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The role of the professional association: A grounded theory study of Electronic Medical Records usage in Ontario, Canada

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ABSTRACT

Many professionals utilize computer systems to assist them with the exercise of their skilled knowledge. These systems are designed with many core features, but their adoption is heterogeneous, with some users adopting more features than others. In this qualitative study, the empirical context is the use of Electronic Medical Records (EMRs) by primary care physicians in Ontario, Canada. We have collected data from interviews, and by using the methodology of grounded theory, we theorize that guidance from the professional association to which the members belong is able to positively influence its members to adopt more core features. Although professionals operate with a high degree of autonomy, their professional association governs their actions. By setting standards and offering education, the association is able to guide its members to make more enhanced use of core features. The theoretical contribution is the conceptualization of a higher order construct, Professional Association Guidance.

1. Introduction

Technology continues to advance with spending on Information Technology growing to an estimated worldwide investment of $3.7 trillion for 2013 (Lovelock, 2013). Computers are indispensable, enabling organizations and individuals to be more productive (Carr, 2003). The growth of computer capabilities has led to the design of software with multiple features, but in many cases the extra functionality available has outpaced users' abilities to take advantage of it (Hsieh & Wang, 2007). For feature rich software, practitioners would benefit from a deeper understanding of how users can be guided to go beyond the default functions (Sundar & Marathe, 2010) and explore additional options that result in additional benefits. An example of feature rich software is the Electronic Medical Records (EMR) system, which has the potential to enhance the delivery of healthcare by physicians (Bates, 2010).

The International Organization for Standardization (ISO) defines the primary purpose of an Electronic Medical Record as the provision of "a documented record of care that supports present and future care by the same or other clinicians" (ISO, 2005). Protti (2007) has further refined this definition by describing an EMR as a system where the clinical data for an individual are location specific maintained by a single clinic and not directly accessible by other health care providers outside of that clinic. The family health team at the clinic consists of a variety of health care professionals, including doctors, nurses, nutritionists, and psychologists. As a team, they standardize on a single EMR, but there is no authority over the physicians at the work unit mandating which individual features are to be deployed other than the basic recording of patient demographic information and clinical notes. The physicians are in a position to voluntarily adopt different features according to their own level of comfort. In our study, the physician is the unit of analysis and our research methodology applies grounded theory to develop a theory that explains how physicians could be influenced to adopt more of the available core features.

From a comparison of the use of EMRs in eleven countries, Schoen et al. (2009) defined the core features as: the electronic ordering of tests, electronic access to patients' test results, electronic prescribing of medication, electronic alerts for drug interaction, and the electronic entry of clinical notes. Beyond these core capabilities, physicians may extend features by performing searches on their patient population, creating templates to speed their entry of notes, set reminders for medical tests, and ensure that non-electronic data are scanned and linked electronically to the patient record.

System use is difficult to define (Barki, Titah, & Boffo, 2007). It has been measured in terms of duration, frequency, and intensity (Lee, Kozar, & Larsen, 2003; Venkatesh, 2008), but this is inadequate when a system has multiple features and users are able to make acceptance decisions at a feature level (Beaudry & Pinsonneault, 2005; Jasperson, Carter, & Zmud, 2005; Sykes, Venkatesh, & Gosain, 2009). Burton-Jones and Straub reconceptualised system use "as a user's employment of one or more features of a system" (2006, p. 20). Professionals are different than non-professionals in that the former are valued based on the exercise of their specialized skills

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and, within an organization, they operate with a higher degree of autonomy than that enjoyed by the non-professional (Walter & Lopez, 2008). There are limited studies of technology acceptance and adoption (Turner, Kitchenham, Brereton, Charters, & Budgen, 2010) that differentiate between the professional and the non-professional user and we address this gap.

In our data collection and analysis, we use our knowledge of technology acceptance as a point of departure (Charmaz, 1996), recognizing that we, as researchers, are not a 'blank slate' (Urquhart & Fernandez, 2006), and therefore need to be 'theoretically sensitive' (Glaser & Strauss, 1967). The selected context is the post-adoption use of Electronic Medical Records (EMRs) by physicians, who are professionals governed by an association, applying their clinical skills and medical expertise with a large degree of autonomy to provide patient care (Chau & Hu, 2002; Walter & Lopez, 2008). From interviews with physicians, we explore the data and develop theory consistent with the data.

The organization of this paper is as follows. Section 2 describes the research methods and includes background on grounded theory. Section 3 provides the results of the analysis and coding of the data. Section 4 is a discussion, which begins with the integration of formal existing literature with our developed theory. Next are the limitations of the research coupled with suggestions for future research. The final section is the conclusion.

