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Steven Wallace

University of Toledo, steve.wallace@utoledo.edu

Lakshmi Iyer

Appalachian State University, iyerls@appstate.edu

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Healthcare IT Value Hierarchy Framework for the Small Physician Practices Context

Steven A Wallace

University of Toledo, steve.wallace@utoledo.edu

Lakshmi S Iyer

Appalachian State University, iyerls@appstate.edu

Abstract

In 2015, \$3.2 trillion was spent in the US and the Center for Medicare and Medicaid is projecting that spending will grow at an average rate of 5.6% a year in the next decade. Researchers have found that organizations with higher IT maturity tend to show better operational and financial performance. While there have been multiple studies on HIT in hospitals and large practices, there have been few studies that have directly examined HITs in Small Physician Practices (SPP). The purpose of this study is to explore maturity of HIT use using multiple case study methodology to observe how SPP have matured through their use of HIT. Hence, the goal of this study is to answer the following question: *How is the IT maturity of use different for small physician practices?* To answer this question, we conducted multiple case studies with five SPP. This study developed a modified IT Value Hierarchy and highlights the importance of both IT security and inter-organizational integration on these healthcare organizations.

Keywords: IT Value Hierarchy, IT Maturity, Healthcare, Health IT, Small Physician Practice

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1. Introduction

In 2015, \$3.2 trillion was spent in the US¹ and the Center for Medicare and Medicaid is projecting that spending will grow at an average rate of 5.6% a year in the next decade². Researchers have found that organizations with higher IT maturity tend to show better operational and financial performance (Francalanci & Morabito, 2008; Raymond, Pare, & Bergeron, 1995). More recently, Liu et al. (2011) found that hospitals with higher IT maturity have relatively better operational performance. Hospitals with higher IT maturity also are “more efficient and effective, providing higher service quality at lower costs (p. 572).” In their study of 1,011 acute care providers, Dey, Sinha, and Thirumalai. (2013) found that providers with higher levels of IT maturity show higher operational performance. Collectively, these studies show that we should look at the stages of IT maturity of healthcare organizations to examine how their IT maturity affects their organizational impacts.

HITs are a group of systems that allow access to and help update health care information to support both the clinical and administrative sides of a health care facility (Goldschmidt, 2005; Goldzweig, Towfigh, Maglione, & Shekelle, 2009; Menon, Yaylaccigi, & Cezar, 2009). Clinical HITs handle patients’ records; processes lab results; and provides a means of health information exchange between practices. HITs also handle administrative functions such as scheduling, insurance claims (i.e., Revenue Cycle Management), and inventory management.

While there have been multiple studies on HIT in hospitals and large practices, there have been few studies that have directly examined HITs in Small Physician Practices (SPP) (Ludwick & Doucette, 2009). SPP are medical practices that consist of a staff of less than 10 physicians and have historically been the most common place for doctors to work (Decker, Jamoom, & Sisk, 2012). Nearly 60 percent of all US physicians are employed by SPP (Kane & Emmons, 2013).

In addition, there has been little research on the effects of maturity of HIT use on healthcare organizations. Pare and Sicotte (2001) compared IT sophistication in hospitals in two provinces in Canada. Jaana, Ward, Paré, and Wakefield (2005) extended Pare and Sicotte’s (2001) study and compared Iowa hospitals with their Canadian counterparts. Venkatesh Bala, Venkatraman, and Bates (2007) examined the Enterprise Architecture Maturity (EAM) of the Veterans Health Administration (VHA). England and Stewart (2007) studied the level of IT adoption of hospitals compared to the banking industry. Liu et al. (2011) examined the e-healthcare maturity in Taiwan hospitals and its impact on financial performance. While some of these studies (Dey et al., 2013; Jaana et al., 2005; Pare & Sicotte, 2001) have looked at the IT capabilities of healthcare organizations, they did not examine how the organizations have matured through their use of IT. Also, these studies have focused on large organizations such as hospitals and have ignored SPP. This study aims to explore maturity of HIT use in SPP and answer the following question: *How is HIT maturity of use different for small physician practices?*

To answer this question, we conducted multiple case studies. We used Urwiler and Frolick’s (2008) IT Value Hierarchy to provide a relevant theoretical basis for our research design and gives us a framework for the data analysis phase of the study. We collected interview data from employees within five small physician practices.

