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Pepperdine University
Graduate School of Education and Psychology

APPLICATION OF SOCIAL CAPITAL THEORY TO EXAMINE THE RELATIONSHIP
BETWEEN IT-BUSINESS ALIGNMENT AND ORGANIZATIONAL PERFORMANCE
OUTCOMES IN HEALTH CARE

A dissertation submitted in partial satisfaction
of the requirements for the degree of
Doctor of Philosophy in Global Leadership and Change

by

Michael David Seagraves

March, 2019

Doug Leigh, Ph.D. – Dissertation Chairperson

This dissertation, written by

Michael David Seagraves

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Doctoral Committee:

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TABLE OF CONTENTS

	Page
LIST OF TABLES.....	vii
LIST OF FIGURES	ix
DEDICATION.....	x
ACKNOWLEDGEMENTS.....	xi
VITA.....	xii
ABSTRACT.....	xiii
Chapter 1: Introduction.....	1
Background.....	1
Statement of the Problem.....	15
Purpose and Nature of the Study	16
Research Questions.....	21
Hypotheses.....	22
Theoretical Framework.....	26
Operational Definitions and Key Terms.....	27
Importance of Study.....	31
Limitations	32
Assumptions.....	33
Chapter 2: Literature Review.....	35
IT-Business Alignment.....	35
Communities of Practice.....	47
Social Capital History.....	55
Social Capital Theory	65
Organizational Benefits of Social Capital.....	77
Global Leadership and Social Capital.....	102
Intellectual Capital.....	117
Summary.....	121
Chapter 3: Research Design and Rationale.....	123
Research Design and Rationale	123
Population and Sample	124
Human Subjects Protections	126
Measures	126
Data Collection Procedure	130
Data Analysis Procedures	131

Chapter 4: Results	137
Summary of Research Questions and Hypotheses.....	137
Description of Sample.....	139
Primary Analyses	145
Multi-level SEM analysis.	145
Chapter 5: Discussion, Implications, Conclusions, and Recommendations.....	155
Summary of the Findings.....	155
Discussion of the Results	158
Summary.	164
Impact of Limitations.....	165
Implications for Hospital and IT Leaders	166
Contributions and Implications for Future Research.....	166
Conclusion	168
REFERENCES	171
APPENDIX A: IRB Approval from Pepperdine University	194
APPENDIX B: IRB Approval from Dignity Health Research Institute.....	195
APPENDIX C: Permission to Use Turner Social Capital Instrument	196
APPENDIX D: Recruitment Email	197
APPENDIX E: Social Capital Survey Instrument.....	199

LIST OF TABLES

	Page
Table 1. Summary of Individual Survey-Based Covariate, Social Capital, and Intellectual Capital Variables.....	30
Table 2. The New Model of Learning Proposed by Lave and Wenger (1991)	49
Table 3. The Contrasting Nature of Canonical and Non-Canonical Knowledge Based on Brown and Duguid (1991)	50
Table 4. Linking Communities of Practice, Social Capital, and Business Outcomes	53
Table 5. Definitions of Social Capital.....	66
Table 6. Social Capital Sources and Historical Antecedents.....	69
Table 7. Correlation Coefficients Reproduced from Tsai and Ghoshal (1998).....	87
Table 8. Summary of Hypotheses Tested Quantitatively by Espedal et al. (2013)	113
Table 9. Summary of Facility-level Performance Outcome Variables.....	127
Table 10. Social Capital and Intellectual Capital Survey Questions as Modified for Context from Turner (2011)	128
Table 11. Frequencies and Percentages for Categorical Individual-level Demographic Variables	140
Table 12. Frequencies and Percentages for Categorical Individual-level Study Variables	141
Table 13. Means and Standard Deviations for Continuous Individual-level Study Variables ..	144
Table 14. Means and Standard Deviations for Continuous Hospital-level Variables	144
Table 15. Bivariate Correlations between Hospital-level Study Variables	149
Table 16. Summary of Multiple Regression Analysis for Intellectual Capital Predicting Hospital Quality with Bootstrapped Confidence Intervals.....	150
Table 17. Summary of Multiple Regression Analysis for Intellectual Capital Predicting Employee Productivity with Bootstrapped Confidence Intervals.....	150
Table 18. Summary of Multiple Regression Analysis for Intellectual Capital Predicting Length of Stay with Bootstrapped Confidence Intervals.....	151

Table 19. Summary of Multiple Regression Analysis for Intellectual Capital Predicting Patient Satisfaction with Bootstrapped Confidence Intervals.....	152
Table 20. Summary of Multivariate Multiple Regression Analysis for Intellectual Capital Predicting Hospital Quality, Employee Productivity, Length of Stay, and Patient Satisfaction	153
Table 21. Summary of Hypotheses and Results	156

LIST OF FIGURES

	Page
Figure 1. Dimensions of social capital and their impact on performance.	11
Figure 2. How social capital drives operational alignment and IT business value.	13
Figure 3. Relationships examined between social capital, intellectual capital, and performance.	20
Figure 4. MIS strategic planning framework.	37
Figure 5. Structural model of information technology.	38
Figure 6. The Strategic Alignment Model.	39
Figure 7. Antecedents and mediating practices leading to IT-business alignment.	44
Figure 8. The modified IT-business alignment model.	45
Figure 9. A model of organizational social capital.	73
Figure 10. Social capital in the creation of intellectual capital.	76
Figure 11. Tsai and Ghoshal's (1998) model of social capital and value creation.	85
Figure 12. Summary of hypotheses and results tested by Merlo et al. (2006).	90
Figure 13. Karahanna and Preston's Research Model.	94
Figure 14. Research model with moderating effects of cognitive and relational capital.	98
Figure 15. Research model adapted from Wagner et al. (2014).	101
Figure 16. Dissertation research framework.	106
Figure 17. Parameters estimated using observed variable SEM.	133
Figure 18. Parameters to be estimated using multivariate and OLS regression.	134
Figure 19. Multi-level SEM analysis of individuals within hospitals.	146
Figure 20. Combined model.	158

DEDICATION

As with everything, for my family.

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Finally, a distant thank you to Dr. Farzin Madjidi who seven and half years ago introduced me to the idea that we are not in this program to become Michelangelo. Rather, we are in this program because *we are* The David. The greatest lesson in life is this: we do not need to strive to become anything more than we are. We only need to be.

I am.

VITA

EDUCATION

2019	Pepperdine University Doctor of Philosophy, Global Leadership and Change
1998	University of Puget Sound Master of Occupational Therapy
1994	Graceland University Bachelor of Science, Pre-Medical Biology

PROFESSIONAL SUMMARY

Michael Seagraves provides transformational leadership to individuals, teams, and organizations with an emphasis on cultural transformation, personal leadership development, organizational change, and building trust. He is the senior operational executive for digital transformation at a multi-billion dollar national health care organization in the United States. In this role, Michael is responsible for a global team that develops and delivers a best-in-class digital experience and portfolio of products that transform the way the organization attracts, engages with, and provides care for patients and consumers. Several times per year, Michael plans and facilitates large group workshops for corporations on the topics of *Building High-Performing Teams* and *Leading with Purpose*.

WORK EXPERIENCE

Dignity Health	2001-2019
Sr. Director Digital Transformation	2015-2019
Sr. Director Enterprise Healthcare IT Services Strategy and Operations	2013-2015
Director, Market Strategy and Organizational Synergy	2012-2013
Program Director	2011-2012
Director, Change Realization	2009-2011
Ancillary Team Lead, Care Connect	2006-2009
Occupational Therapist and Manager	2001-2006
Care Initiatives, South Central Iowa	1998-2001
Occupational Therapist	
Graceland University, Lamoni, IA	1998-2000
Residence Hall Director and Leadership Development Educator	

ABSTRACT

Health care organizations are facing increasing challenges as they strive to keep pace with evolving service delivery and reimbursement models. In this context, the effective use of Information Technology (IT) is widely acknowledged as a critical factor for achieving the quadruple aim of health care: better outcomes, lower cost, improved patient experience, and improved clinician experience. Even so, health care organizations have struggled to develop effective working relationships between IT and business units and there remains a dearth of research on the impact that the quality of the relationship between IT and business employees has on organizational performance outcomes.

Applying social capital theory, the purpose of this study was to investigate the extent to which the quality of the relationship between IT and non-IT employees is correlated with organizational performance outcomes in a hospital setting. Hypothesized relationships between the structural, cognitive, and relational dimensions of social capital and intellectual capital were examined. Multi-level SEM path analysis was employed to analyze survey data from 143 IT Field Service workers who provide services in one of 34 hospitals within a single health system in the western United States. Multivariate and ordinary least squares linear regression was used to investigate the relationship between intellectual capital (aggregated by hospital, $N = 34$) and extant data from four hospital performance metrics: hospital quality, employee productivity, patient length of stay, and patient satisfaction.

A positive correlation was observed between structural and cognitive dimensions of social capital ($Std. \beta = 0.550, p = 0.003$), cognitive and relational dimensions of social capital ($Std. \beta = 0.581, p = 0.001$), and between the cognitive dimension of social capital and intellectual capital ($Std. \beta = 0.643, p = 0.001$). Intellectual capital was positively correlated with employee

productivity (*Std. β = 0.468, $p = 0.005$*) and negatively correlated with patient length of stay (*Std. $\beta = -0.422, p = 0.032$*). These correlational results provide direction for future experimental research and offer guidance for health care and IT leaders as they examine whether the development of structural and cognitive social capital between IT and non-IT employees has a causal impact on hospital performance.

Chapter 1: Introduction

Background

In 2015 health care spending in the United States totaled \$3.2 trillion, a figure which represents 17.8% of our gross domestic product — the highest percentage in our history (Martin, Hartman, Washington, & Catlin, 2016). Per capita, the United States spends more on health care than every other country in the Organization for Economic Cooperation and Development (OECD) and yet in 2015 still ranked nearly two years below the average life expectancy at birth when compared to those same countries (OECD, 2015). The highly fragmented nature of the United States health care industry is a contributing factor to these problem. Rising health care costs coupled with these lackluster population health statistics have spawned increasing attention and a growing national debate on the topic of health care reform. Central to this debate is the Patient Protection and Affordable Care Act — often referred to as the Affordable Care Act — which was signed into law by President Obama on March 23, 2010. In response to the health care crisis in America, the Affordable Care Act established regulations aimed at three categorical objectives: (a) increasing access to health care through expanded insurance coverage, (b) increasing consumer protections, and (c) improving quality of care while concurrently lowering costs (Reeve & Institute of Medicine [US], 2014).

The struggle to control health care spending is decades old. For much of that time the predominant mode of physician payment has been a fee-for-service model (Berenson & Rich, 2010) in which revenue increases with utilization, regardless of clinical quality or outcomes. In the fee-for-service model, providers are financially incentivized to deliver maximum services which in turn cause health care spending to rise. In the 1990s, managed care organizations introduced the concept of capitation in an effort to control spiraling health care costs in the

United States (Frakt & Mayes, 2012). Under capitation, health care spending was regulated through fixed fee payments to providers. Providers who spent less on care earned greater profits, and those who over-spent their payments were at risk for financial losses. This shifting of financial risk from payor to provider incentivized the reduction of services and/or the deferral of necessary care, which ultimately had a negative impact on the quality of care provided (Goodson, 2001). An additional outcome of capitation was a spike in the number of mergers and acquisitions among physician provider groups so that they would be better positioned to negotiate contracts and manage risk across greater populations of patients (Frakt & Mayes, 2012). The advent of larger provider organizations resulted in the need for better care coordination (Goodson, 2001), a challenge that continues to exist despite the fact that capitation has fallen from favor. With fee-for-service driving up costs and capitation having proven unsuccessful, the Affordable Care Act took a major step toward payment reform by establishing a new fee-for-value payment model under which physician payments are modified based on the ratio of cost to clinical outcomes (Reeve & Institute of Medicine [US], 2014). This value-based system revolutionizes health care delivery by incentivizing providers to deliver the highest quality care for each patient at the lowest cost possible. As a result, the demand for collaboration within and across medical groups only increases as providers aim to take better care of patients while minimizing duplication of services.

The evolution of payment and care delivery models has occurred simultaneously with a technological revolution in health care. Between 2001 and 2013, the percentage of office-based physicians with at least a partial electronic health record system rose from 18.2% to 78.4% (Hsiao & Hing, 2014). Similarly, between 2008 and 2013, adoption of electronic health record systems in U.S. non-federal acute care hospitals rose from 9.4% in to 59.4%, a trend that

continues to rise (Charles, Gabriel, & Furukawa, 2014). This increasing health care technology investment can at least partially be attributed to the 2009 passage of the Health Information Technology for Economic and Clinical Health (HITECH) Act as part of the American Recovery and Reinvestment Act (American Recovery and Reinvestment Act, 2009). One of HITECH's major provisions was to incentivize the use of Health Information Technology through the inclusion of incentive payments for automation by 2015 and financial penalties for hospitals who fail to adopt use of the electronic health records thereafter (Tomes, 2010). The advent of the American Recovery and Reinvestment Act and HITECH have become compelling motivators in the race to use technology in health care, and across the nation health care organizations continue moving swiftly to find the path forward. This is an expensive undertaking: in 2014 health information technology spending at large health care organizations in the United States was expected to reach \$34.5 billion (Technology Business Research, 2013).

As health care organizations strive to implement technology solutions that support clinical and business practices and meet increasingly stringent government regulations, those very business practices and regulations continue to change. In a fee-for-service model, where profits are driven by volume and throughput, providers rely on technology solutions to safely and efficiently move patients through an episode of care. In contrast, under a value-based model where profits are driven by increasing quality while lowering cost, providers need technology that enables interoperability and information sharing so that they have the clinical information necessary to make the right decisions at the right time regardless of where the patient has previously received care. Technology that supports a fee-for-service model does not necessarily work for value-based care. In addition, the ongoing and rapid evolution in available technology places increasing demands on health care organizations as both providers and consumers demand

modern capabilities such as digital mobility and telehealth (Edgerton, 2014). As a result, business leaders in health care organizations find themselves in the position of having already spent — in some cases — billions of dollars on technology solutions that don't necessarily meet their current or future needs. Considering the already stressful nature of the industry, the level of IT spending necessary to support evolving business strategies has brought increasing attention to the relationship between IT and business leaders in health care settings. Now, more than ever, effective working relationships between IT and business leaders are required to successfully keep pace with changing payment models, increasing consumer demands, government regulations, and expanding insurance coverage.

IT-business alignment has been the focus of organizational leaders in many industries since the advent of computer technology into business practice in the 1960s (Doll & Ahmed, 1983). In the 1980s, it was posited that organizations could utilize information technology systems to differentiate themselves from competitors (Ives & Learmonth, 1984; Johnston & Vitale, 1988; McFarlan, 1984). However, in the 1990s authors began suggesting that it was not the technology itself that would drive such competitive advantage, but rather the corresponding maturation of the organization itself (Dvorak, Holen, Mark, & Meehan, 1997; Keen, 1993; Mata, Fuerst, & Barney, 1995), and empirical research began to emerge to support this idea. For example, Kettinger, Grover, Guha, and Segars (1994) performed a longitudinal study of 28 firms in an effort to determine whether some strategic users of IT realized sustained gains in profitability and/or market share and, if so, whether those firms exhibited differences from firms that did not demonstrate such sustainability. The authors used available literature and trade press to identify sample organizations that had demonstrated strategic applications of information technology. For each of the firms in the sample, analysis of profitability and market share was

performed in three stages: prior to IT system implementation (Pre-Launch), over the five year period after initial IT system implementation (Post-Launch 1), and over the period from five to ten years after the initial IT system implementation (Post-Launch 2). Fifteen of the 28 firms studied were determined to be “sustainers,” defined as those firms which were able to demonstrate an improvement in market share and/or profitability in the Post-Launch 1 and Post-Launch 2 phases. Based on a review of the literature, the authors identified 14 variables across three categories that they suggested would have an impact on sustainability. These categories included environmental factors (such as the number of direct competitors), foundation factors (such as total sales, cash flow, working capital, sales per cost of goods sold, and research and development expenses), and action/strategy factors (such as the ratio of current assets to liabilities, operating income to interest expense, and owners’ equity to debt). A stepwise method was utilized to test the discriminant function of each variable, enabling the researchers to successfully classify 82.14% of the cases. This result suggests that fundamental pre-launch differences did exist between those firms that realized and sustained competitive advantage and those that did not. The authors concluded that the implementation of technology itself was not sufficient to garner competitive advantage, but rather such advantage requires a process of organizational development that enables innovative action.

Similarly, in a survey of 250 organizations in the retail industry, Powell and Dent-Micallef (1997) performed empirical research to test three hypotheses: (a) human resources, in complement to IT resources, create the advantages that explain performance variation among firms; (b) business resources, in complement to IT resources, create the advantages that explain performance variation among firms; and (c) IT resources do not in and of themselves explain performance variation among firms. These authors used the following definitions in their

analysis:

1. Technology resources:

- computer hardware, software, and linkages.

2. Human resources:

- open organization – a culture of trusting and open relationships with minimal formalization and bureaucracy,
- open communications – free oral and written communications within and across business units, chains of command, and functional boundaries,
- consensus – minimal conflict in goal-setting, decision-making and action-taking.
- CEO commitment – a clear and visible CEO commitment to IT,
- flexibility – a culture that embraces and encourages change and experimentation, minimizes fear of failure, and welcomes opportunities to apply new IT developments,
- IT/strategy integration – integration of IT planning with the overall goals, strategies, and strategic planning processes of the firm; an attempt to fit IT into strategic objectives rather than adopt ITs for their own sake.

3. Business resources:

- supplier relationships – Open and trusting relationships with key suppliers,
- supplier-driven IT – encouragement and support by suppliers to adopt new ITs that may create inter-organizational efficiencies,
- IT training – personnel are well trained on existing applications, and IT training is a visible priority in the firm,
- process redesign – an attempt to reevaluate and reorient traditional activities and structure along process lines, through “business process reengineering” or other

- process-based methods,
- teams – conversion to a team-based structure, or the increased use of cross departmental teams in problem-solving,
 - benchmarking – actively researching and observing best practices of other firms in activities or processes that need improvement,
 - IT planning – clearly identified IT priorities and a plan for development and implementation.

Using a linear regression model, results showed that although retail executives attributed IT success nearly equally to human ($r = 0.45$), business ($r = 0.44$), and technology ($r = 0.36$) resources, actual overall organizational performance was only significantly correlated positively with human resources ($r = 0.45, p < 0.001$). A moderate correlation with business resources ($r = 0.23, p = 0.010$) was demonstrated, while no significant relationship with technology resources ($r = -0.05$) was found.

The idea that the quality of the relationship between IT and business leaders is the key element in driving IT-business value has since been reinforced by a number of authors who simultaneously acknowledge the persistent difficulty organizations have in closing the gap between them. In an interpretive study using semi-structured interviews Coughlan, Lycett, and Macredie (2005) studied the IT-business relationship in a major bank in the United Kingdom. Data were analyzed via thematic analysis. The authors concluded that the challenges of creating a highly functional IT-business relationship in a large organization are major, particularly when it comes to effective communication across organizational boundaries. They also suggested that effective communication in support of a strong IT-business relationship requires an equal partnership between the two, with mutual respect and a united front.

Manfreda and Štemberger (2014) surveyed 210 CIOs and 93 CEOs of European companies with at least 50 employees and net sales revenue of €8.8 million to compare the perspectives of the top IT and business leaders in each organization for the purpose of better understanding factors that cause the relationship gap between them. The researchers used exploratory factor analysis to identify a list of IT-business relationship variables and then performed a *t*-test to evaluate whether there were differences in the way that IT and business leaders perceived each. Seven factors showed statistically significant differences in the way they were perceived: top business management support of IT ($t = 9.752, p = 0.000$), mutual trust between management and IT personnel ($t = 2.229, p = 0.027$), perceived value of the IT department ($t = -3.696, p = 0.000$), technological skill of the IT leadership ($t = 6.513, p = 0.000$), business role of the IT department ($t = 4.562, p = 0.000$), supporting role of the IT department ($t = 1.973, p = 0.050$), and technological role of the IT department ($t = 2.725, p = 0.007$). Noting that IT projects continue to fail due to struggling IT-business relationships, the authors concluded that organizations should consider making a substantial effort to bridge the gap between these seven identified factors.

In a similar exploratory study, Peppard and Ward (1999) surveyed the CIO, IT director, and a sample of business and IT management in three organizations in the United Kingdom. Their instrument was designed to elicit both quantitative and qualitative responses. The researchers first used a combination of an interpretive approach and descriptive statistics to analyze each of the three organizations independently, revealing three distinct typologies of the IT-business relationship. In one, the IT organization was seen as “disconnected.” In another, the IT organization was seen as “unloved.” In the third, the IT organization was seen as “high achieving.” Based on their analysis, the authors then presented a framework for managing the

relationship that included structures and processes, leadership, service quality, values, and beliefs, and roles. Each of these five areas was considered by the authors to be necessary but individually insufficient to improve the quality of the IT-business relationship. The authors also suggested in their conclusion that many organizations are mistakenly focused on the objective of creating a high performing IT organization when in fact a more nuanced and appropriate objective is to create a high performing organization that strategically leverages the use of IT. Accordingly, the authors found that in low performing organizations IT focused on technical matters and service delivery while in high performing organizations IT focused on being proactive and driving the overall business strategy through IT enablement. Similarly, using an embedded single case study approach to evaluate the IT-business relationship in the German banking industry, Wagner, Franke, Beimborn, and Weitzel (2006) concluded that better performance at individual bank branches was correlated with better interconnectedness between IT and business domains in daily business.

Although there is general agreement that alignment between IT and business units is an important pre-cursor to service quality, value, and organizational legitimacy, a consistent theoretical foundation for such alignment has yet to emerge (Chan & Reich, 2007; Lim, Stratopoulos, & Wirjanto, 2013; Wagner, Beimborn, & Weitzel, 2014). In the absence of such a theoretical foundation, successful IT-business alignment remains elusive in practice. Luftman (2009) suggested four reasons for such difficulty. First, in the absence of theory-based language, alignment is treated as a “buzz word.” Second, leaders often look for a simple answer to this complex organizational problem. Third, leaders wrongly place emphasis on aligning IT with the business, when the true need is to align IT and the business with each other. Fourth, when considering IT strategy, leaders often focus too much on IT infrastructure, thus ignoring other

important aspects of alignment. In a thorough review of the IT alignment literature, Chan and Reich (2007) defined four alignment dimensions — strategic/intellectual, structural, social, and cultural — and called for additional research to include a greater theoretical underpinning for IT-business alignment. As will be reviewed in detail in Chapter 2, responding to this challenge, Wagner et al. (2014) drew on social capital theory to develop an alignment model that explains IT and business interrelationships and describes their impact on IT business value.

By using social capital theory as a framework for understanding, the interconnectedness referred to by Wagner et al. (2006) can be further defined and conceptualized. In their oft-cited work, Nahapiet and Ghoshal (1998) defined social capital as “the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (p. 243). These relationships take place across three key dimensions. The first is the structural dimension, which refers to “the impersonal configuration of linkages between people or units...the overall pattern of connections between actors” (p. 244). Second is the relational dimension, which refers to “the kind of interpersonal relationships people have developed with each other through a history of interactions” (p. 244). Examples include trust, trustworthiness, expectations, and norms. Third is the cognitive dimension, which refers to shared language, or “shared representations, interpretations, and systems of meaning among parties” (p. 244). With their arguments rooted in sociology and organizational analysis, Nahapiet and Ghoshal (1998) hypothesized that social capital coevolves with intellectual capital, defined as “the knowledge and knowing capability of a social collectivity such as an organization, intellectual community, or professional practice,” (p. 245) and that the coevolution of these two types of capital serves as a causal basis for the development of organizational advantage.

