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The Dynamics of Information Collaboration: A Case Study of Blended IT Value Propositions for Health Information Exchange in Disability Determination*

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Abstract

Recent developments in health information technology (health IT) for health information exchange suggest that successful public-private collaborations should devote more attention to understanding the dynamics of collaboration. In the context of health information sharing for disability determination, this case study examines early instances of public-private interorganizational sharing of health information. The theoretical focus of the paper is on the construction of blended value propositions and their role in collaboration for health information exchange. For this purpose, we performed a case analysis of a prototype health IT application to be shared between the United States Social Security Administration and Beth Israel Deaconess Medical Center. The case analysis found that business, socio-organizational, and technical dynamics were operative during the planning and execution of the prototype. From a theoretical perspective, the case study provides insight into blended value propositions in terms of understanding and potentially predicting the success of newly established Health Information Exchanges (HIEs). The findings have implications for further development of collaboration value propositions and their evolution over the course of IT deployments for health information exchange.

Keywords: Interorganizational Systems, HIE Value, Disability Determination, Public-Private Partnerships

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1. Introduction

The exchange of information is a fundamental organizational function that is necessary for coordinating tasks and making decisions (Barrett & Konsynski, 1982; Galbraith, 1974). In the last half-century, information systems have facilitated and fostered efficient information exchange by bringing together disparate data to build information and knowledge sets that can be used to increase organizational efficiency (Davenport et al., 2001). Initially, such gains in efficiency were tightly held within an organization. Later, businesses began to leverage information sharing among private organizations to create strategic advantages and increase the value of the shared information (Fairchild & Peterson, 2003; Hartono & Holsapple, 2004; Legner & Schemm, 2008). The last decade has seen information sharing extend beyond business-to-business strategic alliances into public-private collaborations. However, successful information sharing may lie in understanding each stakeholder's value proposition (Faerman et al., 2001; HIMSS, 2006; Malepati et al., 2007; Widdus, 2001).

Limited research has been done on the dynamics of public-private information exchange to produce successful and sustainable results for health data exchange, particularly for nonclinical use (Kern et al., 2009; Malepati et al., 2007). Moreover, most of the lessons have been learned from failures of such collaborations (Adler-Milstein et al., 2008; Miller & Miller, 2007; Walker et al., 2005). Indeed, national attention is now focused on Health Information Exchange (HIE) and concerns over whether state and federally subsidized growth will translate into sustainable operations (Frohlich, 2010). With under-performing information exchange endeavors costing organizations millions of dollars, prototyping a successful information exchange application has value for organizations as well as for the United States (Tiwana & Keil, 2004).

The United States Social Security Administration (SSA) has long been a proponent of prototyping innovative methods of information exchange. In keeping with this approach, SSA recently developed a prototype to address the inefficiencies of paper practices in disability determination. SSA spends more than \$500 million annually gathering medical records for more than three million disability applicants. Applications for disability benefits are filed when a person has a disability that is terminal or expected to last longer than one year and affects the person's ability to work. As disability applications increase and further strain an already stressed determination process, SSA has begun looking at its own information needs relative to available Electronic Health Record (EHR) data for disability determination. The goal of this information exchange is to use existing data to expedite medical information gathering and analysis to reduce the time individuals must wait for a disability benefit determination (Astrue, 2007; Social Security Administration, 2008).

This study analyzes the collaboration between SSA, a public agency, and Beth Israel Deaconess Medical Center (BIDMC), a private health-care organization. This collaboration tested a prototype application developed by SSA for system-driven requests for and receipts of medical evidence (medical information collected by SSA becomes medical evidence). The application also encompassed business rules based on established medical criteria for use in the analysis of disability determinations.¹ This prototype case application of MEGAHIT (Medical Evidence Gathering through Health IT) was the first instance of what is intended to be a broader electronic request, collection, and analysis initiative by SSA. As such, this case study reports on the dynamics surrounding the successful implementation of the first live information exchange between SSA and BIDMC. From a theoretical perspective, this exchange offered a unique opportunity to explore the concept of blended value propositions² and their role in unfolding collaborative health IT endeavors.

¹ Business rules, in this context, serve to define a predictable and traceable process of matching health data with predetermined criteria (a set of medical impairment listings).

² The authors acknowledge the work of social-entrepreneur Jed Emerson (2003) in advancing the concept of blended value, although his context was social entrepreneurship and environmental sustainability.

This paper presents the theoretical constructs used to guide the case study analysis, followed by background on the case study participants and a description of the analytical framework for examining the business, socio-organizational, and technical dynamics. The discussion draws upon the findings to suggest theoretical directions to better conceptualize and assess stakeholder value propositions. Finally, the conclusion examines the relevant and practical contributions of this case study for expanding public-private information collaborations for non-clinical purposes as well as future directions for assessing the influence of blended value propositions on collaborations, particularly as they unfold over time.

2. Theoretical Orientation: Blended IT Value Propositions

A recent review by Gregor (2006) nicely summarizes the role of theory in Information Systems (IS) research. She notes that theories should be viewed as “abstract entities that aim to describe, explain, and enhance understanding of the world and, in some cases, to provide predictions of what will happen in the future and to give a basis for intervention and action” (p. 7). In this paper, the exploratory theoretical construct applied is that of blended value propositions and their influence on collaborative information sharing within the health IT environment.

2.1. Blended Value Ingredients: Multiple Dimensions of Information Sharing

Delone and McLean (2003) noted that the exploration of multiple dimensions can help align organizational needs and bring value to each organization. Malepeti et al. (2007) suggested that value can be found in a wide spectrum of benefits, ranging from technical performance (getting usable data where it needs to be) to organizational fiscal health (changes in market share). While technical performance is a crucial element in information exchange between organizations, the success of interorganizational collaborations and information exchanges frequently hinges on other factors, such as interorganizational alignment and shared leadership (Geels, 2004; Kern et al., 2009; Markus, 1983; Schooley & Horan, 2007). Two recent examples of public-private collaboration for health information sharing, one in New York and one in California, demonstrate the importance of effective and efficient organizational decision making in these alliances (Kern et al., 2009; Ruaber, 2010).

