In search of Insights for Institutionalization of Telemedicine in the Health Care System in Ethiopia

Research-in-Progress

Getachew Hailemariam Mengesha
Addis Ababa University, Ethiopia
Getachew.mengesha@gmail.com

Asfaw Atnafu Kebede
Addis Ababa University, Ethiopia
asfawatnafu@yahoo.com

Monica J. Garfield
Bentley University, USA
MGrafield@bentley.edu

Philip F. Musa
Univ. of Alabama at Birmingham, USA
musa@uab.edu

ABSTRACT

Accessibility and health service coverage problems impact many low income countries. Telemedicine is one of the technologies that can play a significant role in reducing these healthcare related issues. The study is primarily aimed at exploring how institutionalization of a system occurs and its impact on system use. This study is informed by theories on institution and institutional work to develop a conceptual schema for institutionalization of Telemedicine systems. Using a case study methodology we explore the use of telemedicine at the Black Lion Hospital in Addis Ababa, Ethiopia. The study reveals absence of organizing vision for telemedicine projects and limited role of actors to alter the institutional context in order to institutionalize telemedicine systems. When validated with further studies the conceptual schema used in this study would have great theoretical contribution. The link observed between institutionalization and Telemedicine system use will have practical relevance for similar projects.

Keywords
Institutions, institutional work, institutionalization, telemedicine, reconfiguration, alteration, political work

INTRODUCTION

Harnessing Information Communication Technologies to leverage health care services is becoming indispensable both in developed and low income countries around the world. In tandem with this growing recognition of the potential benefits from ICT in health care service delivery, various small and large scale information systems projects have been launched across African countries. The underlying objectives include improving public services, promoting education, and improving health care service delivery. However, most of these projects have failed to yield the intended purpose. Reasons for these failures include difficulties encountered during the implementation phase and lack of post implementation sustainability. As has been observed widely, e-government projects tend to fall short of their goals. The partial or total failures have been attributed to the gap between project design considerations and African public sector reality (Heeks, 2002). A recent study conducted in China informed by stakeholder theory examined the key groups that have significant impacts on the implementation and operations of telemedicine. It was meant to understand management strategies that could be deployed to ensure the success of telemedicine projects in China where diffusion rate remains very low (Zhan, Lin, and Wang, 2011). While the settings are different, the authors’ experiences are not unlike our results from this study.

This study reports on the introduction, use, and integration challenges faced in Black Lion Hospital (the teaching hospital at Addis Ababa University, Ethiopia) when new telemedicine (TM) systems were launched. The study explores the operation of two separate Telemedicine centers found in the Hospital. This study is primarily aimed at addressing the following research questions: (1) how does the institutionalization of a system occur? (2) what are the impacts of institutionalization in system use? The data for this study were gathered through key informant interviews held with TM technical personnel and TM system coordinators. We observed and analyzed how telemedicine centers operated, and how technical personnel and administrators participated in telemedicine meetings and workshops organized by the Telemedicine Unit of the Medical School, Addis Ababa University. We also performed analyses of the telemedicine unit’s documents. The result of the study revealed a lack of vision in planning and successfully executing telemedicine projects, limited role of designated actors to alter institutional context, and lack of institutionalization of telemedicine systems at Black Lion Hospital.

There are direct and indirect effects of Telemedicine system failures (Yellowless, 2005). The direct or observable effect is the financial loss. The indirect effect involves loss of reputation and trust in a telemedicine system. This eventually leads to a loss
of confidence in the viability of the telemedicine project to deliver health care services initially envisioned. Drawing from institutional theory, we have investigated the institutional environment at the Black Lion teaching Hospital at Addis Ababa University in order to identify factors that underpin telemedicine use and integration into the health care system.

The remainder of this paper is organized as follows. First, the theoretical foundation of the study is presented, after which we describe the context of the study and then we present the research method employed. Subsequent to that, some preliminary findings from the study is reported. Finally, the paper ends with a conclusion and reflections, as well as recommendations for further research endeavors.