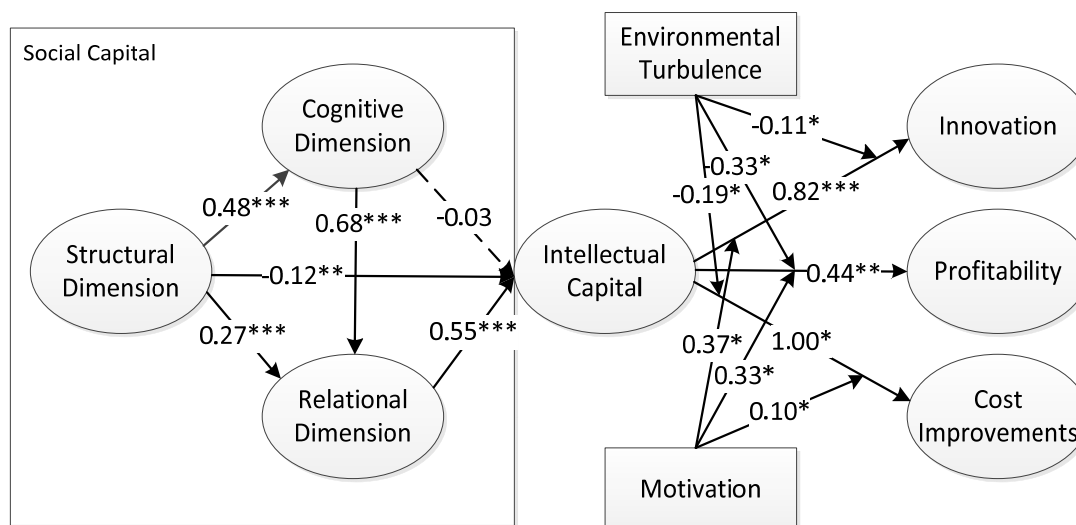


Figure 1. Dimensions of social capital and their impact on performance. Solid lines indicate statistically significant paths. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. From “Social Capital: Measurement, Dimensional Interactions, and Performance Implications,” by J. T. Turner, 2011, *All Dissertations*, Paper 762, p. 95. Copyright 2011 by TigerPrints. Adapted with permission.

Turner (2011) furthered the work of Nahapiet and Ghoshal (1998) by using the two stage process detailed by Menor and Roth (2007) to develop a valid and reliable survey instrument designed to measure the dimensions of social capital. Stage one included specifying the theoretical domains and operational definitions of each construct, generating items through literature review and structured expert interviews, and pretesting items through use of an independent panel of expert judges to confirm reliability and validity. Items deemed valid and reliable advanced through stage two of the process which included a cycle of questionnaire development, survey data collection, confirmatory analyses, and item/scale refinement. Turner (2011) then utilized this instrument to survey a sample of 239 senior managers in companies that were retail members of the National Association of Convenience Stores to evaluate the relationship of social capital between IT and business leaders and its impact on three organizational performance outcomes: innovation, profitability, and cost improvements. The

results of this work, summarized in Figure 1, present empirical validation of the social capital theory originally put forth by Nahapiet and Ghoshal (1998).

When applied to the relationship between buyers and suppliers in the supply chain industry, the structural dimension of social capital was shown, as expected, to positively influence the creation of both the cognitive ($r = 0.48, p < 0.001$) and relational ($r = 0.27, p < 0.001$) dimensions. The cognitive dimension was shown to positively influence the creation of the relational dimension ($r = 0.68, p < 0.001$), while the relational dimension was the only factor that correlated directly and positively with the development of intellectual capital ($r = 0.55, p < 0.001$). This evidence suggests that the path to developing intellectual capital and performance improvement travels through the relational dimension of social capital. Also of particular interest was the unexpected finding that the structural dimension of social capital was independently and negatively correlated with the development of intellectual capital ($r = -0.12, p < 0.01$). From this observation the author inferred that the dimensions of social capital must be considered together and “increasing one aspect of social capital without developing social capital holistically leaves a firm open to negatively impacting firm performance” (Turner, 2011, p. 114). Intellectual capital was shown to positively correlate with the three performance metrics studied: innovation ($r = 0.82, p < 0.001$), profitability ($r = 0.44, p < 0.01$), and cost improvements ($r = 1.00, p < 0.05$). Each of these positive correlations was also positively moderated by the level of motivation the organization had towards developing social capital (Innovation $r = 0.37, p < 0.05$; Profitability $r = 0.33, p < 0.05$; Cost Improvements $r = 0.10, p < 0.05$) and negatively moderated by environmental turbulence, defined as the degree of risk and uncertainty faced by the organization (Innovation $r = -0.11, p < 0.05$; Profitability $r = -0.33, p < 0.05$; Cost Improvements $r = -0.19, p < 0.05$). Turner (2011) concluded that “this supports the idea that firms must be committed over

a sustained period of time to realize the benefits of social capital in terms of improved firm performance,” and “the higher the level of risk and uncertainty faced by a firm, the more challenging it is to translate intellectual capital into firm performance” (p. 116).

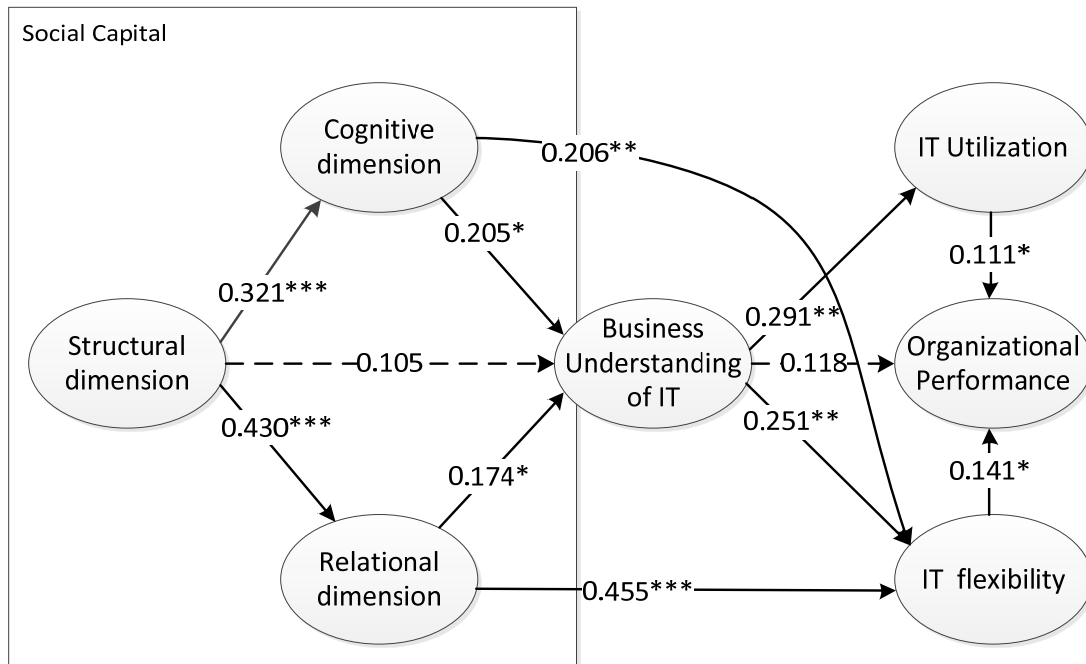


Figure 2. How social capital drives operational alignment and IT business value. Solid lines indicate statistically significant paths. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. From “How Social Capital Among Information Technology and Business Units Drives Operational Alignment and IT Business Value” by H. T. Wagner, D. Beimborn, and T. Weitzel, 2014, *Journal of Management Information Systems*, 31, p. 253. Copyright 2014 by M. E. Sharpe, Inc. Adapted with permission.

Figure 2 illustrates a slightly modified application of social capital theory to IT-business alignment research in the German banking industry (Wagner et al., 2014). In this study, reviewed in greater detail in Chapter 2, intellectual capital was replaced with a similar construct, “business understanding of IT,” which the authors described as the combined and new knowledge resulting from the interactions between people. A survey method was utilized to assess the level of social

capital between IT and business leaders and its relationship to organizational performance. A total of 132 survey responses were included. As with Turner (2011), the results indicated that the structural dimension of social capital is positively correlated with the cognitive ($r = 0.321, p < 0.001$) and relational ($r = 0.430, p < 0.001$) dimensions. The relational dimension was shown to have a positive relationship with business understanding of IT ($r = 0.174, p < 0.05$) however in contrast to Turner (2011), the results also indicated the presence of a positive relationship between the cognitive dimension of social capital and the level of business understanding of IT ($r = 0.205, p < 0.05$). This difference may be explained by the subtle variation that intellectual capital as defined by Turner (2011) aims to capture both combined knowledge and knowing capability, while business understanding of IT as defined by Wagner et al. (2014) aims only to capture the combined knowledge itself. Wagner et al. (2014) defined performance outcomes in terms of IT-business value using three constructs: IT utilization (the extent to which IT is deployed to support operational and strategic tasks), IT flexibility (the willingness and ability of IT to adapt to changing business needs), and organizational performance (productivity and improved financial results). Their model suggests that IT flexibility and IT utilization serve as intermediaries between business understanding of IT and organizational performance. Wagner et al. (2014) found a positive relationship between both the cognitive ($r = 0.206, p < 0.01$) and relational dimensions ($r = 0.455, p < 0.001$) of social capital and the intermediary performance variable of IT flexibility. This indicates that greater trust and shared understanding between business and IT units positively and directly influences the willingness and ability of IT to adapt to changing business needs. Business understanding of IT was also shown to have a direct, positive relationship with both IT flexibility ($r = 0.251, p < 0.01$) and IT utilization ($r = 0.291, p < 0.01$), while both IT utilization ($r = 0.111, p < 0.05$), and IT flexibility ($r = 0.141, p < 0.05$),

were shown to have a positive relationship with organizational performance.

Applying their social capital theory-based model at both the strategic leadership and operational (implementation) levels, Wagner et al. (2014) concluded that while strategic level IT-business alignment is important, alignment at the operational level is critical to the development of IT-enabled business value. “Alignment of strategies leads to appropriate investments and implementation,” they suggested, “which lead to — mainly driven by operational alignment — appropriate utilization and flexible adaptation of IT, which finally creates the business value of IT” (p. 262). Using a similar social capital framework, such operational alignment between IT and non-IT employees in a health care setting serves as the central focus of this dissertation.

Statement of the Problem

Health care organizations face increasing challenges as they strive to adapt to evolving service delivery models, expanding health insurance coverage, and the shift toward value-based payment. Although information technology is widely acknowledged as a critical resource in the effort to drive down cost while simultaneously increasing quality of care, health care organizations have long struggled to develop effective working relationships between IT and business units (Mohrmann, Kraatz, & Sessa, 2009). Organizational research across industries suggests that to improve outcomes, the partnership between IT and business services must evolve away from transactional relationships and more toward strategic collaboration and mutual understanding (Coughlan et al., 2005; Kettinger et al., 1994; Manfreda & Štemberger, 2014; Powell & Dent-Micallef, 1997). Even so, there remains a dearth of research on this subject in the health care industry specifically, and the majority of articles that have been published fail to propose theory-based solutions for strengthening IT-business alignment in a health care environment (Mohrmann et al., 2009). Considering that clinicians and other non-IT employees

represent the “business” in a health care environment, empirical, theory-based research that explores the quality of the relationship between IT and non-IT employees while evaluating its impact on key business outcomes will serve to guide health care organizations as they further integrate technology into practice and drive IT-enabled business value. Social capital theory as put forth by Nahapiet and Ghoshal (1998), substantiated by Turner (2011), and applied to the IT-business relationship by Wagner et al. (2014), presents a meaningful opportunity to further develop both the theory and practice of IT-business alignment research in the health care industry.

Purpose and Nature of the Study

Using the social capital research model as presented and validated by Turner (2011), the objective of this study was two-fold. First, this study was designed to examine the extent to which hypothesized relationships between the three dimensions of social capital and intellectual capital hold true in a health care setting. Second, this study included an exploratory investigation of the extent to which the presence of intellectual capital in a health care organization setting is correlated with organizational performance outcomes. Specifically, the 10 purposes of the study were as follows:

The first purpose of this study was to identify the extent to which, if at all, there is a relationship between the structural and cognitive dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates.

The second purpose of this study was to identify the extent to which, if at all, there is a relationship between the structural and relational dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates.

The third purpose of this study was to identify the extent to which, if at all, there is a

relationship between the cognitive and relational dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates.

The fourth purpose of this study was to identify the extent to which, if at all, there is a relationship between the structural dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates.

The fifth purpose of this study was to identify the extent to which, if at all, there is a relationship between the cognitive dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates.

The sixth purpose of this study was to identify the extent to which, if at all, there is a relationship between the relational dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates.

The seventh purpose of this study was to identify the extent to which, if at all, there is a relationship between intellectual capital and hospital quality metrics.

The eighth purpose of this study was to identify the extent to which, if at all, there is a relationship between intellectual capital and employee productivity in a health care setting.

The ninth purpose of this study was to identify the extent to which, if at all, there is a relationship between intellectual capital and patient length of stay in a health care setting.

The tenth purpose of this study was to identify the extent to which, if at all, there is a relationship between intellectual capital and patient satisfaction in a health care setting.

The rationale for the selection of each outcome metric was as follows:

Hospital quality. In an effort to standardize quality reporting across hospitals, in 1999 the Joint Commission for Accreditation of Hospital Organizations (JCAHO) began the work of developing core quality metrics and in 2003 hospital quality standards were published nationally across the United States health care system (JCAHO, 2018). For the purposes of this study, hospital quality was selected as an outcome variable because it is a standard performance metric that is reported out monthly as key operational metric by the hospital system that was sampled.

Employee productivity. Given the multiple economic pressures that hospitals and health systems face, it follows that labor efficiency is of importance to operational executives in the health care industry. Managers in health care environments are under pressure to use a number of different approaches to increase productivity such as organizational redesign, integration of services, and process engineering. While hospital executives continue to push for higher productivity, the result is often not positive with staff. For example, a study of 319 nurses working across 303 hospitals revealed high levels of job dissatisfaction, burnout, and concerns over the ability to provide quality care (Aiken, Clarke, & Sloane, 2002). Tools that can be leveraged for the purpose of making productivity easier may help to ease the burden on care providers in hospital settings. Although information technology aspires to be a productivity tool, many health care studies suggest that they can in fact have a negative impact on provider productivity (Jha et al., 2009; Rau, 2011; Simon et al., 2007). Employee productivity was selected as a performance outcome in this study because, technology notwithstanding, it is of interest to explore whether the relationship between IT and non-IT staff can have an impact on job performance. In addition, productivity is reported out monthly as a key operational metric by the hospital system that was sampled.

Length of stay. Hospital length of stay is an oft-used metric to evaluate overall

efficiency within a hospital under the rationale that a shorter length of stay is a sign of better care that will result in reduced overall costs and better outcomes (OECD, 2017). Moreover, since the advent of the Prospective Payment System (PPS) in the 1980s hospitals have been financially incentivized to reduce inpatient length of stay by virtue of receiving fixed fee payments per diagnosis. Accordingly, the average hospital length of stay for patients 65 and over in the United States has dropped from 10.7 days in 1980 to 5.5 days in 2010 (Kozak, Lees, & DeFrances, 2006; US Department of Health and Human Services, 2010b). However, this metric is not without controversy as shorter length of stay has also been correlated with higher risk for readmission and 30-day mortality rates (Cutler, 1995; Gilbert, 2015; Heggstad, 2002; Southern & Arnsten, 2015). Nevertheless, for the purpose of this study length of stay was selected as an outcome measure because it remains an important performance indicator for hospital leaders and because it is specifically reported out monthly as a key operational metric by the hospital system that was sampled.

Patient satisfaction. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey was developed in partnership between the Centers for Medicare & Medicaid Services (CMS) and the Agency for Healthcare Research and Quality (AHRQ) (CMS.gov, 2018). The HCAHPS Survey, which is administered to a random sample of patients on a continuous basis, provides a standardized methodology for collecting data about patients' perspectives on hospital care. CMS has been publishing patient satisfaction scores on its hospital compare website since 2008 and in 2012 CMS began using these scores to adjust payments to hospitals as part of its Value-Based Purchasing Program (Rau, 2011). There are two global questions on the HCAHPS Survey: overall rating of hospital and willingness to recommend the hospital. For the purposes of this study the willingness to recommend score was selected as an

outcome variable because it is reported out monthly as key operational metric by the hospital system that was sampled.

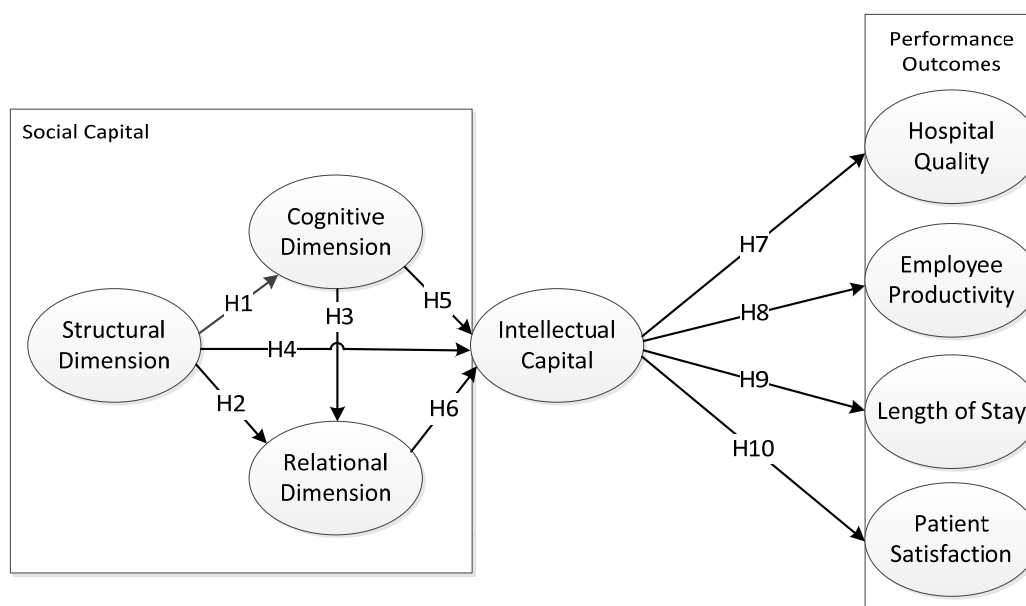


Figure 3. Relationships examined between social capital, intellectual capital, and performance.

Figure 3 illustrates the overall relationships that were examined. As discussed in further detail in Chapter 3, relationships among the three dimensions of social capital and intellectual capital (H1-H6) were evaluated using structural equation modeling, while the relationship between intellectual capital and performance outcomes (H7 -H10) were evaluated using multivariate linear regression analysis. The primary nature of this study was observational, quantitative, and relational, though differences between facilities with regard to the relationship between the dimensions of social capital, intellectual capital, and organizational performance were to be compared. The structural, cognitive, and relational dimensions of social capital and the degree of intellectual capital were measured cross-sectionally using a validated survey instrument, with no experimental manipulation. The four business outcomes: hospital quality, employee productivity, length of stay, and patient satisfaction, were assessed cross-sectionally, using extant data and with no experimental manipulation.

Research Questions

1. To what extent, if at all, is there a relationship between the structural and cognitive dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?
2. To what extent, if at all, is there a relationship between the structural and relational dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?
3. To what extent, if at all, is there a relationship between the cognitive and relational dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?
4. To what extent, if at all, is there a relationship between the structural dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?
5. To what extent, if at all, is there a relationship between the cognitive dimension of social capital and the existence of intellectual capital IT and non-IT employees in a health care setting while controlling for demographic covariates?
6. To what extent, if at all, is there a relationship between the relational dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?
7. To what extent, if at all, is there a relationship between intellectual capital and hospital quality metrics?
8. To what extent, if at all, is there a relationship between intellectual capital and employee productivity in a health care setting?

9. To what extent, if at all, is there a relationship between intellectual capital and patient length of stay in a health care setting?
10. To what extent, if at all, is there a relationship between intellectual capital and patient satisfaction in a health care setting?

Hypotheses

H1: The structural dimension of social capital will have a positive relationship with the cognitive dimension of social capital among IT and non-IT employees in a health care setting while controlling for covariates.

H1₀: The relationship between the structural and cognitive dimensions of social capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

H1 Rationale: Turner (2011) demonstrated a positive relationship between the structural and cognitive dimensions of social capital in the supply chain industry. Similarly, and more specific to the context of this study, Wagner et al. (2014) demonstrated the same positive relationship in a study of IT-business alignment in the banking industry.

H2: The structural dimension of social capital will have a positive relationship with the relational dimension of social capital among IT and non-IT employees in a health care setting while controlling for covariates.

H2₀: The relationship between the structural and relational dimensions of social capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

H2 Rationale: Turner (2011) demonstrated a positive relationship between the structural and relational dimensions of social capital in the supply chain industry. Similarly, and more specific

to the context of this study, Wagner et al. (2014) demonstrated the same positive relationship in a study of IT-business alignment in the banking industry.

H3: The cognitive dimension of social capital will have a positive relationship with the relational dimension of social capital among department leaders and information technology staff in a health care setting while controlling for covariates.

H3₀: The relationship between the cognitive and relational dimensions of social capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

H3 Rationale: Turner (2011) demonstrated a positive relationship between the cognitive and relational dimensions of social capital in the supply chain industry.

H4: The structural dimension of social capital will not have a relationship with the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for covariates.

H4₀: The relationship between the structural dimension of social capital and existence of intellectual capital among IT and non-IT employees in a health care setting will not differ significantly from zero while controlling for covariates.

H4 Rationale: Turner (2011) demonstrated that there is no direct relationship between the structural dimension of social capital and the existence of intellectual capital. Similarly, Wagner et al. (2014) demonstrated that there is no direct relationship between the structural dimension of social capital and the development of shared understanding between IT and business units in the banking industry.

H5: The cognitive dimension of social capital will have a positive relationship with the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling

for covariates.

H5₀: The relationship between the cognitive dimension of social capital and existence of intellectual capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

H5 Rationale: Although Turner (2011) demonstrated that there is no direct relationship between the cognitive dimension of social capital and the existence of intellectual capital, in a study of IT-business alignment, Wagner et al. (2014) did indicate a positive relationship between cognitive social capital and business understanding of IT. The greater contextual relevance of Wagner's (2014) result provides the rationale for this hypothesis.

H6: The relational dimension of social capital will have a positive relationship with the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for covariates.

H6₀: The relationship between the relational dimension of social capital and existence of intellectual capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

H6 Rationale: Turner (2011) demonstrates a positive relationship between the relational dimension of social capital and the presence of intellectual capital in the supply chain industry. Similarly, and more specific to the context of this study, Wagner et al. (2014) demonstrate a the same positive relationship between the relational dimension of social capital and the development of shared understanding between IT and business units in the banking industry.

H7: Intellectual capital will have a positive relationship with hospital quality metrics.

H7₀: The relationship between intellectual capital and hospital quality metrics will be non-positive.

H7 Rationale: Turner (2011) demonstrates a positive relationship between intellectual capital and organizational performance measures in the supply chain industry. Similarly, Wagner et al. (2014) demonstrate a positive relationship between shared understanding between IT and business units and the creation of IT-enabled business value.

H8: Intellectual capital will have a positive relationship with employee productivity.

