# Using Kotter's Change Management Theory and Innovation Diffusion Theory In Implementing an Electronic Medical Record

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## Abstract

The high incidence of preventable medical errors in health care is a key factor that has led to pressure on health care organizations to implement electronic medical records (EMRs) as a means to mitigate the issues antecedent to these adverse outcomes. However, despite the potential benefits of implementing an EMR, the adoption of this technology has been slow. There are many potential barriers to the implementation of an EMR with the most salient being poor change management. There are many change management theories available and two that have been used to successfully implement technological innovations in health care are Kotter's Change Management Theory and Rogers' Innovation Diffusion theory. This article presents a theoretical discussion of how a combination of these two theories could be applied in practice to successfully implement an EMR.

## Key Words

Electronic medical record, change management, innovation diffusion, Kotter's Change Management Theory, Rogers' Innovation Diffusion theory

# Introduction

The trend in the United States following the Institute of Medicine (IOM) report *To Err is Human: Building a Safer Health System* has been to move toward the adoption of an electronic health record (EHR) as a means to transform health care and improve patient safety (Pomerleau, 2008). The goal of an electronic health record that connects care providers to patient information nationwide has permeated the Canadian health care system as well, but before a national EHR can be realized, health regions across the country need to implement an

electronic medical record (EMR). The electronic medical record (EMR) allows for efficient access to patient information and can include functions such as computerized prescriber order entry (CPOE) and electronic medication administration record (eMAR) (Holtz & Krein, 2011). Using an EMR with CPOE improves access to more complete patient information (Holtz & Krein, 2011), enhances medication safety, decreases prescribing errors (Horning, 2011), and eliminates the need for redundant data entry and the potential for error that causes (McLane, 2005). Yet despite these benefits many health regions are slow to adopt this technology (Wolf, 2006). One of the reasons for this slow adoption may be that reports show up to 50 per cent of attempts to implement health information technology (HIT) initiatives fail (McLane, 2005). Barriers to the successful implementation of an EMR identified in the literature include: high costs, lack of standardization, concerns about privacy, and an unwillingness of staff to accept and use the new system (Hillestead et al., 2005; McLane, 2005).

Effective change management is integral to the successful implementation of an EMR (McCarthy & Eastman, 2010). Change management is about engaging and preparing people. It is about behavior change, maximizing abilities, and achieving results. It is about identifying and anticipating barriers and creating strategic solutions. It is the human side of implementation, and it is an essential practice in order to be successful in "the new world of EMRs" (p. 2). The purpose of this paper is to demonstrate how using Kotter's Change Management Theory and Rogers' Innovation Diffusion Theory can help identify and address barriers to change that could be encountered when implementing an EMR.

# Implementing an EMR

The IOM report *To Err is Human: Building a Safer Health System* (2000) details shocking statistics that at least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year in the United States as a result of preventable medical errors. Estimates from the Canadian Institute for Health Information (CIHI) suggested that one in ten adult Canadians taking medications would receive the wrong medication or dose (CIHI, 2007). These errors have been linked to system issues that lead people to make mistakes or fail to prevent them, versus poor care from individual providers (IOM, 2000). System issues that have been implicated include: difficulty in obtaining complete and accurate patient medication lists, multiple care providers in multiple locations with access to incomplete information, transcription errors, illegible writing, delay in receiving information, lack of clinical decision support tools, and lack of automated medication alert systems (CIHI, 2007; IOM, 2000; McLane, 2005; Sassen, 2009). As systems issues have been identified as contributing factors mistakes can best be prevented through systems interventions that make it "harder for people to do something wrong and easier for them to do it right" (IOM, 2000, p.2). One of the primary ways to improve patient safety is to reduce the risk of adverse drug events, and one strategy for reducing that risk is to implement an EMR (CIHI, 2007).

## What is an EMR?

“An EMR is one or more computerized clinical information systems that collects, stores, and displays patient information” (McLane, 2005, p.85). An EMR is designed to replace the traditional paper medical record, and at its most basic level, provides a legible, organized method of recording and retrieving patient information. An EMR allows for “efficient retrieval and access to patient data, including notes, laboratory results, and prescription records” (Holtz & Krein, 2011, p. 248). However, an EMR is more than just an efficient electronic filing system for patient records. An EMR can include patient safety and provider support features such as computerized clinical decision support (CDS), computerized provider order entry (CPOE), electronic medication administration record (eMAR), and electronic medication alerts, just to name a few. These embedded safety and clinical support tools have been shown to decrease the number of prescribing and medication administration errors, improve access to information and decision making, and decrease costs (CIHI, 2007; Holtz & Krein, 2011; IOM, 2000). However, despite the evidence to suggest that implementing an EMR may reduce system inefficiencies that are contributing to adverse events, the adoption of this technology has been slow, and many attempts to implement change have been unsuccessful (McLane, 2005; Wolf, 2006).