This study develops a modification of the IT Value Hierarchy and how SPP are affected by HIT maturity of use. This study also highlights the importance of both IT security and inter-organizational integration on these healthcare organizations.

2. Literature Review

The following section will provide an overview of the various IT maturity theories and explain our study’s framework for HIT maturity in the context of SPP.

2.1 IT Maturity

There are several IT maturity models that have been used in IS literature. The Stage Growth Model (SGM) was first introduced by Nolan (1979) as a way to describe a firm’s maturity. In the original SGM, there were six stages of

¹ <http://money.cnn.com/2016/12/02/news/economy/health-care-spending/>

² <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected.html>

growth: initiation, contagion, control, integration, data administration, and maturity. The Capability Maturity Model (CMM) was originally created to classify the maturity of firms that develop software and systems (Paulk, Curtis, & Chrissis, 1993). The CMM focuses on the capability of the firm to develop software products and uses metrics called Key Process Areas (KPA's) (Swinarski, Parente, & Kishore, 2012). Like the SGM, CMM does a good job of categorizing and describing the maturity of IS within different firms but it does not adequately explain the process of IS maturation.

The Strategic Alignment Model (SAM) is based on measuring the alignment between IS processes and business processes (Luftman, 2000 & 2007). This model is currently limited to only measure IT alignment and has not been used for any other purpose. The Evolutionary and Contingency Perspective is another view of IS Maturity that has not been widely used but should be noted. The evolutionary view of IS maturity states that only processes and procedures that best fit within an organization will survive over the life of the organization (Teo & King, 1997; van de Ven & Poole, 1995). Unlike the SGM, this form of maturity is not based on pure growth but includes the "pruning" of less useful portions of the organization.

There have been a few studies that have examined IT Maturity within the healthcare industry. Pare and Sicotte (2001) compared IT sophistication in hospitals in two provinces in Canada and found that hospitals had a low sophistication level. Jaana et al. (2005) used Pare and Sicotte's (2001) instrument in their study of Iowa hospitals and found that Iowa hospitals had a higher sophistication level than their Canadian counterparts. Venkatesh et al. (2007) examined the Enterprise Architecture Maturity (EAM) of the Veterans Health Administration (VHA). They found that the VA hospitals did not achieve the highest maturity level of their model. England and Stewart (2007) studied the level of IT adoption of hospitals compared to the banking industry and found the banking sector had more IT maturity than the healthcare sector. Liu et al. (2011) examined the e-healthcare maturity in Taiwan hospitals and was able to show that hospitals with higher levels of IT maturity had lower costs. Dey et al. (2013) studied the EMR system capabilities within 1,011 acute care facilities in the US and found that hospitals with higher EMR capabilities had higher operational performances.

While these studies have used IT maturity in the healthcare industry, they have only examined IT maturity within large organizations. In addition, most of these studies only measured the level of IT maturity and either compared the maturity levels between geographic regions or against other industries. Two studies did examine the correlation between IT maturity levels and performance but they only used quantitative analysis to show this correlation. Our study intends to not only show a relationship between IT maturity and impacts, but we also intend to show how IT maturity influences organizational impacts.

2.2 IT Value Hierarchy

Urwiler and Frolick (2008) took a different approach to studying IT maturity by bringing in psychology. They adapted Maslow's (1954) Hierarchy of Needs theory to the realm of IS. Urwiler and Frolick argue that organizations also have needs and will fulfill them in the order that is required for survival. They ranked IT based on the value to the organization in following order: Infrastructure & Communication Needs, Stability & Security Needs, Integrated Information Needs, Competitive Differentiation, and Paradigm Shifting.