THEORETICAL FOUNDATION

This study is based on institutional theory to draw insights how institutionalization or lack thereof impacts Telemedicine system use and integration into the health care system. We looked to a related study by Wonga et al., 2009 which explored the effect of institutional pressure in shaping Information Technology Management and how these pressures helped a company to realize the intended benefits.

Institutional theory recognizes cultural influences on managerial decisions and actions. Organizations and the individuals who populate them are suspended by a web of values, norms, and beliefs. These values, norms, and beliefs guide and constrain the organizational actions over time (Barley and Tolbert, 1997). The presence of values, norms, beliefs, and assumptions arise from the existence of institutions (Mignerat and Rivard, 2009). In the context of information systems, institutional analysis is believed to help researchers comprehend how institutions influence the design, use, and consequences of technologies, either within or across organizations. Recently, information systems related phenomena such as IT innovations, IS development and implementations, IT adoption and use have been examined using institutional perspectives (Orlikowski and Barley, 2001). Organizations and actors’ intent to gain legitimacy and acceptance in their environment is the underlying assumption of institutional theory (Meyer and Rowan, 1977).

Various descriptions and definitions of institutions have been provided in the literature. One way in which to conceptualize an institution is that it is an entity with a social order, structure, or pattern that has attained a certain state or property (Jepperson, 1991). Institutions are social structures that have attained a high degree of resilience (Scott, 2001). In this study we consider an institution as a social structure that has gained some degree of acceptance and durability by a particular community or society. Contracts, formal organizations, insurance, and the corporation are commonly acknowledged as institutions (Jepperson, 1991).

Institutionalization can be viewed as the process by which social practices conform to environmental pressures, and eventually become taken for granted (Scott, 1995). It is a process whereby the practices expected in various social settings are developed and learned (Dillard, Rigsby, and Goodman, 2004). In the context of information systems, institutionalization is the stabilization of an information system which occurs when a system is no longer considered an innovation, but as unnoticed and unremarkable set of tools that people take for granted in doing their work (Mignerat and Rivard, 2009). Institutionalized information systems are noticed only when they break down (Mignerat and Rivard, 2009).

The process of institutionalization can be viewed as an S-curve (Lawrence et al., 2001). The curve begins with the Innovation stage, where new ideas, schemas, logics, routines, strategies, and tools are generated. In the second stage the ideas, routines, or logics are expected to be objectified and diffused. As they are widely diffused they may reach the third stage where they are likely to gain legitimation and then stabilize or fully institutionalized. As new organizing logic emerges, the existing institution heads towards being eroded and reaches the last stage labeled deinstitutionalization.

On the other hand, Scott (1995) reformulated the three mechanisms of institutionalization identified by DiMaggio and Powell (1983), as being coercive, normative, and mimetic pressures, and came up with regulative processes, normative processes, and cognitive processes. Although the institutionalization mechanisms or institutionalization processes are believed to be instrumental in creation, stabilization, disruptions, and change of organizational forms or institutions, how these processes are orchestrated in order to bring about stabilization, persistence, and change in the institutional context has not fully been addressed. A prominent work, entitled Institutions and Institutional Work (Lawrence and Suddaby, 2006), for the first time systematically addressed how institutions are created. It shed some light on the vital role of actors in the process of creating, stabilizing, and legitimating institutions.

Institutional work refers to the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions (Lawrence and Suddaby, 2006). Although prominent institutional researchers shed light on the significance of organizational forms as an area of study in organization science, issues regarding how institutions are created remained unaddressed in the new institutional theory (Lawrence and Suddaby, 2006). An organizational form is regarded as a model that shows structural configuration and practice. It is also considered as a manifestation of and legitimated by
institutional logic. Institutional logic is the organizing principles that guide the behavior of actors (Friedland and Alford, 1991; Lounsbury, 2002). Also called institutional entrepreneurs, actors are individuals, organizations, or coalitions involved in institutional work or in the creation of new organizational forms (Lawrence and Suddaby, 2006; Tracey, Phillips, and Jarvis, 2011). Institutional entrepreneurs are involved not only in creating and legitimizing a new organizational form, but also in legitimizing new technology, a new practice, or a new product (Tracey, Phillips, and Jarvis, 2011).