At the core of these assessments is the value proposition of the exchange to each party (Treacy & Wiersema, 1993). A value proposition can be defined as the implicit promise of mutual value to the organization and its customers and/or partners (Ramirez, 1999). Based on an in-depth case study of the fashion industry, Martinez and Bitici (2006) found that interorganizational value propositions can have both “hard” elements (economic gain, technological mastery, etc.) and “soft” elements (brand identity, trust relationships, etc.). The current case study builds on this notion of “hard” and “soft” elements to consider business and socio-organizational factors in information exchanges and health IT collaboration. Thus, the overarching construct in this study is blended value propositions and their role in information exchange through health IT.

2.2. Business Value

The field of Information Systems (IS) has a long history of studying organizations that collaborate to share information. While organizations have shared information for decades, in the past, this sharing public-private value exchanges (Navarro, 1984; Wright, 1990). Further, the IS literature includes a variety of conceptualizations of collaborative efforts in information sharing. The basis of most of these conceptualizations has been primarily economic or business-related, where information exchange provides new information or facilitates decisions that produce strategic or financial advantages (Klein & Rai, 2009; Wright 1990)

In terms of motivation to collaborate, differences may develop when public agencies and private organizations partner. While a public agency may be satisfied to find value in an arrangement's social good, a private organization may be motivated by business value, as measured by economic impact (Adler-Milstein et al., 2008; Kern et al., 2009; Kohli & Grover, 2008). Achieving successful public-private collaborations may require a shared understanding of what is valued by each of the collaborating organizations.

2.3. Socio-Organizational Value

Recent literature suggests that the benefits of interorganizational information sharing can be diffuse and need not be limited to “the ledger sheet.” For example, Aldrich (2007) suggests that collaborating organizations now consider reasons other than economics as drivers for sharing information, and Brynjolfsson and Saunders (2010) note that the intangible benefits of interorganizational information sharing may be the untapped value proposition for interorganizational information collaborations. The idea that economics may not be the primary driver – and that the motivation may be a sliding-scale blend of economics (such as “the bottom line”) and intangibles (such as “social value”) – is compatible with the use of such multidimensional conceptualizations to understand information collaboration in health information exchange.

For ease of discussion, we consider social factors to include the range of intangible and actor-based organizational considerations that contribute to collaboration success. As Nevo and Wade (2010) have recently noted, “IT assets have an important role to play in enhancing the strategic potential of the organizational resources with which they are combined...and that synergy is likely to be realized when the IT asset and the organizational resources are compatible” (p. 177). Such organizational resources can include political/personal motivations and organizational knowledge (Fountain, 2001; Markus, 1983; Mowery & Simcoe, 2007). Furthermore, successful IT project advancement is frequently associated with the leadership of project champions to manage expectations and facilitate communications and approvals (Bowen et al., 2007; Reich & Benbasat, 1990). The ability to combine and mobilize such dynamics can often support business factors and lead to strategic competitive advantages (Bharadwaj, 2000).

2.4. Technical Process and Evolution Value

Value propositions are not static, especially in the context of technology deployment. Several IS researchers underscored the need to acknowledge that IT value propositions evolve over time (Markus, 1983; Orlikowski & Baroudi, 1991; Robey, 1979). More recently, Arthur (2009) explained that evolving technologies may lead to economic, business, social, and technical realignments as technologies are adjusted to fit their context and vice versa.

Nelson et al. (1982) described this evolution as changes in the “dynamic process by which firm [organization] behavior patterns and outcomes are jointly determined over time” (p. 18). Robey et al. (2008) added that to understand value proposition changes and differences among collaborating organizations, it may be necessary to “revise theories to reflect the evolution of interorganizational system technologies” (p. 512).

When the evolutionary process is embraced by all collaborating parties, projects tend to have more positive outcomes, regardless of the original motivations for collaborating (McLaughlin, 1990). As noted previously, the evolutionary process may lead to shifting organizational motivations. Although public-private collaborations welcome primary motivations other than profit or competitive advantage (Alter & Hage, 1992; Hergert & Morris, 2002), including altruistic motivations (Sen, 1977), the long-term sustainability of the partnership may necessitate a shared appreciation of how and why motivations evolve (Alter & Hage, 1992; Greenwald, 2002; Huxham & Vangen, 2000; Trist, 1983).

As reasons for collaborating evolve, so too does the technology. As the utilization of information increases, it fosters an environment in which collaborators are not bound by regular and predictable routines (Nelson & Winter, 1982) but are able to use time as an advantage to improve technology through multiple iterations of actions and reactions. As technology develops, it experiences breakthroughs and limitations that are overcome by incremental, iterative changes over time, leading to an eventual period of stability and sustainability (Arthur, 2009).

Prototypes are important in co-creating value among collaborators and are useful in supporting organizational learning about processes and outcomes (Payne et al., 2008; Schooley & Horan, 2007). Studying an early instantiation, as in this case study, helps expose design-reality gaps before the application reaches full production. Furthermore, the prototyping methodology puts designers in touch

with real-time use and is associated with subsequent successful implementation of health information systems (Heeks, 2006).

Our conceptualization of blended value propositions of collaboration is summarized in Figure 1. The MEGAHIT prototype provides a unique opportunity to examine the early stages of these value propositions in terms of socio-organizational, business, and technical value propositions.