Maslow's (1954) Theory on Hierarchy of Needs was published in the book, *Motivation and Personality*. He argued that individuals needed to fulfill their basic needs before they are able to attempt to fulfill any higher level of needs. For example, before a person can think about fulfilling their needs to belong to society (Social Needs), they need to achieve physiological needs (food and air) and safety needs (shelter). Maslow categorized these needs into five levels: Physiological Needs, Safety Needs, Social Needs, Self-Esteem Needs, and Self-Actualization.

Urwiler and Frolick (2008) created the IT Value Hierarchy that modified Maslow's Hierarchy of Needs to explain IT Maturity for competitive organizations. Like Maslow, they argue that before an organization can strive to achieve the next level of maturity, they must satisfy the lower tiered needs. Their model is shown in Figure 1.

Figure 1: IT Value Hierarchy (Urwiler & Frolick, 2008)

Urwiler and Frolick's model has five IT Maturity levels: Infrastructure & Connectivity Needs; Stability & Security Needs; Integrated Information; Competitive Differentiation; and, Paradigm Shifting. They explain that the first three levels are considered commodity IT and for most organizations, the Integrated Information level is the highest level that they will achieve. The top two levels are considered innovative IT and are achieved by organizations that see IT as more than a commodity.

To proceed past the Infrastructure and Connectivity Needs level, the organization must achieve the basic needs for their organization in order to operate. The organizations are just acquiring basic infrastructure with no standards and little to no IT policies. Their IT department is a reactive group that is there only to install needed equipment and provide fixes when equipment goes down.

For the Stability and Security Need level, the organization realizes that IT failure can be detrimental to the organization and so they strive to achieve stability. IT standards and policies begin to form and the organization starts to focus on IT optimization. Security also becomes important at this stage and controlled access to both the system and its information is enacted. IT support becomes more proactive and begins to fix problems before users become aware of them. The organization at this level still has a fragmented IT infrastructure with individual departments with their own equipment and applications and with information staying within the boundaries of each departmental system.

At the Integrated Information level, departments within the organization have the need to communicate outside their departmental boundaries. Information systems begin to cross departmental and functional boundaries and organization wide systems begin to be implemented. Information becomes available across the organization and common business processes are integrated into the systems.

The fourth level, Competitive Differentiation, the organization tries to show the public why it's unique. At this level, IT takes a greater role in the organization's strategy. Organizations will use unique IT solutions to differentiate themselves from their competitors to try to create a competitive advantage. In its early days, on-line banking was one example where a bank will try to attract new customers through its novel on-line services.

The highest level, Paradigm Shifting, the organization through the use of IT is changing the way industry does business. This is not a case where a new product is created but instead, IT is creating a different way in which the organization is delivering its products and services. Examples include Amazon's selling of books on-line and Apple's iTunes.

The maturity models covered in the previous subsection focused on the sophistication of the organization's IT system but did not show how the organization itself has matured. . In their study on IT needs and culture, Walsh (2014) used the IT Value Hierarchy to explain some of the study's findings. They found that users within mature organizations require additional persuasion when adopting technology if that technology does not immediately impact their current role. The IT Value Hierarchy explains how the organization matures through its expanding needs and this provided a better fit for our study. We argue that it does not matter how sophisticated the system, the organization will not use it to

its fullest potential if they do not mature in its use.

3. Methodology

The following section provides a brief description of the study methodology, describes the criteria for the SPP that we are targeting for this project, and the protocols that were used for each case.

3.1 Case Study

We used the case study methodology outlined by Yin (2003) for this research. We took an interpretive approach to this study to search for a richer understanding of the phenomenon under study (Klein & Myers, 1999). We used the IT Value Hierarchy framework described in the prior section to help guide us in designing the research and to gain appropriate insights as we analyze the data (Walsham, 2006).