Informed by the reformulation of Scott (1995), institutional work practices of actors identified by Lawrence and Shuddaby (2006), and concepts of organizing vision from (Swanson & Ramiller, 1997), we developed a conceptual framework indicated in Figure 1 to guide our data collection, analysis, and conclusion. A brief description of the components in Figure 1 and their original sources are also presented.

An organizing vision for an information systems innovation is a vision for organizing in a way that embeds and utilizes information technology in organizational structures and processes (Swanson and Ramiller, 1997). For telemedicine systems, an organizing vision refers to Addis Ababa University’s management key ideas, objectives, and strategies for the introduction and use of Telemedicine system. Actor(s) is/are expected to internalize the organizing vision and champion and execute institutional work in order to realize and stabilize the telemedicine system over time. In this process, the actor or coalition of actors are supposed to undertake political work, reconfiguration of the prevailing institutional arrangement, and changing the boundaries of the prevailing systems. To do so, the actor(s) is/are expected to have power and command over resources in order to change the prevailing institutional context. Table 1 below shows descriptions of actor’s practices.

<table>
<thead>
<tr>
<th>Categories of Activities</th>
<th>Actors’ Practice</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Work</td>
<td>Vesting</td>
<td>Reflect overtly political works in which actors reconstruct rules, property rights, and boundaries.</td>
</tr>
<tr>
<td></td>
<td>Defining</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advocacy</td>
<td></td>
</tr>
<tr>
<td>Reconfiguration</td>
<td>Constructing identities</td>
<td>Emphasizes actions in which actors belief system are reconfigured.</td>
</tr>
<tr>
<td></td>
<td>Changing norms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constructing networks</td>
<td></td>
</tr>
<tr>
<td>Alteration</td>
<td>Mimicry</td>
<td>Involves action designed to alter abstract categorization in which boundaries of meaning systems are altered.</td>
</tr>
<tr>
<td></td>
<td>Educating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theorizing</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Actors activities and practices (Source: Extracted from Lawrence and Suddaby, 2006)

As reflected in Figure 1, we assumed institutionalization as a process triggered and orchestrated by the practice of actors and organizational members. Actors’ practices are assumed to be consistent until such time that the envisioned institution is created, legitimized, and stabilized. We posit that inconsistent practices of actors will not lead to institutionalization. Once institutionalization is achieved, the role of the actor is expected to diminish. This is because institutionalized systems become taken for granted and operate as a black box in a sense that all its members and stakeholders may not notice how it operates and most actions related to the system will be predictable (Silva and Backhouse, 1997).
However, we must note that institutionalization is an ongoing process, and not a one-time exercise (Lawrence et al., 2001). Actions within an organization are inextricably linked and that institutionalization is best understood as a dynamic, ongoing process (Barley and Tolbert, 1997).

THE RESEARCH CONTEXT AND METHODOLOGY

The Research Context

Black Lion Hospital is the largest tertiary level referral hospital in Ethiopia. It provides major referral services for 80 million people across the country. Compared to other Hospitals in the Ethiopia, it has a good number of specialized physicians in most medical specialty fields. The hospital is usually crowded by huge number of outpatients and inpatients. The overwhelming majority are referral patients directed to the hospital from various regions and from other health facilities in Addis Ababa for further diagnosis and treatment. More than two thousand health science students attend their clinical attachments and professional practice courses in this hospital.