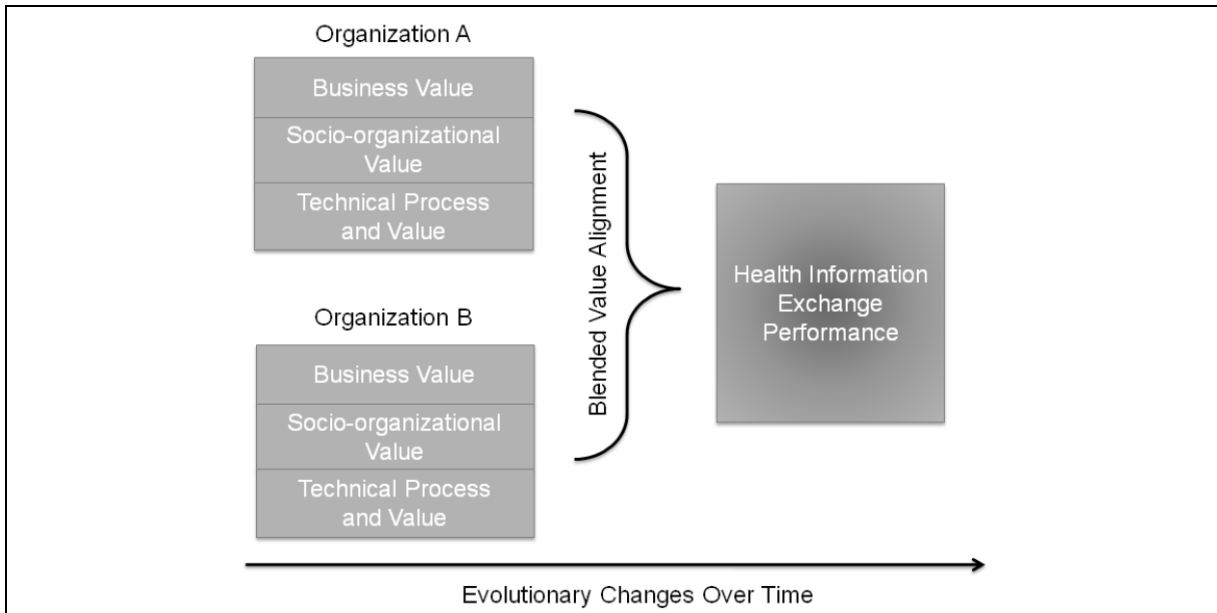


Figure 1. Overview of Blended Value Proposition Construct for HIE Performance

3. Background: Case Study Participants

SSA is an independent agency of the United States federal government with headquarters located in Woodlawn, Maryland. This location, outside the customary federal agency location of Washington, DC, was selected in the 1930s as a suitable site for storing SSA's extraordinary quantity of paper records. Organizationally, SSA is a complex, multi-layered structure. SSA administers several social welfare and insurance programs, including Social Security Disability Insurance (SSDI). Several years ago, as one of the largest users of health information in the world, SSA began to look beyond information systems for administrative process improvement and support, and they turned their focus to health IT as a means for health information exchange. Faced with increasing processing times for disability benefit claims, SSA recognized a natural opportunity to leverage the benefits of technology to improve the lengthy processes of requesting, collecting, and analyzing medical information for disability benefit determination. By its very nature, this process entails collaboration between SSA and private medical providers.

BIDMC, a Harvard Medical School affiliate, is located in Boston, Massachusetts. As of 2010, the facility had 621 licensed beds with more than 6,000 staff, including 819 full-time staff physicians and 1,179 full-time registered nurses. This multi-specialty research, teaching, and multi-treatment care organization sees nearly 750,000 patients annually. BIDMC is a leader among health care providers dedicated to using information systems to efficiently provide patient information to treatment sources. Central to the BIDMC electronic health record (EHR) system is its conformity to current health care interoperability standards – a necessity for system-to-system communication and MEGAHIT use. BIDMC annually processes more than 30,000 requests for medical information, almost 17 percent of which are related to disability applications. Prior to this collaboration, BIDMC's response to these requests involved printing records from the EHR and transporting those records (by fax or mail) to a SSA-contracted data-imaging clearinghouse for imaging and electronic transmission to SSA. This method was inefficient, time consuming, and resource intensive.

SSA typically tests prototypes of new projects before their limited production release to a broader audience. Consequently, SSA began to think about potential provider collaborators for testing the MEGAHIT prototype. As SSA explored the necessary ingredients for public-private collaboration (such as a standards-based EHR system and an innovative corporate culture), they looked for a provider with similar goals and visions for using health IT for health information exchange. This search and early discussions led to the collaboration between SSA and BIDMC to test the MEGAHIT prototype for disability determination using existing medical data from BIDMC's EHR.

The SSA-BIDMC collaboration on the MEGAHIT prototype involved the transfer of medical evidence upon request to SSA, which then used the data in disability determination (a more technical description of the process can be found in Appendix A). The parties entered the collaboration to ascertain and confirm whether MEGAHIT had the potential to improve the efficiency of the existing, primarily paper-based system of medical evidence requests, collection, and analysis. Furthermore, the prototype was considered important as a proof-of-concept because SSA had expressed interest in expanding its use through the newly established Nationwide Health Information Network (NwHIN).

4. Analytical Structure

As previously noted, collaboration between organizations requires them to look beyond a one-dimensional focus and consider blended value propositions that are multi-dimensional and evolve over time. The theoretical focus articulated above provides a structure to capture, understand, and appreciate the importance of such dynamics. Drawing upon this overall approach, a multidimensional framework provides analytical guidance for examining the dimensions within the context of the MEGAHIT prototype. Table 1 provides an overview of each dimension and the associated factors that were considered in the case study.

