Tactics for Constructing Visions about Electronic Health Records (EHRs)

Nina Boulus-Rødje
Roskilde University

ABSTRACT

Background *Many qualitative studies focus on the ways healthcare technologies affect situated practices. Although these studies are undeniably important, it is equally important to pay attention to visions about these technologies. This article investigates the media discourse surrounding electronic health record (EHR) initiatives in North America.*

Analysis *Drawing upon Bruno Latour's (1987) framework for analyzing the process of constructing scientific facts, this article examines the tactics through which media discourses construct visions of EHR technologies.*

Conclusions and implications *The analysis shows how these are used to highlight the potential of EHR initiatives in spite of weak empirical evidence. Furthermore, the article demonstrates how visions can be constructed and to support specific agendas by encouraging and discouraging particular interpretations, expectations, and practices.*

Keywords *Electronic health records (EHRs); Media discourse; Qualitative research; Newspapers*

RÉSUMÉ

Contexte *De nombreuses études qualitatives portent sur les manières dont les technologies des soins de santé affectent les pratiques situées. Bien que ces études soient incontestablement importantes, il est tout aussi important de se soucier des visions envers ces technologies véhiculées par des parties intéressées. Cet article examine le discours médiatique sur certaines initiatives nord-américaines envers les dossiers de santé informatisés (DSI).*

Analyse *Cet article s'inspire du cadre développé par Bruno Latour (1987) pour analyser la construction du savoir scientifique. L'article a recours à ce cadre afin d'examiner les tactiques employées par les médias pour développer des visions particulières à l'égard des technologies DSI.*

Conclusions et implications *L'analyse montre comment certains médias vantent le potentiel d'initiatives DSI sans fournir de données empiriques à l'appui. L'article montre en outre comment ces médias construisent leur perspective en encourageant ou en décourageant certaines interprétations, attentes et pratiques, et ce sous l'influence de parties prenantes particulières.*

Mots clés *Dossiers de santé informatisés (DSI); Discours médiatique; Recherche qualitative; Presse écriteIntroduction*

Nina Boulus-Rødje is Assistant Professor in the Department of People and Technology at Roskilde University. Email: ninabr@ruc.dk .

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The idea of computerized patient records emerged in the 1960s and 1970s (Collen, 1995). Yet, in spite of tremendous amounts of resources and money, the transition to Electronic Health Records (EHRs) has been an unexpectedly long process, and many benefits claimed by governments and vendors have so far not materialized (Berg, 2004). One of the classic academic articles about EHR argued that it "has been pursued as an ideal by so many, for so long, that some suggest that it has become the Holy Grail of Medical Informatics" (Kay & Purves, 1996, p. 73). The process of waiting for EHRs to fulfill their undoubted potential is compared to "waiting for Godot" (Berg, 2004, p. 11). Another article posed this humorous yet critical question: "computers can land people on Mars, why can't they get them to work in a hospital?" (Jones, 2003). Common to these quotes is the critical tone of, and perhaps the frustration experienced by, some researchers in regard to the lack of progress and/or the non-satisfactory status quo of EHR technologies.

Indeed, the healthcare technology literature has expanded rapidly across various disciplines in the past few decades (Fitzpatrick & Ellingsen, 2013; Greenhalgh, Potts, Wong, Bark, & Swinglehurst, 2009), along with a surge of qualitative workplace studies focusing on how healthcare technologies affect situated practices (Berg, 1999, 2004; Boulus 2009; Boulus & Bjørn, 2007, 2010; Boulus-Rødje, 2015). Although understanding situated work practices is undeniably important, it is equally important to pay attention to visions about these technologies (Bloomfield & Vurdubakis, 1997; Currie & Guah, 2007). In other words, it is important to study how healthcare technologies are enacted discursively in public arenas, not least in media discourse. This article will illustrate how these views expressed by academic researchers are a stark contrast to the overly optimistic tone that can be found in some of the media discourse describing the visions of EHRs.

In this article, the term discourse refers to rhetoric and persuasion tactics used to promote the implementation of EHR technologies, rather than the broader social structures and power relations. The term visions is conceptualized as ideas about what EHR technologies can do—the problems that they are envisioned to solve and the needs that they are expected to address. Visions refer to the way in which the future of healthcare is imagined and framed, stressing wishful enactments of a desired future. They become part of a conceptual framework for innovation (Swanson & Ramiller, 1997), "fram[ing] possibilities and stock imaginations" (Felt, Gugglberger, & Mager, 2009, p. 28). Visions take part in influencing what the public views as important, encouraging and discouraging specific interpretations, views, meanings, expectations, and practices. Furthermore, visions "play a central role in mobilizing resources … for example in national policy though regulation and research patronage (Borup, Brown, Konrad, & Lente, 2006, p. 286). So far, however, relatively few studies have examined the discursive processes that surround healthcare technologies.

The contribution of this study is twofold. First, whereas many studies of healthcare technologies focus on situated work practices and organizational issues related to these technologies (e.g., Berg, 1999; Nilsson, Grisot, & Aanestad, 2002; Strauss, Fagerhaugh, Suczek, & Wiener, 1985), this study shifts the focus to the media discourses surrounding these technologies. Media discourses offer interesting sites for investigation, as they

bring together descriptions of how the future is imagined, but also of how the problems of today are perceived. Second, whereas most of the existing studies about the visions of technological innovations tend to focus on the ambiguous nature of visions and their effects (Balka, Rodje, & Bush, 2007; Ellingsen & Monteiro, 2008; Greenhalgh, Procter, Wherton, Sugarhood, & Shaw, 2012; Swanson & Ramiller, 1997), this study focuses on the construction process of visions, examining the way in which these are discursively crafted, using different tactics, to make the case for EHRs. The article draws upon parts of Bruno Latour's (1987) work Science in Action, in which he identifies different types of tactics applied to constructing scientific facts. Four of these tactics have been selected and used here as a conceptual framework to examine and analyze the media discourses about visions of EHRs.