H8₀: The relationship between intellectual capital and employee productivity will be non-positive.

H8 Rationale: Turner (2011) demonstrates a positive relationship between intellectual capital and organizational performance measures in the supply chain industry. Similarly, Wagner et al. (2014) demonstrate a positive relationship between shared understanding between IT and business units and the creation of IT-enabled business value.

H9: Intellectual capital will have a negative relationship with patient length of stay.

H9₀: The relationship between intellectual capital and patient length of stay will be non-negative.

H9 Rationale: In health care, shorter length of stay represents a more desirable business outcome.

Turner (2011) demonstrates a positive relationship between intellectual capital and organizational performance measures in the supply chain industry. Similarly, Wagner et al. (2014) demonstrate a positive relationship between shared understanding between IT and business units and the creation of IT-enabled business value.

H10: Intellectual capital will have a positive relationship with patient satisfaction.

H10₀: The relationship between intellectual capital and patient satisfaction will be non-positive.

H10 Rationale: Turner (2011) demonstrates a positive relationship between intellectual capital and organizational performance measures in the supply chain industry. Similarly, Wagner et al. (2014) demonstrate a positive relationship between shared understanding between IT and

business units and the creation of IT-enabled business value.

Theoretical Framework

The principal theory that bears upon this study is communities of practice as introduced by Lave and Wenger (1991), and further developed by Brown and Duguid (1991), Wenger (1998, 2000), and Wenger, McDermott, and Snyder (2002). At the heart of the postulated relationship between social capital and organizational performance is a requirement for organizational learning in a social context. As illustrated in Figure 1, intellectual capital serves as an intermediary between social capital and organizational performance. This notion of learning as a social enterprise has its roots in social constructivist theories which argue that what is learned cannot be separated from how it is learned nor the context in which it is learned (Brown, Collins, & Duguid, 1989). Expanding on this idea of situated learning, Lave and Wenger (1991) introduced the concept of communities of practice as a social theory of learning.

As will be further reviewed in Chapter 2, communities of practice are defined as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, McDermott & Snyder, 2002, p. 3). Such communities of practice possess three fundamental elements: a domain of knowledge which defines the content and context in which the community functions, a community of people who share an interest and passion for the domain and its purpose, and a shared practice in which members of the community develop and apply the knowledge and skills necessary to be effective within the domain. When functioning optimally, communities of practice are mechanisms through which all three dimensions of social capital (structural, relational, and cognitive) are developed and maintained. Such communities of practice have a positive impact on organizational performance by decreasing the learning curve

for community members, increasing customer responsiveness, reducing rework, and increasing innovation (Lesser & Storck, 2001).

Applying community of practice theory to the context of this study, the domain can be defined as a shared commitment to providing quality health care services, the community as the collective IT and non-IT employees who share a common interest and interdependence on one another to maximize organizational value and performance within the domain, and shared practice as the implementation, optimization, utilization, and support of technology solutions for the purpose of adding value to both patient care and the IT user experience. In the context of the communities of practice framework, this study examined the extent to which the quality of relationships within the community, as defined by the presence of social capital, positively influences organizational performance and outcomes (practice) within the domain.

Operational Definitions and Key Terms

Operational definitions.

Structural dimension of social capital. The properties of the social system and the network of relations as a whole. This includes the impersonal configuration of linkages between people or units and the overall pattern of connections between actors (Nahapiet & Ghoshal, 1998). This exogenous variable was measured via electronic survey at the individual level using the four related questions from the survey instrument developed and validated by Turner (2011) modified for organizational context. For the purposes of this study, the structural dimension of social capital was hypothesized to be an indirect cause of intellectual capital through its influence on the cognitive and relational dimensions of social capital.

Cognitive dimension of social capital. Shared representations, interpretations, and systems of meaning among parties (Nahapiet & Ghoshal, 1998). This endogenous variable was

measured at the individual level via electronic survey using the four related questions from the survey instrument developed and validated by Turner (2011) modified for organizational context. For the purposes of this study, the cognitive dimension of social capital was hypothesized to be one of two direct causes of intellectual capital.

Relational dimension of social capital. The kind of interpersonal relationships a people have developed with each other through a history of interactions (Nahapiet & Ghoshal, 1998). This endogenous variable was measured at the individual level via electronic survey using the four related questions from the survey instrument developed and validated by Turner (2011) modified for organizational context. For the purposes of this study, the relational dimension of social capital was hypothesized to be one of two direct causes of intellectual capital.

Intellectual capital. The knowledge and knowing capability of a social collectivity such as an organization, intellectual community, or professional practice (Nahapiet & Ghoshal, 1998). This endogenous variable was measured at the individual level via electronic survey using the four related questions from the survey instrument developed and validated by Turner (2011) modified for organizational context. As detailed in Chapter 3, individual responses for intellectual capital were aggregated into a single score for each facility to allow for correlational analysis with facility-level outcomes. For the purposes of this study, intellectual capital was hypothesized to be an effect of the three dimensions of social capital, with the four performance outcomes being caused by it.

Hospital quality. A performance outcome concerning the extent to which patient experience and quality survey results are at or above the 75th percentile. This endogenous variable was assessed at the facility level using extant data from patient satisfaction and quality surveys for the participating organization. For the purposes of this study, hospital quality was

hypothesized to be one of four performance outcomes caused by intellectual capital.

Employee productivity. A performance outcome concerning the percentage of employee time spent providing billable patient care. This endogenous variable was assessed at the facility level using extant productivity data for each hospital. For the purposes of this study, employee productivity was hypothesized to be one of four performance outcomes correlated with intellectual capital.

Length of stay. A performance outcome defined as the average number of midnights a patient stays in the hospital per admission. This endogenous variable was assessed at the facility level using extant facility data, specifically reporting the average length of stay for Medicare patients in each facility. For the purposes of this study, length of stay was hypothesized to be one of four performance outcomes correlated with intellectual capital.

Patient satisfaction. A performance outcome concerning the extent to which patient expectation of caring is consistent with the caring actually received (Greeneich, 1993). This endogenous variable was assessed at the facility level using extant data from Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) “willingness to recommend” scores for each hospital. For the purposes of this study, patient satisfaction was hypothesized to be one of four performance outcomes correlated with intellectual capital.

Covariates. In addition to the variables operationally defined above, five self-explanatory covariates were included in the study: gender, years of age, level of education, years in current job and years of service at the current organization.

Table 1 presents a summary of the individual survey-based covariate, social capital, and intellectual capital variables that were measured.

Table 1.

*Summary of Individual Survey-Based Covariate, Social Capital, and Intellectual Capital**Variables.*

Variable	Type	Scale	Definition
Gender	Cov.	Nominal	Male=1, Female=2, Non-binary=3
Years of Age	Cov.	Ordinal	<30=1, 30-40=2; 40-50=3; 50-60=4; >60=5
Level of Education	Cov.	Ordinal	High School Diploma=1; Associate's Degree=2; Bachelor's Degree=3; Master's Degree=4; Doctoral Degree=5
Years in Current Job Position	Cov.	Interval/Ratio	A numeric value representing the number of years the respondent has been in his or her current position.
Years of Service at Current Organization	Cov.	Interval/Ratio	A numeric value representing the number of years the respondent has been employed at the organization where the study is taking place.
Structural Dimension of Social Capital	IV	Interval/Ratio	This is an average of 4 items from Turner's instrument with each item consisting of a 5-point Likert scale and will be a continuous range from 0.0 to 4.0. Higher scores imply a greater amount of Structural Social Capital.
Cognitive Dimension of Social Capital	IV	Interval/Ratio	This is an average of 4 items from Turner's instrument with each item consisting of a 5-point Likert scale and will be a continuous range from 0.0 to 4.0. Higher scores imply a greater amount of Cognitive Social Capital.
Relational Dimension of Social Capital	IV	Interval/Ratio	This is an average of 4 items from Turner's instrument with each item consisting of a 5-point Likert scale and will be a continuous range from 0.0 to 4.0. Higher scores imply a greater amount of Relational Social Capital.
Intellectual Capital	DV	Interval/Ratio	This is an average of 4 items from Turner's instrument with each item consisting of a 5-point Likert scale and will be a continuous range from 0.0 to 4.0. Higher scores imply a greater amount of Intellectual Capital.

Note. Cov. = covariate; IV independent variable; DV=dependent variable.

Key terms.

Social capital. The sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit

(Nahapiet & Ghoshal, 1998). Social capital has three dimensions: structural, cognitive, and relational, as previously defined.

IT-business alignment. Cross-domain interconnectedness comprising social capital between IT and business departments and their common knowledge base (Wagner et al., 2014). For the purposes of this study IT-business alignment focused on the relationship between IT and non-IT employees in each facility.

Performance outcomes. For the purposes of this study, “performance outcomes” refers to the four dependent variables of hospital quality, employee productivity, length of stay, and patient satisfaction.

Business. For the purposes of this study, “business” refers to health care facility department managers and directors who consume IT services and whose daily work involves the coordination or provision of health care services.

Facility. A hospital within the health care system being studied, defined discretely as having its own Federal Tax ID.

Importance of Study

This study contributes to the literature by empirically evaluating the relationships between the dimensions of social capital, intellectual capital, and organizational performance in a health care information technology setting. This study also contributes specifically to the growing body of research on social capital theory by validating its applicability to the IT-business relationship in a health care setting. In addition, this study contributes to IT-business alignment research by further developing a theoretically sound framework for the better understanding the IT-business relationship and its impact on organizational performance.

The implications of this study are useful for organizational leaders in health care who are

working under great pressure to optimize value by decreasing costs and improving outcomes through the use of information technology. As information technology becomes increasingly integrated into service delivery and consumer engagement models in health care, this study contributes to the development of an evidence-based approach for understanding and optimizing the relationship between health care non-IT employees and the information technology staff who support them in the mission to provide safe and high quality patient care.

Finally, the results of this study serve to further evaluate the applicability of communities of practice as an underlying theoretical framework for social capital research. The theoretical framework for social capital as developed by Nahapiet and Ghoshal (1998) and further refined by Turner (2011) includes organizational learning in a social context as a central principle. The concept of communities of practice as developed by Wenger (1998) is, in and of itself, a social theory of learning. Explicitly discussing the study results within the communities of practice framework will help to strengthen the theoretical underpinnings of social capital research while conversely providing additional evidence for the underlying social mechanisms through which communities of practice positively impact organizational performance.

Limitations

This study had several inherent limitations. First, the cross-sectional design allowed for analysis of only a single point in time, preventing the exploration of a potential temporal relationship between variables. Second, there may have been uncontrolled confounding variables that obscured the relationship between the variables being studied. To limit the impact of these confounds, the following covariates were considered within the statistical analysis: gender, age, level of education, and years in current job position. Third, only the three social capital variables and intellectual capital were assessed at the individual level via survey, while all four

performance outcome variables were assessed at the facility level using extant data. For this reason, as presented in Chapter 3, both structural equation modeling and multivariate linear regression were employed for data analysis. As will be discussed, these statistical methods are most congruent with the sample size employed for both individual and facility level variables. Fourth, in order to evaluate the relationship between intellectual capital and the four facility level performance outcomes, individual responses for the intellectual capital variable were averaged by facility. This resulted in the loss of within-facility variance and reduced the overall sample size to the number of facilities being studied ($N = 34$). To mitigate concerns about parametric assumptions in this sample, bootstrapping was utilized prior to data analysis. Correlational results have been interpreted with the utmost caution and are considered indications for potential future research rather than as conclusive on their own. In addition, the aggregated intellectual capital measure and associated relationships to performance outcomes are only considered generalizable to the facility and not to the individual. Fifth, because this study was limited to multiple facilities within a single health care organization, the generalizability of the results is considered limited to the health care organization. Finally, as with all correlational analyses, only associations between variables can be inferred, not causation. To mitigate this concern, results have been interpreted cautiously with a bias toward correlational interpretation across all analyses.

Assumptions

For the purposes of this study it was assumed that participants were truthful in their responses to survey questions and did not demonstrate personal bias. To support this assumption, survey results were kept confidential, with no personally identifiable information presented in the findings. It was also assumed that for each survey question participants were evaluating a

single variable, that is, each participant was asked about the overall quality of social and intellectual capital between IT and non-IT employees in a specific facility. Finally, with respect to the survey questions being asked, it was assumed that the respondents had an accurate perception of the quality of the relationship between IT and non-IT employees in the facilities being studied.

Chapter 2: Literature Review

This literature review provides a relevant history of IT-business alignment research, further introduces communities of practice as an appropriate theoretical foundation for social capital research, presents an integrated overview of social capital, relates the topic social capital to the field of global leadership, and further reviews the additional variables relevant to the current study. The chapter is divided into seven major sections: IT-business alignment, communities of practice, social capital history, social capital theory, organizational benefits of social capital, social capital and global leadership, and intellectual capital. The first section provides a historical overview of relevant IT-business alignment research. The second section provides a historical and developmental overview of the communities of practice theoretical framework. The third section, which reviews social capital history, includes a review of both early and contemporary social capital research. The fourth section, which reviews social capital theory, includes a review of theoretical developments from two different influential perspectives: economic sociology and the role of the firm. The fifth section, which reviews organizational benefits of social capital, includes a review of social capital's impact on job satisfaction, organizational performance, and information technology business value. The sixth section broadly explores the intersection of global leadership and social capital. The seventh section provides a historical overview of intellectual capital. These seven sections are followed by a summary which demonstrates the need for further research in this area.

IT-Business Alignment

As information technology became increasingly mainstream in the 1960s and 1970s, business executives, technology leaders, researchers and authors began to recognize and evaluate the importance of understanding the alignment between technology and business objectives. In

1974 a “Planning for Management of Information Systems (MIS)” conference was held for information technology leaders across industries to discuss the importance of integrating information technology planning with overall business strategy. This event, which was co-sponsored by McKinsey & Company Inc. and the Graduate School of Management at the University of California, Los Angeles, sought to foster convergence in the conversation around business and MIS alignment (MIS was the contemporary term for IT). Among eight major points that emerged from conference discussions was the consensus that in the most advanced organizations IT planning is integral to business planning such that “MIS executives have become an integral part of the management team of their organization” and MIS planning is “interactive not reactive” (McLean and Soden, 1977 p. 426). Additionally it was concluded that successful IT planning depends on both the previous credibility of the MIS teams and the overall maturity of the organization’s management and business planning. These findings represent some of the earliest indications that IT-business alignment would be critical to organizational performance.

Building upon the work from the McKinsey-UCLA conference, McLean and Soden (1977) presented a framework for strategic planning in MIS. As shown in Figure 4, this framework illustrates that strategic planning occurs in steps at the intersection between business and MIS objectives within the organization. In their conclusion the authors noted the importance of recognizing that the MIS function is “not an end in itself but a part—and hopefully a vital part—of the larger objectives and activities of the overall enterprise” (p. 431). The authors end their paper with a list of ten questions that executives should seek to answer when performing strategic planning. Among these were three questions specifically focused on the interrelationship between business and MIS: (a) “Are we making sure that the MIS plan will

focus on the company's—rather than the MIS division's—use of the computer?" (p. 431), (b) "Are the MIS strategy and plan integrated with our overall corporate strategy and plans?" (p. 432), and (c) "What are the respective roles of top management, the MIS division, and the users groups within our organization in the launching and conduct of the planning effort?" (p. 432). These questions demonstrate that even in the earliest of organized discussions regarding the introduction of technology into business strategy, the importance of IT-business alignment was at the fore.

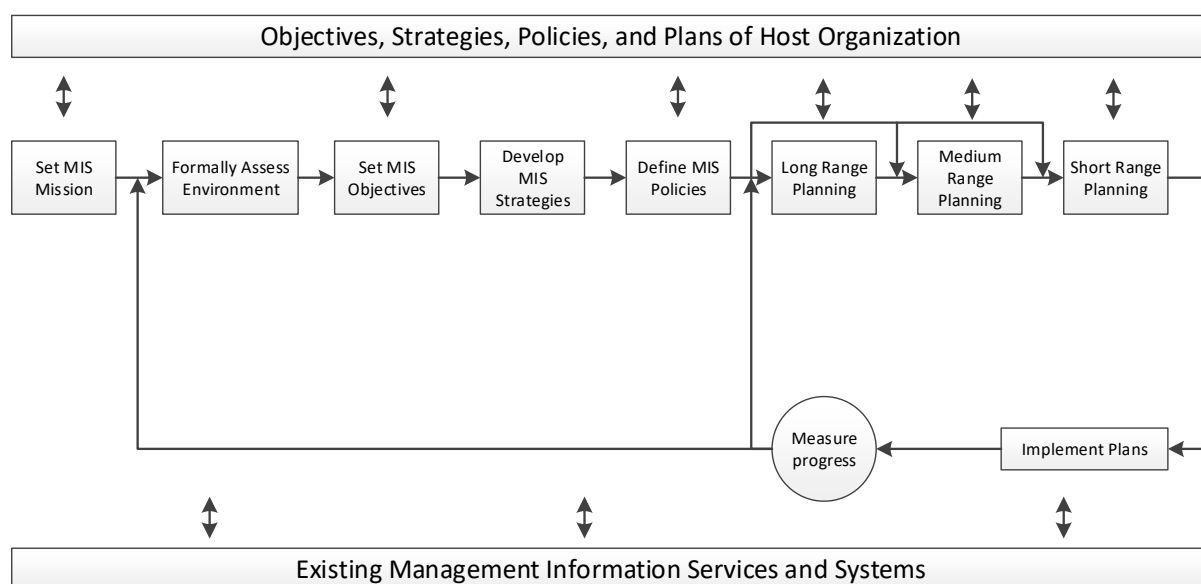


Figure 4. MIS strategic planning framework. From *Strategic Planning for MIS* (p. 453) by E. R. McLean and J. V. Soden, 1977, New York, NY: Wiley. Copyright 1977 by Wiley. Adapted with permission.

Despite the apparent consensus that IT-business alignment would become increasingly important to organizations in general, a coherent theoretical framework did not begin to emerge throughout the 1970s and 1980s (Attewell & Rule, 1984; Markus & Robey, 1988). In an effort to further evolve the theoretical underpinnings of IT-business alignment research, Orlikowski and

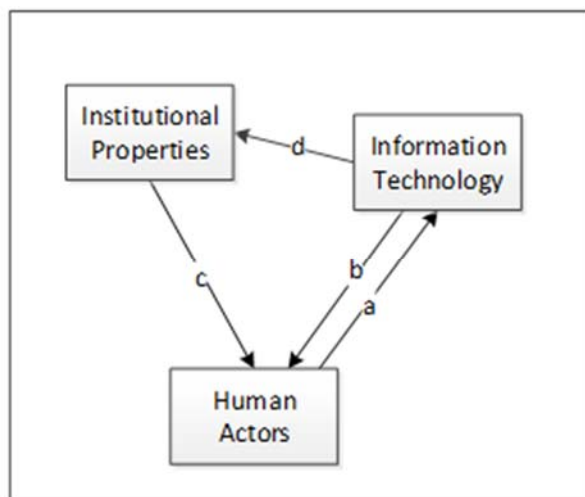


Figure 5. Structural model of information technology. From “Information Technology and the Structuring of Organizations,” by W. J. Orlikowski and D. Robey, 1991, *Information Systems Research*, 2, p. 152. Copyright 1991 by The Institute of Management Sciences. Adapted with permission.

Robey (1991) constructed a theoretical framework as an extension of Anthony Giddens’ structuration theory. In structuration theory, Giddens sought to reconcile the historical divide between Weber’s subjectivist vs. Durkheim’s objectivist reality by asserting a perspective that accommodated both simultaneously (Giddens, 1979, 1984; Giddens & Dallmayr, 1982).

Applying structuration to information technology, Orlikowski and Robey (1991) developed a theoretical model to illustrate the relationship of information technology to the organization. As shown in Figure 5, their model conceptualized four simultaneous and continuous attributes of the interaction between IT and the business: (a) IT is the product of human interaction, (b) IT is also a means by which humans complete actions, (c) IT is both built and used within social contexts (“institutional properties”) which are of significance, and (d) interaction with IT influences those same social contexts. This work contributed significantly to the body of research on the IT-business relationship by emphasizing both the social and material properties of IT and suggesting

a defensible theoretical model that could be used to guide future research. The authors conclude that structuration theory applied to the IT-business relationship “permits us to see the connection between ongoing human activities, social processes, contexts of use, and enduring social structures” (p. 165).

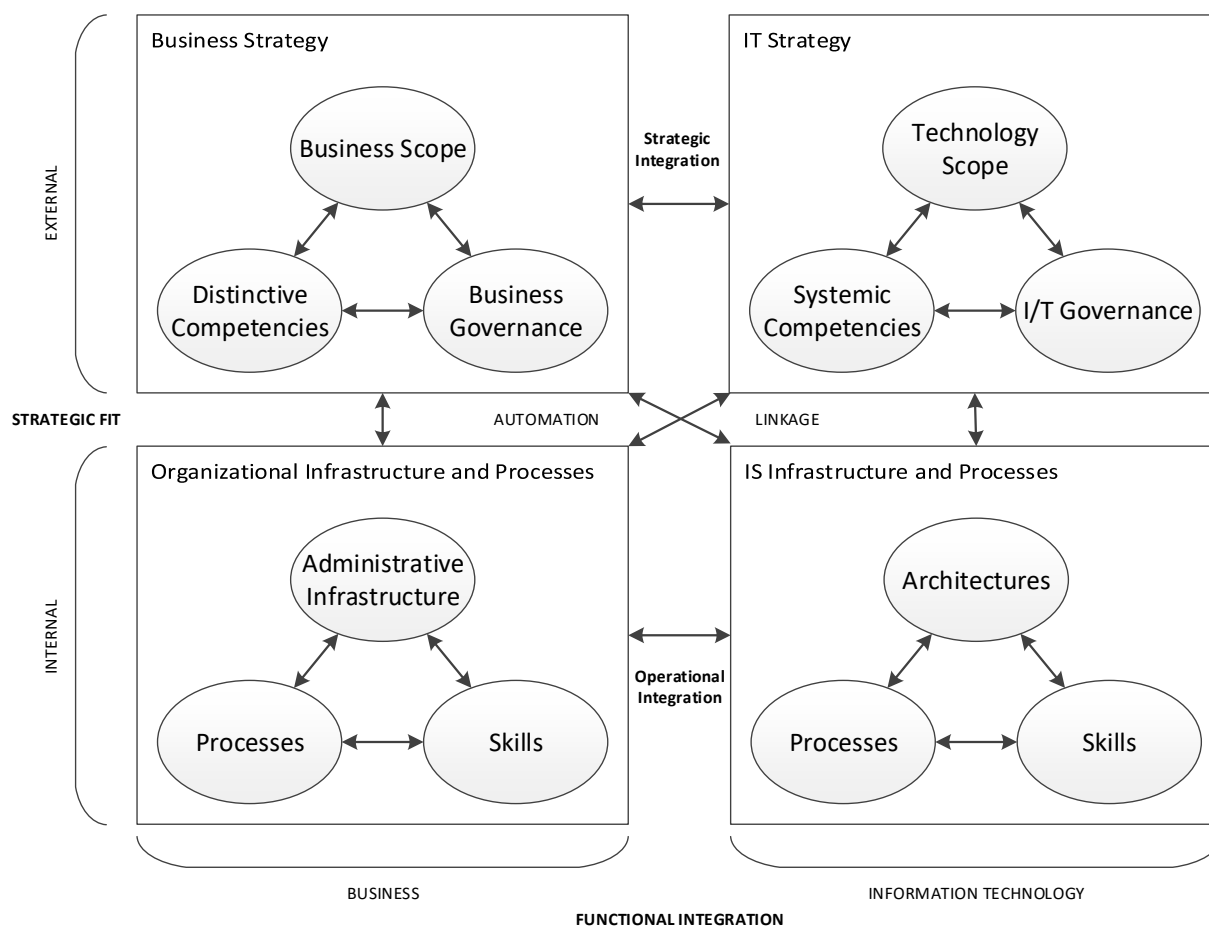


Figure 6. The Strategic Alignment Model. From “Strategic Alignment: Leveraging Information Technology for Transforming Organizations,” by J. C. Henderson and H. Venkatraman, 1993, *IBM Systems Journal*, 32, p. 476. Copyright 1999 by IBM. Adapted with permission.