Table 1. Multidimensional Analytical Framework	
Dimension	Factors
Business Dynamics of Interorganizational Collaboration	Enhanced business performance Strategic advantages Fiscal impacts
Socio-Organizational Dynamics of Inter-organizational Collaboration	Intangible social benefits Organizational mission alignment Leadership and team accomplishments
Technical Performance of the Inter-organizational Collaboration	Technical interactions Technical performance and evolution

The business and socio-organizational dynamics of the collaboration can be used to understand and explain the technical performance of the MEGAHIT prototype and its implications for evolutionary growth. For example, in terms of the business dynamics, we considered the ability of the prototype to provide value in the following areas: enhanced business performance, strategic advantages, and positive fiscal impacts. In terms of the socio-organizational dynamics, we considered the ability of the collaboration to provide the following types of value: intangible social benefits, alignment with the organizational mission, and leadership and team accomplishments.

From the business perspective, it is important to develop metrics by which to gauge performance improvement and progress. This MEGAHIT prototype provided an opportunity for improvements in medical evidence transmission and mean case processing time. These information processes create strategic advantages and value in terms of efficiency in the use of available EHR information. This efficiency can result in fiscal benefits that influence sustainability (Nguyen et al., 2007).

From the socio-organizational perspective, the intangible social benefits include collaboration activities that provide value related to the ethos of the organization. Research indicates that when organizations have the same or similar missions, synergistic development is more likely, mitigating any potential resistance and creating a culture of mutual reliance and value (Halamka et al., 2005; Halverson, 2000; Hardy et al., 2003). Findings from various health information exchange demonstrations confirm that such organizational value must be matched with demonstrable and measurable value for each participating organization if the system is to be sustainable (Miller & West, 2007; Perlin et al., 2004). In other words, a strong business model can add value to and facilitate the implementation of the organizational mission, which often includes intangible benefits.

In terms of technical performance, the MEGAHIT prototype involved the following: 1) a series of collaborative technical interactions consistent with health IT standards development for the receipt of an authorized request for information and 2) the use of standardized data definition templates such as those applied to the Continuity of Care Document (CCD).³ For MEGAHIT, the data definition templates relaxed the CCD constraints to include data fields specifically needed by SSA for disability determination (Consumer Empowerment Technical Committee, 2007). The receipt of an authorized request for information and CCD rendering, as well as subsequent transmission, constitute the first element by which to measure prototype efficacy. The key "bottom-line" measure of technical performance is the amount of time required to render a CCD, transmit medical evidence, and perform a preliminary analysis, compared to the time required under previous methods.

5. Research Objectives and Methodology

The objective of this research was to explore how blended value propositions were operative in the formative period of the MEGAHIT prototype. The question guiding the research was the following: what mix of business and socio-organizational dynamics was involved in producing a technically viable exchange prototype? We expected the answer to the question to lead to a better understanding of the overall value proposition of the health information exchange collaboration, including business value and broader socio-organizational considerations.

A qualitative case methodology is appropriate for such an intensive exploration of these information-collaboration dynamics, allowing for an understanding of the dynamics within their natural context during a formative period (Benbasat et al., 1987; Yin, 2008). The defined prototype time for this case study allowed for an initial assessment of collaboration in an early stage and subsequent consideration of ongoing efforts. The case methodology facilitated detailed domain exploration and supported methodological triangulation and analysis (Creswell, 2008; Denzin, 2006; Yin, 2008).

A qualitative, multiple-methods approach was appropriate for understanding the key factors in this public-private interorganizational collaboration (Creswell, 2008). Interviews were the primary data-collection method and were supported by technical performance data. To gain an understanding of how and why certain factors were important to the dynamics of the collaboration and to the value propositions, interviews enabled in-depth holistic case explorations and detailed descriptions across domains (Gerring, 2007; Miles & Huberman, 1994). Furthermore, a qualitative strategy facilitated the preliminary comparative analysis and prevented information saturation. We conducted the in-person interviews at the interviewees' workplaces, a natural environment for discussing the various economic and social factors. We used system performance data to track technical progress against the prototype goals: receipt of an authorized request for information, CCD rendering, and subsequent transmission for more expeditious disability determinations.

The prototype implementation began in August 2008. We conducted interviews between December 2008 and January 2009. We gathered additional technical metrics via statistical reports provided by SSA from November 2008 through February 2009, and we concluded the research in March 2009.

³ A CCD is a summary of clinical patient data contained within an EHR. The CCD provides a means of sharing standardized health data between organizations.

6. Data Collection

To gain an understanding of the SSA-BIDMC dynamics and value propositions, stakeholder interviews focused on understanding the technical performance of the system as well as the business and socio-organizational dimensions. Using semi-structured individual and focus group interviews, two researchers conducted a total of 25 one-hour interviews and one 90-minute focus group over the eight-week period from December 4, 2008 to January 30, 2009. The interviewees were supplied with the study objectives and interview protocol four to six days before the interview. The protocol provided guidelines for investigating a range of factors related to each dimension. The factors explored across the technical and organizational dimensions included challenges and perceived value.

The data-gathering periods included breaks to allow for preliminary comparative analysis (Creswell, 2006). Wherever possible, the interviews were face-to-face; alternatively, interviews were conducted via telephone. We gathered field notes during each interview, and confirmed key points with each interviewee. Each researcher scribed separate field notes, although one researcher was responsible for ensuring that detailed notes were acquired.

On the public sector side (SSA), the interviewees included key representatives from SSA's headquarters in Woodlawn, MD (e.g., MEGAHIT Program Manager, MEGAHIT technical staff, Executive Sponsors, etc.). Also included were Massachusetts (Boston and Worcester) Disability Determination Services (DDS) administration and end-users (e.g., DDS Managers, Supervisors, and Examiners, etc.) who had worked with MEGAHIT cases.

On the private sector side (BIDMC), the interviewees included those critical to the collaboration (CIO), the flow of data from the EHR to the CCD (technical, analytical staff), the transmission of information between BIDMC and SSA (infrastructure staff), and the practical perspective (release of information manager).

In addition, we collected documents pertinent to the technical performance of the program from SSA. These included performance data, architecture and program summaries and official descriptions of the program.

