differ from larger hospital settings in the nature of treatments provided, types of patients seen and the extent of resources available to them. Smaller clinics can be totally independent, or a part of a hospital system, or belong to a private network. Their technology adoption efforts can be greatly influenced by the organizational and environmental contexts in which they operate. Smaller clinics seem to be largely influenced by the
technology actions of their peer groups, market resources, other affiliates and also respond to governmental initiatives. Yet, little extant research addresses the salience of these environmental factors and the extent of their influence on small clinics’ HIE adoption. Therefore, it becomes important to explore and understand the specific institutional factors that are associated with differences in HIE adoption among small clinics.

Our research objectives are as follows:

(1) To understand HIE adoption by small ambulatory practices.

(2) To explore key factors in the institutional context that affect the extent of HIE adoption by small ambulatory clinics.

Institutional Perspective to Understand HIE Adoption

The institutional perspective has been suggested as providing a vantage point for conceptualizing and examining the structural and cultural forces that give rise to an emergent and evolving social production of information technology (Orlikowski et al. 2001). Institutional theory suggests that the institutional environment in which an organization operates can influence the organizational adoption of technical solutions. Ultimately, adopting these innovations reach a level of legitimization where non-adoption of those innovations are often seen as irrational and they often could even become legal mandates. Institutional theory has been widely used in MIS literature to explain the adoption of EDI (Teo et al. 2003), ERP (Ugrin 2009), and EHR systems (Sherer 2010).

Institutional theory views organizations as being driven and constrained by multiple external factors as they seek legitimacy in their field by operating within a social framework made up of regulative, normative, and cognitive elements. These elements provide coercive, normative, and mimetic pressure on organizational choice (DiMaggio et al. 1983). A coercive isomorphic force is seen in the formal and informal pressure exerted upon an organization by others upon which they are dependent. This coercive pressure can be felt as persuasion and government mandates. Normative pressure occurs as organizations learn from peers, professional associations, and others, the benefits of adopting a new technology. Mimetic pressures are evidenced in two ways. In the prevalence of a practice in an organization’s industry, and the perceived success of other organizations within the industry that have implemented the practice (Haveman 1993). When organizations realize the success of others from using a technological innovation, pressure to mimic this success arises. Institutional theory postulates that organizations experience these pressures to conform and adhere to acceptable forms and behaviors, and that deviation or violation of these social expectations will jeopardize the organization’s legitimacy.

The coercive, normative, and mimetic pressures are evident in the diffusion of health information technology (HIT). The HITECH act financially incentivizes (coerces) healthcare provider organizations to implement and demonstrate use of EHRs and the electronic exchange of patient health information. The number of hospitals and healthcare systems acquiring and using EHRs is growing (McCann 2014b; Wood 2013). In addition, vendor coalitions to provide interoperability between their products have taken root (Zina Mou 2014). Together, these are leading to greater normative and mimetic pressure. Larger healthcare organizations have the resources to be on the forefront of IT adoption and use (Reardon et al. 2007), where resource-constrained, and risk-averse, smaller organizations are more likely to be laggards in their adoption (Gans et al. 2005; Lorenzi et al. 2009; Reardon et al. 2007). The result is a number of pressures on small ambulatory clinics to adopt and use HIE.