Further adding to the theoretical foundation of IT-business alignment research, citing previously published studies as justification, Henderson and Venkatraman (1993) developed and published the Strategic Alignment Model as a framework for conceptualizing and directing the

strategic management of IT. As shown in Figure 6, the authors based their Strategic Alignment Model on two fundamental concepts: strategic fit—how internal information systems (IS) and organizational infrastructure and processes position the organization’s business and IT strategies in the marketplace; and functional fit—how IT strategy and IS infrastructure and processes support the external business strategy and the underlying internal organizational infrastructure and processes. The authors emphasized three key points with their model. First, they made clear their perspective that “strategic fit” is a product of aligning external and internal strategies across both business and technical domains. While this is typical of the business domain, the authors suggest that the emergence of IT as a business transformation enabler also necessitates its elevation from a historically internal focus to an external one as well. Thus, IT strategy must also be considered with respect to its impact on how well the organization itself is positioned competitively in the marketplace. According to their research, three key factors play an important role in ensuring that IT is positioned to support the business strategy in this external context: technology scope, systemic competencies (such as reliability and scalability), and IT governance. A second point emphasized by the authors is that functional integration between IT and business strategies requires both internal integration and external integration. Internally, operational integration is required to ensure that technical capabilities of the organization support daily business requirements. Externally, strategic integration is required to ensure that IT capabilities are positioned to support and influence the business strategy itself. The third point emphasized by the authors is that effective management of IT requires a continual balance between all dimensions of the Strategic Alignment Model – that is, the model is not a static recipe, but rather a framework for thinking about how to prioritize various aspects of IT and business alignment within and across an organization over time and in various circumstances.

This publication contributed to the body IT-business alignment research by providing an evidence-based framework upon which further research could be based.

Further exploring the relational nature of IT-business alignment, in a case study focused on four large Australian banks (with a number of employees ranging from 10,000 to over 40,000), Broadbent and Weill (1993) sought to better understand which organizational practices contributed most to strategic alignment between the business and IT. Data sources for this study included written and focused interview responses from 4-5 executive managers at each bank, board-level strategic plans, annual reports, and other organizational documentation such as organizational charts and IT presentations. The key research objective was to determine whether there was evidence to support a relationship between each bank's comparative business advantage and the following four areas: (a) the firm-wide strategy formation process, (b) the bank's organizational structure and accountabilities, (c) responsibilities and policies specific to information technology, and (d) the technology strategy itself. Broadbent and Weill (1993) concluded there was evidence to support a number of such propositions in each of the four areas as follows:

1. Firm-wide strategy formation process:

- longer experience of firm wide strategic planning processes,
- planning that focuses on critical and long term issues,
- more extensive participation in firm-wide planning,
- executive manager consensus on firm-wide strategic orientation,
- clarity and consistency in strategic orientation,
- more extensive executive manager experience reviewing IT strategy.

2. Organizational structure and accountabilities:

- organizational structure that complements strategy,
 - decision-making processes appropriate to strategic orientation,
 - accountabilities appropriate to strategic orientation.
3. Information systems responsibilities and policies:
- business management responsibility for information-based developments,
 - extensive interaction between business and IT staff,
 - development of IT understanding in business managers,
 - development of business skills in IT managers.
4. Technology strategy:
- appropriate technology architectures,
 - IT to suit the generation of required information products and services.

Although the case study approach applied in a particular industry limits the generalizability of these conclusions, the authors' in-depth analysis of the IT-business relationship and associated dynamics makes the results of this particular piece of research worthy of consideration in the context of the current investigation. In particular, the four propositions related to information systems responsibilities and policies produced additional evidence in support of the emerging theoretical supposition that the extent and nature of the relationship between IT and business employees is of importance when desiring to foster strategic alignment between IT and business units and thus achieve comparative business advantage.

Despite the clear importance of IT-business alignment, organizations continued to struggle with putting it effectively into practice. In an effort to bring greater insight to this challenge, a stream of investigation soon emerged looking into the antecedents of effective IT-business alignment. An emerging theme in this line of investigation was the importance of

relational factors between business and IT leaders such as shared domain knowledge and the quality of interpersonal connections (Yayla & Hu, 2009). As discussed in Chapter 1, Peppard and Ward (1999) performed an exploratory study of senior level business and IT leaders across three organizations in the UK, one in distribution, one in manufacturing, and one in the financial industry. A total of 238 surveys and 68 interviews were administered for the purpose of understanding the nature of the relationship between IT and business personnel in each organization. Interpreting the collected data, the authors created a three category typology of IT organizations: (a) the “disconnected” organization, (b) the “unloved” organization, and (c) the “high achieving” organization. Each organization was deemed to be the product of varying degrees of alignment in five key relational areas: structure and processes, leadership, service quality, roles, and values and beliefs. The authors concluded that high performing organizations don’t simply leverage IT’s ability to build, deliver, and maintain technology systems. Rather, they place an organization-wide emphasis on developing a strong relational partnership between IT and business personnel.

Similarly, in multi-year survey of senior executives from over 500 Fortune 1000 firms across 15 industries, Luftman and Brier (1999) collected perspectives on the key factors enabling and inhibiting IT-business alignment. They found four of the top six enablers to include relational factors: IT involvement in strategy development, IT understanding of the business, quality of the business/IT partnership, and senior executive support for IT. Notably, the single most impactful inhibitor of IT-business alignment was determined to be the lack of close relationships between IT and business personnel.

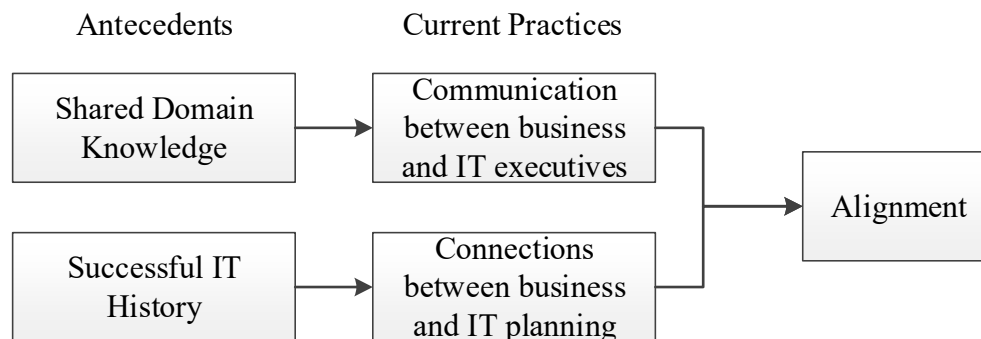


Figure 7. Antecedents and mediating practices leading to IT-business alignment. From “Factors That Influence the Social Dimension of Alignment Between Business and Information Technology Objectives,” by B. H. Reich and I. Benbasat, 2000, *MIS Quarterly*, 24, p. 85. Copyright 2000 by the Management Information Systems Research Center (MISRC) of the University of Minnesota. Adapted with permission.

In another relationally focused study, Reich and Benbasat (1996) clarified the concept of IT-business linkage by distinguishing between its intellectual and social dimensions. They defined the intellectual dimension of linkage to occur when “the content of IT and business plans are consistent and externally valid,” (p. 55) and the social dimension of linkage to occur when “the level of mutual understanding of and commitment to the business and IT mission, objectives and plan by organizational members” is high (p. 58). Then, in a qualitative study of 10 business units within three large Canadian life insurance companies, the authors completed 57 two to three hour interviews with 45 informants to investigate ways in which the social dimension of the IT-business linkage could be measured. While preliminary, their results suggested that for short term alignment (one to two years) a stronger linkage was primarily associated with a greater shared understanding of business objectives and the overall vision for IT. In a subsequent analysis of the same data, Reich and Benbasat (2000) conceptualized the alignment model illustrated in Figure 7. In this model, both shared domain knowledge and a successful history of

IT were considered to be antecedents of IT-business alignment, and both were mediated by the quality of current communication between IT and business executives and the connections between IT and business units during planning.

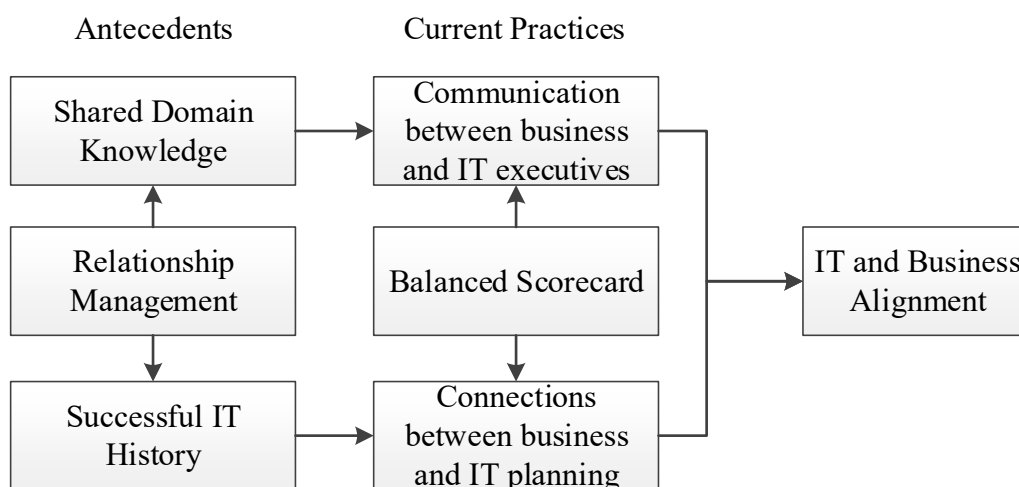


Figure 8. The modified IT-business alignment model. From “Using the Balanced Scorecard to Achieve Sustained IT-Business Alignment: A Case Study,” by Q. Hu and C. D. Huang, 2006, *Communications of the Association of Information Systems*, 17, p. 187. Copyright 2006 by the Association for Information Systems. Adapted with permission.

Hu and Huang (2006) then used the balanced score card approach to further extend Reich and Benbasat’s (2000) alignment model. Using a case study within a mid-sized biopharmaceutical company, the authors examined how strategic alignment was being implemented in practice. As shown in Figure 8, the result was a validation and subsequent augmentation of Reich and Benbasat’s (2000) alignment model to include a new theoretical construct, “relationship management,” and a new practical tool, the balanced scorecard. The authors concluded that successful relationship management impacts IT-business alignment in three important ways: (a) by improving communication between IT and business personnel, (b) by enhancing the understanding of each other’s operations, thereby increasing shared domain

knowledge, and (c) by effectively managing perceptions of IT effectiveness and thereby mitigating the impact of any previous IT failures. Similarly they suggested that the use of the balanced scorecard was instrumental in the overall success of the company in three ways: (a) by clarifying and communicating corporate strategies, (b) by prioritizing competing projects, and (c) by setting up tangible goals for every individual and department that are aligned to the overall goals of the company. In an effort to better understand why IT-business alignment remained historically difficult to master, Chan (2002) used a qualitative approach to investigate the techniques that eight high-performing organizations use to improve alignment of their IT functions. The organizations ranged in size from \$40 million in annual revenue and 50 employees to more than \$6 billion in annual revenue and 3200 employees. C-suite level executives and business partners from each company were guaranteed anonymity and interviewed for one to two hours (in some cases repeatedly). Results were transcribed and a summary of observations and conclusions were presented back to the participants for comment and incorporation of feedback. The authors presented five key findings. First, they concluded that most business units fostered strategic IT alignment in predictable ways, congruent with the existing literature. Second, they found that structural alignment (the way in which interaction between IT and business units occurred) varied widely by organization, with no one particular approach surfacing as more correct than others. Third, they concluded that strategic alignment between IT and business units was more important than structural alignment. This observation led to their fourth conclusion: that flexibility of structure is important, and to their fifth conclusion: that structural alignment is a means to the strategic alignment end, which is ultimately what matters. Sixth, and most relevant to the current investigation, the authors concluded that “informal structure” is of high importance in the journey toward IT-business

alignment. By “informal structure” the authors referred to the social composition of relationships including “positive ongoing interactions,” and “strong working relationships” (p. 106). In their final two conclusions, the authors suggested that a strong company culture may in fact be a precondition of IT-business alignment and that alignment of such informal structures necessitates further attention and investigation. “In our view, research which investigates this form of IS alignment – trust, cultural ties, social bonds, virtual linkages, and fluid processes – is most welcome” (p. 108). This relational aspect of IT-business alignment lies at the center of the current investigation, and is theoretically rooted in communities of practice.

Communities of Practice

The concept of communities of practice was first introduced by Lave and Wenger (1991) in their pioneering book on situated learning and legitimate peripheral participation. In this work, the authors developed a novel theory of learning (including learning in the workplace) that stood in stark contrast to the dominant pedagogical paradigm of the day in which learning was seen as a function of teaching and transferring canonical knowledge in a classroom and was largely abstracted from practice. Instead, Lave and Wenger (1991) expanded upon the seminal argument put forth by Brown et al. (1989) that conceptual knowledge is inherently situated in nature and that abstracting it for the purpose of teaching ultimately limits learning effectiveness. In doing so, Lave and Wenger (1991) introduced their concept of legitimate peripheral participation. Broader than the idea of learning in situ, legitimate peripheral participation was intended to draw attention to the idea that learning is inherently a social enterprise – one that requires participation through interactions and relationships in a community. “Learners inevitably participate in communities of practitioners,” they wrote, and “the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community” (p.

29). While the term communities of practice was introduced in this work, the authors did not seek to explicitly define it. Instead, they chose to describe communities of practice conceptually enough for the reader to intuit an appropriate meaning. The authors further clarified that community, as they use the term, does not imply the pre-existence of a common culture or other structural entity, nor does it necessarily imply the existence of a co-located, well-defined group with socially identifiable boundaries. Rather, community only implies “participation in an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their communities” (p. 98). The authors add, A community of practice is a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice. A community of practice is an intrinsic condition for the existence of knowledge...The social structure of this practice, its power relations, and its conditions for legitimacy define possibilities for learning. (p. 98) This perspective clearly stood in contrast to the generally accepted cognitive model of learning at the time, a distinction which Cox (2005) nicely summarized as reflected in Table 2. Building upon the ideas put forth by Lave and Wenger (1991), Brown and Duguid (1991) sought to develop an integrated theoretical perspective that explicitly applied the concept of communities of practice to organizational learning and innovation in the workplace. Drawing on the ethnographic analysis of photocopier repairmen completed by Orr (1990), the authors began by observing the nature of knowledge and practice in the workplace. In what amounts to the tangible manifestation of Lave and Wenger’s (1991) theoretical distinction between the old and new style of learning, Brown and Duguid (1991) observed several key differences between canonical knowledge and the real, practical, non-canonical knowledge observed in actual practice. Cox (2005) also nicely summarized this comparison, as shown in Table 3. The authors further

clarified this distinction with the useful analogy of learning to travel by reading a map: attempting to appreciate the complexities of a journey by studying a two-dimensional map removes the learner from the true context of the twists, turns, relationships and environment that will be experienced in reality (and the greater the complexity of the journey, the more profound this effect will be). Similarly, they argued, canonical knowledge fails to engender the non-canonical details that lead to meaningful learning and innovation in the workplace.

Table 2.

The New Model of Learning Proposed by Lave and Wenger (1991)

Old model (cognitive)	New model (communities of practice)
Teaching	Learning
Classroom	In Situ
By Teaching	By observation (therefore social) By peripheral participation
Pupil learns from teacher (individualized)	Learning from other learners, (therefore social)
Planned in a curriculum	Informal
Learning is a mechanistic, cerebral process of transmission and absorption of ideas	Learning is as much about understanding how to behave as what to do, and is an identity change

Note. From “What Are Communities of Practice? A Comparative View of Four Seminal Works,” by A. Cox, 2005, *Journal of Information Science*, 31, p. 529. Copyright 2005 by CILIP. Adapted with permission.

Brown and Duguid (1991) then identified three key components of effective (non-canonical) work practice: narration, collaboration, and social construction. First, narration was described as the practice of creating and exchanging stories about the work being done (and the problems being solved). Such stories, they suggested, serve two important purposes: (a) they help to diagnose and solve problems in the first place (learning) and (b) they act as “repositories of accumulated wisdom” (p. 45) for the future. Second, in describing collaboration the authors emphasized that such narratives are inherently shared within, between, by, and for the

community. Thus the relationships within the community are an integral part of practice in the workplace. Finally, they described the concept of social construction as the idea that shared understanding is actually the product of such collaboration. Through narrative and collaboration, they argued, social construction transpires which allows meaning to be made even from mounds of seemingly confusing and conflicting information. Moreover, through this process there is a concurrent development of self and community identity that occurs.

Table 3.

The Contrasting Nature of Canonical and Non-Canonical Knowledge Based on Brown and Duguid (1991)

Canonical	Non-Canonical
Abstract	Situated
Written, logical	Oral, narrative, loosely structured
Fixed	Improvised
Imposed, deskilling	Collaborative, enabling
Individual	Collective
Alienating	A place in which identity is made and accepted
Merely a useful resource	Right (actually works)

Note. From “What Are Communities of Practice? A Comparative View of Four Seminal Works,” by A. Cox, 2005, *Journal of Information Science*, 31, p. 530. Copyright 2005 by CILIP. Adapted with permission.

With this understanding of practice in the workplace, the authors concluded that workplace learning is best understood in terms of communities and evolving personal identities within them. This was summarized in the simple statement that “the central issue in learning is *becoming* a practitioner not *learning* about practice” (p. 48). It was from this perspective that Brown and Duguid (1991) suggested that the legitimate peripheral participation as developed by Lave and Wenger (1991) is essential for workplace learning and innovation.

Several years later, Wenger (1998) further refined the burgeoning theoretical concept of

communities of practice by suggesting that it held three key dimensions: mutual engagement, joint enterprise, and shared repertoire. Mutual engagement engendered the idea that in communities of practice all members are involved together, and thus mutuality is inherent. “Practice resides in a community of people and the relations of mutual engagement by which they do whatever they do” (p. 73) the author wrote. A community of practice is not defined by proximity, by being a part of a social category, or by the persons an individual already knows. Rather, it is a matter of mutual engagement in practice of a joint enterprise. Joint enterprise was used to suggest that there is a common objective within a community of practice. Such joint enterprise, the author suggested, results in the creation of a shared repertoire (e.g., of knowledge, skills, artifacts, stories, and tools) that reflects the history of mutual engagement. To help further conceptualize the meaning of a community of practice, Wenger (1998, pp. 125-126) suggested the following fourteen indicators that one has formed in the workplace:

- sustained mutual relationships – harmonious or conflictual,
- shared ways of engaging in doing things together,
- the rapid flow of information and propagation of innovation,
- absence of introductory preambles, as if conversations and interactions were merely the continuation of an ongoing process,
- very quick setup of a problem to be discussed,
- substantial overlap in participants’ descriptions of who belongs,
- knowing what others know, what they can do, and how they can contribute to an enterprise,
- mutually defining identities,
- the ability to assess the appropriateness of actions and products,

- specific tools, representations, and other artifacts,
- local lore, shared stories, inside jokes, knowing laughter,
- jargon and shortcuts to communication as well as the ease of producing new ones,
- certain styles recognized as displaying membership,
- a shared discourse reflecting a certain perspective on the world.

In an effort to push the concept of communities of practice further along the continuum from theory to practice, Wenger et al. (2002) provided the first explicit definition and structural model for it. They defined communities of practice as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis,” (p. 3) and suggested that the structural model for communities of practice includes three elements: the domain of knowledge, the community of people, and the shared practice. The domain creates the common context in which the community operates. The community creates the social fabric through which learning takes place. The practice itself is a “set of frameworks, ideas, tools, information, styles, languages, stories, and documents that community members share” (p. 28). The authors suggested that when these three elements of a community of practice function well together, the result is an ideal knowledge structure, rooted in social enterprise, conducive to situated learning, and ideal for practice, learning, and innovation. “A strong community fosters interactions and relationships based on mutual respect and trust...it encourages a willingness to share ideas, expose one’s ignorance, ask difficult questions, and listen carefully” (p. 28). They also suggested that these three elements can therefore serve as a guide for the intentional development of communities of practice within organizations.

Table 4.

Linking Communities of Practice, Social Capital, and Business Outcomes

Performance Area	Social Capital Dimensions		
	Structural	Relational	Cognitive
Decrease learning curve	Find experts	Mentor and coach new employees	Understand rules of the firm
Increase customer responsiveness	Find individuals with similar experiences	Develop willingness to respond to random questions	Understand the common language
Reduce rework and prevent reinvention	Find artifacts and the individuals who developed them	Establish positive reputation	Understand situational nature of knowledge
Increase innovation	Leverage weak ties that provide exposure to new ideas	Build safe environment for brainstorming and testing new ideas	Understand which problems are of common interest

Note. From “Communities of Practice and Organizational Performance,” by E. L. Lesser and J. Storck, 2001, *IBM Systems Journal*, 40, p. 839. Copyright 2001 by IBM. Adapted with permission.

To better explain the mechanism through which communities of practice can benefit organizations, Lesser and Storck (2001) turned to the related concept of social capital. Their hypothesis was that communities of practice improve organizational performance through the creation and maintenance of social capital. To investigate, they performed a qualitative analysis of seven different companies across multiple industries in which communities of practice were acknowledged to be creating value. After completing a series of interviews with members of the existing communities of practice, the researchers developed a mind map and categorization scheme through which to review the transcripts. From those results key sources of organizational value produced by the communities of practice were identified. These key sources of organizational value were then analyzed within the context of Nahapiet and Ghoshal’s (1998) social capital framework. Results are summarized in Table 4, wherein the common products of communities of practice were plotted within a matrix of social capital dimensions and associated

organizational performance benefits.

This study made several relevant contributions. First, researchers found evidence to support the idea that communities of practice increased all three dimensions of social capital. Structurally, communities of practice increased both formal and informal opportunities for communication, including both in-person and asynchronous through the use of technology enabled common databases and information repositories. Relationally, communities of practice made it easier for members to identify others with common interests and to develop a sense of empathy, trust, and mutual understanding. Cognitively, communities of practice enabled the development of shared taxonomies within the repositories being used, with information being classified and organized in ways that allowed members of the community to find and benefit from it when needed. Second, the researchers identified four performance outcomes that were positively influenced by the communities of practice in each of the organizations studied: (a) decreased learning curve for new employees, (b) faster response to customer needs and inquiries, (c) reduced re-work, and (d) increased innovation and spawning of new ideas. Third, as detailed in Table 4, the researchers illustrated the conceptual alignment between communities of practice outcomes, social capital, and organizational performance. They concluded by supporting their claim that “the vehicle through which communities are able to influence organizational performance is the development and maintenance of social capital among community members” (Lesser & Storck, 2001, p. 833). The results of this study suggest that the relationship between communities of practice and social capital is relevant and that communities of practice is a logical theoretical framework through which to carry out social capital research.