7. Data Analysis

The data analysis involved three systematic stages of interviews and field notes and two stages using documents. First, to avoid the potential for over-saturation or under-saturation (obtaining too much information on one issue and/or not enough on others) and to ensure adequate data gathering about the case, we performed a preliminary comparative analysis between interviews by both researchers to be certain that all areas of the interview protocol were addressed. Second, using the interview field notes, we used open coding to categorize responses related to the key factors nested within each dimension. This stage helped to organize the case events within each dimension and to identify unifying themes among the dimensions (Corbin & Strauss, 1990, Creswell, 2008). Table 2 provides a synthesis of this coding. Finally, a synthesis from stage II led to information-collaboration dynamics and value propositions in the evolution of the MEGAHIT prototype application. It is worth noting that some of the interview data, while important in a broader sense, were outside the scope of this collaboration and, therefore, were filtered out during the stage III analysis. We discarded any unclear or ambiguous data.

This data analysis approach was useful for identifying dimension-specific factors at a micro level with linkages to interrelated multidimensional dynamics at a macro level. In other words, the analysis consisted of breaking down the collaboration into factors and then reconstructing the dimensions to understand the information-collaboration dynamics as elements of the whole. This is consistent with the construct presented above and is helpful in understanding the blended value propositions for each organization and the subsequent alignment.

Table 2. Synthesis of Interview Responses Across Dimension by Factor

Dimension	Factor ● Interview Information
Business Dimension	Perceived value of medical evidence collected through health IT <ul style="list-style-type: none"> ● Speed and increased efficiency ● Helps to get quicker determinations Strategic Value of medical evidence through health IT <ul style="list-style-type: none"> ● Relationship to health IT goals ● Workforce with technical specificity skill set Metrics for success <ul style="list-style-type: none"> ● Mean case processing time
Socio-Organizational Dimension	Organizational role definition <ul style="list-style-type: none"> ● Open communication ● Leadership ● Managing expectations Perceived value to organization <ul style="list-style-type: none"> ● Social values ● Relation to organizational mission ● Competing organizational health IT priorities
Technical Dimension	Technical developments and performance <ul style="list-style-type: none"> ● System-to-system communication ● Claimant authorization for release of information ● Medical evidence receipt time ● Standards for CCD rendering and business rules for preliminary analysis

We obtained data reports on a weekly basis (approximately) from SSA between November 24, 2008 and February 27, 2009. These reports provided a variety of measurable elements collected and followed by SSA specifically for this prototype. These reports provided an understanding of the technical processes and measurements for MEGAHIT cases during the prototype implementation and of the potential that exists for broader or more sustained MEGAHIT use.

We performed the document analysis in two stages. We first organized the documents by dimension, then we analyzed them to tease out data relative to medical evidence development and mean case processing times.

We verified the data by triangulation to provide corroborating evidence and to decrease researcher bias. This was accomplished using the methods suggested by Creswell (2008) and Yin (2008): multiple methods and sources of data collection (interview and field notes and document analysis), multiple level analyses, and multiple researchers involved in the data collection.

8. Findings

8.1. The Blended Value Proposition of Collaboration

Both organizations had business and social value propositions in this collaborative effort. SSA noted the “hard” benefits of higher disability determination productivity and the “soft” value of being a national leader in advancing health IT systems for health information exchange. SSA interviewees observed that the standardized system has the advantage of providing more adequate medical evidence and more timely disability determinations. Several interviewees speculated that this collaboration demonstrated the tremendous potential of MEGAHIT for rendering consistent determinations throughout the country, thus lessening the number of appeals.

As a public agency with a social mission, SSA was motivated by its blended value proposition to advance MEGAHIT and collaborate on its use. A SSA interviewee commented, “When we first started talking about the project, there was not a lot of excitement. Communicating its value took some time

and we need to change the mindset toward a broader use of existing data.” SSA was asking BIDMC to consider a new business value proposition for the use of its EHR data, namely, a use other than treatment, payment, or operations. In terms of the perceived value of electronic medical evidence request and collection, SSA and BIDMC noted some shared elements of value, such as improved mean case processing time, fewer re-requests for medical evidence, and the potential savings from the reduction of paper-based medical evidence requests and collection. Some interviewees at BIDMC also suggested that these benefits could lead to shorter benefit determination times and subsequent increased access to medical care.

Over the course of the collaboration, the alliance also began to offer shared social “intangible” elements. SSA’s long-running commitment to use technology to improve business processes added to the perceived value of standardizing disability determinations. Several SSA interviewees noted that SSA has always characterized itself in a public service role, and this was viewed as an opportunity to be a federal organization champion and to help move the nation forward in health IT adoption. Likewise, BIDMC’s dedication to using health IT to improve and expedite patient services was a motivation for extending EHR data use beyond the clinical and operations environment. An interviewee summed up the culture at BIDMC: “We are in the business of helping our patients. If we can help them obtain a disability determination more quickly, then what we are doing is the right thing for the right reason.”

Between the fundamentals of business value and the idealistic aims of social value were the interorganizational dynamics that made the prototype testing happen within a relatively short time period. There was widespread agreement that both parties devoted considerable effort to ensure that practices were mastered successfully within the short time frame. This required open communication, effective leadership, and expectation management. Interviewees from both organizations advocated open communication with “welcomed push-back,” and both parties discussed the many details of all iterations of the development and implementation. Several interviewees cited the “leadership, guidance, and passion to just move forward” as important for managing expectations and avoiding scope creep. The overarching sentiment of both organizations was the sense of importance gained from innovating and participating in a cutting-edge project with significant nationwide applications. As noted by an SSA interviewee, “We see ourselves as an organizational champion in the new administration.” This self-expectation had one interviewee rhetorically asking, “Why not SSA?”