This article reports on a follow-up study that was conducted after a four-year action-research project investigating the introduction of electronic medical records (EMRs) in the primary healthcare sector in Canada (Boulus, 2009; Boulus & Bjørn, 2007, 2010). During the fieldwork for this research project, I encountered countless situations where there were gaps between the imagined potentialities ascribed to EMR technologies in policy and media discourses and the actual functionalities and complexities encountered by healthcare practitioners on the ground. In an attempt to follow those imagined visions, I started reviewing media reports because these can be seen as providing a space for reflecting not only on present practices but also on future visions. The empirical data used in this article are drawn from document analysis of major Canadian and American newspapers published in 2010–2011. The analysis identifies four tactics deployed in media discourses, and it demonstrates how these are used to highlight the potentials of EHR initiatives, in spite of weak empirical evidence from studies of EHR technologies.

The article beings with a brief review of qualitative studies from the field of healthcare technologies, followed by a review of studies on technology visions in general and healthcare technologies in particular. It then explains the method used to collect and analyze the media discourse. This is followed by a presentation of the analysis, identifying four tactics deployed in media discourse about EHR technologies. Finally, the implications of this study are discussed, and a few concluding remarks that highlight the limitations of this study are offered.

Overview of literature

Healthcare technologies

Recently, several scholars have cast doubt on the optimistic visions that have been ascribed to EHRs, highlighting their weak empirical evidence in relation to increasing efficiency and improving medical care (Black, Car, Pagliari, Anandan, Cresswell, Bokun, McKinstry, Procter, Majeed, & Sheikh, 2011). Researchers report challenges with EHR related to integration, interoperability, and standardization (Berg, 1999; Ellingsen & Monteiro, 2006). Similarly, healthcare organizations have been unable to fulfill the dream of seamless data exchange across the boundaries of healthcare institutions (Fitzpatrick & Ellingsen, 2013). In addition to technical issues, healthcare organizations encounter various social, organizational, and financial challenges (Kaplan & Harris-

Salamone, 2009). A literature review of electronic patient records (EPRs) points out that "large-scale distributed EPR systems are likely to be less efficient, less cost-effective, less safe, and the information they contain less trusted than smaller, more local systems" (Greenhalgh, Potts, Wong, Bark, & Swinglehurst, 2009, p. 759). Looking at the status quo of EHRs, it quickly becomes clear that the complexity in implementing these technologies has been underestimated.

The literature about healthcare technologies has explored the roles that technologies and other artefacts play in the organization and delivery of care. Some studies emphasize the artefact's material properties and the ecological flexibility that enables supporting particular coordination activities (Heath, Luff, & Svensson, 2003). Sociotechnical studies take this point further, arguing that technologies do not simply represent healthcare workers' cognitive activities but rather transform them (Boulus, 2009; Markussen & Olesen, 2007). Therefore, sociotechnical studies have emphasized the irreducible intertwinement of technologies within organizational practices (Berg, 1999). In addition, some studies emphasize the importance of taking into account resources beyond the patient record itself in order to facilitate organizational learning (Reardon & Davison, 2007), to establish spaces for reflection-on-practice(Boulus & Bjørn, 2007, 2010), or to allow communication flows across organizational boundaries (Nilsson, Grisot, & Aanestad, 2002). Research has also focused on the relationship between technological change and changes in the professional identity and autonomy of healthcare practitioners (Boulus, 2009; Kohli & Kettinger, 2004).

In general, the above-mentioned studies are critical of the mainstream view—found in media discourses, among other places—that medical activities can be understood as a rational, linear assembly-line process that can simply be "supported" by technology (Berg & Goorman, 1999). Indeed, this view has been roundly criticized by researchers for its inability to take into account the complexities, contingencies, and contexts of healthcare (Strauss, Fagerhaugh, Suczek, & Wiener, 1985). Nevertheless, this view remains predominant in media discourses on the potentials of these technologies. These visions, however, cannot be viewed as divorced from the specific context of use.

Visions of technologies

The importance of situating visions and abstract design principles within the context of use has been increasingly acknowledged in various studies of healthcare technologies. Furthermore, it is seen as important to understand the technology-in-use practices that are developed, including peoples' understandings of the technologies they use (Orlikowski & Gash, 1994). However, while there has been significant interest in understanding users and their experiences (Oudshoorn & Pinch, 2003), considerably less has been written about understanding how these micro experiences connect (or not) to macro perceptions and visions. Yet, these perceptions are utterly important, as they are disseminated in public media, where they influence public and policy perceptions more generally (Borup et al., 2006).

Paul Dourish and Genevieve Bell (2011) argue that visions "are interesting not for what they say about the future but also for what they say about the present" (p. 21). Furthermore, investigating visions provides "a useful analytical lens for considering

how the problems of today are perceived, framed, and understood" (Dourish & Bell, 2011, p. 21). Visions are important because we cannot separate the ways in which we know the world from the ways in which we choose to live in it (Felt, Gugglberger, & Mager, 2009). In other words, our knowledge and visions of the world are inseparable from practical activities and consequences. Thus, the way we envision a technology influences its design and actual use, either implicitly or explicitly. By examining the media discourses around EHRs, a better understanding is offered of the conceptual repertoires that infuse technical design and, eventually, healthcare work.

There are various studies examining visions of different innovations. One of the popular notions in the literature is organizing visions (Swanson & Ramiller, 1997), which refers to a central community idea about the application of a new technological innovation in an organization. Using this notion, Burton Swanson and Neil Ramiller (1997) draw attention to the ambiguity of visions, given that they have multiple interpretations, as well as to the evolution of visions over time, which they relate to the need to ensure the continued legitimacy of visions. They suggest that organizing vision serves an important function, because it enables the mobilization of resources needed to promote the realization of visions. Similarly, Joanne Yates and Wanda Orlikowski (1992) emphasize the evolving dimension of organizational communication. They propose the notion of genres as a way to ensure that conceptualizing communication is something that is embedded in the social process that constantly evolves, rather than viewing it as a result of an isolated action. The same can be said about visions, as these cannot be divorced from the social processes they are embedded in and that they influence. Therefore, studying genres and visions both within and outside of organizations (i.e., public arenas) is important, as these can become institutionalized, taken-for-granted conceptualizations, norms, and practices that become difficult to question.

Visions of healthcare technologies

Among the studies of visions, a few focus on healthcare technologies in particular (e.g., Naidoo & Leonard, 2012). Alistair Preston, David Cooper, and Rob Coombs (1992), for example, investigate the construction and fabrication process of management budgeting systems in the British National Health Service. They illustrate how this system was not fixed with well-defined purposes and uses; rather, the definition of its purposes emerged during its design and implementation process. Gunnar Ellingsen and Eric Monteiro (2008) have a similar focus on ambiguity and transformation, arguing that visions are often purposefully ambiguous in order to mobilize support from the different stakeholders.