In summary, communities of practice in the workplace can be described as informal networks of human resources, bound together in mutuality and common purpose. Across

organizational structures, boundaries, and barriers, members of the community rely on one another (and thus on the collective) to share the knowledge, tools, and skills necessary to achieve shared goals. This concept provides an accurate depiction of organizational IT-based initiatives wherein members from across the organization collaborate to socially construct a shared awareness of how technology integration into business practice can best be optimized for the common purpose at hand. No one individual, nor group of individuals, would be able to achieve the same desired outcome. It requires a mutual endeavor of shared practice within a community, and it is a process through which narration, collaboration, and social construction of solutions and identities takes place. Thus, the use of communities of practice as a theoretical framework for this social capital based dissertation stems from the idea that the two are highly related. Communities of practice are vehicles through which social capital can be developed and maintained. Conversely, the dimensions of social capital are mechanisms through which communities of practice can ideally function. Their mutuality is evident. Greater social capital creates an environment for higher functioning communities of practice, which in turn creates even greater social capital. To further illuminate this relationship, the following sections will review the history and theory of social capital.

Social Capital History

Since its contemporary reemergence by the 1980s, the concept of social capital has received an increasing amount of academic interest from organizational scientists, sociologists, and economists seeking to better understand its nature and the potential benefits (and in some cases liabilities) it might afford individuals and organizations. Over the same period of time, nearly every publication on the subject has given consideration to the challenges presented by the absence of a widely accepted historical definition of, or theoretical foundation for, social capital.

As will be reviewed in this chapter, in recent years progress has been made toward developing a more widely accepted definition and better understanding of social capital's theoretical underpinnings. Prior to exploring this recent clarity, it is beneficial to develop an understanding of modern social capital's historical antecedents.

Early history. Although the term social capital does not appear in the literature until the 20th century, conceptual elements can be traced back to some of the earliest 19th century works in the field of sociology. Notable precursors of modern social capital include Emile Durkheim's work on value introjection in which group life and social cohesion are seen as an antidote to anomie, Karl Marx's work on class consciousness and bounded solidarity of the proletariat, Georg Simmel's work on group affiliation and the reciprocity transactions that permeate social life, and Max Weber's work on substantive rationality and the enforceable trust that stems from group goals governing individual economic behavior (Portes, 1998; Portes & Sensenbrenner, 1993; Woolcock, 1998).

Highly influential to the conceptual history of social capital were contributions from socialist-minded political economists of the same era (Farr, 2004). As the dawn of capitalism emerged through the post-reconstruction rise of industrial America, imbalances of wealth and opportunity quickly developed. Native Americans, people of color, immigrants, and working class citizens (to name a few) were becoming increasingly disadvantaged in comparison to those with growing money, power, and influence. Some economists and socialist authors of the era recognized both the value and the perceived threat of organized cooperation, purposeful community, and increased social capacities that might give greater power to the working class and disenfranchised minorities. In the context of such burgeoning socioeconomic and political tension, social theorist Edward Bellamy described the potential economic value of individuals

working in social concert with one another in his utopian novel *Equality*. In it, Bellamy (1897) suggested there is a 200 fold increase in the economic production that comes from the social organism when compared to individuals working in isolation. While the idea of a common, shared fund of collective wealth is different than contemporary conceptualizations of social capital, the premise that there is value in the strength of social networks is a relevant notion.

Prominent political economists of the same era also spoke in terms of capital from the social point of view, and expanded their perspective beyond monetary capital to include the aggregate of collectively owned and produced material elements as well as immaterial elements such as goodwill (Farr, 2004). The increasing perception of value in the social organism gave rise to a variety of associations designed to engender solidarity, sympathy, and trust, all for the purpose of influencing economic and living conditions for the masses — one way or the other.

Farr (2004) summarized this:

In the works of Marx, Sidgwick, Marshall, and Clark alone, one finds a teeming life of corporations, combinations, trusts, cartels, joint-stock companies, guilds, trade unions, brotherhoods of labor, friendly societies, mutual aid societies, communes, and cooperatives of endless variation. These associations served competing or complementary economic purposes: to maximize profits, monopolize markets, increase efficiency, render mutual aid, raise wages, shorten the working day, share wealth, mitigate or inflame class antagonism. (p. 23)

In the early 1900s, as the United States entered the heart of the Progressive Era, the value of social networks as a tool for economic activism and political reform was made manifest in a variety of ways including the emergence of civic clubs, reading circles, the settlement movement, and the country life movement. Exploring these roots of social capital's modern

history, Farr (2004) suggested that the most influential social thinker around the turn of the century was renowned author and educator John Dewey, whose philosophy of pragmatism was the “seedbed for the concept of social capital in this era” (p. 14). “Society means association,” wrote Dewey (1920), “coming together in joint intercourse for the better realization of any form of experience which is augmented and confirmed by being shared” (p. 197). As a result, amidst the rise of capitalism, Dewey (1908) criticized the burgeoning enterprise of business wherein corporations “have no souls,” and “men are organized solely for economic purposes” (p. 445). Dewey took a stand against political, economic, and social conditions that deprived individuals or communities the right to cooperation, association, and the strength found in relationship to one another. “The evils of the present industrial and political situation,” he wrote, “...are not due so much to actual perverseness on the part of the individual concerned...as to inability to appreciate the social environment in which we live” (Dewey, 1897, p. 72-73).

Farr (2004) referred to Dewey’s philosophy of pragmatism more specifically as “critical pragmatism,” highlighting its critical stance against the socially oppressive institutions of public life, and identified three key elements of it that relate to the origins of social capital. First, critical pragmatism is as much about offering solutions to the social condition as it is about identifying the problem. Dewey believed that any criticism against the government, business, or society must be attended by constructivist solutions, and thus he had no shortage of ideas on how to build social capital. In 1896 he established the Laboratory School at the University of Chicago (“The Dewey School”) as a socially minded alternative to traditional education. In 1906, Dewey helped to found and lead the National Association for the Advancement of Colored People (NAACP) and the American Civil Liberties Union (ACLU), aptly referred to by Farr (2004) as “radical efforts of cooperative action to solve the problems or resolve the crises that called them

into existence” (p. 16). Second, critical pragmatism is dependent upon the capacity for sympathy, which Dewey (1887) defined as “the reproduction of the experience of another, *accompanied by the recognition of the fact that it is his experience,*” (p. 285) and referred to as the general principle of moral knowledge because “all that we call society, state, and humanity are the realization of these permanent and universal relations of persons which are based upon active sympathy” (p. 294). Third, as Farr (2004) noted, Dewey actually used the precise term “social capital” in four different publications throughout his Progressive Era writings, the first appearing in *The School and Society* in 1900. In contrast to the traditional transactional nature of the “three R’s curriculum” (reading, writing, and arithmetic), Dewey invoked social capital and countered that these subjects are inherently and doubly social in nature, both rooted in the history of society’s intellectual pursuits and representative of “the keys which will unlock to the child the wealth of social capital which lies beyond the possible range of his limited individual experience” (Dewey, 1900, p. 104). In retrospect, this perspective clearly foreshadowed the concepts of situated learning and the ensuing development of communities of practice as reviewed in the previous section.

Dewey’s focus on the importance of schools in the development of social capital continued in his 1902 address, “The School as Social Centre,” before the National Education Association. There he spoke of the sudden awakening of social life in America and the emerging truth that strength in community is essential because government and legislation alone are not capable of understanding and resolving society’s challenges. Returning to the central notion of sympathy he added, “we find that most of our pressing political problems cannot be solved by special measures of legislation or executive activity, but only by the promotion of common sympathies and a common understanding” (Dewey, 1902, p.82). Dewey’s view was that the

school must play a central role as a center of civic and societal investment and that the fundamental meaning of citizenship in America must evolve to include the wide variety of relationships that constitute membership within a community.

The idea that schools should be central to the intentional development of community social capital was put into practice and documented in 1916 by L.J. Hanifan, State Supervisor of Public Schools in West Virginia (Hanifan, 1916). Hanifan defined social capital as “goodwill, fellowship, mutual sympathy, and social intercourse among a group of individuals and families who make up a social unit, the rural community, whose logical center is the school” (p. 130). His publication tells the story of a rural community of 2180 residents in West Virginia who over the course of a single year intentionally and systematically developed social capital through a series of structured activities and thereby reaped its benefits in the form of improved civic, academic, and economic conditions. His conclusion was simple: “First the people must get together. Social capital must be accumulated. Then community improvements may begin. The more the people do for themselves the larger will community social capital become, and the greater will be the dividends upon the social investment” (p. 138).

Contemporary history. Following the works of Dewey and Hanifan, the concept of social capital generally disappeared from the academic arena for several decades. Although it resurfaced briefly in several different forms through the 1950s, 1960s, and 1970s, the current stronghold of contemporary interest did not take root until the 1980s, when social capital was introduced anew by sociologists Pierre Bourdieu (1985), James Coleman (1988), and Robert Putnam (1993, 1995a, 1995b, 2000, 2001).

Without referencing any historical works, French sociologist Pierre Bourdieu (1985) introduced the construct of social capital in a book chapter arguing against the typical reduction

of human interaction to only economic capital and all its tangible forms. The creation of economic capital, he argued, inherently involves the development of both cultural and social capital. “Priceless things have their price,” (p. 47) he wrote, and focusing narrowly on economic capital and goods that can readily be converted into money creates a false sense that these other forms of capital have no economic value nor influence on perpetuating social inequalities. On the contrary, he suggested, both cultural and social capital are convertible, under certain conditions, into economic capital, and thus their influence should not be ignored. Because he viewed these concepts through the lens of social inequality, Bourdieu is credited with expanding on the views of Karl Marx (Rogers & Jarema, 2015). Bourdieu defined social capital as

The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition—or in other words, to membership in a group—which provides each of its members with the backing of the collectively-owned capital, a “credential” which entitles them to a credit, in the various senses of the word. (p. 51)

The connection between the roots of social capital and communities of practice began to emerge with this definition, as evidenced by the common emphasis on the centrality of relationships. At the same time, Bourdieu’s definition differed from Dewey and Hanifan’s earlier conceptualizations of social capital by characterizing it as a personal asset that can be developed, accumulated, and potentially converted into economic capital.

As the concept of social capital received increasing attention over the next three decades, focus shifted back toward the value of social capital as a community asset, resulting in its conceptual alignment with communities of practice becoming more apparent. Coleman (1988) reintroduced and defined social capital in a self-described effort to bridge the gap between the

social and economic intellectual streams that were often being used to describe and explain social action. Coleman suggested that social capital is defined by its function and that, in contrast to being a personal asset, it “inheres in the structure of relations between actors and among actors” (p. 98). While skills and capabilities (human capital) exist within a person, and tools (physical capital) and money (economic capital) are owned, in contrast social capital is only made available to a person by virtue of his or her membership within a community. From the perspective of communities of practice, it is through this membership that narration, collaboration, and social construction takes place. Coleman gave several examples of social capital’s potential benefits. In particular, he argued that the development of human capital depends on social capital, as it must occur through relationships and social interactions with others who possess the skills and capabilities to be developed.

Coleman specifically examined the relationship of social capital within the family unit to high school dropout rates. In a relational study using a random sample of 4000 high-school students, he analyzed a variety of family characteristics in comparison to high-school dropout rates. He observed that students who had an environment less conducive to social capital (single parent, four siblings, no college expectation) were nearly four times as likely to drop out of high school than those who had an environment more conducive to social capital (two parents, one sibling, expected to go to college). A particular weakness of his study was the absence of validation that these variables represent social capital in the first place. However, despite this, Coleman’s contribution to the early contemporary study of social capital is important and directionally aligned with subsequent developments in social capital research. In addition to broadening the view of social capital from Bourdieu’s individualistic perspective by defining it as an asset available to all through community relations, Coleman went on to identify three forms

of social capital: “obligations and expectations, which depend on trustworthiness of the social environment, information-flow capability of the social structure, and norms accompanied by sanctions” (p. 119). These three concepts represent the first early forms of modern social capital’s relational, structural, and cognitive dimensions.

While Bourdieu and Coleman were well known in academic circles, it was Harvard Professor Robert Putnam who brought the concept of social capital to the public forefront in the 1990s. His initial contribution was through a two-decade analysis of the differences in effectiveness between regional governments in northern and southern Italy. This exercise, which he called a “voyage of inquiry” asked the question, “What are the conditions for creating strong, responsive, effective representative institutions?” (Putnam, 1993, p. 6). To carry out his inquiry, Putnam collected data from multiple surveys, a series of personal interviews with government and community leaders, new research studying government responsiveness to common citizens, close examination of multiple metrics related to institutional performance, and multiple case studies. After two decades of analysis, Putnam concluded that the presence of greater social capital between the people and government in the north was the key differentiator in effectiveness, and tracing its roots, he determined that the social capital in northern Italy was a civic legacy of the self-regulating city-states in the medieval period. In this work, Putnam first defined social capital as “features of social organization, such as trust, norms and networks, that can improve the efficiency of society by facilitating coordinated actions” (Putnam, 1993, p. 167). “Social capital as embodied in horizontal networks of civic engagement,” he concluded, “bolsters the performance of the polity and economy, rather than the reverse: Strong society, strong economy; strong society, strong state” (p. 176). Putnam’s argument served as a contrast to other contemporary economic perspectives, including that of Olson (1982) who argued that a

strong society among the likes of labor unions and blue collar workers creates protectionist policies which ultimately hurt economic growth (strong society, weak economy) and Migdal (1988) who argued that the strength of social organizations must come at the expense of a strong and capable government (strong society, weak state).

Putnam then turned his attention to the United States. In “Bowling Alone,” the pithy title of his next study (Putnam, 1995a) and subsequent best-selling book (Putnam, 2000), Putnam examined and lamented the decline of civic engagement and social capital in America. Citing myriad statistics — including participation in social clubs, church activities, parent teacher associations, bowling leagues, and even community picnics — Putnam demonstrated a nearly universal trend: that social capital across America had been on a rapid decline since the 1960s to the point where at the time of publication the level of civic engagement was below even that of the depression era (Putnam, 1995a). Throughout the late 1990s and early 2000s, Putnam became the public face of the social capital condition in America. He went on to make a strong case for social capital’s relevance to individuals and society, publishing articles that showed correlations between levels of social capital and a multitude of factors that impact society as a whole such as health, educational performance, murder rates, and criminal convictions (Putnam, 2001). Putnam’s work drew wide public recognition, including from then President Clinton who summoned Putnam to Camp David to discuss the subject and President-elect Bush whose advisors consulted with Putnam as they penned the 2001 Inaugural Address. From the outset, citing the importance of better understanding such an influential construct, Putnam called attention to the need for more empirical research aimed at developing a deeper theoretical understanding of social capital.

Social Capital Theory

With increasing awareness about social capital and the resultant resurgence of it as a subject of academic and public interest, a multitude of studies were published on the topic in the 1990s. Still without a strong theoretical foundation, the result was a variety of different definitions being put into print. Table 5, adapted from Adler and Kwon (2002), provides a summary of these definitions. Robison, Schmid, and Siles (2002) suggested that a contributing factor to the imprecision of a definition for social capital was the lack of agreement on whether social capital should be described by what it is (substance), where it resides (sources), or how it can be used (effects). Adler and Kwon (2002) also noted that these definitions differ depending on whether the focus of social capital is on the relationships between individual actors (bonding), the overall structure between actors within a collective (bridging), or both. In the context of this study, bonding social capital would focus on the individual relationships between IT and non-IT employees, while bridging social capital would focus on the overall structure and nature of relationships within the collective group of IT and non-IT employees.

During this same period of time, two relevant and important ideas surfaced to further shape the definition of social capital and clarify its underlying theoretical foundation. The first idea, harkening back to the works of early 20th century political economists, was that social capital is important to economics and that traditional economic theories had generally failed to acknowledge or account for the critical role that social structure and function played in their models and outcomes (Granovetter, 1985; Portes & Sensenbrenner, 1993). The second idea, which is clearly aligned with the concept of communities of practice, was that social capital is important to business organizations, and that corporate firms are inherently social organizations whose function depends on embedded social networks and the transfer of knowledge within and

Table 5.

Definitions of Social Capital

Author(s)	Definition	Type
Bourdieu (1985, p. 51)	"the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition — or in other words, to membership in a group — which provides each of its members with the backing of the collectivity-owned capital, a 'credential' which entitles them to credit, in the various senses of the word"	Bridging
Baker (1990, p. 619)	"a resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationship among actors"	Bridging
Boxman, De Graaf, and Flap (1991, p. 52)	"the number of people who can be expected to provide support and the resources those people have at their disposal"	Bridging
Bourdieu and Wacquant (1992, p. 119)	"the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition"	Bridging
Burt (1992, p. 9)	"friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital"	Bridging
Belliveau, O'Reilly III, and Wade (1996, p. 1572)	"an individual's personal network and elite institutional affiliations"	Bridging
Burt (1997, p. 355)	"the brokerage opportunities in a network"	Bridging
Portes (1998, p. 6)	"the ability of actors to secure benefits by virtue of membership in social networks or other social structures"	Bridging
Knoke (1999, p. 18)	"the process by which social actors create and mobilize their network connections within and between organizations to gain access to other social actors' resources"	Bridging
Coleman (1988, p. 98)	"social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics' in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that in its absence would not be possible"	Bonding
Portes and Sensenbrenner (1993, p. 1323)	"those expectations for action within a collectivity that affect the economic goals and goal seeking behavior of its members, even if these expectations are not oriented toward the economic sphere"	Bonding
Putnam (1995a, p. 67)	"features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit"	Bonding

(continued)

Author(s)	Definition	Type
Fukuyama (1995, p. 10)	"the ability of people to work together for common purposes in groups and organizations"	Bonding
Thomas (1996, p. 11)	"those voluntary means and processes developed within civil society which promote development for the collective whole"	Bonding
Brehm and Rahn (1997, p. 999)	"the web of cooperative relationships between citizens that facilitate resolution of collective action problems"	Bonding
Inglehart (1997, p. 188)	"a culture of trust and tolerance, in which extensive networks of voluntary associations emerge"	Bonding
Schiff (1992, p. 160)	"the set of elements of the social structure that affects relations among people and are inputs or arguments of the production and/or utility function"	Both
Loury (1992, p. 100)	"naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits valued in the marketplace... an asset which may be as significant as financial bequests in accounting for the maintenance of inequality in our society"	Both
Pennar (1997, p. 154)	"the web of social relationships that influences individual behavior and thereby affects economic growth"	Both
Nahapiet and Ghoshal (1998, p. 243)	"the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network"	Both
Woolcock (1998, p. 153)	"the information, trust, and norms of reciprocity inherent in one's social networks"	Both

Note. From "Social Capital: Prospects for a New Concept," by P. S. Adler and S. W. Kwon, 2002, *Academy of Management Review*, 27, p. 20. Copyright 2002 by Academy of Management Review. Adapted with permission.

between them (Kogut & Zander, 1992, 1993, 1995, 1996; Zander & Kogut, 1995). With some overlap, the evolution of social capital theory continued on these two tracks. Within the broader context of economics, this called for consideration of social capital's nature and impact at community, national, and international levels. Conversely, at the level of the firm, social capital theory evolved as an element of closer knit relationships within and between actors working together in a common environment, for a common purpose. Of these two perspectives, the evolution of social capital as a concept within the firm is most closely aligned with communities

of practice and the central focus of this dissertation.

Economic sociology. Granovetter (1985) thought of economic sociology as “the extent to which economic action is embedded in structures of social relations in modern industrial society,” (p. 481) and he refuted the predominate and longstanding mindset of economists which considered the study of economics to be necessarily independent of social relations since they play, at most, a secondary and disruptive role to market forces. In echoes of Max Weber’s position that economics is fundamentally a category of social action (Weber, 1922, 1947), Granovetter assailed economic theorists for their atomized and reductionistic view of market forces and chastised social theorists for a demonstrable lack of assertiveness in applying their theories to the study of economic life. The “argument of embeddedness,” as Granovetter coined it, suggests that “the behavior and institutions to be analyzed are so constrained by ongoing social relations that to construe them as independent is a grievous misunderstanding” (p. 481-482).

Portes and Sensenbrenner (1993) expanded on Granovetter’s notion of embeddedness by using the more nuanced concept of social capital to examine the economic behavior (both action and inaction) among American immigrants in the 20th century. This resulted in two important contributions to social capital theory. First, in an effort to achieve greater clarity and specificity, the authors analyzed and summarized four sources of social capital and their historical antecedents, thus linking modern social capital to the thinking of early social theorists. Table 6 summarizes this work. In categorizing these four sources of social capital, Portes and Sensenbrenner (1993) also drew a distinction based on the source of individual motivation to exhibit behavior that is beneficial for the collective, categorizing each as either principled or instrumental. In the principled context (which includes value introjection and bounded

Table 6.

Social Capital Sources and Historical Antecedents

Sources	Operating Principle	Individual Motivation for Compliance	Classical Referents
Value Introjection	Socialization into consensually established beliefs	Principled	Durkheim's (1884) 1893 analysis of the social underpinnings of legal contracts
Reciprocity exchanges	Norm of reciprocity in face-to-face interaction	Instrumental	Simmel's (1908) 1908 analysis of exchanges in dyads and triads
Bounded solidarity	Situational reactive sentiments	Principled	Marx's (1848) 1848 and Marx and Engels's (1847) 1846 analysis of the emergence of working-class consciousness
Enforceable trust	Particularistic rewards and sanctions linked to group membership	Instrumental	Weber's 1922 analysis of substantive rationality in economic transactions

Note. From "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action," by A. Portes and J. Sensenbrenner, 1993, *American Journal of Sociology*, 98, p. 1326.

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solidarity), individual motivation for collective-oriented behavior stems from a belief that it is the right thing to do for the whole. Although the stimulus for action may differ (value introjection is prompted by shared values that have been developed among the group while bounded solidarity stems from individual responses to the situational circumstances of the collective), the primary driver of individual behavior is the betterment of the whole. The result of such principled individual action includes benefits appropriable to the collective. In contrast, individual motivation in the instrumental context (which includes reciprocity transactions and enforceable trust) stems from a belief that there will be an individual benefit in return. With reciprocity transactions, individuals comply with behavior that is good for others because they expect others will do the same for them in return. With enforceable trust, individuals comply

with behavior that is good for the whole because they believe such an investment will ultimately produce an individualized return.

A second contribution from Portes and Sensenbrenner (1993), was the introduction of the potential economic downside of the social capital equation – having observed that in addition to its benefits, solidarity can also create conditions for excessive free-riding and the development of leveling pressures in which individual economic success is discouraged and that enforceable trust can also restrict freedom of individual economic expression. The idea that social capital has a downside, and that too often this downside is ignored by academic and economic theorists, was echoed by Woolcock (1998) as he aimed to develop a theoretical synthesis of social capital and economic development. In this and subsequent works, Woolcock (1998, 2001) defended the importance of social capital as a relevant and impactful element in economics while at the same time calling for greater clarity of its definition and theoretical bases. For his part, Woolcock (2001) concluded that to avoid confusion, social capital should be thought of in terms of its sources rather than its consequences. Notably, Woolcock also argued that trust is actually a consequence of social capital and thus it can and should be eliminated from the definition of the concept. Definitionally, Woolcock added that despite the lack of formal agreement, there was at least an emerging consensus in the literature that social capital “refers to the norms and networks that facilitate collective action” (p. 13). Even without a sound theoretical framework, the increasing awareness that social capital is a relevant and important concept in economic sociology gave further legitimacy to the idea that it may serve as a potential source of value for organizations as well. In the next sub-section, the evolution of social capital theory in the context of organizations is reviewed.