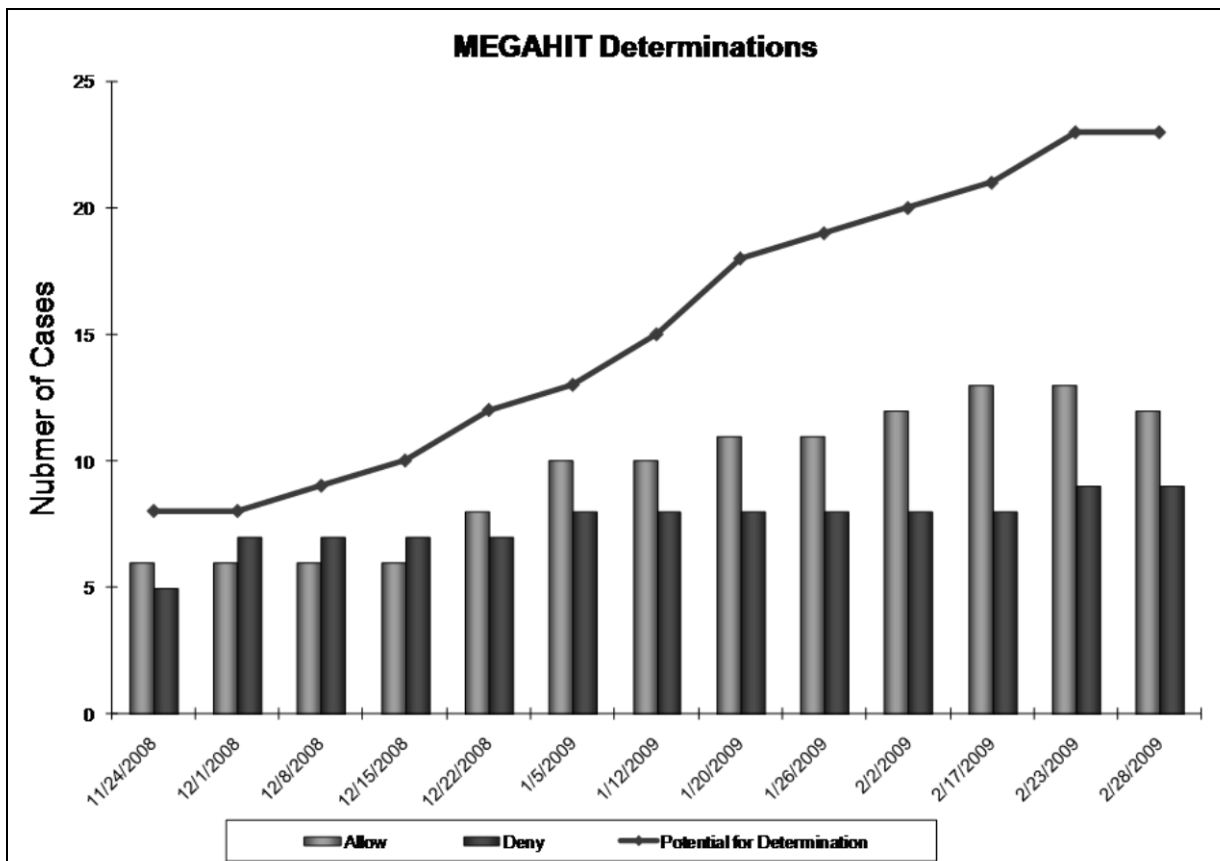
8.2. Technical Performance: What Came of the Effort?

Central to the perceived success of this prototype was the timeliness and adequacy of the medical evidence received and the resulting impact on overall disability determination. A series of system-to-system technical communications contributed to this technical exchange, including the authorized release and disclosure of information, health IT standards to render a CCD, and business rules for matching health data against predetermined criteria to perform preliminary analysis of the medical evidence. The technical accomplishments included the following:

- **Authorization:** For SSA to collect medical evidence, the provider was required to have a signed authorization for the release and disclosure of information. Initially, the technical process was so rapid that if the authorized release was not present in the electronic folder upon case transfer from the SSA field office to the SSA DDS office, the ability to gather the medical evidence electronically was aborted and the case was rerouted to traditional paper collection methods. The process has since been modified to include periodic successive checks for a signed authorized release.
- **CCD Creation:** the process of rendering a health IT standard CCD involved using XML-structured medical record data to generate a document usable by SSA for preliminary analysis. Converting the data to a format that could be automatically machine-read once received by SSA was a significant technical feat requiring intensive discussions among technical representatives from both SSA and BIDMC.

- **Business Rule Development:** a third notable technical process was the development of approximately 7,000 business rules guiding preliminary analysis for 30 medical impairment listings. These business rules defined a predictable and traceable process to match health data contained within the CCD with the claimant’s disability allegation, providing decision support for the disability examiner.

From a technical perspective, the “bottom line” success was measured in terms of the timeliness with which medical evidence was received. Document analysis of SSA-supplied reports showed that during the study period (August 24, 2008, to February 28, 2009), 396 claims generated medical evidence through the MEGAHIT application. Of those, 20 cases generated a “HIT extract” (a summary of the medical evidence)⁴ across 30 mapped medical impairment listings, with an average medical evidence request and receipt time of 42 seconds. Medical evidence with sufficient information to satisfy SSA’s medical listings can yield favorable disability determinations earlier in the process of medical evidence development. However, non-favorable determinations (i.e., denials) require the development of all medical evidence. This is shown in Figure 1 in the “allow” and “deny” columns. The “potential for determination” line represents cases that, according to the SSA Office of Quality Performance (OQP), had the potential to be determined with medical evidence received and analyzed through MEGAHIT, but for various reasons the cases required the further development of medical evidence.



Notes: Source is SSA OQP HIT Reports 11/24/2008 to 2/28/2009

Figure 1. MEGA HIT Determinations and the Potential for Health IT only Determinations (n=188 cases)

⁴ “HIT extract” is an SSA term used to define a summary of the medical evidence extracted from the body of medical evidence using Health IT.