Moving away from the ambiguity of visions, Trisha Greenhalgh, Rob Procter, Joe Wherton, Paul Sugarhood, & Sara Shaw (2012) identify the use of different, conflicting discourses for telehealth and telecare. This includes the modernist discourse, which is futuristic, utopian, and technologically determinist. It views technology as the solution to most issues, compensating for human deficits and helping achieve efficiency, cost-effectiveness, and rational solutions. Another is the political economy discourse (Greenhalgh et al., 2012), which is visible particularly through the use of marketing language, the excessive focus on costs, and the focus on health and care as commodities. This use of political economy discourse and a dense market-oriented vocabulary

has also been found in previous studies that reviewed media discourse surrounding healthcare initiatives (e.g., Felt et al., 2009).

Investigating the portrayal of EHRs in media and policy discourses reveals that they are often characterized as vehicles not only for saving money but also for saving lives (The White House, 2007; Walberg, 2010). For example, Ellen Balka, Ketil Rodje, & Gee Corlan Bush (2007), who examine the discourse in the Romanow Report—an important Canadian policy report containing national views about healthcare technology—claim that healthcare technologies are conceptualized as neutral instruments that will enable a more efficient healthcare system. They conclude that "the technological future of the Canadian health care system is envisioned, myopically and utopically through rose coloured glasses" (p. 476). Indeed, a closer look at how EHRs are articulated in the Romanow Report (Romanow, 2002) reveals that they are referred to as the "jewel in our crown" (p. 78), and are viewed as revolutionary technologies that are driving the modern health sector. These technologies are often ascribed major technological power, or even heroism. This usually occurs in a discursive context, with imaginative visions about the potential of EHRs to transform future healthcare practices.

While many of these studies focus on the nature and the effects or outcomes of visions, this article expands the body of literature by focusing on the construction process of visions. Specifically, this article focuses on the persuasive tactics used in the media to construct visions promoting EHR technologies. Bruno Latour's (1987) analysis of "tactics" used in the production of scientific facts and technical artefacts informs this article. Latour (1987) argues that to understand the nature of a technology, its construction process must be investigated. This includes analyzing how certain arguments are framed, how certain actors and material are enrolled, and how particular voices or arguments are made invisible or absent from the discussion—all in the name of crafting persuasive arguments. This analysis selects four tactics and uses them as a conceptual framework for examining the discourse surrounding EHR technologies.

Method

This investigation follows up on a four-year action-research project I conducted about EMR technologies in Canada (Boulus, 2009; Boulus & Bjørn, 2007, 2010). That project followed the adaptation process of EMRs across several clinics by carrying out different observation sessions and interviewing healthcare practitioners, patients, policymakers, and information technology (IT) vendor representatives. I also attended various seminars and training sessions organized by the IT vendors and policymakers. During this fieldwork, I encountered countless situations where there were gaps between the imagined potentialities ascribed to these technologies by policymakers and vendors, and the actual EMR functionalities that were available and the issues encountered on the ground. I began following those imagined visions and started reviewing media reports. Selecting media reports for examination is particularly interesting, because newspapers can be seen as providing space for reflecting not only on present policies and practices, but also on future visions.

Analyzing visions and discourses can be done in different ways. Casper Jensen and Peter Lauritsen (2005) develop two approaches for analyzing governmental reports within healthcare. The first one, "reading against the text," aims at critically in-

terpreting a text and uncovering hidden assumptions or ideologies within it; the second approach, "reading with the text," adds agency to a report by following where the text goes and investigating what it does in practice. This article predominantly reads "against the text," focusing on critically analyzing newspaper articles and the ideologies they inscribe.

The empirical data used in this article constitutes articles from Canadian and American newspapers. Despite the differences in the healthcare systems in Canada and in America, the challenges encountered in the healthcare sector are very similar (e.g., an ageing population and rising healthcare costs), and so are the tactics used in media discourses to craft overly optimistic visions of EHR technologies. Thus, the differences across these national contexts are not pertinent when investigating how EHRs are envisioned in the media discourse. A review of newspaper articles was conducted with ProQuest Newsstand[1], which provided access to a digital online database of newspaper articles. This database covers more than 1,370 key newspapers. Using this database, queries were run across all the available Canadian and American newspapers. This includes, among others, the *Globe and Mail,* the *Vancouver Sun,* the *Times Colonist,* the *National Post, The Province,* and the *New York Times.* A preliminary exploration used the following general keywords: "Electronic Health Record" (EHR), "Electronic Medical Record" (EMR), and "Electronic Patient Record" (EPR). The search was limited to articles published in 2010 and 2011. This imposed several limitations on the study, which are addressed in the conclusion section. The initial search resulted in 280 articles. A few of the articles analyzed were editorials and columns, but most of the articles were news, written mostly by reporters, and not by experts from the medical field. These articles were reviewed with the aim of getting an overview of the various topics discussed. This was done to identify the dominant issues that were repeatedly discussed during the above-mentioned one-year period. This includes the expectations of these technologies, the visions that were ascribed to them, the benefits that were realized, and the challenges that were encountered.

In order to focus on issues of national relevance in America and Canada, articles from local or regional newspapers discussing issues that were only relevant to a specific province, state, or region (e.g., issues related to a local vendor, a local initiative, or a specific health authority) were excluded. This resulted in a dataset of 30 articles, which includes two articles from the *New York Times,* seven from the *National Post,* nine from the *Globe and Mail,* four from the *Toronto Star,* seven from the *Vancouver Sun,* and one from the *Calgary Herald.* Each article was read carefully several times to identify the broad themes discussed. Each article was then categorized based on the core themes discussed and grouped with articles that discuss the same themes. Some articles that discussed several themes were grouped under several categories. This categorization process led to the identification of the core themes discussed across newspapers articles during that period of time.

Once the core themes were identified, a document analysis was carried out focusing more in-depth on each article, interpreting and assessing the ways in which the core themes were discussed (Bowen, 2009). This analysis was inspired by grounded theory (Glaser and Strauss, 1967) and was carried out through the use of open codes.