Social capital and the firm. At the level of the firm, the theoretical development of

social capital begins to align even more clearly with the communities of practice framework. In an effort to better explicate an underlying theory for the manner in which firms gain, manage, and transfer knowledge, Kogut and Zander (1992) suggested that organizations “exist because they provide a social community of voluntaristic action structured by organizing principles that are not reduceable [sic] to individuals” (p. 384). This aligns with the notion that communities of practice are inherently a mutual endeavor of shared practice through which collaboration and learning take place. Kogut and Zander (1992) went on to explore the paradox that codifying knowledge in order to support replication and growth within a firm simultaneously lowers the barriers to imitation from competitors. Rather than reducing the firm’s work effort into codified processes, they hypothesized that competitive advantage is more likely to be a function of the organization’s ability to leverage and build on existing social relationships. This aligns with Lave and Wenger’s (1991) new model of learning and Brown and Duguid’s (1991) emphasis on non-canonical knowledge, both of which are integral to the communities of practice theoretical framework.

Among other variables, Kogut and Zander (1993) empirically studied the effect that codifiability and teachability have on whether knowledge is best transferred within the organization (to a wholly owned subsidiary) or outside of it (to a third party through a license or some other means). Codifiability was defined as “the extent to which the knowledge has been articulated in documents” (p. 632). Teachability was defined as “the ease by which know-how can be taught to new workers” (p. 633). Using a questionnaire administered via a telephone interview with 20 different firms, the authors gathered responses on 35 innovations. Results showed a statistically significant negative correlation between both codifiability and the probability of internal transfer of knowledge ($r = -0.32, p < 0.05$) and teachability and the

probability of internal transfer of knowledge ($r = -0.21, p < 0.05$). Stated another way, the more codified and teachable knowledge was, the more likely it would be transferred outside of the organization. The authors concluded that this analysis lends support to the idea that firms are social communities that specialize in the transfer of tacit knowledge that is more difficult to understand and codify. Having established that firms are “organizations that represent social knowledge of coordination and learning,” Kogut and Zander (1996, p. 502) logically analyzed the difference between intra-firm and inter-firm capabilities. They concluded that coordination, identity, and learning within the boundaries of the firm are unique because “the rules of coordination and the process of learning are situated not only physically in locality, but also mentally in an identity,” and that “people are bounded by what they know and what they value, and they are sensitive to norms of what is appropriate behavior” (p. 515). These findings are congruent with the communities of practice theoretical framework which emphasizes performance and learning through ongoing relationships situated in a particular domain.

While these studies afforded substantial insights into the nature of organizations as social systems, a coherent theoretical foundation from which to explain or guide further social capital research was still missing. Leana and Van Buren III (1999) and Nahapiet and Ghoshal (1998) each responded to this need by attempting to synthesize a wide body of relevant literature and develop a theory-based social capital framework for use in organizations. The primary focus of Leana and Van Buren III (1999) was to frame social capital so that organizations could discern how best to behave in light of its implications. In addition to this organizational focus, Nahapiet and Ghoshal (1998) focused intently on the development of a sound theoretical framework for social capital so that it could be more defensibly and objectively studied in future organizational research.

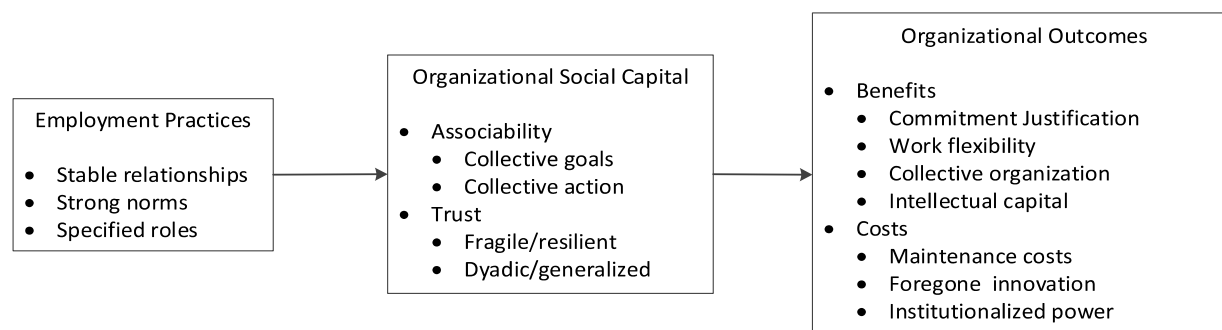


Figure 9. A model of organizational social capital. From “Organizational Social Capital and Employment Practices,” by C. R. Leana and H. J. Van Buren, 1999, *Academy of Management Review*, 24, p. 547. Copyright 1999 by Academy of Management Review. Adapted with permission.

Figure 9 shows the model of organizational social capital as developed by Leana and Van Buren III (1999). They defined organizational social capital as “a resource reflecting the character of social relations within the firm,” (p. 538) and noted that it is an asset for both the individual and the organization as a whole. The two major components of social capital in their model are associability and trust. Associability was defined as “the willingness and ability of participants in an organization to subordinate individual goals and associated actions to collective goals and actions” (p. 541). The authors specifically characterized associability as being collectivist in nature, meaning it consists of more than just effective relationships between individuals. Trust was described generally as a willingness to be vulnerable. The authors noted that trust can be experienced between individuals (dyadic) or as a generalized tendency within the community. In addition, they drew a distinction between fragile trust and resilient trust. Fragile trust is based on case-by-case transactional predictability and can easily be lost if a particular transaction violates expectations. Resilient trust stems from more deeply rooted ties within a community that shares norms, values, and thus a culture of reciprocity. Such resilient

trust can survive the occasional transactional violation. Leana and Van Buren III (1999) concluded that organizations that are strong in social capital demonstrate generalized, resilient trust even among individuals who are only loosely associated.

Notably, Leana and Van Buren III's (1999) framework suggested that organizational social capital produces outcomes that can be categorized as either a benefit or a cost. Benefits of social capital include its use as justification for individual commitment to collective goals and actions, the creation of a more flexible work environment, the ability to use social capital as a substitute for leadership in an effort to manage collective actions, and the facilitation of greater intellectual capital within the organization. Costs of social capital were described as maintenance, foregone innovation, and institutionalized power. Maintenance costs include the cost of socializing new employees to established norms as well as the potential cost associated with investing in employees as a long-term resources rather than seeing them as a short-term cost that needs to be minimized. Regarding the cost of forgone innovation, the authors pointed out that established norms and relationships can be resistant to new ideas. Finally, they also noted that the diffusion of leadership through the organization can create too much of an internal focus. As a result, the organization may become less adaptable to the external environment. Leana and Van Buren III (1999) ultimately suggested three employment practices that can serve to engender social capital within the organization: stable relationships, strong norms, and specified roles. They concluded that organizations wishing to reap the benefits of social capital should focus on these three employment practices.

In contrast to the organizational focus of Leana and Van Buren III (1999), Nahapiet and Ghoshal (1998) focused on creating a theoretical framework for social capital that could serve as a basis for future research. Through an analysis and synthesis of the available literature, they

formulated a social capital-based theoretical framework which has since been cited more than 4600 times, and which is used as the basis for this dissertation. The primary focus of their framework was on describing the dimensions of social capital and the manner in which they facilitate the creation and exchange of knowledge. Nahapiet and Ghoshal (1998) first defined social capital as “the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit,” (p. 243) and then further distilled the facets of social capital into the three dimensions: structural, cognitive, and relational. Their theoretical model, as reproduced in Figure 10, maintains that social capital facilitates the combination and exchange of intellectual capital, which in turn creates new intellectual capital. In this model, the combination and exchange of intellectual capital has four necessary conditions: access, anticipation of value, motivation, and capability. With these four conditions met, new intellectual capital is thought to be able to be created. Also based on existing literature, Nahapiet and Ghoshal’s (1998) theoretical framework suggests that each of the dimensions of social capital has sub-elements which positively affect these four conditions. While acknowledging that these individual facets are likely interrelated in important and complex ways, for sake of clarity the authors presented and considered each of their more direct effects. Lines A1 through C9 in Figure 10 illustrate these relationships. Within the structural dimension, network ties (i.e., social relations and “who you know”) positively influence the formation of intellectual capital by positively influencing access to others for the exchange of intellectual capital and positively influencing the anticipation of value through that exchange (lines A1 and A2). Network configuration (i.e., the density, connectivity, and hierarchy of relationships) and appropriability of relational assets within and across the organization also positively influence network access (lines A3 and A4). Within the cognitive dimension, shared

codes and language increase network access, anticipated value of exchange, and combination capability, while shared narratives (e.g., myths, stories, and metaphors within the organization) positively influence combination capability (lines B1-B4). Finally, within the relational dimension, trust positively influences network access, anticipated value of exchange, and motivation; norms positively influence access and motivation; obligations positively influence network access and motivation; and identification (i.e., the extent to which “individuals see themselves as one with another person or group of people” (Nahapiet & Ghoshal, 1998, p. 256)) positively influences both motivation and combination capability (lines C1-C9).

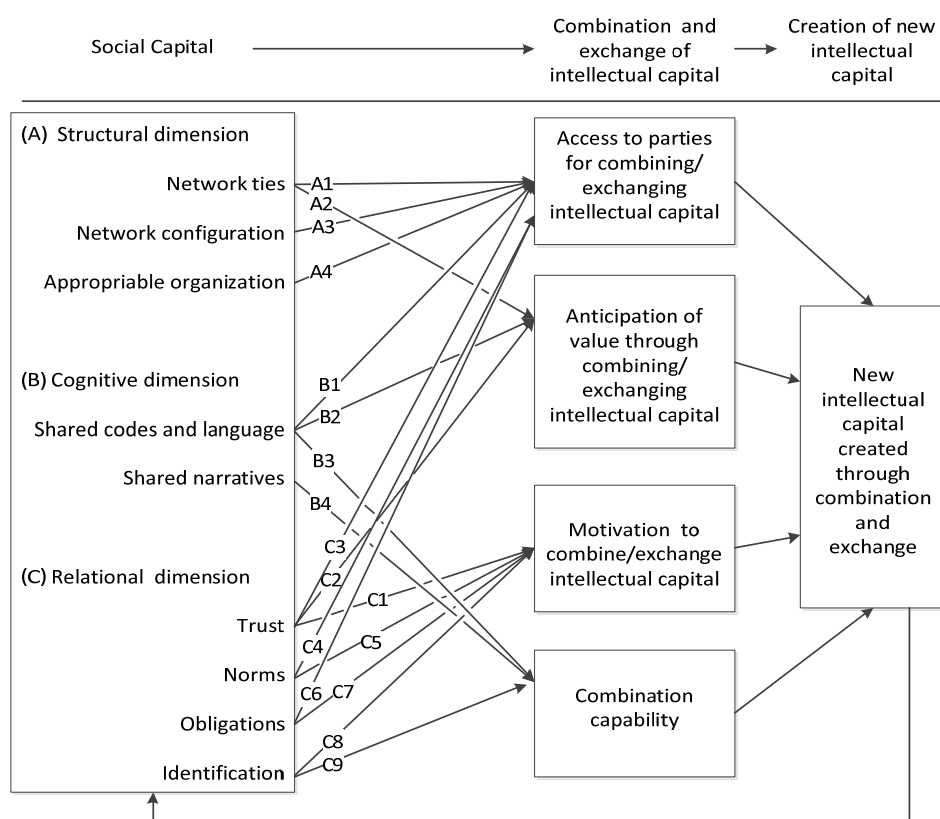


Figure 10. Social capital in the creation of intellectual capital. From “Social Capital, Intellectual Capital, and the Organizational Advantage,” by J. Nahapiet and S. Ghoshal, *Academy of Management Review*, 23, p. 251. Copyright 1998 by Academy of Management Review. Adapted with permission.

In developing this social capital framework Nahapiet and Ghoshal (1998) responded to the growing need for a more developed theoretical foundation from which to further study social capital within organizations. Their contribution provides at least one clear option for theoretical clarity within social capital research. With respect to social and intellectual capital, their concluding remarks echo their intent:

By defining the concepts and developing clear propositions about their interrelationships we have established an agenda for future research that both complements and extends existing knowledge-based theories of the firm. Moreover, we suggest that the model outlined here also provides the foundation of a viable framework to guide the investments — individual or collective — of practitioners seeking to build or extend their network of connections and, therefore, their stocks of social capital. (p. 262)

Despite the major theoretical developments put forth by Nahapiet and Ghoshal (1998), variation in the conceptualization and study of social capital has continued. While most research has generally held some form of alignment with the structural, relational, and cognitive dimensions of social capital, the manner in which these constructs are operationalized and measured has continued to vary. Despite this variation, a review of social capital's benefits at the organizational level demonstrates several consistent trends. The next sub-section provides an overview of studies that have used Nahapiet and Ghoshal's (1998) theoretical framework (or a variation of it) to further study the benefits of social capital in an organizational context.

Organizational Benefits of Social Capital

The concept of social capital (and the promise of its potential benefits) has long been enticing to both economic and organizational theorists and practitioners. However, the absence of a sound theoretical foundation has made it difficult to empirically evaluate or validate social

capital's perceived value. While not perfect nor universally adopted, the theoretical advancements made by Nahapiet and Ghoshal (1998) have provided a more coherent framework from which to study social capital in organizations. A review of related studies reveals three trends that are specifically relevant this dissertation: (a) social capital is positively related to job satisfaction, (b) social capital is positively related to organizational performance, and (c) social capital is positively related to IT-business alignment.

Job satisfaction. Organizational social capital has been shown to increase job satisfaction. Requena (2003) evaluated data from a Spanish survey of quality of life at work to study the extent to which social capital in the workplace influences job satisfaction. A random representative national sample of 6020 respondents was used, which was then limited to the 4800 respondents who were employed by public or private organizations at the time of the survey. The survey was conducted in person at each respondent's home to minimize pressures from the corporate setting. In this case, social capital was operationalized in terms of five dimensions, related but not fully aligned with Nahapiet and Ghoshal (1998): trust, social relations, commitment, communication, and influence. Requena (2003) used the following prompts to assess each of the five dimensions:

1. Trust:

- I have [much, some, little, almost no, no] trust in management.
- In my company/organization people who work together trust each other because that is the best and easiest way to get the work done.

2. Social Relations:

- Could you please tell me if you have strong friendships with [all, most, some, almost none, none] of your co-workers? (i.e., asking for a favor; going out to dinner or coffee

with them and/or their mate.)

- In general how would you describe the relationships between peers in your workplace—very good, fairly good, neither good nor bad, fairly poor, or very poor?

3. Commitment:

- I am willing to work more than required in order to help my company or organization succeed.
- I am proud to be working for my company or organization.
- I consider my company's/organization's experiences as my own.

4. Communication:

- I can share my opinion concerning matters related to my job.

5. Influence:

- At work I can put my ideas into practice.

The dependent variables in this study were job satisfaction, measured subjectively by survey response on a scale of 1 to 10, and the Index of Quality of Life at Work (Encuesta de Calidad de Vida en el Trabajo) (Requena, 2000) which is a more complex instrument developed in 1999 by the Spanish Ministry of Labor and Social Affairs for the purpose of performing an annual survey of a random and representative national sample in order to gather “substantive information concerning employed people’s social relations, situations, attitudes, and values at the work place” (Requena, 2002, p. 2). All five of the social capital dimensions were shown to correlate positively with overall job satisfaction: trust ($r = 0.413, p < 0.01$), relationships ($r = 0.289, p < 0.01$) commitment ($r = 0.453, p < 0.01$), communication ($r = 0.275, p < 0.01$), influence ($r = 0.345, p < 0.01$). Using a model that included the analysis of a variety of additional independent variables such as personal (age, gender, education, income, size of city), corporate

(size of company, industry, construction, services, private sector, shift schedule), workplace (weekly hours, level in hierarchy, supervisor, years working at the company, dangerous work conditions), and family setting (head of household, married, separated/divorced, widower, dependent children), social capital was shown to be the predictor that explained the largest portion of variance in job satisfaction, increasing the r -squared of the model by 4.18 times to .322, with an F value of 59.20 for the model, which was significant at the $p < 0.001$ level. In a similar analysis, social capital was also shown to be the predictor that explained the largest portion of variance in quality of life at work, increasing the r -squared of the model by 2.01 times to .358, with an F value of 318.44 for the model, significant at the $p < 0.001$ level. The authors then used the Analysis of Moment Structures (AMOS) program to further evaluate the causal model between social capital and job satisfaction. While each influenced the other positively, their analysis revealed that the impact of social capital on job satisfaction was 0.48, which was 24 times greater than the impact of job satisfaction on social capital (.02). The stability index of the model was calculated to be 0.011 and the model was reported to be statistically significant at the $p = 0.000$ level. The authors concluded that their model demonstrated a stable and positive causal relationship between social capital and job satisfaction.

Strömgren, Eriksson, Bergman, and Dellve (2015) performed a prospective cohort study of the relationship between social capital and job satisfaction, work engagement, and engagement in clinical improvements among physicians, nurses, and assistant nurses working at small (approximately 100 beds) to medium-sized (approximately 500 beds) hospitals in Sweden. Their analysis was based on a random sample of 477 respondents. Again closely related but not precisely equivalent with Nahapiet and Ghoshal's (1998) approach, social capital in this study was operationalized as reciprocity, trust regarding management, mutual trust between

employees, and recognition. The social capital dimensions and associated questions as used by Strömberg et al. (2015) were as follows:

1. Reciprocity:

- At my workplace we care for each other.
- At my workplace we treat each other with respect.
- At my workplace I feel safe and accepted.

2. Trust regarding management:

- Can you trust the information that comes from the management?
- Does the management withhold important information from the employees?

3. Mutual trust between employees:

- Do the employees withhold information from the management?
- Do the employees in general trust each other?

4. Recognition:

- Is your work recognized and appreciated by the management?
- Does the management at your workplace respect you?
- Are you treated fairly in your workplace?

Using a five-grade scale for each, social capital was calculated as the sum of scores for these four elements. The dependent variables were measured using three different assessment tools. Job satisfaction was measured by a six-item index from the Copenhagen Psychosocial Questionnaire (Pejtersen, Kristensen, Borg, & Bjorner, 2010). Work engagement was measured using the Swedish Scale for Work Engagement and Burnout (Hultell & Gustavsson, 2010). Engagement in clinical improvements was measured using two researcher-developed indexes which were also tested for internal consistency. The first focused on engagement in patient safety

and consisted of four items: (a) we work actively to improve patient safety, (b) we discuss how to avoid errors, (c) we work actively to improve reporting of errors, and (d) we report directly and without hesitation when we see something that can harm patients' safety. The second focused on engagement in quality of care and consisted of three items: (a) we have an active dialogue about how to provide good care for patients at our ward/ clinic, (b) we have good opportunities to meet patients' needs, and (c) the values of providing good care at my clinic agree with my own.

Bivariate analysis revealed positive correlations between each measured aspect of social capital and job satisfaction. Recognition showed the strongest correlation ($r^2 = 0.31, p < 0.05$), followed by reciprocity ($r^2 = 0.17, p < 0.05$) and trust regarding management ($r^2 = 0.17, p < 0.05$). In the relationship between social capital and engagement in clinical improvements, bivariate analysis revealed patient safety activities were most strongly associated with trust regarding management ($r^2 = 0.11, p < 0.05$) and recognition ($r^2 = 0.10, p < 0.05$) while quality of care activities were most strongly associated with reciprocity ($r^2 = 0.12, p < 0.05$) and work engagement ($r^2 = 0.09, p < 0.05$). Multivariate analysis showed that social capital explained 36% of the variance in job satisfaction, 12% of the variance in work engagement, 18% of the variance in engagement in clinical improvements for patient safety, and 19% of the variance for engagement in clinical improvements for quality of care. Results were further analyzed using logistic regression models which showed increased social capital to be a predictor of increased job satisfaction, work engagement, and engagement in clinical improvements for patient safety. However, increased social capital did not predict increased engagement in clinical improvements for quality of care. These results held true even when controlled for professional role, years in profession, and gender.

This study contributed to the social capital literature by further validating the importance of social capital for job satisfaction and establishing a relationship between social capital and clinical job performance in health care. While the study was performed in Swedish hospitals, the authors note that Copenhagen Psychosocial Questionnaire has been translated and used in several languages, thus improving generalizability. As with other studies of social capital, the authors of this study operationalized their own unique definition of social capital, citing similar works but ultimately creating a new and different approach to the definition and assessment of social capital's dimensions.

Organizational performance. In a meta-analysis of fifteen years' worth of empirical research on social capital, Westlund and Adam (2010) concluded that at the firm level there is unambiguous evidence of a positive relationship between social capital and economic performance. However, consistent with research trends, social capital was conceptualized and measured differently in each of these studies. For example, Kilkenny, Nalbarte, and Besser (1999) completed 35-minute telephone surveys with 800 randomly selected businesses from 30 different towns across the state of Iowa to evaluate the extent to which social capital between the business and community had a correlation with the business's own opinion on their success. Social capital in this study was operationalized as reciprocated support between the business and the community. Using the SCORE procedure, the researchers found reciprocated community support to be the most significant determinant of business success among dozens of other possibilities (quantified statistics were not reported on this finding). Logistic regression also revealed that reciprocated community support had a positive correlation with business success (parameter value=0.1968, $p < 0.05$).

Wu and Leung (2005) used a survey of 177 small to medium sized firms in China to

evaluate the extent to which social capital influences firm performance. Their study operationalized social capital as the level of trust and network ties within the firm. Using this concept, they evaluated the extent to which managerial value of reciprocity influenced the creation of social capital and, in turn, the extent to which social capital impacted overall firm performance and competitiveness improvement. Their results showed significant correlations between managerial value of reciprocity and the development of social capital in the form of trust (parameter estimate=0.221, $p < 0.10$) and network ties (parameter estimate=0.432, $p < 0.01$). The trust element of social capital was also shown to have a significant positive relationship to both overall firm performance (parameter estimate=0.369, $p < 0.01$) and competitiveness improvement of the firm (parameter estimate=0.183, $p < 0.05$). The network ties element of social capital did not have a significant influence on either firm performance or competitiveness improvement. However, the authors failed to evaluate the relationship of network ties to trust, and thus may not have captured a potential indirect path of influence. This path would be consistent with the finding of Turner (2011) presented in Chapter 1, wherein the structural dimension of social capital did not have a direct influence on the development of intellectual capital but rather had an indirect influence by positively impacting the development of social capital's cognitive and relational dimensions.

More relevant to this dissertation, there have been several studies that directly applied Nahapiet and Ghoshal's (1998) theoretical framework to evaluate the relationship of social capital to organizational performance measures in a variety of contexts. For example, in an analysis of the relationships among the cognitive, relational, and structural dimensions of social capital and between those dimensions and organizational performance in the form of innovation, Tsai and Ghoshal (1998) surveyed a large multi-national electronics corporation (more than

30,000 employees with annual sales over \$4 billion) that consisted of 15 business units with operations across North America, Europe, and Asia. Three members of the management team from each of the business units were selected in partnership with corporate leadership, resulting in a 100% response rate ($N = 45$). To reduce social desirability bias results were anonymized and reported in aggregate. Their results are summarized in Figure 11.