## Barriers to Implementation

Barriers to successful implementation of EMRs identified in the literature include: high costs, lack of standardization, concerns about privacy, and an unwillingness of staff to accept and use the new system (Hillestead et al., 2005; McLane, 2005).

However, considering that attempts to implement EMRs continue to fail despite the commitment of serious financial resources (McLane, 2005), I would suggest that the most significant barrier to implementation is a resistance to change. An EMR is not simply a tool to enhance efficiency through automation, but is in fact a transformational tool that “refashions how work is done and how people relate to each other” (McLane, 2005, p. 87). Implementing an EMR involves significant change, and if that change was not sought by staff, significant resistance may be the response. Staff acceptance of and willingness to use an innovation are major determinants of that innovation’s success and considering that nurses are a primary stakeholder in healthcare, it is important to understand their adoption tendencies in order to develop a successful implementation plan (Holtz & Krein, 2011).

In her review of the current literature on EMR implementation Sassen (2009) examined nurses’ feelings about the EMR and reasons for adopting or rejecting it. She found that the most important factor influencing the attitude a nurse ultimately adopts towards an EMR are the change management techniques used. Nurses emphasized the need to be involved in the decision making process from the beginning as part of project teams and usability testing. When nurses were not included in shared decision making their suspicions and myths regarding EMRs were not dispelled, and the EMR did not adequately support nurses’ work. Neglecting to manage the human side of technology implementation led to serious challenges and failure for the EMR to be adopted.

As a change management strategy prior to the roll out of an EMR, McLane (2005) surveyed a sample of staff to gain an understanding of their experience with and opinions about computers and their expectations for the EMR. Concerns about patient confidentiality and nursing workload were raised in the surveys. Survey data was used to guide staff education about expected benefits of the EMR and when those benefits would be seen, as well as patient safety features of the EMR including confidentiality protection. The survey data also guided the development and design of the nursing documentation feature. Assessing and recognizing the attitudes and expectations of staff prior to the implementation of the EMR allowed the planning team to create a system that met the needs of its users and resulted in a successful launch of their EMR.

Holtz and Krein (2011) used the unified theory of acceptance and use of technology (UTAUT) model to understand nurses' perceptions of a newly implemented EMR. The UTAUT model considers performance expectancy, effort expectancy, social influence, and facilitating conditions as key predictors of a person's intention to use technology and actual use behavior. Results of the study showed performance expectancy or the degree to which an individual believes an innovation will help them perform their job, and social influence or the degree to which an individual feels social pressures to use an innovation, were significant factors in EMR adoption. Social influence was found to be the most significant factor with nurses having the strongest influence on the attitudes and perceptions of their nursing coworkers. Nurses in this report were more concerned about the impressions of other nurses than the improved productivity provided by the EMR.

This brief review of the literature highlights the importance of understanding the human side of technology implementation. Discrete barriers and facilitators to successful EMR implementation varied, but the need to address the human factors in change was clear. McCarthy and Eastman (2010) state "If the goal of your EMR implementation is to achieve sustainable results, growth, or organizational transformation, then a substantial investment in people must be central to your overall implementation strategy" (p.viii). I believe that this investment in people can be facilitated through the thoughtful application of change management theory.

## Theoretical Framework

Initiating a change is a complicated process, and following a theoretical framework can provide a basis for making informed decisions that allows for better control over the outcomes of action (McEwen & Wills, 2007). Two theories on change and innovation that have been used successfully to facilitate the adoption of technology in health care organizations are Rogers' Innovation Diffusion Theory and Kotter's Change Management Model (Campbell, 2008; Wolf, 2006). Both of these models provide steps and guidelines for engaging individuals and organizations to support both willingness and ability, thus helping to improve the likelihood the EMR would be adopted.