This resulted in the following list of open codes: medication errors or adverse events, rising costs, baby boomers or an ageing population, electronic health records, personal health records, e-prescriptions, saving costs, increasing efficiency, empowerment, privacy or confidentiality, comparing industries/countries, a lack of evidence and contestable statements, and generalization. During the creation of the open codes, memos were written to capture the nature and relationship of the codes, with special attention paid to the way in which arguments were crafted. Axial codes were then used to identify relationships and connections among the open codes. This resulted in the following list of axial codes: threats to healthcare, solutions, benefits, critical issues, and persuasion tactics. During this process, patterns began to emerge across the different media articles in terms of the use of tactics made to construct arguments in favour of EHRs. Latour's (1987) framework, outlined above, was used to systematically investigate these tactics. Below are the results from the analysis, which outline the various tactics that are used by the media to construct visions about EHRs.

Tactics for constructing EHR visions

When a new technology is introduced, there are always uncertainties and disputes about its qualities. Therefore, if text is to convey support of technology's potential, it needs to not only be convincing but also written in such a way that it crafts a persuading argument, reduces controversies, and withstands critiques. Writers use several tactics to achieve this end (Latour, 1987), some of which are interrelated and overlap. Common to these tactics is their emphasis on the collective and relational nature of the process of constructing facts. A sentence in and of itself, for example, can be made into fact or fiction, depending on how it is inserted among other sentences and where it appears in the order of debates (Latour, 1987). This article will now examine the four tactics identified for constructing visions about EHR technologies in media discourses.

Fortifying tactics: From opinion to facts and technical details

The first tactic identified can be referred to as fortifying. Arguments relying on this tactic often start by enlisting various bits of evidence or facts that are then used to highlight particular threats to healthcare. The argument proceeds to formulate a vision in which these threats can be dispensed with the EHR. Some of the threats identified in the articles include the rising costs of healthcare (Baluja, 2010; Berkow, 2011; Simpson, 2011), the "escalating aging population" that is "crippling the health-care system" (Entwistle, 2011; Picard, 2010a), and adverse events and medication errors leading to many deaths each year (Blackwell, 2011; Health Council of Canada, 2009; Taylor, 2010).

Once these potential threats have been put on the table, a number of "external allies" are enrolled to strengthen the arguments. These allies may be other newspaper articles, policy documents, governmental initiatives, findings from academic research or commercial research, et cetera. However, external allies do not have to be documents or articles, they can also take the form of the voices of actors and stakeholders (e.g., healthcare practitioners, governmental actors). For example, an article entitled "Survey Finds Most Fear Boomers Will Cripple Health-care System," published in the *Globe and Mail,* quotes Richard Alvarez, the president and chief executive officer of *Canada*

Health Infoway—a national program established in 2001 to accelerate the adoption of EHRs in Canada—as saying that "patients are increasingly demanding electronic health records because they know they improve their care" (Picard, 2010a, para 19). Enrolling external allies strengthens the argument immensely, for it is not only Alvarez, the individual, who is speaking. Rather, Alvarez is speaking on behalf of a collective of patients, and the newspaper article is fortified by drawing on this combined set of allies. There are several similar instances where different actors speak on behalf of patients. For example, doctors sometimes speak on behalf of their patients, sharing what they think their patients' needs and demands are (Gerstel, 2010). In addition to enrolling external allies such as texts, articles, and the voices of others, references to different projects from other provinces, countries, sectors, or industries are also found. These references depict the experiences of these projects as positive and successful, indirectly (or even directly) arguing that since they were successful in other settings, they will also be successful in healthcare. In principle, anything can be turned into a resource and enrolled to lend credence and epistemic authority to the journalist.

By appealing to other accepted "given truths"—the fact that technologies have already saved money and increased efficiency in other industries/sectors—texts fortify themselves by lending epistemic or rhetoric authority from other contexts. They become increasingly difficult to dispute and are able to withstand critique. Furthermore, these texts include reminders that these statements are supported by experts. For example, "computerized medical charts are considered a crucial goal for the health-care system, with experts predicting they will reduce costs, curb medical error and boost efficiency" (Blackwell, 2010, para 4, emphasis added). Who those experts are is not always clear, and, as mentioned earlier, academic researchers within the field claim that these technologies are "likely to be less efficient, less cost-effective, less safe" (Greenhalgh, Potts, Wong, Bark, & Swinglehurst, 2009, p. 759) than paper records. Enrolling experts and external allies alone, however, is not enough. To convince the reader, enrolling quantitative measurements is a powerful tactic commonly used in media discourses.

The media discourse surrounding EHRs contains many types of quantitative measurements used to make arguments about the amount of errors that could be avoided, the amount of deaths that could be prevented, et cetera. However, the most common measurement relates to how much money can be saved by using EHRs. For example, in an editorial published in the *Wall Street Journal*, former president Barack Obama claimed that these technologies would save $80 billion a year in the U.S. (Groopman & Hartzband, 2009). Similarly, Alvarez, of *Canada Health Infoway*, estimated that EHRs "will save between $6-billion and $7-billion a year" (Health Council of Canada, 2009, para 11) in Canada. Thus, the reader no longer needs to blindly believe the claim that EHRs will save money, because it is apparent from the figures. By stacking many layers of claims and masses of supporting references, such texts give readers an impression of a depth of vision that becomes immensely difficult to oppose. Other numbers that are regularly highlighted refer to the number of doctors or patients already using electronic records.

The point of the articles, however, is not simply to overwhelm the reader with numbers. Rather, mobilizing numbers is often the beginning of a process intended to

convince the reader by providing support for specific arguments and claims made on behalf of the EHR. Many newspaper articles spend several paragraphs or pages describing the increasing costs of healthcare and providing estimates of how much money or how many lives EHRs will save. Thus, there are articles with titles such as "Better Data Save Lives" and "Financial Payoffs of Electronic Record Keeping Are High" (Walberg, 2 010). Another article, entitled "Initiative to Get More Bang for the Buck," also deploys multiple financial figures, while emphasizing that EHRs are "not just about reducing costs; they are about Canadians getting real value for money" (Health Council of Canada, 2009, para 7). Similarly, the use of marketing language and economic notions (e.g., value, gains, productivity, efficiency) portraying health and care as commodities for which the patient should demand to get "real value" is a prominent feature of these articles.