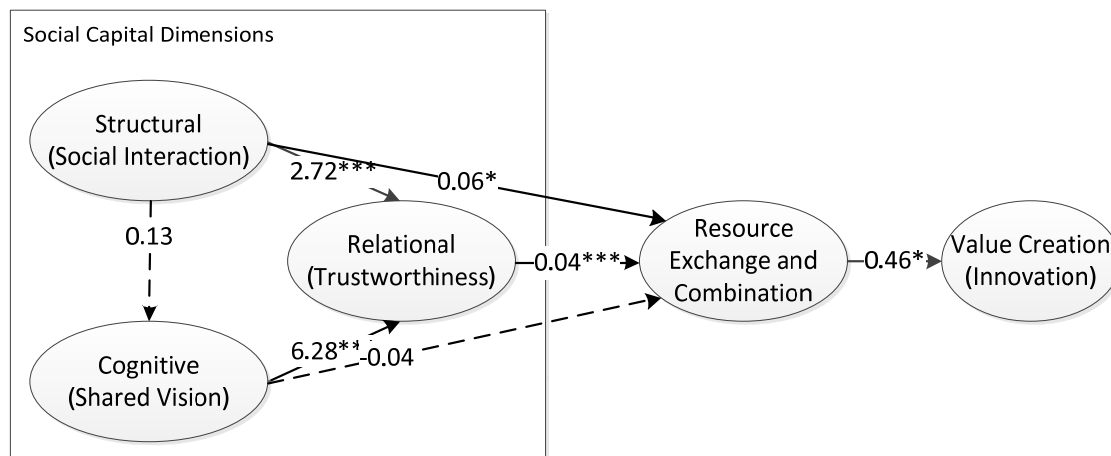


Figure 11. Tsai and Ghoshal's (1998) model of social capital and value creation. Solid lines indicate statistically significant maximum likelihood estimates. $*p < 0.05$; $**p < 0.01$; $***p < 0.001$. From "Social Capital and Value Creation: The Role of Intrafirm Networks," by W. Tsai and S. Ghoshal, 1998, *Academy of Management Journal*, 41, p. 466. Copyright 1996 by Academy of Management Journal. Adapted with permission.

The structural dimension of social capital was operationalized as inter-unit social interaction and was measured with two researcher-developed questions, "With people of which units do you spend the most time together in social occasions?" and "Please indicate the units which maintain close social relationships with your unit" (p. 469). The relational dimension of social capital was operationalized as perceived trust between and trustworthiness of business units. Two questions were developed by the researchers to examine the nature of trust in the company, "Please indicate the units which you believe you can rely on without any fear that they

will take advantage of you or your unit even if the opportunity arises,” and “In general, people from which of the following units will always keep the promises they make you?” (p. 469-470). The cognitive dimension of social capital was operationalized as the extent to which business units shared a vision with one another and with the organization as a whole. Again two questions were developed by the researchers to assess shared vision, “Our unit shares the same ambitions and vision with other units at work,” and “People in our unit are enthusiastic about pursuing the collective goals and missions of the whole organization” (p. 470). Resource exchange and combination was operationalized as the extent to which business units exchanged resources. Four researcher-developed questions were utilized to assess the level of resource exchange and combination: “With which of the following units does your unit frequently exchange important information (such as market trends, sources of supplies, or ideas for product development),” “Does your unit offer any product or service to other units,” “Have members of your unit been sent to other units to work for them or for a joint project,” and “Which units on the list does your unit feel a special duty to stand behind in time of trouble: that is to which units would you give your support?” (p. 470). Finally, product innovations were measured through the following researcher-developed question, “On average, how many product innovations per year were produced in your unit during the recent past (from 1993 to 1996)?” Responses to this question were validated against extant corporate data.

Solid lines in the path model shown in Figure 11 indicate statistically significant relationships between the dimensions of social capital, resource exchange and combination, and value creation. Table 7 presents the means correlations between each of the variables analyzed in the study. Employing an adaptation of Nahapiet and Ghoshal’s theoretical framework, Tsai and Ghoshal’s (1998) study showed strong empirical support for the relationship between social

capital and value creation in a large scale organization. One counterintuitive finding was that the presence of structural social capital was not positively correlated with the cognitive social capital — the presence of relationships in this case did not necessarily predict the existence of a shared vision.

This study had two notable points of weakness. The first was the nature and size of the sample (single organization with only fifteen business units) which reduced the generalizability of the findings. The second, and perhaps most critical, was the failure to validate the operational definitions and measures of social capital. These weaknesses notwithstanding, this study contributed to social capital research by providing empirical support for the relationship between social capital and organizational performance while adding further support for the framework established by Nahapiet and Ghoshal (1998).

Table 7.

Correlation Coefficients Reproduced from Tsai and Ghoshal (1998)

Variable	1	2	3	4	5	6	7	8
1. Social interaction: Time spent								
2. Social interaction: Close contact	.86**							
3. Trustworthiness: Reliability	.69**	.75**						
4. Trustworthiness: Promise keeping	.71**	.70**	.96**					
5. Shared vision across units	.41	.42	.49	.47				
6. Shared organizational vision	.51	.55*	.69**	.63*	.71**			
7. Resource exchange	.70**	.66*	.89**	.91**	.38	.53*		
8. Product innovations	.47	.23	.29	.33	.14	.24	.47	
9. Business unit size	.42	.37	.47	.51	.58*	.48	.49	-.03

Note. * $p < 0.05$, ** $p < 0.01$. From “Social Capital and Value Creation: The Role of Intrafirm Networks,” by W. Tsai and S. Ghoshal, 1998, *Academy of Management Journal*, 41, p. 471.

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Merlo, Bell, Mengüç, and Whitwell (2006) also employed Nahapiet and Ghoshal’s (1998) theoretical framework in a study of the relationship between social capital, service

orientation, and creativity in 112 stores within a national retail chain in the United Kingdom. For this investigation a two-survey design was used. The first survey, which was completed by 413 area sales managers, was designed to assess the three social capital dimensions. The second survey, which was completed by 112 store managers, was designed to assess creativity, customer service, and overall store performance. The authors operationalized each variable and developed associated survey questions citing relevant literature as follows:

1. Shared vision (Cognitive), cited source Hult and Ferrell (1997):

- A 'team spirit' exists in our ranks.
- Around here, cross functional teamwork is the common way of working rather than the exception to the norm.
- There is a commonality of purpose in our store.
- There is total agreement on our store's vision across all levels and departments in our store.

2. Communication openness (Structural), cited source Kohli, Jaworski, and Kumar (1993):

- There is a wide-spread sharing of critical information between people within our store.
- People in our store always share relevant information about customers.
- Ideas are shared openly within our store and can be tested by all interested employees.
- New employees are given frequent opportunities to learn from others at all levels at [company name].
- Our store is structured so that people or teams working on similar tasks can easily share their experiences and problems.

3. Trusting culture (Relational), cited source, Robinson (1996):
 - I am not sure that I fully trust my fellow employees.
 - Overall, the motives and intentions of those in my store are good.
 - My co-workers are always honest and trustworthy.
 - Members of my store show a great deal of integrity.
4. Retail store creativity, cited sources Denison, Hart, and Kahn (1996) and Mclean (2005):
 - People in our store are receptive to unanticipated ideas and processes.
 - Experimentation is encouraged within in our store.
 - In our store, new insights and ideas get developed into improved services or processes.
 - Our shared understanding of store ideas supports the development of new ideas in our store.
5. Customer service orientation, cited source Peccei and Rosenthal (1997):
 - In our store, we are always working to improve the quality of service we give to customers.
 - We have specific ideas about how to improve the service we give to customers.
 - We often make suggestions about how to improve customer service in our store.
 - We put a lot of effort into our jobs to try to satisfy customers.
 - No matter how we feel, we always put ourselves out for every customer we serve.
 - We often go out of our way to help customers.
6. Store performance, formative construct with no cited source:
 - Overall our store runs very efficiently.
 - Overall our store outperforms the competition.

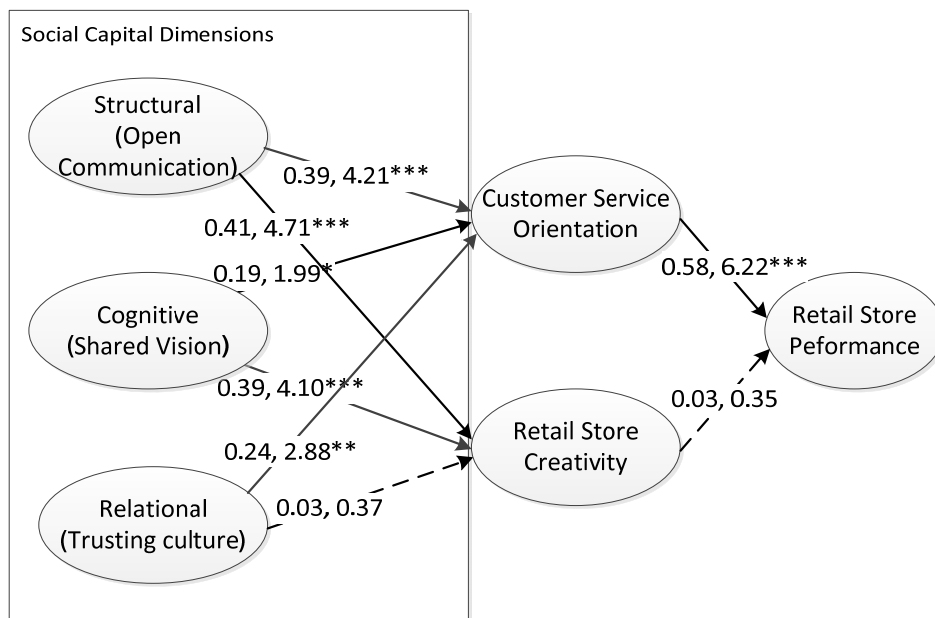


Figure 12. Summary of hypotheses and results tested by Merlo et al. (2006). Solid lines indicate statistically significant paths showing β and t -values. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. From “Social Capital, Customer Service Orientation, and Creativity in Retail Stores,” by O. Merlo, S. J. Bell, B. Mengüç, and G. J. Whitwell, 2006, *Journal of Business Research*, 59, p. 1219. Copyright 2006 by Elsevier Inc. Adapted with permission.

The structural dimension of social capital was operationalized as “the degree of open communication facilitated by a social network infrastructure, which enables retail employees to combine and share resources” (p. 1215). The relational dimension of social capital was operationalized as “a trusting culture, which is a key relationship asset, and is capable of increasing cooperation and support among service employees” (p 1215). The cognitive dimension of social capital was operationalized as “shared codes and commonality of goals...reflected here in the concept of shared vision, which represents the shared values that facilitate individual and group actions” (p. 1215). Creativity was operationalized as “experimentation and risk taking, the generation of new ideas, and the translation of new ideas to

valuable or meaningful outputs” (p. 1215). A Likert scale (ranging from 1 to 5) was used to assess each of these variables, with results treated as interval data (means and standard deviations reported).

Results from the eight hypotheses tested in this study are presented in Figure 12. These findings suggest that social capital in a retail store environment increased customer service orientation which, in turn, increased organizational performance. In addition to lending further empirical support for the value of social capital within organizations, this study provided additional validation and support for Nahapiet and Ghoshal’s (1998) theoretical framework for social capital. Weaknesses of this study include the nature of the sample (which was focused on a single retail chain) and the lack of validation of the assessment tools developed to measure each variable studied.

Information technology business value. Particularly relevant to this dissertation, several studies have sought to understand the value of social capital in the context of information technology departments and their relationship to the business organization. Karahanna and Preston (2013) empirically examined the extent to which social capital between the Chief Information Officer (CIO) and organization’s top management team (TMT) effects overall organizational performance in a health care setting. Based on Nahapiet and Ghoshal’s (1998) theoretical framework, structural social capital was operationalized as the structural position and informal interactions between the CIO and TMT. Informal interaction was defined as the “frequency of informal interaction of the CIO with the TMT” and structural position was defined as “the structural position of the CIO within the organization that allows for official access to the TMT” (p. 54). Cognitive social capital was operationalized as shared language, “the degree to which the CIO and TMT share a common language and terminology in their communication,”

(p. 54) and shared cognition, “the degree to which the CIO and TMT have a shared understanding regarding the role of IS within the organization” (p. 54). Relational social capital was operationalized in two forms, “TMT’s trust in the CIO” and “CIO’s trust in the TMT” (p. 54). Questions used to assess the operationalized definitions of social capital variables were as follows:

1. Structural:

a) Informal interaction:

- I have informal contact with TMT members.
- I socialize with TMT members (e.g., social gatherings, golf, tennis, etc.).
- I have informal exchanges with TMT members.

b) Structural position:

- How many reporting levels are between you and the CEO?
- Are you a formal member of the TMT?

2. Cognitive:

a) Shared language:

- CIO and TMT members share a common language in our conversations.
- CIO primarily uses business terminology when interacting with TMT members.
- CIO avoids using IS jargon when interacting with TMT members.

b) Shared cognition:

- CIO and TMT members have a shared view of the role of IS in our organization.
- CIO and TMT members have a shared understanding of the role of IS as a competitive weapon for our organization.

- CIO and TMT members have a shared understanding of how IS can be used to increase productivity of our organization's operations.
- CIO and TMT members have a common view regarding the prioritization of IS investments.

3. Relational:

a) TMT's trust in the CIO:

- The CIO acts in the best interest of the organization.
- The CIO is honest in his/her dealings with me.
- The CIO is competent in what he/she does.

b) CIO's trust in TMT:

- The TMT acts in the best interest of the organization.
- The TMT is honest in its dealings with me.
- The TMT is competent in what it does.

A two-phase survey was utilized to collect data. First, surveys were distributed to 1057 hospital CIOs. 198 complete and usable surveys were returned. Second, a survey was sent to the TMT of each hospital for which a completed CIO survey was received. A final sample of 81 complete pairs of surveys was utilized to evaluate seven hypotheses. The relationships between the operationalized constructs of each social capital dimension were also studied. The research model and associated results are summarized in Figure 13. These results show compelling empirical evidence for the role that social capital between the CIO and TMT played in creating strategic IT-business alignment and ultimately financial performance in hospital settings.

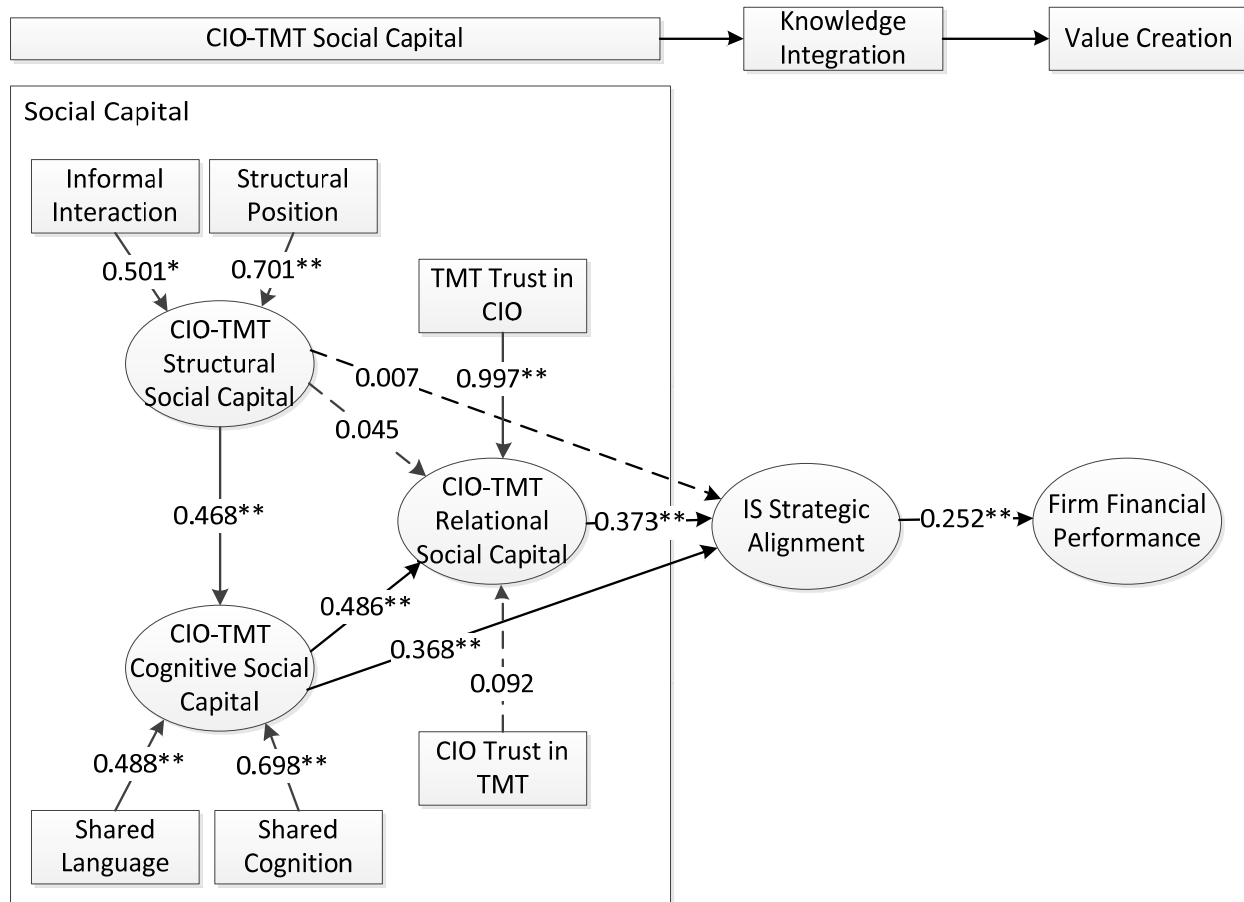


Figure 13. Karahanna and Preston's Research Model. Solid lines indicate statistically significant paths. $**p < 0.01$; $*p < 0.05$. From "The Effect of Social Capital of the Relationship Between the CIO and Top Management Team on Firm Performance," by E. Karahanna and E. S. Preston, 2013, *Journal of Management Information Systems*, 30, p. 33. Copyright 2013 by M.E. Sharpe, Inc. Adapted with permission.

Inherently, these results also support a key supposition of this dissertation that alignment between business and IT is positively correlated with organizational performance in a health care setting. As with other studies that employed some form of Nahapiet and Ghoshal's (1998) theoretical framework of social capital, Karahanna and Preston (2013) operationalized their own explicit definitions of each social capital dimension and developed their own measures for them. In this case, the authors developed two measurement constructs per dimension of social capital

and performed a validation of the hypothesized relationship between each of these two constructs and the dimension of social capital they purported to measure. Only CIO trust in the TMT ($r = 0.092$) failed to show a statistically significant relationship with the dimension it was intended to predict (the presence of relational social capital between the CIO and TMT). Thus, the presence of relational social capital in this study was nearly entirely attributable to the level of trust that the TMT had in the CIO. Also noteworthy was the lack of a statistically significant correlation between structural social capital and either relational social capital or strategic alignment. Although contrary to the researchers' hypotheses that there would indeed be a positive correlation, this result is consistent with findings from similar studies across industries which reveal that structural social capital only indirectly influences organizational performance (and intermediate variables such as alignment or the development of intellectual capital) via a positive correlation with other social capital dimensions.

Sun, Fang, Lim, and Straub (2012) used Nahapiet and Ghoshal's (1998) theoretical framework as a basis for the study of user satisfaction with IT services. Their basic premise was that greater social capital between IT and end users would increase end user satisfaction. In this study, structural capital was operationalized using Nahapiet and Ghoshal's (1998) definition "the overall pattern of connections between actors; impersonal configuration of linkages between people or units" (Nahapiet & Ghoshal, 1998, p. 244 as cited in Sun et al, 2012, p. 1198). Cognitive capital was operationalized as "those resources that enable shared representations and interpretations among parties" (Sun et al., 2012, p. 1198). Relational capital was operationalized as "assets that are created and leveraged through social relationships, including trust, trustworthiness, norms, obligations, and identification" (Sun et al., 2012, p. 1198). A survey method was utilized to sample executives from four different financial services firms in China. A

total of 174 usable responses were received. Measurement items for the three social capital dimensions were adapted from prior studies, with some terminology modified to fit contextually as follows:

1. Structural:

- Employees in my department maintain close social relationships with employees in the IS department.
- Employees in my department spend a lot of time interacting with employees in the IS department.
- Employees in my department know some employees in the IS department at a personal level.
- Employees in my department have frequent communication with employees in the IS department.

2. Relational:

- The relationship is characterized by mutual respect between employees in my department and those in the IS department.
- The relationship is characterized by personal friendship between employees in my department and those in the IS department.
- The relationship is characterized by mutual trust between employees in my department and those in the IS department.
- The relationship is characterized by high reciprocity between employees in my department and those in the IS department.

3. Cognitive:

- When interacting with employees in the IS department, we use common terms or jargon.
- During the discussion with employees in the IS department, we use understandable communication patterns.
- When communicating with employees in the IS department, we use understandable narrative forms.

These items were measured on a 7-item Likert scale with results treated as interval data (means and standard deviations reported). Service quality was measured using the SERVPERF instrument (Cronin Jr & Taylor, 1992) and user satisfaction was measured using a short form measure verified by Baroudi and Orlikowski (1988).

The research model evaluated in this study was conceptualized based on existing evidence from Nahapiet and Ghoshal (1998) and Tsai and Ghoshal (1998). The hypotheses tested and results bear a striking similarity to Wagner et al. (2014) (introduced in Chapter 1 and further reviewed in this section), which also focused on the relationship of social capital between IT and business units and organizational performance. In the case of Sun et al. (2012), structural social capital was hypothesized to positively relate to both cognitive and relational capital, and the relationship of structural social capital on user satisfaction was hypothesized to be fully moderated through its relationship to the other two elements of social capital. Both cognitive and relational capital were hypothesized to directly influence user satisfaction. The known positive relationship between cognitive and relational capital was included for completeness, as was the known positive relationship between service quality and user satisfaction. The known relationship between service quality and user satisfaction was hypothesized to be positively mediated by the presence of cognitive and relational capital.

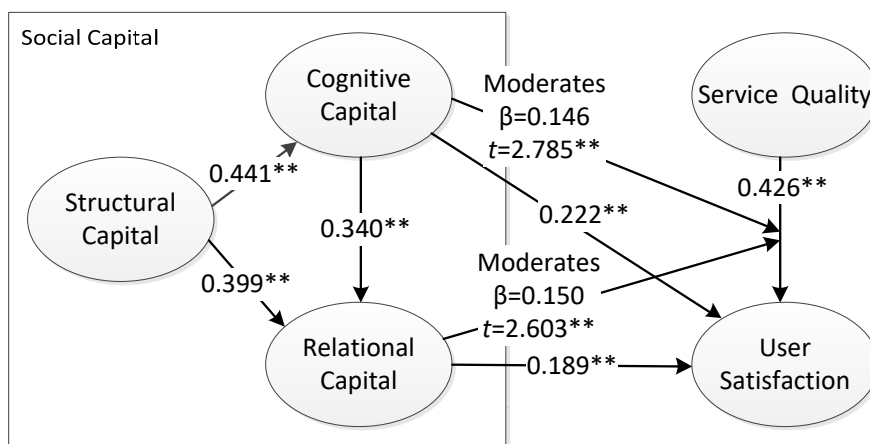


Figure 14. Research model with moderating effects of cognitive and relational capital. $**p < 0.01$. From “User Satisfaction with Information Technology Service Delivery: A Social Capital Perspective,” by Y. Sun, Y. Fang, K. H. Lim, and D. Straub, 2012, *Information Systems Research*, 23, p. 1204. Copyright 2012 by INFORMS. Adapted with permission.