Research Model and Hypotheses

Building on the institutional perspective, we reviewed a number of scholarly articles, commentaries and market research reports to gain a preliminary understanding of key institutional factors that are likely to be associated with HIE adoption among small ambulatory clinics. Table.1 presents a summary of selected studies that throw light on institutional factors associated with HIE adoption.
<table>
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<th>Source</th>
<th>Research Goals/Questions</th>
<th>Methods</th>
<th>Key Findings</th>
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<tr>
<td>(Adler-Milstein et al. 2014)</td>
<td>Are current policy efforts addressing key barriers to HIE participation by hospitals?</td>
<td>Secondary analysis of American Hospital Association’s IT Supplement.</td>
<td>Majority of hospitals do not engage in HIE. Stronger policies and incentives may be needed to convince organizations to electronically share patient health data.</td>
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<td>(Adler-Milstein et al. 2013)</td>
<td>To determine what types of stakeholders are participating in HIEs, and what types of data are being exchanged. What are the barriers to using HIEs?</td>
<td>National survey of 119 operational HIEs.</td>
<td>Despite increase in the number of HIE efforts, participating hospitals and ambulatory clinics, significant challenges remain. These include – sustainability of business model, funding, lack of features, inadequate participation of stakeholders.</td>
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<td>(Gold et al. 2012)</td>
<td>Examination of market and regulatory forces influencing provisions laid out by the HITECH act of 2009.</td>
<td>Expert opinion and analysis of EHR and HIE adoption issues as envisioned and incentivized by HITECH.</td>
<td>Identification of key drivers and challenges in the adoption of EHRs and HIEs, as well as issues important to providers. Discussion of HITECH progress and measures of success.</td>
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<td>(Vest et al. 2011)</td>
<td>Determine the key factors associated with HIE usage.</td>
<td>Secondary analysis of patient-level clinical dataset from an emergency room in an operational HIE in TX.</td>
<td>Actual usage of HIE is very low in emergency rooms. Degradation of use occurred over time. Odds of usage lower when time constraints increased. Novel usage was seen in familiar patients or patient revisits and in cases of prior hospitalizations.</td>
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<td>(Fontaine et al. 2010)</td>
<td>Examine factors that motivate or prevent small primary care practices from participating in an HIE.</td>
<td>Survey and interviews of nine primary care practices in Minnesota with fewer than 20 physicians.</td>
<td>No practice was fully involved with an HIE and most did not have HIE. External motivators for HIE included state and federal mandates, payer incentives, and increasing expectations for quality reporting.</td>
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<td>(Edwards et al. 2010)</td>
<td>What are the barriers to healthcare information systems interoperability?</td>
<td>Literature review of research through 2009.</td>
<td>Major barriers include need for standards, security and privacy concerns, economic loss to competitors, and complex and costly system interfaces.</td>
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<td>(Ross et al. 2010)</td>
<td>Determine desired functions of HIE and potential motivators, barriers, and facilitators of adoption in small-to-medium primary care practices.</td>
<td>Case study of nine practices</td>
<td>Practices were motivated to adopt HIE to improve the quality and efficiency of care. The greatest facilitator of HIE adoption was technical support during and after implementation. Trust in HIE partners was a major issue, and practices with rich professional and social networks appeared to be especially favorable settings for HIE adoption.</td>
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**Table 1. Key HIE studies on institutional factors associated with HIE adoption**

Based on our research review outlined in Table 1 and current developments, we choose five specific factors (Figure 1) namely government agencies, patients, information exchange affiliates, professional peers, and vendors. ‘Government’ consists of the federal and state agencies with oversight or jurisdiction over healthcare entities. ‘Patients’ are the subpopulation cared for by the focus organizations. ‘Affiliates’
are the healthcare organizations with which a focus organization exchanges patient information. ‘Peers’ are all other healthcare professionals with whom the focal organization has contact. This may include members in professional associations, competitors, and others. ‘Vendors’ are those providing EHR systems and particularly those participating in a coalition to provide an interoperable service between members systems.

**Pressure from Government**

Ambulatory clinics face significant coercive pressure in the form of mandates and financial incentives from government to adopt and implement HIE. Pressure from government entities primarily comes from federal and state agencies. For instance, the Centers for Medicare and Medicaid Services (CMS) administers the Meaningful Use program that financially incentivizes healthcare organizations to use HIT. Furthermore, each state has its own regulatory environment and may administer incentive programs for the use of HIT.