While many of the articles reviewed focus on costs, other articles remind readers that "it's not just about cost savings" (Berkow, 2011, para 16), and ask to "widen healthcare debate beyond costs" (Galloway, 2010). But these articles rarely fulfill their promise and tend to end up discussing a different set of quantitative measurements. Some discussions, however, move beyond measurements, focusing on other aspects of EHR use that are not easily quantifiable (e.g., patient empowerment) [Entwistle, 2011; Parker-Pope, 2008]. Such discussions are important in the EHR context because, as will later become evident, the figures used to demonstrate enhanced efficiency or cost savings of EHRs are by no means unproblematic.

Stacking: From details to generalizations

Stacking refers to the discursive mobilization of multiple resources, instruments, numbers, and figures in order to enable the text to move inductively and incrementally from details to generalizations. Similar to building a stone hut where each stone must move further away than the previous one, stacking resources implies moving gradually from specific to more general layers. Thus, such processes of layering and stacking can enhance facts (Latour, 1987). Although both fortifying and stacking tactics refer to the presentation of facts and figures, each one of them focuses on a different effect of the presentation. Fortifying tactics focus on the aspect of withstanding the assaults of a hostile environment through references, whereas stacking tactics focus on the way data are arranged (i.e., incremental, inductive) to generate an effect of generalization. The difference between fortifying and stacking tactics is akin to the difference between qualitative and quantitative claims.

As mentioned above, there are various numbers that are regularly enrolled in order to make the case that EHRs are needed to improve the situation in healthcare. In one article, former Ontario health minister Deb Matthews explains that the province has "managed to get five million patients onto digital medical charts" (Blackwell, 2010, para 1). What is important here is that different quantitative measurements are stacked in such a way that they give the reader an impression of depth and incontrovertibility. For example, outside of Ontario, "about 50 per cent of citizens have an electronic medical record—meaning information stored in electronic form- but only 17 per cent have an electronic health record—one that contains all their essential health information" (Picard, 2010, para 11). In Canada, in general, "there are electronic medical records in

about 37 per cent of physician's offices, 65 per cent of hospitals and nearly 100 per cent of pharmacies" (Picard, 2010, para 12), and in British Columbia, "40 per cent of doctors have gone digital" (Simpson, 2011, para 32). It is important to note here how these quantitative numbers are stacked in such a way that it is not easy to compare and contrast them, as the different percentages refer to different things.

Once many layers of quantitative information have been stacked, it is difficult to breach the argument without great effort (Latour, 1987). One reason is that the quantitative stacking of discourse renders it increasingly technical (e.g., by bringing in different measurements), which makes it harder to pick apart and thus to criticize. It becomes increasingly challenging to dispute such statements, especially since many of them rely on measurements that the reader has no basis for contrasting and comparing, such as the tendency to use quantitative measurements to reformulate medical problems into economic ones.

As mentioned, stacking refers to bringing in numbers to enable the text to move inductively from details to generalizations. In this case, to enable generalization, the implementations of Canadian healthcare technologies are often compared to other countries or other sectors. Thus, it can be claimed that EHRs are either "near-universal" or simply "universal" (Walberg, 2010, para 2) in other countries (e.g., the U.K., Australia, Sweden, and Italy). Furthermore, it is often stated that technology has already transformed other sectors or industries (e.g., banking, retail, manufacturing) (Berkow, 2011; CTVglobemedia Publishing Inc., 2010; Walberg, 2010), implying that because it has already transformed other industries, it will invariably also transform healthcare.

Another version of this tactic is provided by many newspaper articles by comparing electronic records to a wide range of other technologized tasks, such as paying bills online, changing flights, downloading music, booking hotels, renewing library books, buying movie tickets, et cetera (Entwistle, 2011; Steenhuysen, 2011). These comparisons are framed in such a way that they lead to a "clear conclusion," namely that healthcare is not different from other social domains and, hence, that EHRs are an unavoidable part of the future (Berkow, 2011). However, academic studies of EHRs consistently show that healthcare practices are, in fact, quite different from other practices, not least due to their complexity and to the fact that failures or errors of practice are often life and death matters. Anselm Strauss and his colleagues (1985) write at length about how the medical practice depends upon multiple contingent and unpredictable factors that vary from patient to patient but must be taken into account. Thus, the claim that healthcare is not different than other sectors (Berkow, 2011) is a rather imprecise and misleading generalization.

A similarly misleading comparison of the healthcare sector to other industries can be found in the following quote: "Banks, video stores, pizza parlours, taxi companies, couriers, bus systems and newspapers are all light years ahead of health institutions when it comes to electronic recordkeeping and information management" (Picard, 2007, para 4). This quote, too, relies on stacking to produce an argument that underestimates fundamental differences between the service sector and the healthcare sector. The effect here is to suggest that there is basically no difference between requesting a bank account summary and a medical diagnosis. Yet the former is an automated task

that can be (re)produced simply by printing a list of the various transactions, whereas the latter is a much more complicated task that cannot simply be automated and is dependent on the aforementioned heterogeneous, contingent, and unpredictable factors (Strauss, et al., 1985). Also, in contrast to information found in bank accounts, medical information is of a fundamentally contextual nature, since it is at once collective and distributed and thus subject to interpretation by various professionals (Berg & Goorman, 1999).

As shown above, the newspaper articles mobilize various allies and a wide range of details to fortify arguments made in the text. This includes the references to and/or enrollment of different actors, documents, initiatives, technologies, and projects from various provinces, countries, sectors, industries, et cetera. Statements can be stacked in a particular way to allow generalization and produce arguments that construct misleading or inaccurate comparisons. Finally, it can be quickly noticed how producing quantitative measures and focusing on the topic of finance has been dominant in the EHR context. Enrolling quantitative measures, however, is not always sufficient, as crafting a convincing argument relies on positioning; the allies must be staged and framed (Latour, 1987).