Case study is “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context” (Yin, 2003, p. 18). Case study is an excellent method to both test and generate theory (Eisenhardt, 1989). Case study excels at answering explanatory research questions (Yin, 2003). Because there is still a lot of work to be done in this research area, this methodology is a better approach to explore this phenomenon and gives us a better understanding of the relationships between the framework’s constructs. In our study, we explain how Maturity of HIT use affects SPPs and by collecting qualitative data from multiple sources; we provided a deeper understanding of this phenomenon.

Prior studies have shown that case studies provide a deep understanding in both the SPP context and in HIT. West, Farmer, and Whyte (2004) performed a case study on the challenges of implementing an information system in rural physician practices in Scotland. MacDonald and Metzger (2002) used multiple case study to observe the benefits of HIT to small physician practices. Baron, Fabens, Schiffman, and Wolf (2005) ran a single case study of the impact of the implementation of the EHRs on their small practice. Ward, Froehle, Hart, Collins, and Lindsell (2014) used case study to understand the EHR impact on a hospital’s performance. Lichtner, Venters, Hibberd, Cornford, and Barber (2013) also used this method to understand the impact of e-prescribing systems on office efficiencies. Lahiri and Seidmann (2012) used case study methodology to understand the impact of Radiology Information Systems (RIS) on an office’s workflow.

3.2 Data Collection

We collected data from five SPPs in order to answer our research question. Each SPP was selected based on size and willingness to participate. We targeted physician practices that employ 10 or less physicians. Since we are looking at the maturity of HIT use of the organization, we only considered practices that have been using an HIT system for at least one year. Before we conduct any interviews, we received site approval from the practice and subject approval from each participant.

We only interviewed subjects that are employed by the physician practices. We received a wide selection of roles within each practice by interviewing physicians, physician assistants, nurses, medical assistants, and front office staff. We did not interview patients as our study is only interested in the organization and how the organization is impacted by their use of information systems. Please note that Practice B and Practice E both use the same HIT system.

Table 1: Case Summary

Case	# of Providers	Total # of Employees	# of Subjects	Location	HIT System	Experience With HIT
A	5	13	4	Rural	Allscripts	2 years
B	6	27	3	Suburban	Epic	2.5 years
C	7	60	3	Urban	Canopy	6 years
D	3	5	3	Urban	eClinical Works	10 years
E	6	13	4	Suburban	Epic	2 years

4. Findings

Using the IT Value Hierarchy framework, we categorized the different cases according to their maturity of HIT use. We also examined how that Maturity of Use has influenced the SPP impacts and how those impacts compare between each SPP.

4.1 Maturity within each SPP

All of the practices were able to fulfill their needs for Infrastructure by simply having an HIT system. This study did not select any SPP that did not have an existing HIT for at least a full year so we were not going to have a case that had not fulfilled the lowest level in the pyramid. Which leads us to second level of Needs and that is fulfilling Security and Stability. While most of the cases had some intermittent outages, none of the outages reached the level where the SPP could not properly function. This informs us that all of the cases were able to complete the second level.

The third level of Needs, Integration, was reached by all of the SPP except Practice C. Practice C was still operating with three different systems: EMR, registration, and scheduling. While there was some integration between the systems, they were not fully integrated and even the clinical side of the practice had to have at least the scheduling and the EMR open at the same time in order to do their work. The other practices (A, B, D, E) were able to fulfill their need for Integration by adopting an HIT system that performed all needed functions within the practice both administrative and clinical. For example, the Office Manager from Practice B provided some examples of how the system integration has helped with patient interactions with the office:

We have an online patient portal and the patient can email back through the system. They can request appointments and they can view their lab work.

The original model used Competitive Advantage as the fourth level. As we analyzed the data, this level was confounded by the Operational and Financial Performance from the HIT Success Framework. Instead, we had a construct emerge from our analysis that pointed to an alternative needs level: Inter-Organizational Integration (IOI). IOI is the ability of the SPP to be integrated with other medical organizations that are involved with their patients. Those organizations include pharmacies, specialists, labs, and hospitals.