The Meaningful Use program, designed in part to entice healthcare providers to electronically exchange patient health information, has already influenced a number of healthcare organizations to use HIE (Fontaine et al. 2010; Patel et al. 2011; Ross et al. 2010). As such, we expect to find that government financial incentives positively influence small ambulatory clinics to adopt and use HIE. Another financial incentive that is influencing healthcare providers is the favorable reimbursement rates for those that adopt the value-based reimbursement model being implemented by CMS. We believe that the pressure to move toward value-based reimbursement by CMS, the largest payer in the U.S., and influential on private payer policy, will positively influence small ambulatory clinics to adopt this reimbursement model. Given government mandates and associated financial incentives, we hypothesize,

\[ H_1: \text{Greater government pressure will lead to higher adoption of HIE by small ambulatory clinics.} \]
Pressure from Patients
As the number of providers grow that provide electronic access to patients for retrieving their medical records, then normative pressure arises. As patient use of IT for managing their health and medical needs grows in sophistication (McMullan 2006; Rai et al. 2013), so too will the complexity of information management needed to meet patient expectations resulting in a coercive pressure from patients. HIEs provide the functionality to coalesce, summarize, and present medical information to patients. Furthermore, with the development of patient-centered medical home in support of coordinated care and value-based reimbursement models (Williams et al. 2012), small ambulatory clinics may come under greater pressure from patients for access to their medical information than other healthcare organizations, particularly since most primary-care physicians work in small practice settings (Kane et al. 2013).

H2: Greater patient pressure will lead to higher adoption of HIE by small ambulatory clinics.

Pressure from Affiliates
Ambulatory clinics interact with hospitals, laboratories, specialists, pharmacies, care facilities, and others in providing clinical care to patients. Affiliates are defined here as those healthcare organizations with which the focal organization exchanges patient health information in the clinical care of their patients. Clinics routinely send and receive patient health information to and from these affiliates. Those affiliates using HIE, especially larger hospitals, that are in a dominant position relative to the clinic may exert pressure on the clinic to use HIE. With small ambulatory clinics likely in a less dominant relationship with hospitals, and perhaps other affiliates, we expect to find coercive pressure from affiliates that use HIE.

As organizations learn from affiliated organizations that have adopted an innovation, they are more likely to behave similarly (Burt 1987). Even if coercive pressure is not experienced by a clinic from affiliates, they may experience normative pressure, particularly as the number of affiliates using HIE grows. This normative pressure is even more pronounced when integration between organizations is seen as beneficial (Ugrin 2009).

H3: Greater affiliate pressure will lead to higher adoption of HIE by small ambulatory clinics.

Pressure from Peers
Shared norms stemming from professionalization among members of a network have the potential to influence organizational behavior (DiMaggio et al. 1983). Two aspects of professionalization important to normative isomorphism are the legitimization afforded by formal education as a cognitive base, and the growth and elaboration of professional organizations across which new models rapidly diffuse (DiMaggio et al. 1983). Both of these aspects are arguably prevalent in healthcare. As organizations learn from peers (other healthcare professional organizations) about their use of HIE as a result of professionalization and other contact, normative pressure will arise. However, it has been suggested that small business knowledge about an innovation and its benefits does not translate into adoption in part due to the complexity of knowledge transfer and organizational learning needed to adopt and use the innovation (Parker et al. 2007). Therefore, as peers realize benefits and experience success in their use of HIE, particularly larger organizations, they become mediating institutions in the transfer of knowledge (Attewell 1992). As a result, mimetic pressure increases on small ambulatory clinics to obtain this success.

H4: Greater peer pressure will lead to higher adoption of HIE by small ambulatory clinics.

Pressure from Vendors
Several major EHR vendors (eg. Allscripts, Athenahealth, Cerner, Epic) are members along with several healthcare systems (CVS Caremark, UnitedHealth Group, Walgreens, Surescripts, and Kaiser Permanente), and others in one of two coalitions – Carequality and CommonWell Health Alliance –
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designed to provide a common HIE interoperability framework between EHR systems (Mouheiber 2014). In addition, the two coalitions are in discussions about how to make interoperability work between them (Mouheiber 2014). The rise of these two coalitions provides vendors with a product offering that includes HIE; one of the measures for obtaining Meaningful Use incentives.

\[ H_5: \text{Greater vendor pressure will lead to higher adoption of HIE by small ambulatory clinics.} \]

Research Status

A survey instrument to assess our key constructs has been developed based on prior studies and pilot tested. We intend to roll out the survey in the next few months and have our preliminary findings ready for sharing with participants at AMCIS 2015.

REFERENCES