Staging and framing: Telling the reader how text should be interpreted

Staging and framing is achieved when the author provides hints, clues, or direct statements concerning how the text should be interpreted. For example, the author may guide readers by indicating what is especially interesting, what is disputable, et cetera. These discursive tactics help to stage the mobilized resources in support of particular arguments. For example, an article entitled "For Happier Patients, Go Electronic" (CTVglobemedia Publishing Inc., 2010) clearly states that doctors who still have not implemented an EHR should read it. The title is formulated as a condition, stating to doctors that if they wish to have "happier patients," then they should implement an EHR. However, studies of EHR implementations show that doctors, and thereby also indirectly patients, are rather frustrated with these technologies, which, according to a recent literature review, make clinical work less efficient, distract staff into data entry and standardized protocols, and jeopardize the human aspect of providing medical care (Greenhalgh et al., 2009). A closer look at this same newspaper article (CTVglobalmedia Publishing Inc., 2010) reveals that its framing begins by making some general observations, such as drawing attention to the fact that EHR technologies are widespread in other countries. The reader is then told about the general threats of rising healthcare costs and ageing populations. This leads the reader to think about the need for a solution, which is then provided by EHR technologies. Again, figures and other resources are staged in such a way that they cannot easily be questioned.

Indeed, it was surprisingly difficult to find newspaper articles that are critical toward EHRs or raise questions about the potentials that are ascribed to these technologies. In fact, there were very few articles in the sample that contained critical reflections concerning issues that might range from privacy and confidentiality (Steenhuysen, 2011) to technical security and computer viruses (Komarnicki, 2010). In direct contrast to the academic literature, most of the newspaper articles analyzed in this study were strongly normative and critical toward those doctors who had not yet implemented EHRs.

Even in the cases where some critical concerns were highlighted, they were mostly sidelined by appeals to economic reasoning and efficiency. For example, one article focused on how doctors should "Prescribe a Technology Fix for Health Care," indicated in its title (Berkow, 2011). This article spends a great deal of space explaining how the healthcare sector is lagging behind other industries, and how Canada is lagging behind other countries. In the middle of the article there is a brief comment about how technology developers have been concerned with creating systems that are fully secure and protected (Berkow, 2011), but this issue is not pursued any further. This trivial mention is in spite of the fact that security in the healthcare sector (which is different than online banking, for example) is of paramount importance since health records contain patients' medical conditions. After all, this type of information is private and sensitive, and it can have unrecoverable consequences if it falls into the wrong hands. A similar example of marginalizing critical concerns can be found in the article entitled "Paper Jam Blocking Patient-care Reforms," which explains that the reason doctors are not adopting EHRs is their culture, which is based on a lack of collaboration. Toward the end, the article briefly admits there are also "concerns over privacy: ensuring that electronic health records are only accessible to appropriate health professionals" (Picard, 2010, para 17). However, we are quickly assured that this is simply "done with passwords and varying levels of system access" (Picard, 2010, para 17), and the issue is not taken up again.

Very few newspaper articles explore the reasons for the relatively slow adoption rate of EHRs by general practitioners (GPs). There are, in fact, many reasons, some of which were mentioned above in the review of the academic literature. Among them is the fact that EHRs are too costly for a small GP's office, and this is particularly true for the commercial EHRs upon which the federal government has relied (Blackwell, 2010). Even open-source programs, which are much less costly, still require the establishment of an entirely new technical infrastructure, which includes purchasing hardware, software for the new hardware, the EHR system, and technical support (Boulus 2009; Boulus & Bjørn, 2007, 2010). Other issues include the fact that Canadian GPs have received little financial support from the provincial or federal governments (Blackwell, 2010), and that many GPs have few incentives for implementing EHR technologies because of their low return on investment. In addition to the financial issues of escalating costs, there are various technical issues that still need to be resolved, including system crashes, the lack of standardization, and the need for interoperability (Berg, 1999; Ellingsen & Monteiro, 2006; Greenhalgh et al., 2009; Harstwood et al., 2003). Furthermore, it is often the case that those who invest the money and time in EHR development are not the ones to enjoy the fruits of their labour (Berg, 2004). Indeed, the dream of a seamless Web enabling the exchange of information across all healthcare organizations is still far from reality. In fact, according to a review of EHR studies by Geraldine Fitzpatrick and Gunnar Ellingsen (2013), "seamless integration of different EPR systems is unlikely because human work will always be needed to bridge the model-reality gap and recontextualize knowledge for different uses" (p. 767).

Such considerations, however, are almost entirely absent from the media discourse on EHRs. The fact that many medical records still remain paper-based is turned

into "a uniquely Canadian problem" (Berkow, 2011, para. 7), a wildly inaccurate claim. Furthermore, the slow uptake among GPs is reduced to the anodyne "explanation" that there is "resistance to change" (Berkow, 2011, para 6). Thus, when the reader is told what the "real concerns" are, these rarely refer to any of the problems and issues mentioned in the academic literature, instead pointing to a vaguely defined issue of culture and mentality. For example, Alvarez's response to the question of why most Canadians still do not have EMRs is that: "it's not technology or money that's lacking but a culture of collaboration" (Picard, 2010, para 7). Though several researchers claim that Canadian hospitals spend too little money on IT in comparison with other countries (Berkow, 2011), most newspaper articles give the impression that too much money has been spent on EHRs (Blackwell, 2010).

As these examples illustrate, the arguments are framed in a particular manner, inscribing the author and an image of an ideal reader within the text. In the case of EHRs, readers are told that they are the solution to the contemporary problems within the healthcare sector. Through a series of trials, the author tries to convince the readers (who also happen to be patients), that GPs and their "lack of collaborative culture" are the "real" reasons for the slow uptake of EHRs. Staging and framing statements are very powerful tactics, particularly when combined with captation.

Captation: Away from indisputable statements to contestable ones

"Captation" implies achieving subtle control of the reader. Captation efforts typically entail making a series of general and less disputable statements and then slowly leading the reader to accept more unfamiliar and contestable ones. To illustrate this, let us look at the debates about medication errors. These debates often start by listing facts about the number of patients who die every year from some kind of adverse event and how these deaths could have been avoided with the help of technologies (Baluja, 2010; Health Council of Canada, 2009; Walberg, 2010).

Money is not the only quantitative measure that this discourse enrolls. The numbers of deaths that could have been prevented are also provided. For example, more than one million patients were affected by medication errors in 2010 (Baluja, 2010). The reader is then told that "Doctors' Scribbles put Patients at Risk," as indicated in the title of the article (Appleyard, 2011): patients' lives are in danger because of the misinterpretation of doctors' illegible handwritten prescriptions. Thus far, these arguments indeed seem convincing and rather difficult to dispute. The problem, however, begins when these arguments are linked to the conclusion that healthcare technologies will prevent the mistakes and deaths mentioned above (e.g., Baluja, 2010). This is a move away from indisputable to contestable statements, because one could just as well argue that introducing healthcare technologies will not necessarily result in reducing medication errors or is even unlikely to do so. These technologies may reduce errors, but they may also introduce some new ones—an argument made in a Toronto study mentioned in an article by Tom Blackwell (2011), which compared the rate of prescription errors with and without a digital program and found that the rate of error was the same.