Currently two different Telemedicine programs operate in Black Lion Hospital. The first is the Ethio-Indian Telemedicine Program and the second is the Johns Hopkins University (JHU-TSEHAI) Telemedicine Program. The Ethio-Indian Telemedicine center was established in November 2005. It was planned to be part of the envisioned Pan African Telemedicine and Tele-education center funded by the Indian government. At the pilot project phase, the telemedicine program was designed to provide expert medical consultation services in the field of Radiology, Cardiology (for Adults), Cardiology (for Pediatrics), Pathology and Dermatology from CARE Hospital based at Hyderabad, India which was designated to be the “Hub”, while Black Lion Hospital, Addis Ababa, Ethiopia was designated to be the “Spoke”. Despite the presence of Telemedicine hardware and software facilities, a study conducted by Asfaw (2009) showed that only 63 Tele-consultations and continuing medical education sessions were conducted between Black Lion Hospital, Ethiopia and Care Hospital at Hyderabad, India between December 2006 and December 2008.

The JHU-TSEHAI Telemedicine center started operation around January 2010. It is a part of the Johns Hopkins University technical support for the Ethiopian HIV/AIDS initiatives aimed at minimizing morbidity and mortality among HIV infected and affected individuals (http://jhutsehai.org/). The program currently operates in four regions of Ethiopia.

The Research Methodology

This study is primarily aimed at exploring how institutionalization of a system occurs and the impact of institutionalization in system use. In an attempt to address these issues, the study intends to uncover organizational and institutional factors that may impact telemedicine system use and integration into the health care system. Therefore, the study employed case study approach as suggested by Yin (2003). Using structured interview guide (see Appendix 1), interview sessions were conducted with technical personnel and Telemedicine project coordinators at Ethio-Indian Telemedicine center and Johns Hopkins Telemedicine center both based at Black Lion teaching and referral Hospital, at Addis Ababa University.

The interviews held, particularly with JHU-TSHAI Telemedicine Center technical personnel were lengthy and involved a series of people and dates, coupled with an in depth discussions and demonstration sessions in which we were in a position to gather the opinion of these personnel for the observed under-utilization of the telemedicine system. In addition relevant documents relating to both Ethio-Indian and JHU-TSHAI telemedicine systems from the date of inception to the current state were gathered and reviewed.

Observations of participants were conducted during live Telemedicine sessions between Black Lion Hospital and Johns Hopkins University based at Baltimore on September 22, 2012. Additionally, active participations were made, and substantial facts were gathered during Telemedicine and Tele-education sensitization workshop held at Ghion Hotel, Addis Ababa, Ethiopia on December 22, 2011.

PRELIMINARY RESULTS

In line with the conceptual schema presented in Figure 1, the data gathered has been summarized and presented as follows:-

Organization Vision

Information Systems innovations frequently demand the fashioning and incorporation of new roles, responsibilities, relationships, lines of authority, control mechanisms, work processes, and work flows, in short, new organizational designs (Swanson and Ramiler, 1997), which is very difficult to realize in the absence of organizing vision.

By reviewing project documents, we found out that three different telemedicine projects have been launched at Black Lion Hospital between August 2004 and January 2010. All three telemedicine projects were not initiated by the management of the hospital or by the medical school. The first telemedicine project was launched by the International Telecommunication
Union (ITU). To oversee and coordinate this project, a national telemedicine committee was established; members were drawn from the Ministry of Health, Addis Ababa University and from Ethiopian Telecommunication Corporation. The project was regarded as the “Ethiopian Telemedicine Pilot Project” and was designed to interconnect the central referral hospital (Black Lion Hospital) with ten rural sites. This pilot project focused on Tele-radiology and Tele-dermatology applications. While the project was in progress, the second project, the Ethio-Indian Telemedicine project was launched in the same setting in 2005.

HIV/AIDS focused telemedicine program, named JHU-TSEHAY was launched in 2010 by Johns Hopkins University as the third project. Modern videoconferencing facility was established to facilitate case-based Tele discussion twice a month between Mayo clinic in the USA and Black Lion Hospital, Addis Ababa, Ethiopia.