2. Research methods

2.1. Grounded theory

Grounded theory was selected because it is ideal for the development of theory that explains contextually rich processes (Myers, 1997) where limited theory exists. The adoption of EMRs by primary care physicians is complex, depending upon the physician, the clinic, and the professional association. Survey based quantitative analysis is limited by the need for 'data reduction'. In order to achieve acceptable response rates for statistical analysis, a survey has to be constrained in size. Therefore theoretical constructs need to be limited and well defined in order to design a questionnaire that will result in meaningful data for variance analysis. In contrast, grounded theory incorporates these complexities (Martin & Turner, 1986; Orlikowski, 1993), enabling the researcher to focus on elements omitted in variance models. It is a systematic way of dealing with non-standard data from which the researcher derives core categories that explain the phenomena (Corbin & Strauss, 1990; Martin & Turner, 1986). Ideally, there are no preconceived concepts and the researcher approaches the analysis with a 'blank slate' (Glaser & Strauss, 1967). However, this is rarely the case as researchers have prior knowledge that may influence their thinking and they are therefore advised to be 'theoretically sensitive' and use their 'guiding interests as points of departure' (Charmaz, 1996, p. 32).

Glaser and Strauss (1967) introduced grounded theory in order to provide a rigorous methodology for developing theory from data. They defined it as 'the discovery of theory from data – systematically obtained and analyzed in social research' (Glaser & Strauss, 1967, p. 1). As data are collected, they are compared with prior concepts to determine if they are already part of an existing category or if they form a new one. Theoretical sampling (Glaser, 1978) allows the researcher to select slices of data for further analysis. We follow the methodology through its iterative steps of coding and constant comparison (Corbin & Strauss, 1990; Strauss & Corbin, 1994).

2.2. The empirical context

In Ontario, there are 11,000 primary care physicians, of whom 6000 work in clinics employing three or more doctors. The government of Ontario, which is responsible for the delivery of healthcare in the Province, is encouraging the adoption of EMRs (Flaherty, 2009) and has directed funds for this purpose to the Ontario Medical Association (OMA). OMA has set up an organization, OntarioMD, whose focus is the adoption, implementation, and continued use of EMRs (OntarioMD, 2009a). In this paper, the professional association is represented by OntarioMD, which operates with the same governance and influence as OMA. The services provided by OntarioMD are listed in Table 1.

Table 1
Services provided by OntarioMD.

Funding	Physicians receive funding toward their costs of an EMR
Standards	Software specifications are published, detailing baseline requirements
Certification	Vendors of EMR software are certified when their software meets pre-defined standards
Consulting	Practice Management Consultants are available to clinics to describe the benefits of EMRs and assist with implementation and use
Mentoring	Primary care physicians who have experience in the implementation and use of EMRs are available to visit clinics, observe and suggest improvements

Source: OntarioMD (2009a).

2.3. Sampling

With the assistance of OntarioMD, we invited physicians, who had been using EMRs for one year or more, to participate in a 30-min interview. Each interview was recorded and then transcribed. The transcription was imported into NVivo 8, which is a specialized software tool that enables researchers to code qualitative data. In the open coding stage, the transcript was analyzed line by line. After each interview, theoretical memos were written to record the evolving ideas about categories, which, in turn, lead to theoretical sampling to support the emerging theory (Corbin & Strauss, 1990; Urquhart, Lehmann, & Myers, 2010). As additional physicians were interviewed, data were analyzed for new concepts. After thirty-five interviews, no new concepts were being introduced, but we conducted a few more interviews to validate that saturation had occurred. We were therefore satisfied that saturation (Corbin & Strauss, 1990; Guest, Bunce, & Johnson, 2006) had occurred after thirty-eight interviews, following which existing themes were being repeated and no new themes were introduced. Table 2 shows the gender, age ranges, and years practising medicine of the sample group.

2.4. Triangulation

In this study, triangulation was accomplished by seeking the opinions of others who worked closely with the physicians and were intimately acquainted with a physician's use of an EMR. OntarioMD employs Practice Management Consultants who offer guidance to doctors who are implementing an EMR. Five of these consultants were also interviewed plus representatives from four major EMR software vendors. The interviews were conducted in a similar manner to the interviews with the physicians, except that the vendors and the consultants were asked to respond in two different ways: first they were asked their own opinion and then they were asked how they expected the doctors to respond to the question.

2.5. Coding

Qualitative data typically consists of large quantities of unstructured text, sourced from such documents as researcher notes, forms, and interview transcripts (Lings & Lundell, 2005; Richards,