As this example illustrates, using captation is the opposite of using stacking tactics, where the author moves away from details toward generalization. Instead, captation

implies that the author moves away from general and less disputable statements, and into those that are less known and more contestable, thus moving into an imaginary and utopian universe that does not necessarily have empirical evidence. In the case of EHRs, this implies a move from claiming that doctors' handwritten prescriptions put patients at risk (a non-disputable statement) to claiming that electronic prescriptions will reduce medical errors (a statement that has been disputed in some studies).

Discussion

Various studies focus on visions in media and policy discourses in general (Dourish & Bell, 2011; Swanson & Ramiller, 1997), and on visions of different healthcare innovations in particular (Ellingsen & Monteiro, 2008; Felt et al., 2009; Greenhalgh et al., 2012; Jensen & Lauritsen, 2005; Preston et al., 1992). Similar to other studies, this study found the existence of multiple conflicting discourses of healthcare innovations. This includes the dominant use of modernist discourse characterized by its utopian and technologically determinist tone (Greenhalgh et al., 2009), and the political economy discourse with its extensive focus on costs and on the commodification of health and care (Felt et al., 2009; Greenhalgh et al., 2012). While many of these studies focus on the effects of visions, this article extends this body of literature by focusing on the construction process of visions. Drawing upon Latour (1987), it identifies the tactics that are used for constructing visions about EHRs in media discourses.

Several newspaper articles often begin by presenting a number of supposedly incontrovertible facts that are typically framed as potential threats that demand action is taken. Once these "threats" or "problems" are put in place, various allies are enlisted to support the arguments made on behalf of EHRs. These allies can be anything, from different kinds of documents, to experts, to projects. Facts and arguments are incrementally and inductively stacked in layers, mobilizing various resources and quantitative measurements. Different statistics are enrolled, giving the reader an impression of depth, which makes it difficult to compare and contrast the different numbers. This move from opinions to facts and technical details implies a fortifying tactic. Fortifying tactics are strengthened by the tactics of stacking, which implies a move from particularities to generalizations, enabled by offering a comparison between EHRs and other things (e.g., other technologies, industries, sectors). Stacking enables the construction of equivalence across different domains, and it relies on the epistemic authority of experts that offer evidence from other contexts (such as the claim that EHRs already save money in other settings). The analysis has also identified the use of staging and framing tactics that help mobilize support for particular arguments and ensure that resources are "formatted" in a particular way, such that they become difficult to question (Latour, 1987). Staging and framing anticipate reader responses and their possible objections to the argument. Thus, this article illustrates the ways in which the reader is guided through the text while being told what is critical and relevant and what is inconsequential or insignificant. A final tactic identified here is captation, which refers to the way in which arguments gradually move from indisputable statements to contestable ones, eventually enrolling readers in an imaginary and utopian universe that does not necessarily have empirical evidence on the ground (such as the claims that EHRs will prevent medical errors, increase efficiency, or save money or lives).

The use of these persuading tactics can also be found in academic research, as is illustrated in Latour's (1987) work analyzing the production of scientific text. Authors of academic articles typically mobilize various resources and quantitative and/or qualitative data to provide depth and craft solid arguments in their articles. Once researchers have backed up their arguments with enough solid data, typically taken from a specific case, they begin moving cautiously from the specific case to crafting more general claims. This move is often described as "Standing on the Shoulders of Giants" (Thrower, 1990), which implies building upon and extending previous research and literature. Authors of academic articles also use the tactics of staging and framing to ensure all objections (by their reviewers and future readers) to the arguments they make are addressed. However, the major difference between the two types of discourses—namely the one found in academic articles and the one found in media discourse—is that academic articles go through a tedious and careful process of peer review, which ensures that all claims made are based upon solid data and facts. Thus, for example, the captation tactic cannot be used in academic articles, as contestable or disputable statements will be questioned during the peer-review process.

When investigating the content of academic articles vis-à-vis the newspaper articles about healthcare technologies analyzed in this article, a stark contrast can be identified. Whereas the academic articles offer quite a mixed view of EHRs, presenting both positive estimations of their technological potential and critical assessments based on contextual analysis, the newspaper articles present an unwaveringly optimistic view of these technologies, centring on utopian depictions of the benefits to be reaped if they are implemented properly. Greenhalgh et al. (2012) labelled this overly optimistic portrayal of technologies "the modernist discourse," (p. 4) referring to the futuristic utopian and technologically deterministic view of technology as having the power to solve most issues encountered in the healthcare sector. Indeed, most of the newspaper articles analyzed in this study adopt a distinctly normative viewpoint, emphasizing the "failure of the doctors" to adopt what are viewed as unproblematic, "successful EHRs." This is in contrast to the approach applied in some of the academic research, where the emphasis is on understanding and unpacking the complexities related to the different kinds of users (Oudshoorn & Pinch, 2003) and their contexts (Orlikowski & Gash, 1994).

In this way, EHR technologies are discursively staged as the gold standard toward which all doctors should strive. At the same time, this sidelines any public consideration of the critical sociotechnical, financial, and organizational challenges the healthcare system must resolve before these technologies can offer significant benefits (Kaplan & Harris-Salamone, 2009). Investigating these discourses is important because they inflict a burden on policymakers, designers, and healthcare practitioners, who are faced with different realities on the ground. Reading the newspapers, for example, might offer the impression that the only reason for the low uptake of EHRs among GPs is simply a "lack of will." This is, however, a simplistic portrayal that disregards the many valid critical concerns GPs have toward implementing an EHR and the complexities it involves.

As discussed across many academic articles, healthcare practitioners who wish to adopt an EHR must deal with various problematic issues, including concerns about

security and patient privacy, issues related to standardization and interoperability (Berg, 1999; Ellingsen & Monteiro, 2006; Nilsson et al., 2002), dealing with the escalating costs involved in establishing an entire IT infrastructure in a small clinic, and standardized technologies imposing changes on organizations and local practices (Berg, 1999; Hartswood, Procter, Rouncefield, & Slack, 2003). Although these concerns are nearly absent from media discourse, they have a strong presence in the field, as healthcare practitioners have to deal with them on the ground. The different and at times conflicting visions found in media discourses and the views held by policymakers were particularly visible when I attended seminars organized by policymakers for healthcare practitioners. These visions have influence on both the organizational and individual level in healthcare institutions.