During the interview sessions, the e-health unit coordinator at College of Health Science, Addis Ababa University disclosed that currently, the telemedicine center has no recognized functional structure and budget. Moreover, the center has no operating procedures or work process link with the health service system. During the telemedicine sensitization and orientation workshop held on December 22, 2011 the keynote speaker, the then director of the medical school stated the following “Technologies like Telemedicine will help the college and the university at large to smoothly take part in various collaborative programs with national and international institutions. These Technologies have made possible and easier transfer of knowledge and skill from continent to continent. Adequate information infrastructure is already in place for implementing e-health systems. Although two major Telemedicine settings are available at Black Lion Teaching Hospital, they are poorly utilized.”

Various reasons were raised regarding the underutilization of the telemedicine system, the most prominent of which was coordination problems between the telemedicine centers. To resolve this problem, a representative from an NGO called Medical Education Partnership Initiative (MEPI) expressed his organization’s interest to coordinate the various Telemedicine and Tele-education initiatives at the medical school. Although MEPI is an external body, it was unanimously decided that MEPI should take the mandate to work on the coordination process of the telemedicine centers at Black Lion Hospital. This action suggests that the university’s management or the medical school lacks clear organizing vision, as the very idea of Telemedicine was not originated in house.

**Organization Vision**

Institutionalization is often supported by coalitions of agents (Barley and Tolbert, 1997). The survey revealed the following dominant actors of Telemedicine programs in the study area: Project sponsors (ITU, JHU, and Indian government), regulatory body (Ministry of Health), Addis Ababa University or the medical school management. Regarding the ITU-pilot Telemedicine Project the following has been stated:-

“The Ministry of Health has full responsibility of ownership, implementation, execution, monitoring and evaluation of the Telemedicine pilot project in collaboration with the Faculty of Medicine. ITU will be responsible for the coordination of the International Partners, namely, United Nations Economic Commission for Africa (UNECA), and United Nations Education, Scientific & Cultural Organization (UNESCO)” (ITU, 2001, page 7).

This indicates that multiple actors have been involved in the telemedicine programs at Black Lion Hospital. During the implementation phase of the ITU-pilot telemedicine project, a national telemedicine committee with a focus restricted to this particular project was established.

Regarding the Ethio-Indian Telemedicine project, the role of actors involved in the project has been stated as follows: “The Government of India has agreed to provide funds for providing a Tele- Education & Tele-Medicine pilot project in Ethiopia and appointed Telecommunications Consultants India Limited (TCIL).” It should be noted that TCIL is a turnkey implementing agency of the Project Network (Asfaw, 2009, p. 37). After this project, the then faculty of medicine established a telemedicine unit and assigned a coordinator. The coordinator is a radiologist by profession and an academic staff of the university. A telemedicine steering committee drawn from clinical departments of the faculty of medicine was formed to dwell on strategic issues. The coordinator has been championing telemedicine use through trainings and workshops.

Apparently, actors at the faculty of medicine have attempted to engage in a political work through advocacy and lobbying to mobilize resources in order to organize the telemedicine unit to conduct training and workshops. However, since they have no command over the project, and given that they appear to be passive beneficiaries of the project outcome, they lack the capacity to engage in reconfiguration and alteration practices as powerful dominant actors do.
Institutionalization Process

Systematic and legitimate execution of actors’ activities and practices presented in Table 1 are political work, reconfiguration, and alteration. These lead to institutionalization process. The fact gathered at Black Lion Hospital revealed that, to some extent, the telemedicine system in the study area attempted to learn and apply practices of similar hospitals from around the world that have successfully implemented and used telemedicine systems in their health care service delivery system. Exposure visits and short trainings have been used as a means to learn from the practices of other hospitals.

During the interview, the current coordinator of e-health system at the College of Health Sciences, Addis Ababa University disclosed that four trainees, three from medical school and one from the Ministry of Health were sent to India for two weeks exposure visit at Care Hospital and at affiliated Indian Medical Schools in 2006. Additionally, Basic trainings on Telemedicine system were offered to end users of the three telemedicine projects. However, as respondents disclosed, no organized advocacy has been carried out to promote Telemedicine.