While the number of “HIT extract” cases is limited, the trend for more cases to be determined by electronic preliminary analysis illustrates the potential for widespread MEGAHIT deployment. The continued development of MEGAHIT may lead to increased comfort with medical evidence presentation. As one interviewee explained, “Once the examiners become more comfortable with the presentation of the content, we will see more cases determined with HIT MER [medical evidence received and analyzed through MEGAHIT] only.”

In terms of the disability determination process, the average processing time for MEGAHIT cases overall was 48 days from receipt of the case at DDS to disability determination. Compared with the national average of 81 days, this represented an average time saving of approximately 41 percent. While the number of cases generated in the prototype is somewhat limited, the results illustrate a high potential for time saving.

Looking specifically toward the evolution of the collaboration, both parties noted the changing landscape of health IT for health information exchange. At the time of this study, these changes were in the pending stage, but they soon became formalized through the passage of the American Recovery and Reinvestment Act of 2009 (ARRA). ARRA provided incentives for accelerated adoption and implementation of EHRs, including HIEs. Such opportunities increased the potential for using MEGAHIT across HIEs and the NwHIN to decrease the response time and increase the response rate in the request and collection of medical evidence, ultimately leading to shorter disability determination times. Moreover, most interviewees felt that the social benefit of providing faster disability determinations would continue to be a strong driver for both parties in the exchange.

9. Discussion: Toward Blended and Evolutionary Value

This case study draws upon the construct of blended value propositions. This construct builds upon exchange, interorganizational, and evolutionary theories, highlighting business, socio-organizational, and technical dynamics and recognizing the unfolding nature of value. As noted by Gregor (2006) and discussed earlier in this paper, the role of theory is to “describe, explain, and enhance understanding of the world and, in some cases, to provide predictions.” In the following discussion, we use the theory-infused case analysis to explore how blended value propositions could be expanded to provide explanatory and predictive value. We also consider the utility of building out this theory within the context of health IT for health information exchange.

9.1. Why Blended Value Propositions are Important

Interorganizational collaborations are undertaken for a variety of purposes. Drawing upon our framework, this case study has highlighted three dynamics: business value, socio-organizational value, and technical performance. The concept of blended value propositions accepts that these (and perhaps others) will be operative in consonant (or non-consonant ways) across various dimensions and that the blending ingredients may change over time. The MEGAHIT prototype provided an important formative opportunity to use these theoretical concepts to examine public-private collaboration and to understand factors relevant to the interorganizational motivations. We present a discussion of these motivations collectively across dimensions to enhance our understanding of blended value propositions and proper alignment for successful collaborative performance.

The perceived value of the collaboration for both organizations was parallel and appropriate to their respective public and private sectors. For SSA, the experience suggested that the value proposition of the collaboration was a relatively equal blend of business and socio-organizational drivers, and this proof-of-concept was a successful demonstration for the broader use of MEGAHIT. For BIDMC, the value proposition blend featured the business driver, with the socio-organizational component related to the strategic identity of BIDMC as a national leader. Most importantly, these two value proposition blends were in alignment, meaning that the collaboration served to enact and allow for reciprocal achievement of the “implicit promises” of the collaboration.

In addition to the business and socio-organizational dynamics, the case study uncovered value dynamics in technical performance. While at one level the existence of business and social value

elements motivates positive technical performance, at another level the technical performance can become, particularly in the early stages, a value driver in and of itself (i.e., “We just wanted to see if we could do it”). Drawing from the related literature on IS deployment, these technical aspects can be expected to recede as the partnership progresses, with business and social values assuming more dominant positions (Davidson & Chismar, 2007). For example, Carr (2004) focused much attention on such a phenomenon in his provocative thesis, “Does IT Matter?” From a blended value perspective, the answer would be “yes,” but as the IT dynamics become routine, the business and socio-organizational factors increasingly come into focus as drivers for investment and use.

There are, of course, limitations to this focus on blended value propositions, and these limitations should be addressed through systematic research. For example, it must be acknowledged that the success or failure of collaborations can have many contributing factors. There may be interorganizational complications that prevent the value propositions from being realized. There may be opportunity costs for pursuing one (health IT) collaboration over another, causing a partner to retreat from the partnership. The macro-timing in terms of the overall economy or business environment may facilitate or frustrate the promise of the partnership. Even within the context of blended value propositions, there may be competing value propositions within the organization that thwart consistency in the interorganizational exchange. In short, while blended value propositions (and the alignment thereof) can play an influential role, multiple factors can influence the strength or weakness of that role. Future research can refine the ways in which value propositions are measured and systematically assess their predictive value, as noted below.

9.2. The Evolution of Blended Value Propositions

While the technical dimension is easily measured by system performance, it is also important to understand the aforementioned collaboration dynamics and how they might unfold or evolve with greater technical or system performance. The conceptualization of a collaboration must not only catch the collaboration at a moment in time but also understand how the dynamics may change in future collaborations.

Looking ahead to future collaborations, those involved with MEGAHIT are optimistic about the technical feasibility and value proposition of using a nationwide system (such as the NwHIN) as a transmission vehicle to expand MEGAHIT to more providers. The economies of scale for technical developments and the potential significant time that would be saved will only increase in value with the broader use of MEGAHIT. A BIDMC representative noted, “There is inertia in the industry [regarding] data exchange...[a] feeling that the technology and the standards are not mature...What SSA does, once again, is show the country that you can just do it – the privacy policy is appropriate, the standards for communication and data representation are there, it is going to save money.” Indeed, SSA’s announcement of the use of ARRA funds to expand MEGAHIT across the NwHIN suggests such an evolutionary path for MEGAHIT and HIE (Social Security Administration, 2010).