# Kotter's Change Management Theory

There are many different change management models, but one that has been used successfully in health care (Clark, 2010), and specifically to address the adoption of technological innovations (Campbell, 2008), is John Kotter's eight-stage process for transformational change (Kotter, 1996). This dynamic model is comprised of eight stages that can be organized into three phases. The first phase is "creating a climate for change" and includes establishing a sense of urgency, creating a guiding coalition, and developing a vision and strategy. The second phase is "engaging and enabling the organization" and includes communicating the vision, empowering action, and creating short-term wins. The final phase is "implementing and sustaining the change" and includes consolidating gains and producing more change, and anchoring new approaches in the culture.

## Creating a climate for change

The first stage is establishing a sense of urgency. The biggest mistake in attempting change is to allow complacency (Kotter, 1996). This is a critical step because without a sense of urgency people will cling to the status quo and resist change. Creating urgency involves helping people see and feel first hand why a change needs to occur (Campbell, 2008).

The second stage is creating a guiding coalition. The guiding team members need to have the knowledge, credibility, influence, and skills required to mobilize change (Kotter, 1996). The third stage is developing a vision and strategy. In this stage you need to create a clear and defining vision that is shared by all stakeholders. The result should be a compelling statement that clearly articulates what you are trying to achieve that can be explained in five minutes or less (Kotter, 1996). The vision needs to include a collective sense of what a desirable future looks like, in clear and measurable terms that all stakeholders can stand behind (Clark, 2010).

## Engaging and enabling the organization

The first stage in this phase is communicating the vision. Once the vision has been created and agreed upon by members from all stakeholder groups, it is imperative that it be communicated frequently and convincingly to all groups. This involves communicating the vision in words and actions by leading through example. Members from all groups need to be hearing the same message from everyone in order to gain buy-in and guide them from awareness of the change to a state where they feel empowered to advocate for the change (Campbell, 2008). This involves engaging in continuous dialogue with stakeholders to build commitment and trust.

The next two stages in this phase are enabling action and creating short-term wins. At this stage all parties need to work together to remove obstacles and empower all members to participate. It may involve providing incentives for embracing change, and feedback on how they can use the changes for their benefit (Campbell, 2008). Changing the culture of a workplace takes time, and as time goes on urgency drops and complacency rises (Kotter, 1996). Creating short-term wins can help keep the momentum going. Wins should be

celebrated in a highly visible way that is connected to the vision and then that momentum can be used to set new achievable goals (Clark, 2010). After each win it is important to analyze what went right and what needs improvement.

### Implementing and sustaining the change

The seventh and eighth stages are consolidating gains to produce more change and anchoring new approaches in the organizational culture. The warning in these stages is not to declare victory prematurely. Declaring that the change has been successfully implemented means that people lose all urgency and if the changes have not been firmly anchored into the culture, people will slip back into the "old" way of doing things (Kotter, 1996). In this phase there needs to be a continued focus on the desired vision and the strategic steps required to achieve it until the change becomes a permanent part of the organization's culture and is reflected in the shared norms and values (Clark, 2010).

## Rogers' Innovation Diffusion Theory

Rogers (1983) defined innovation as "an idea, practice, or object that is perceived as new" (p. 11), and diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p.10). As a new idea or innovation is shared throughout an organization there will be individuals within that organization that adopt the innovation sooner than others. According to Rogers (1983) there are five classifications of individuals when it comes to the adoption of an innovation. The very first people to adopt the innovation are known as the innovators, followed by the early adopters, early majority, late majority, and followed lastly if at all by the laggards. Innovators are keen to change and try new things, and represent a very small percentage of the population. Early adopters are the opinion leaders in an organization that other people will observe to determine if an innovation is worthwhile. The people in the early majority group take more time to consider if they will try an innovation than the early adopters, while those in the late majority group tend to adopt an innovation only after the majority of individuals in the organization have already done so. The laggards are the last group to adopt an innovation after everyone else has accepted the change, and some individuals in this group may never adopt the innovation.

Rogers (1983) identified five main stages in the innovation diffusion process: knowledge; persuasion; decision; implementation; and confirmation. Rogers (1983) stated that "knowledge occurs when an individual is exposed to the innovation's existence and gains some understanding of how it functions" (p.20). At the knowledge stage an individual wants to know what the innovation is, and how and why it works. "Persuasion occurs when an individual forms a favorable or unfavorable attitude toward the innovation" (Rogers, 1983, p.20). In this stage people want to decrease the uncertainty about the outcome of using an innovation. People want to know the advantages and disadvantages of an innovation and how its use would ultimately affect them.