The data we gathered revealed absence of established order, rules, and procedures regarding telemedicine system use. Furthermore, the hospital has not yet started recognizing services delivered via telemedicine equivalent to routine medical personnel’s duties like patient’s ward rounding. In the existing context, use of telemedicine entails additional workload on physicians since they are required to treat incoming patients and at the same time examine records of remote patients and consult with physicians at the patients’ end.

CONCLUSION

This study is primarily aimed at exploring how institutionalization of a system occurs and the impact of institutionalization in system use. Drawing insights from institutional theory and based on the analysis of data we gleaned, we conclude that the Telemedicine system in the study area has not been institutionalized so far. We considered institutionalization as a process triggered and orchestrated by the practice of actors and organizational members.

The study revealed that the management of the university and the medical school lack organizing vision that sets directions of the telemedicine system. Nevertheless, the study reveals that actors at the faculty of medicine have attempted to engage in political work through advocacy and lobbying to mobilize resources in order to organize the telemedicine unit and to conduct training and workshops. However, they lack the capacity to engage in reconfiguration and alteration practices as powerful dominant actors do. Systematic and legitimate execution of actors’ activities and practices such as political work, reconfiguration, and alteration leads to thorough institutionalization process. Our study suggests that Black Lion Hospital is not there yet. It has long been recognized that institutionalization of information system requires the infusion of values beyond the technical requirement of the task at hand (Selznick, 1957).

How much of the lessons learned from other parts of the world is relevant to Africa’s context? Are there some nuances across developing countries that may make this and future studies more (or less) relevant? We know that our results conclusions are similar to that from a recent study conducted in China where telemedicine diffusion rate remains very low (Zhan, Lin, and Wang, 2011). To move this study forward, more comprehensive studies are required to study the bearing of institutionalization in Telemedicine system use, particularly in sub Saharan Africa and other developing parts of the world.

REFERENCES


**APPENDIX 1: INTERVIEW QUESTIONS**

**Structured Interview Guide**

1. **Background**
   1.1. Name of the respondent
   1.2. Department/work unit/
   1.3. Work Experience

2. **Involvement and basic information**
   2.1. Do you have adequate information about Telemedicine program at Black Lion Hospital (BLH)?
   2.2. If your response to Q#2.1 is “Yes”, have you ever been involved in the program from its inception to operation? Please provide in the space below a brief account of your experience with regards to the project.

3. **Mimetic Pressures**
   3.1. Do you think the use of Telemedicine leads BLH to be like similar hospitals in other parts of the world?
   3.2. Have you carried out exposure visits and experience sharing workshops with counterpart institutions that have sound Telemedicine Systems?

4. **Normative Pressures**
   4.1. Do you think Telemedicine based systems like Tele consultation and Tele education positively welcomed by the community of medical practices, for instance by the Ethiopian Medical Association?
4.2. Do you think that the application of Telemedicine tends to erode/compromise some accepted and established principles and standards in medical practices?

4.3. Do you think the use of Telemedicine compromise patient’s privacy?

5. Regulatory pressures

5.1. Does your hospital have established order, rules, and procedures regarding the use of Telemedicine Systems?

5.2. Does your hospital recognize the services given by the medical personnel through Telemedicine as part of regular services, like regular patient ward rounding being made by a physician?

6. Institutionalization Process

6.1. What attempts have you made to get approved rules and procedures of the Telemedicine system by the top management of the hospital and by the regulatory bodies?

6.2. What attempts have you made to promote Telemedicine through professional associations such as the Ethiopian Medical Association and Ethiopian Public Health Associations? Please write your response in the space below:

6.3. Have you conducted a fairly good training for medical personnel regarding the use of Telemedicine?

7. Institutionalized Telemedicine System

7.1. Does the management of the hospital recognize the telemedicine unit like conventional medical care units, Radiology or Pathology?

7.2. Does the Telemedicine unit have functional structure?

7.3. Does the telemedicine unit have recurrent and capital budget allotted by the management?

7.4. Does the telemedicine system have established working systems and procedures with other working units?

Thanks!