10. Conclusion: The Unique Opportunity of Health IT

There is a unique opportunity in the United States to systematically address the alignment (or misalignment) of blended value propositions during the major health IT rollouts (including health information exchange) over the next three to five years. Returning to Gregor’s observation of how theories can help “describe, explain, and occasionally predict,” the blended value proposition construct also represents a significant opportunity to research more systematically the nature of blended value propositions and their influence on the technical and programmatic success of collaborating parties. For example, do HIEs with early demonstrable business value propositions across the partnership fare better than those that have a heightened technical or social value proposition? Answers to this and related questions could contribute to theory development. A potential research proposition is that the success of HIE partnerships is dependent on the ability of both parties to quickly transition from a technical to a business value proposition priority. Another possible proposition is that social dynamics in health exchanges may be important motivators in starting an exchange program but do not necessarily predict its long-term sustainability.

Certainly, this is an opportune time for such theory development and practice insights in health IT. Fueled by federal funding, there are now 234 active health exchanges, and MEGAHIT partnerships are increasing. However, an HIE spokesperson recently noted, "We haven't figured out what makes an [HIE] organization sustainable" (Mosquera, 2010). The field of IS, with its long history of understanding and assessing embedded IT systems, is in a unique position to contribute to the success of such initiatives through empirically validated construct and theory development. This development is demonstrated here through the examination of blended value propositions and their role in the technical success of HIEs.

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Appendix

Appendix A.

The disability determination process begins with a disability application, which can be filed by phone, on the Internet, or in person at one of SSA's many community field offices. Included in the application is a signed authorization to disclose information. The claimant's demographic information and authorization are sent simultaneously to the State DDS office and BIDMC through SSA's National Computer System. Upon validation of the claimant's name, gender, and date of birth, BIDMC gathers the medical records, renders a CCD, and sends the information back to SSA's National Computer System. This information is then available for determination by physicians at the state DDS office.

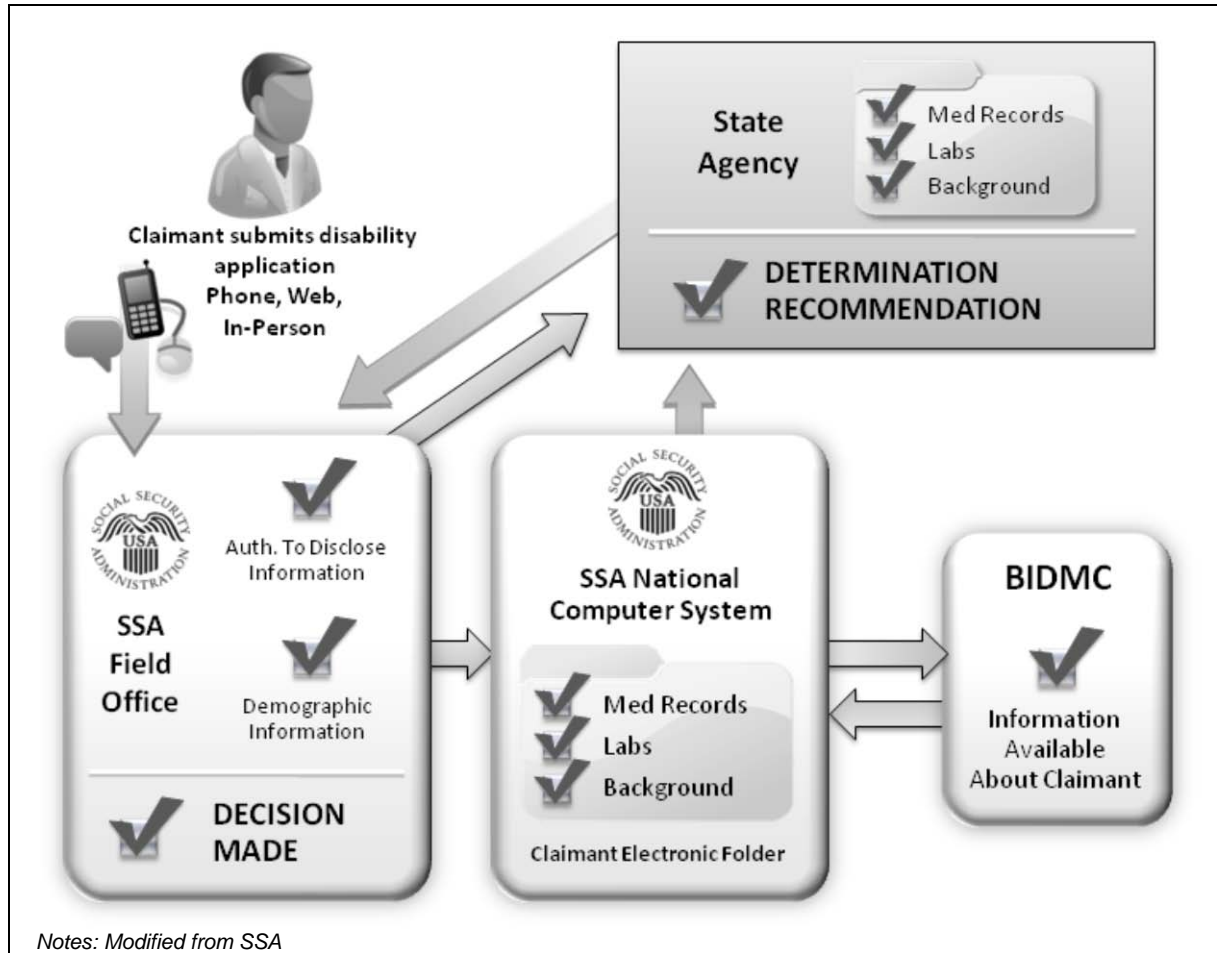


Figure A1. Technical Information Flow of MEGA HIT within the Disability Determination Process

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