The decision stage is the stage where a choice is made whether or not to implement an

innovation (Rogers, 1983). Factors that may hinder or facilitate the decision to adopt an innovation are related to the perceived attributes of the innovation which include its relative advantage, compatibility, complexity, trialability, and observability. These perceived attributes of an innovation are what make it more or less appealing (Ting-Ting Lee, 2004). The relative advantage is the degree to which an innovation is perceived as better than the current practice. It is the perception of how beneficial the change will be. Compatibility is the degree of fit between the proposed change and the individuals or organization that is undergoing the change (Horner, et al., 2004). This relates to how consistent the innovation is with individual and organizational "values, beliefs, past experiences, and needs" (Ting-Ting Lee, 2004, p. 232). The complexity is the degree to which an innovation is perceived as difficult to understand or use. Trialability refers to the availability of opportunities to test the innovation before wide-scale adoption, and observability refers to the extent that the results are visible to others. Innovations with a high degree of observability tend to be adopted faster than those where the results are not highly visible (Rogers, 1983).

Once the decision is made to accept an innovation, the implementation stage begins. The implementation stage is the actual implementation of the innovation, and the confirmation stage involves evaluating the worth of the innovation over time. In the following section I discuss how using Rogers' Innovation Diffusion Theory in conjunction with Kotter's Change Management Theory can guide the successful adoption and implementation of an EMR.

# Discussion

I believe that the marriage of Rogers' Innovation Diffusion Theory and Kotter's Change Management Theory provides a unique way to understand and approach the implementation of technological innovations. I have combined the models and organized them into three distinct phases: planning change, implementing change, and cementing change.

## Planning Change

This phase incorporates the change strategies from Kotter's first four stages (establishing a sense of urgency, creating a guiding coalition, developing a vision and strategy, and communicating the vision) along with the knowledge, persuasion, and decision phases of the Innovation Diffusion Theory. Taking the time to understand your end users is essential in this phase. Using surveys, focus groups, or interviews to gain an understanding of the needs, wants, expectations, and attitudes of all user groups is a great start. In this phase group leaders should share knowledge about what an EMR is and is not, and deal with any misconceptions or unrealistic expectations. Developing a sense of urgency can be a part of the awareness campaign and is an integral component of persuasion. People need more than to understand that there is a need for change, they need to feel it (Kotter, 1996). This urgency can be created by showing videos that share the personal repercussions of preventable medical errors, or the success stories of other hospitals that have successfully implemented

an EMR (Campbell, 2008). Data from the organizational assessment should be used to generate other ideas for creating urgency that would be applicable for each institution and the unique motivating needs of its members.

Creating a guiding coalition involves selecting the right people, and these people should include early adopters from each end user group. These early adopters are opinion leaders who can help continue to drive the sense of urgency and motivate the early majority to buy in to the project. Early adopters can be recruited as system super-users or EMR peer experts. This can aid in persuasion as Holtz and Krein (2011) discovered that nurses' social influence on each other had the most significance in their decision to adopt the EMR.

Developing a vision and a strategy needs to be completed with representatives from all stakeholder groups and should include the data gleaned from the pre-implementation assessment. The vision statement should be service-oriented in order to create emotional motivation, and not specifically related to efficiency or cost containment (Campbell, 2008). Once this vision is decided it should be communicated frequently, in multiple media forms, and to all groups that will be impacted by the EMR implementation.

The perceived attributes of the EMR, and how those advantages can be showcased should also be considered at this stage. Based on data from the initial assessment and information gained from continual 'pulse checks' throughout the process, adjustments to the design features of the EMR and communications about the EMR should be made to address the perceived attributes of the EMR. End users need to be able to test out the EMR to see if it meets their needs and will in fact improve their work. Training needs to occur to decrease the perceived complexity of the EMR and increase its relative advantage. The creation of the guiding vision needs to be done with compatibility factors in mind, and the positive impact the EMR is expected to have on the organization should be highly publicized.

## Implementing Change

This stage involves the actual roll out of the planned change. This involves anticipating barriers and removing obstacles, empowering action, providing incentives, and creating and celebrating short-term wins. This might mean that when you go live with the EMR that extra staff work each shift including super-users to reduce stress and deal with any operational difficulties. Units that are having difficulty with implementation may benefit from having users from successful units come and share their tips and strategies (Campbell, 2008). Short-term wins can be at the individual, unit, or organizational level. For each nurse who was afraid to use the computer and now completes her/his computer charting effortlessly, and for each regular staff who takes on a leadership role as a super-user there should be public recognition. Each unit that reaches 100% implementation and every decrease in medication errors or increase in patient satisfaction related to the EMR should be celebrated. The organization should celebrate each team win and market their successes to other health regions and the public. As each win is celebrated the focus needs to return to the vision and the steps required reach that vision.