By making these problematic issues visible in public discourse (e.g., newspapers), it can perhaps be possible to redesign existing technologies and policies in such a way that they address the actual concerns that are faced on the ground. For instance, a policy that addresses the lack of solid classification systems and technical standards to enable communication and the exchange of data across different healthcare organizations would move us a step further toward realizing the dream of a seamless Web.

Furthermore, if the media portrays EHR technologies as a success and their implementation as relatively simple, then future users of EHRs and policymakers might be drawing upon incorrect impressions and perceptions. Peoples' perceptions are important because they influence the adoption of technology (Orlikowski & Gash, 1994). Thus, it is highly problematic if healthcare practitioners get the impression that implementing EHRs (or electronic prescriptions) is "…at the Click of a Mouse," (as indicated in the title of the article) as is sometimes claimed in media discourses (see Ogilvie, 2011), because actually implementing these technologies has been described in the academic literature as more complex than "putting a man on the moon" (Collen, 1995, p. 464). In addition to the implementation of EHR technologies often being portrayed as simple, it is often portrayed as part of a proximate future, one that is just around the corner. The collective envisioning of a proximate future has also been found in Dourish and Bell's (2011) study of visions underlying ubiquitous computing.

Analyzing technological visions as they are presented in the media can, therefore, lead to a better understanding of the expectations and interpretations guiding future practices of technology development. Furthermore, it might be time to consider redefining these overly optimistic visions so that they are better suited to the situations faced on the ground. As stated by Greenhalgh et al. (2009),

> rather than promising that the EPR will "save time" or "make clinical care more efficient," a more honest message would be that creating accurate and complete clinical records requires the sacrifice of time and effort by frontline clinical and administrative staff but that this is (sometimes) justified by more benefits for efficient business processes (e.g., billing), governance, and research. (p. 755)

Conclusion

Media reports do not exist in isolation. They are part of and reflect upon a greater po-

litical discourse, echoing specific voices and encouraging particular visions. They are part of the ways in which society creates and shares knowledge about itself. As such, they take part in framing the imaginations, visions, and expectations of EHR technologies. Indeed, this article suggests that they participate in important reconfiguration work, as they represent and stabilize very particular and optimistic visions of EHRs held by certain healthcare practitioners, policymakers, and patients. As is shown here, media discourses inscribe particular assumptions about technological efficacy that, in turn, participates in shaping the debate about EHRs. Not only do they reflect selective perspectives and draw on their epistemic authority, they also set agendas for imagining new possibilities for the future of e-health. By adopting the approach of "reading against the text" (Jensen & Lauritsen, 2005, p. 353), this article critically analyzes the media discourse surrounding EHRs and uncovers hidden assumptions. It shows how critical concerns are often marginalized by appeals to economic cost-benefit reasoning. In tandem with in-depth studies of the organizational complexity of healthcare work, a deeper understanding of the consequences of media-propagated visions is of great importance, as it holds the promise of facilitating more adequate understandings of how sociotechnical innovations in healthcare are co-produced with media representations and policy responses.

This study has several limitations related to the method and the data selected. First, because it was a follow-up to a previous study (Boulus 2009; Boulus & Bjørn, 2007, 2010), it is focused on a particular period of time and a specific geographical location. As a result, the analysis is based on a dataset collected from North America during 2010–2011, which limits the relevance of the study results. Therefore, an interesting follow-up study would involve extending the time period, the geographical location, and the type of sources included in the dataset. Nevertheless, this study builds upon previous research where similar findings were observed across a different time period and different geographical spaces—the overly utopian and technologically deterministic tone found in policy speeches and policy documents in the U.K. and the U.S. (Greenhalgh et al., 2009), for example, as well as in E.U. policy and Austrian media documents (Felt et al., 2009). This study can, to some extent, be seen as a response to Greenhalgh et al. (2009), who state that "given the mismatch between what is known about the EPR in organizations and what many policymakers assume is known, there also is room for research that addresses this mismatch" (p. 769). Therefore, analyzing technological visions as they are presented in the media can help us better understand the expectations and interpretations that will guide subsequent practices of technology development.

Visions of technologies tend to be typically overoptimistic, as they are assessments of an unknown future, setting directions for technological developments. After all, overoptimistic visions were also common, for instance, in early debates about office automation, where different information systems were assumed to replace and automate manual procedures. However, several ethnographic studies of office work reviled the idea that complete automation is simplistic, illustrating how not all procedures could be automated, as workers adjust their work in response to different requirements, which often necessitates deviations from formal procedures and the handling of ex-

ceptions (Suchman, 1983). Therefore, the focus shifted from replacing workers by automating processes to designing decision-support systems for local processes. Similarly, the hype about artificial intelligence—which various scholars questioned as early as the 1960s (see Dreyfus, 1972)—is currently regaining momentum, with new promises of improved technologies and new threats.

Nevertheless, it can be argued that a certain degree of imagination is essential for the construction of visions, and that these cannot be limited by contemporary challenges. However, constructing deterministic and simplistic visions of technologies may not be the most productive path. This raises the question of whether there are other ways to construct more appropriate or realistic visions. Here, academic researchers have great potential to contribute to shaping visions about technologies. By disseminating research findings in public arenas outside academia and participating more actively in public discourses, researchers can better contribute to redefining visions about technologies by voicing actual concerns encountered by practitioners on the ground. This article illustrates how the visions and concerns of academic researchers were, at times, reflected in the newspaper articles; however, these were often overshadowed or marginalized. Interestingly, the idea of computerized medical records did not originate from governments or vendors but rather from clinicians, engineers, and researchers, who eventually provided policy recommendations for the use of computerized medical records (Kaplan, 1995). Thus, academic research can play a major role in shaping the visions of technologies, helping to balance between overly optimistic visions and realistic ones.

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Note

1. ProQuest Newsstand covers many databases, including, for example, Gannett Newspapers, ProQuest Newsstand-Mid-Atlantics US Regional Package, Midwest US Regional Package, Canadian Newsstand Complete, Canadian Newsstand Selectable, et cetera.

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