Of the four remaining practices, only practice E was able to demonstrate that they achieved the level of IOI. Because of their location and their parent organization, they are able to send and receive most of their medical information outside of their practice through their system. Most specialists and labs that their patients see are within their parent organization and thus connected with the patient. Not all of the hospitals in the area belong to their parent organization but they are all using the same HIT system and practice E has access to those records. The office manager at Practice E summed up the benefits of inter-organizational integration:

Hospital reports are nice because the primary care team is flagged whenever their patient has been in the hospital or the emergency room. It bridges that gap and reduces re-admissions so that we can contact the patient, reach out, and see if they have any questions or concerns. Or, sometimes people won't follow their discharge summary instructions until they have met with their doctor and that can be two weeks and is just a very vulnerable time for patients so it helps bridge that gap in time.

Practice A is a rural practice that has a parent hospital that is mostly integrated with their practice but they have another hospital that is equally close and on a different system. This prevents them from integrating with that hospital. In addition, most specialists in the area use that hospital's system and cannot communicate directly with Practice A's system.

Both practice B and E belong to a large parent organization and uses the same HIT system. But, they are geographically located on the outskirts of their parent organization and thus work with patients that see labs and specialists outside their parent organization. In addition, one of the newly acquired local hospitals is not yet on the same HIT system and thus prevents full integration.

Practice D is the one independent practice in this study and does not belong to a parent organization. They do not have hospital privileges and do not have access to any of the hospitals. In addition, they do not share a system with any of the local specialists or labs. They can order electronic prescriptions to most of the pharmacies. In order to mitigate those weaknesses, their system allows them to accept and send electronic faxes. This allows them to accept faxes from outside parties and add those documents to the appropriate charts without the need to scan. They still scan documents in the office but those are limited to work notes and sports physicals for their patients.

4.2 Maturity's Influence on SPP Impacts

In our analysis, we broke our findings into four categories that correspond to the modified HIT Value Hierarchy: Stability, Security, Integration, and IOI. In this section, we explore how each of these constructs interact with different types of organizational outcomes. We were interested in the stability of the system which has an inverse relationship with the occurrences of system outages. This in turn affects user satisfaction and productivity as users are disgruntled when they have to spend extra time to enter data into the system once it recovers. During system outages, users do not have access to their patient's records and trying to treat the patient without the assistance of their medical history.

We had limited evidence of Security in this study. Some administrative workers talked about using system logs to track down problems in their workflow. Practice E uses logs to observe which medical assistants are slow at certain tasks. The office manager at Practice B uses logs to see if proper procedures are performed:

One great thing about an electronic medical record is you can view every click that a person has made. Every time they click accept, exit, anything, so it helps us uncover mysteries. Well this patient was seen yesterday but they're telling me that they're not on that medication, why would they say they're not on that medication? Oh, because the CMA yesterday didn't take the time to ask about their medication, they clicked all reviewed before the patient even had arrived.

The next construct, Integration, appears to influence productivity, communication, and quality of care. Because the messaging application is integrated into the system, the SPP has better documentation of any communication surrounding the patient. That documentation could be used later to track what tests, advice, and treatments were given to the patient and give the user better information about what worked and what did not work for that particular patient. In addition, the integration with the various applications within HIT keeps the user from having to manually enter data from one section to the next.

Finally, Inter-Organizational Integration (IOI) affects both productivity and quality of care. When the SPP has full IOI, users do not have to go through extra steps and procedures to transfer medical information from outside the practice into their HIT system. This saves time and labor costs. In addition, information is transferred faster from one office to the next. This can be vital to the patient's health if that information is needed for a proper diagnosis. This was evident when Physician 1 from Practice C complained that in one case, it took 2 weeks to get the Emergency Room records from one of the hospitals outside their parent organization.

5. Discussion

In this section, we provide an overview of the themes that emerged from the data obtained to answer the research question and how our findings have led to revision of the IT Value Hierarchy framework for SPP context.