## Cementing Change

The final stage is cementing change and includes the confirmation of the change through consolidating gains to create more change, and anchoring that change within the organizational culture. The fatal flaw in this stage would be to abandon the change process as soon as the EMR was officially up and running. Changing culture takes time, and old habits quickly take hold once the urgency is lost. Dedicated teams can be created to deal with unforeseen system or user problems as they arise, and information about what else is achievable or what other health care organizations are doing can be shared to help sustain the change (Campbell, 2008). Change can only be cemented once it becomes part of the organizational culture, or in other words, when it simply becomes "the way we do things around here" and this can only be accomplished once the change has been shown to be successful over time (p.33). So keep the dialogue going, keep identifying and training new super-users, and keep the vision at the forefront of the action.

# Conclusion

In response to the devastating effects of preventable medical errors, there has been increasing pressure for health care organizations to adopt EMRs. EMRs allow for efficient access to complete patient information and have been shown to mitigate some of the systems causes of adverse events. However, despite the potential benefits of EMRs and the pressure to implement them, adoption of this technology continues to be slow. In this paper I identified potential barriers to the implementation of an EMR, with a specific focus on change management issues. Change is a challenging process, and successful change is not accidental. The integration of a theoretical framework that combines Kotter's Change Management Theory and Rogers' Innovation Diffusion Theory can provide the necessary structure to successfully plan, implement, and cement the adoption of an EMR.

# References

Campbell, R. J. (2008). Change management in health care. *Health Care Manager, 27*(1), 23-39.

CIHI (2007). Patient Safety in Canada: An Update. Retrieved from: https://secure.cihi.ca/free_products/Patient_Safety_AIB_EN_070814.pdf

Clark, C. (2010). From incivility to civility: Transforming the culture. *Reflections on Nursing Leadership, 36*(3).

Hillestad, R., Bigelow, J., Bower, A., Girosi, F., Meili, R., Scoville, R., & Taylor, R. (2005). Can electronic medical record systems transform health care? Potential health benefits, savings, and costs. *Health Affairs, 24*(5), 1103-1117.

Holtz, B., & Krein, S. (2011). Understanding nurse perceptions of a newly implemented electronic medical record system. *Journal of Technology in Human Services, 29*(4), 247-262. doi: 10.1080/15228835.2011.639931

Horner, S.D., Abel, E., Taylor, K., & Sands, D. (2004). Using theory to guide the diffusion of genetics content in nursing curricula. *Nurse Outlook, 52*, 80-84. doi: 10.1016/j.outlook.2003.08.008

Horning, R. (2011). Implementing an electronic medical record with computerized prescriber order entry at a critical access hospital. *American Journal of Health-System Pharmacy, 68*(23), 2288-2292. doi:10.2146/ajhp110249

IOM (2000). To Err is Human 1999 report brief.

Kotter, J.P. (1996). Leading Change. Boston, MA: Harvard Business School Press.

McCarthy, C., & Eastman, D. (2010). Change Management Strategies for an Effective EMR Implementation. HIMSS, Chicago, IL.

McLane, S. (2005). Designing an EMR planning process based on staff attitudes toward and opinions about computers in healthcare. *CIN: Computers, Informatics, Nursing, 23*(2), 85-92.

McEwen, M., & Wills, E.M. (2007). *Theoretical Basis for Nursing* 2nd Edition. New York, NY: Lippincott Williams & Wilkins.

Pomerleau, M. (2008). Electronic health record: Are you ready for the next step? *Nursing for Women's Health, 12*(2), 151-156.

Rogers, E. (1983). *Diffusion of Innovations*. New York, NY: Free Press.

Sassen EJ. (2009). Love, hate, or indifference: How nurses really feel about the electronic health record system. *Computers, Informatics, Nursing, 27*(5), 281-287.

Ting-Ting Lee (2004). Nurses' adoption of technology: Application of Rogers' Innovation-Diffusion Model. *Applied Nursing Research*, 17(4), 231-238. doi: 10.1016/S0897-1897(04)00071-0

Wolf DM. (2006). Community hospital successfully implements eRecord and CPOE. *Computers, Informatics, Nursing, 24*(6), 307-316.

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