5.1 Themes

One theme that emerged in this study was security's effect on SPP impacts. Before starting the data collection and analysis, we focused on Stability within the Stability/Security Needs level and almost ignored Security. This was under the assumption that all HIT systems have security features and we can safely ignore it while focusing on the Stability issue. What appeared is that Security goes beyond the safety of the information from unauthorized personnel but includes information assurance and the ability to look at the data and know that it is accurate. Two informants from two different practices using the same system (Practice B and E), use the system logs to not only check on the productivity of their employees but to also check the veracity of the information entered by those employees. This suggests that Security not only has an impact on Information Quality but Productivity and Quality of Care as well.

Another theme that emerged from this study is the need for HIT integration with outside entities. Something that

was not mentioned in the literature that we reviewed was the need for SPP to interact with other medical organizations when administering medical care to their patients. The SPP is not the only place where their patients go for medical care and that information needs to be available to their primary provider in order to receive the best care possible. These organizations include hospitals, specialists, labs, and pharmacies. Figure 2 shows how SPP are linked to other medical providers.

Figure 2: Inter-organizational Integration

This is less of an issue for affiliated practices that have some integration with their parent hospital but this is a larger issue for independent practices that do not have hospital privileges and cannot easily obtain patient data from the local hospital. Practice I mitigates some of that disadvantage by implementing a system that allows electronic faxes which helps streamline their data collection from other offices.

In the following section, we show the updated HIT Value Hierarchy and an updated framework for this study.

5.2 Updated Framework

The following figure (Figure 3) is the updated HIT Value Hierarchy which replaces the Performance Gains level with the Inter-Organizational Integration (IOI) Needs level.

Figure 3: Updated HIT Value Hierarchy for SPP

As mentioned earlier in this section, the need for integration outside the SPP is imperative for delivering better quality of care and that level provides some differentiation between practices that have achieved IOI and those that have simply fulfilled the Integration need.

Of the different Hierarchy levels, Stability influences the most constructs: HIT Quality, User Satisfaction, and HIT Impacts. As shown in the sections above, Stability has a positive relationship with HIT Quality. As the system becomes more stable (i.e., fewer outages), the HIT Quality increases. This does not mean that system may have other issues such as a badly designed user interface but if the system is not stable, the perceived HIT Quality tends to decrease even more.

This also correlates with the User Satisfaction. Users tend to be more satisfied with the HIT system if it is more stable.

The biggest effect of Stability is its influence on the various HIT Impacts. When there are HIT systems outages, users are unable to access the patients' records which can lead to lower quality of care. In addition, this disrupts their work flow and productivity decreases as users have to enter data into the system once it is restored. All of this increases labor costs and affects the SPP's financial performance negatively.

Security only influences the HIT Impacts in the form of work flow and productivity. Through the use of system logs, administrators have the ability to check on the SPP employees and their daily work flow. This can help identify problem areas and help administrators remedy issues of productivity through retraining or reallocation of tasks.

Integration influences both Communication, and HIT Impacts. Because the messaging application is integrated into the system, the SPP has better documentation of any communication surrounding the patient. That documentation could lead to better quality of care as the patients' history can be used for better diagnosis and treatment. Through integration of application, productivity is increased as users no longer have to manually transfer data across platforms.

Finally, Inter-Organizational Integration (IOI) affects HIT Impacts in the form of both Productivity and Quality of Care. When the SPP has full IOI, users do not have to go through extra steps and procedures to transfer medical information from outside the practice into their HIT system. This saves time and labor costs. In addition, information is transferred faster from one office to the next. This can be vital to the patient's health if that information is need for a proper diagnosis.

6. Contributions, Limitations, and Future Directions

The goal of this study was to answer the following question: *How is the IT maturity of use different for small physician practices?* To answer this question, we used the IT Value Hierarchy (Urwiler & Frolick, 2008) as our framework. Using the multiple case study approach, we were able to collect data from five SPPs.

There were a few theoretical implications with this study. We found security had a much larger role in HIT impact than we originally thought. HIT security provided administrators with the ability to improve both productivity and quality of care. We also found the importance of Inter-Organizational Integration (IOI). With the dependence of SPP on outside medical providers, lines of easy communication will help both productivity and quality of Care as it becomes easier to get records from hospitals, labs, and specialists. Finally, we updated the HIT Values Framework with the new IOI Needs level.

There are a couple of recommendations that we can offer to practitioners. First, encourage the HIT vendors to provide integration capabilities such as electronic fax capabilities. These types of improvement will enable practices to mature to the IOI level and see improvements in both productivity and quality of care. Second, a couple of the SPP in our study were notified through their HIT system when their patient was released from the local hospital. This only occurred if the patient was received by a hospital that was within the same organization as the SPP. Patients that were discharged from another hospital outside of the parent organization did not have the same benefits. This could be mitigated if the hospital kept a list of patient names and the SPP that they go to so if they are released from the hospital, it will be easier to notify the SPP that are outside the hospital's health system. This could be the responsibility of the SPP to register their patients' names with the hospital and keeping that list up to date which could be easily done through an HIT system.

One limitation with this study is shared with most case studies and that is the small sample size. This can be a problem when analyzing data through statistics but according to Lee (1989), findings can become generalizable through repeated testing. We were able to do this by studying multiple cases and making sure that we had a wide variety in the SPP that we selected. We studied SPP that were rural, suburban, and urban. In addition, we had a variety of SPP that were at different HIT Maturity levels.

Furthermore, we only selected SPP that were located in the southeast region of the US which could limit the generalizability of this dissertation. There may be some cultural differences between the SPP that we selected and SPP in other regions of the US. We are also limited in the case selection to those practices willing to participate. This may limit our selection to those practices that are more mature than others. While we did see one practice with a lower maturity level, we might have missed other SPP with similar or lower maturity.

As mentioned before, we did not focus on security in this study while we were examining the maturity of HIT use but we still found some evidence of how security can influence the organization. One future study is to do a broader study of security within SPP and how it affects the individual practices. This could give us insight into how much security should be emphasized in the practice and how it could be improved to give the SPP better outcomes.

Now that we have a framework for measuring maturity of HIT use, future study can examine more practices to get a better understanding of where the majority of these SPP fit in the framework. One can also take that study further and compare the impacts of each SPP based on their maturity level.

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Author Biographies

Steven Wallace is an assistant professor of Information Systems at the College of Business and Innovation, University of Toledo. He earned a doctoral degree in Information Systems from The University of North Carolina at Greensboro (UNCG). He earned his master's degree in Information Technology Management from UNCG and his bachelor's degree in Electrical Engineering at North Carolina State University. He is a lifetime member of Beta Gamma Sigma International Honor Society and the Upsilon Pi Epsilon Honor Society. His work experience includes nine years as a software designer. His research interests include health information technology, information technology maturity, and small group research.

Lakshmi Iyer is Professor of Information Systems and Director of the Master's in Applied Data Analytics Graduate Programs at the Walker College of Business, Appalachian State University. Her research interests are in the area of emerging technologies & its impact on organizations and users, and social inclusion in computing. Her research work has been published in or forthcoming in *Communications of the AIS*, *Journal of Association for Information Systems*, *European Journal of Information Systems*, *Communications of the ACM*, *Decision Support Systems*, *eService Journal*, *Journal of Electronic Commerce Research*, *International Journal of Business Intelligence Research*, *Information Systems Management*, *Journal of Global Information Technology and Management*, and others. She is a Board member of Teradata University Network, recent past-chair of the Special Interest Group in Decision Support and Analytics (SIGDSA, formerly SIGDSS). She has served as a Guest Editor for *Communications of the ACM*, the *Journal of Electronic Commerce Research*, and *Information Systems Frontier*. She is also co-editor of *Annals of Information Systems* Special Issue on "Reshaping Society through Analytics, Collaboration, and Decision Support: Role of BI and Social Media," from the 2013 pre-ICIS workshop in Milan, Italy.

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