As shown in Figure 14, the results of this study indicated that the relationship of structural capital between IT and business units to end user satisfaction was fully moderated by the other two dimensions of social capital. Structural capital was determined to have a positive correlation to cognitive ($r = 0.441, p < 0.01$) and relational capital ($r = 0.399, p < 0.01$). The positive correlation between cognitive and relational capital was confirmed ($r = 0.340, p < 0.01$). Both cognitive ($r = 0.222, p < 0.01$) and relational capital ($r = 0.189, p < 0.01$) were shown to have a direct, positive correlation to end user satisfaction with IT services. The positive relationship between service quality and user satisfaction was confirmed ($r = 0.426, p < 0.01$) as were the positive moderating effects of cognitive capital ($\beta=0.146, t = 2.578, p < 0.01$) and relational capital ($\beta=0.150, t = 2.603, p < 0.01$) on this relationship. Although this study was limited by virtue of being focused on a single industry in a single culture, the results do provide additional empirical support for Nahapiet and Ghoshal’s (1998) theoretical model of social capital and also provide an empirical example of the positive influence that social capital

between IT and business units can have on end user satisfaction. Moreover, each of the findings regarding the relationship of social capital dimensions provides empirical support for hypotheses 1-6 as constructed in this dissertation.

Most closely aligned to the context and design of this dissertation, and as introduced in Chapter 1, Wagner et al. (2014) utilized Nahapiet and Ghoshal's (1998) theoretical framework to evaluate the extent to which social capital between business and IT units drives IT-business value in the form of IT utilization, IT flexibility, and organizational performance. Citing Nahapiet and Ghoshal (1998), the structural dimension of social capital was operationalized as "the overall pattern of connections between actors, including the settings in which IT and non-IT employees communicate and interact, such as in meetings and projects" (p. 245). The cognitive dimension was operationalized as "shared codes, language, and perspectives" and referred to "the extent to which IT and business staff know each other's interpretations of reality" (p. 245). The relational dimensions of social capital was operationalized as "the extent to which IT and business staff trust each other and respect each other's work" (p. 245-246). Each of these constructs was measured using a survey of 132 managers from the German banking industry. The following questions for each dimension, were asked on a 5-point Likert scale:

1. Structural:

- There are meetings on a regular basis between IT unit and business unit to control change processes.
- There are meetings on a regular basis between IT unit and business unit for business process improvement.
- There exist meetings on a regular basis between IT unit and business unit to ensure an effective and efficient change process.

2. Relational:

- There exists a lot of mutual trust and respect between IT unit and business unit.
- The IT unit and the business unit frequently consult each other.
- A change to the IS is implemented in close cooperation between business unit and IT unit.

3. Cognitive:

- The knowledge of business employees regarding the procedures of IT projects has a high level.
- IT employees are able to inform the business unit about IT-specific issues using a non-technical and business-related terminology.
- The IT employees are very competent.

Results of this analysis, first presented in Chapter 1 and revisited with additional detail in Figure 15 provide additional empirical support for Nahapiet and Ghoshal's (1998) theoretical framework and for the research design of the current investigation. The structural dimension of social capital was positively correlated with both cognitive ($r = .321, p = .001$) and relational ($r = .430, p = .001$) dimensions, while having a statistically insignificant correlation to shared business/IT understanding ($r = .105$). This suggests that a network of connections between IT and business units was only truly valuable inasmuch as it provided the opportunity for the creation of a shared interpretation of reality and a climate of trust and respect. Both the cognitive ($r = 0.205, p < 0.05$) and relational ($r = 0.174, p < 0.05$) dimensions of social capital were shown to have a positive correlation with business understanding of IT, while the impact of business understanding of IT on organizational performance was fully moderated through its positive correlation with IT utilization ($r = 0.291, p < 0.01$) and IT flexibility ($r = 0.141, p <$

0.051). IT Utilization was defined as “the extent to which a firm deploys IT to support operational and strategic tasks” and IT flexibility was defined as IT’s ability to “to adapt to changing business requirements quickly and economically” (p. 247). Both cognitive ($r = 0.206$, $p < 0.01$) and relational ($r = 0.455$, $p < 0.001$) dimensions of social capital also showed a direct, statistically significant positive correlation with IT flexibility, indicating that greater shared understanding and relational trust between IT and the business resulted in increased IT adaptability to the business’s evolving needs. As described in Chapter 1, this type of flexibility is essential in the health care industry as both technology and business requirements continue to rapidly evolve.

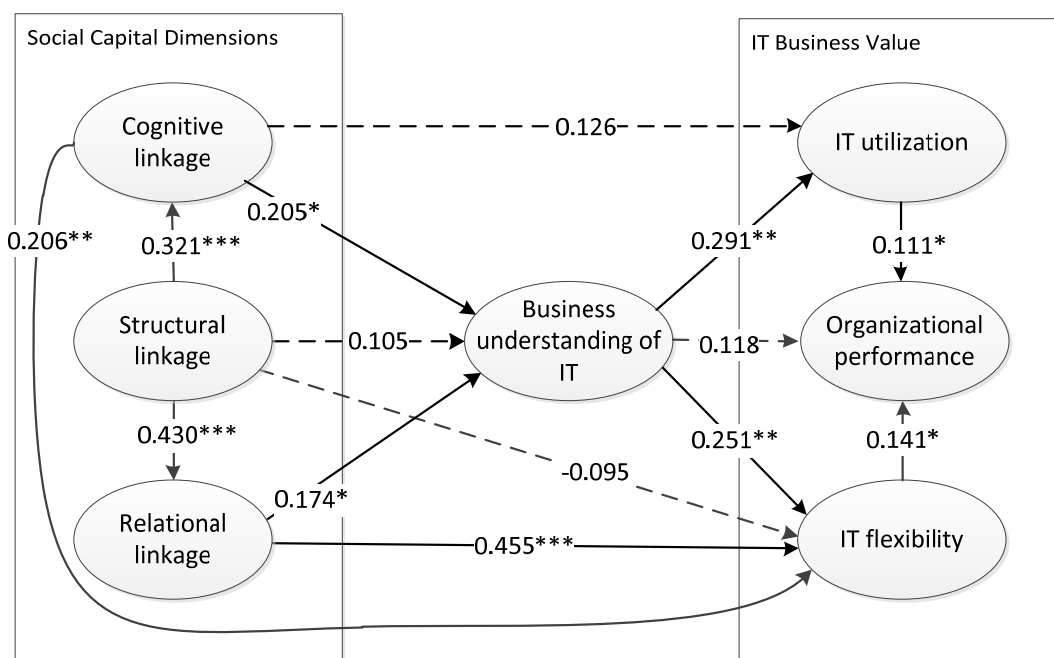


Figure 15. Research model adapted from Wagner et al. (2014). Solid lines indicate statistically significant paths. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. From “How Social Capital Among Information Technology and Business Units Drives Operational Alignment and IT Business Value” by H. T. Wagner, D. Beimbom, and T. Weitzel, 2014, *Journal of Management Information Systems*, 31, p. 253. Copyright 2014 by M. E. Sharpe, Inc. Adapted with permission.

Despite the strength of these findings, two weaknesses must be noted. First, the sample size and homogeneity limit the generalizability of the findings. Second, while the authors did perform statistical validation of their assessment measures for social capital, once again the questions utilized to evaluate cognitive, structural, and relational dimensions of social capital were invented anew. This continued trend gives rise to the key question: How can social capital effectively and reliably be measured? As discussed in Chapter 1, this question was one of two key elements addressed by Turner (2011). The results of his work, which include a validated survey instrument for the study of social capital, serves as the methodological foundation for this dissertation as detailed in Chapter 3. Overall, Wagner et al. (2014) provided a relevant theoretical framework through which social capital between IT and business units can be shown to improve organizational performance.

Global Leadership and Social Capital

Evidence that the theoretical underpinnings of social capital are related to global leadership can be found in the results from Caligiuri and Tarique (2009) who surveyed 256 organizational leaders from 17 different countries to identify predictors of effectiveness in global leadership activities. The authors found that high-contact (i.e., more social) cross-cultural leadership development experiences were more highly correlated with effectiveness ($r = .35, p < .01$) than low-contact (i.e., less social) cross-cultural leadership development experiences ($r = .20, p < .01$). Moderated regression analysis confirmed that this difference was significant ($\beta = .31, p < .01$), thus confirming the authors' hypothesis, rooted in social learning theory, that higher contact experiences are correlated with greater cross-cultural competence. In a subsequent study, Caligiuri and Tarique (2012) completed a two-part survey of (a) 420 global leaders and (b) 221 supervisors who could evaluate the effectiveness of those same global leaders to more

deeply explore the extent to which global leadership competency development versus immutable personality traits could predict overall global leadership effectiveness. Their results suggested a combined effect of personality traits and competencies such that in their conclusion they recommended global leadership development programs “should identify those individuals with the requisite individual characteristics (e.g., personality) and offer high-contact cross cultural experiences” to them (p. 620).

More specific to the understanding of global leadership in the health care industry, MacPhee, Chang, Lee, and Spiri (2013) identified emerging global health care leadership trends and proposed a potential model for leadership development in this context. Based on a review of health care, leadership, organizational development and psychology literature, the authors detailed several evidenced-based propositions that are conceptually aligned with the relational nature of social capital theory. First, they suggested that in global health care leadership development there is a trend away from individual leadership and toward a more relational, collective form of leadership (from “I” to “we”). Second, they suggested that “globalization depends on complex collaborative relationships” and “collective leadership is necessary for building and sustaining global collaborations” (p. 22). Third, they proposed that it is imperative for global health care leaders to be skilled at collective leadership and that the learning process for this skill begins with inter-professional health care education.

Based on these observations the authors developed a multilevel model that they suggested can serve as a framework for global leadership development in a health care context. This model identifies three primary levels: self, relational, and collective, and three additional areas of consideration: organizational learning, collaborations, and culture. For each of these six areas, the authors identified key competencies as follows:

1. Self-level competencies:
 - Self-awareness/reflection,
 - Self-empowerment,
 - Positive psychology/"reflected best self."
2. Relational-level competencies:
 - Other-empowerment/leader empowering behaviors,
 - Team-building.
3. Collective-level competencies:
 - Collective empowerment,
 - Participatory action learning.
4. Organizational learning competency:
 - Developmental evaluation.
5. Collaborations competency:
 - Engagement within and across boundaries (e.g., boundary spanning, bridging, blending).
6. Culture competency:
 - Cultural intelligence/global mindset.

Although not framed specifically in the context of social capital theory, the conceptual alignment between the propositions and competencies put forth by these authors and the previously reviewed dimensions of social capital and intellectual capital is evident.

At the intersection of global leadership and IT, Kien, Soh, and Markus (2013) conducted a case study that applied lessons from IT organizational design literature to a large and complex multinational enterprise. In this study, the authors noted that globalization has created pressure

on IT leaders to scale technology functions in support of increasingly diverse business needs. Based on their analysis, the authors suggested that standard IT organizational design models (centralized, decentralized, and federated) may not be sufficient for this need. Drawing on broader organizational design research, the authors investigated the supposition that a new multidimensional (MDm) IT organization model may be best suited to support business needs in a global context. The MDm differentiated the IT organization into three primary functions: customer-facing, product-centric, and resource management units. The authors noted that a key requirement of an MDm model is the development of organizational mechanisms to facilitate horizontal collaboration across teams. Again, although not specifically discussed in the context of social capital theory, one can readily see a relationship between the dimensions of social capital and a requirement for such horizontal collaboration across teams within an organization.

Several studies have specifically investigated the importance of social capital in global environments such as multinational enterprises. Nakamura (2010) completed a case study within a single global professional services firm to examine factors that influence organizational leaders' building of social capital. An underlying assumption of this study was that social capital construction among leaders is increasingly critical within global organizations. As shown in Figure 16, the basic framework of this study examined the extent to which interactive opportunities, individual-owned resources, and motivational interactivity constraints impacted the development of social capital. A survey of 520 organizational leaders from 51 countries was completed. Quantitative results were subsequently supplemented with qualitative data from field observation, archival documents, and 15 additional telephone interviews. Social capital was operationalized by the author as being inclusive of advice ties (the number of people the leader counted as being available for work-related advice) and network relations which included trust,

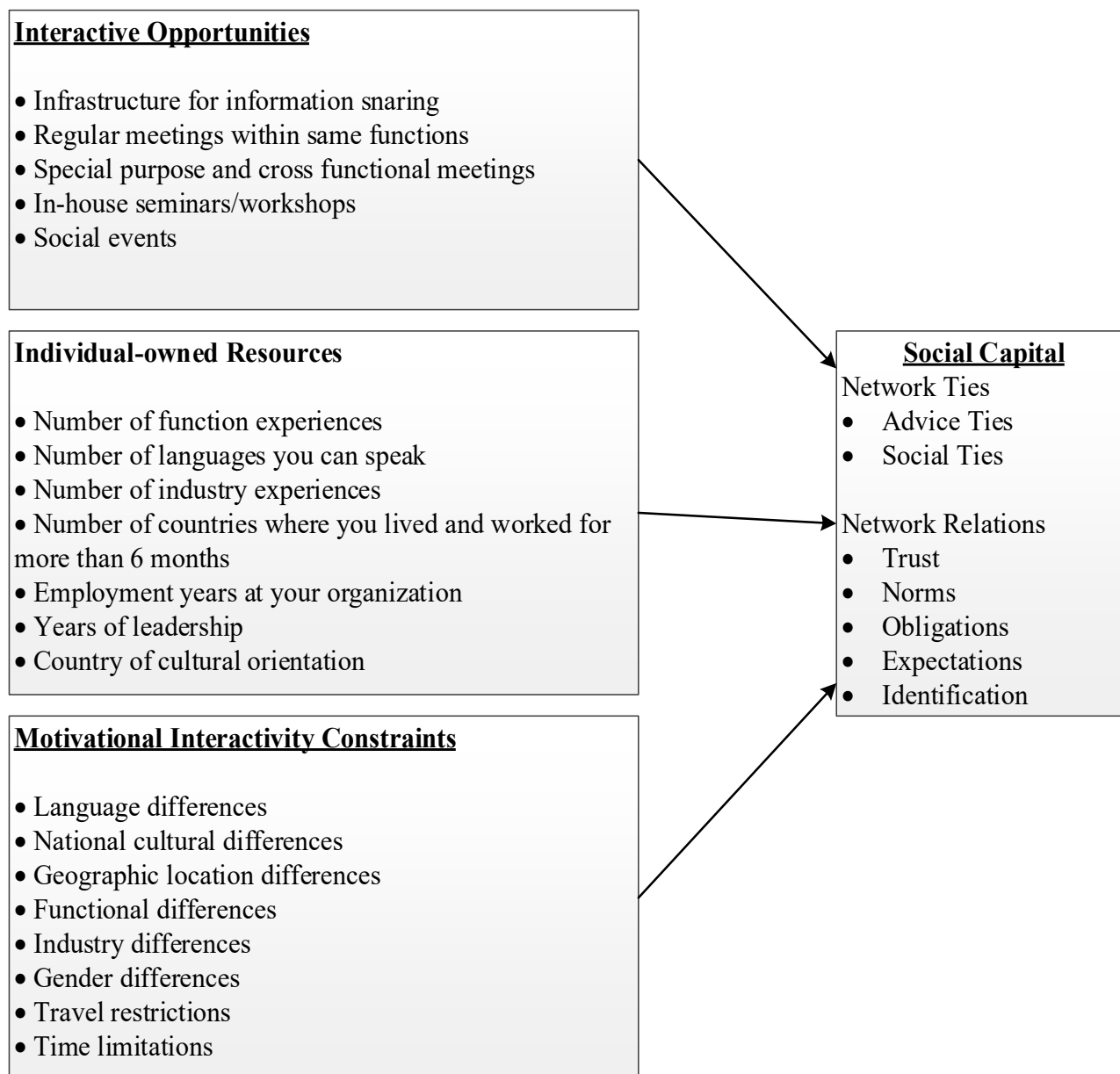


Figure 16. Dissertation research framework. From “Global Organizational Leaders’ Social Capital Formation: A Case Study,” by Y. T. Nakamura, 2010, p.35. Copyright 2010 by ProQuest LLC. Adapted with permission.

norms, obligations, expectations, and identification. Results of this study showed that advice ties were positively impacted by the number of industry experiences held by the respondent ($b = .115, p < .05$) and the number of countries lived and worked in for more than 6 months ($b =$

.235, $p < .001$), and negatively impacted by the degree of industry differences perceived ($b = -.123, p < .05$), number of languages spoken ($b = -.155, p < .01$), and country of cultural orientation ($b = -.115, p < .05$), which the author described as the extent to which the respondent's individual interactive patterns are grounded in their own national culture. Network relations on the other hand were significantly and positively impacted by interactive opportunities ($b = .266, p < .001$), country of cultural orientation ($b = .116, p < .05$), and years of employment ($b = .104, p < .05$).

Nakamura (2010) collected additional interview data between 2004 and 2007 to examine the extent to which participating in an annual leadership development seminar impacted the creation of social capital in a global context. Results indicated that while participation increased the quality of network relations, it did not increase the number of advice ties. The author concluded that although annual leadership training helped to strengthen existing relationships, it did not in and of itself result in an expansion of the leaders' professional network. This result is consistent with the previous finding that interactive opportunities increased network relations but did not increase advice ties. Based on the results of this study, when discussing implications for practice, the author concluded that global organizational leaders must selectively prioritize the development of network relations and advice ties.

Marshall (2015) also shed some light on the intersection of social capital and global leadership through a phenomenological narrative study of global educational leadership practices, guided by these four questions:

1. What personal practices do higher education faculty members implement that contribute to their success in a global environment?

2. What scholarly practices do higher education faculty members implement that contribute to success in a global environment?
3. What practices do higher education faculty members implement to overcome challenges when working in a global environment?
4. What practices do faculty members implement to contribute to the comprehensive internationalization of higher education? (p. 4)

Participants were 8 U.S.-based individuals who have worked as higher education faculty members in a global environment. A first-order narrative approach was used for each interview wherein the eight participants were asked to tell stories about their own lived experiences. The major findings of this study were elucidated from common themes discovered in the interview process. The overall conclusion reported by the author was that successful global higher education leaders implement four personal practices and five scholarly practices. Personal practices, represented by the acronym “CORE,” included: compassion for humanity, open communication, respectfulness, and ethnorelativism. Scholarly practices, represented by the acronym “REACH,” included: reading international literature, establishing a network, adapting, collaborating, and helping others succeed.

The idea that social capital is an important element in global leadership was explicitly acknowledged by the researcher when describing the personal practice of compassion for humanity. “Intercultural empathy,” she pointed out, “is one of the building blocks required for building social capital in a global environment” (p. 147). This observation is consistent with the perspective presented in the author’s literature review that social capital is an essential element of the global mindset because it helps global leaders to become more capable of building trust and successfully engaging with others across a variety of differences and cultures. While not

explicitly discussed in the context of social capital, several of the other major conclusions of this study can readily be thought of in its context. For example, respectfulness, reading international literature, establishing a network, collaborating, and helping others to succeed are all practices that relate in some way to one or more of the dimensions of social capital (relational, cognitive, or structural).

In another dissertation relating social capital to global leadership, Matthes (2012) used mixed methods to understand the impact of nationality on the development of global mindset among U.S. citizens, German citizens, and U.S./German dual citizens. The researcher also evaluated the extent to which this impact was mediated by personal, educational, and professional factors. The final sample included 268 leaders, 109 U.S., 129 German, and 30 dual citizens. In his discussion of global mindset as a construct, the researcher drew on Beechler and Javidan's (2007) Model of Global Mindset, which includes the three major elements of Global Intellectual Capital, Global Psychological Capital, and Global Social Capital, which the author suggested is a critical attribute of global leaders. In this model, Global Social Capital was described as having structural, relational, and cognitive components and was explicitly defined as "the potential value arising from certain psychological states, perceptions and behavioral expectations that social actors form as a result of both their being part of social structures and the nature of their relationships in these structures" (p. 55). Specific research questions addressed in this dissertation were:

1. Does the nationality of business leaders impact their global mindset?
2. Does nationality affect the leaders' personal, educational, and professional backgrounds?

3. Do these personal, educational, and professional factors contribute to the development of global mindset, and if so, which factors have the greatest impact on global mindset development?
4. To what extent is the impact of nationality on the development of global mindset affected by the personal, educational, and professional factors of business leaders? (p. 4)

Results of this study revealed that although dual citizens demonstrated the highest global mindset score, there was no statistically significant difference between U.S. and German citizens. The impact of nationality was fully mediated by personal, educational, and professional factors. Thus, the author concluded that global mindset, inclusive of social capital, is an acquired trait and that it can be increased through a number of important relationships and activities. For example, (a) respondents who held closer relationships with foreign family members demonstrated a higher global mindset, (b) greater socialization with foreigners, in general, related to a higher global mindset, (c) the more respondents reported immersing themselves in foreign culture including the study of language and arts, the higher the global mindset, and (d) the more experience leaders reported with international working assignments, the higher their global mindset. Accepting that the definition of global mindset includes an element of social capital, these results can guide leaders and organizations as they aim to develop both.

Gagnon (2013) used linear regression and structural equation modeling to analyze the relationships between transformational leadership, global mindset, and team effectiveness. In this quantitative analysis, survey data was interpreted from 257 business leaders, ranging from managers to presidents, across 33 countries. All participants were full-time employees with at least 1 year at the current company and 6 months with the current business unit. Global mindset, including psychological capital, social capital, and intellectual capital was shown to have a

positive relationship with transformational leadership ($r = .45, p < 0.0001$). Specifically, the correlation between social capital and the “Five I’s” for transformational leadership (idealized influence attributes, idealized influence behaviors, inspirational motivation, intellectual stimulation, and individualized consideration) were all shown to be statistically significant at the $p < 0.0001$ level. Of particular note was the author’s finding that the relationship between global mindset and transformational leadership held true regardless of whether the team being led was global or local. In other words, global mindset positively impacted transformational leadership even in non-global environments. Given the definition that global mindset is inclusive of social capital, this lends itself to the conclusion that social capital is an important element for successful transformational leadership in both global and non-global environments.

Cooper (2011) utilized a hermeneutic qualitative methodology to interpret expatriates’ experience with mentors and mentorship. Narrative data was collected through first hand interviews with thirteen expatriates who had experienced mentorship while on international assignment for a multinational enterprise. Two key research questions framed her study:

1. How do expatriate workers experience mentoring during an international assignment for a multinational organization?
2. What resources do expatriates seek out and/or rely on to support their professional development and adjustment to life in another culture? (p. 14).

Results from this study revealed that cultural norms had a meaningful impact on the conceptualization of mentorship by both the mentor and protégé, and despite an eagerness to engage, expatriates interviewed in this study reported few mentorship experiences. By contrast, they did report the natural development of many social contacts who provided information and support to them during international assignment. This finding, which the author suggests merits

attention in future research, suggests that social capital is an important asset for global leaders working who are on international assignment.

Stephan and Uhlaner (2010) completed a retrospective analysis of survey data from 40 countries to compare the impact of performance-based culture (PBC) and socially supportive culture (SSC) on entrepreneurship in international business environments. For this study, the authors used historical definitions of social capital that capture its essence including an “instantiated informal norm that promotes co-operation” and “goodwill fellowship, sympathy, and social intercourse” (p. 10). Using data from the Global Leadership and Organizational Behavior Effectiveness (GLOBE) project and the Global Entrepreneurship Monitor Expert Panel, the authors deduced and published two notable results. First, while PBC was closely linked with the creation of an entrepreneurial framework and associated opportunities for entrepreneurship, it did not in fact correlate with entrepreneurship itself. Second, SSC—which the authors suggested is a direct measure of social capital—was shown to play a much stronger role in the presence of entrepreneurship. The implication of these findings were summarized succinctly by the authors, “cooperation and social support (vs. competitive aggressiveness) may be the key lever to stimulate entrepreneurship rates worldwide” (p. 25).

In a qualitative study investigating the manner in which multiple international relocations impact leaders’ social capital, Makela and Suutari (2009) completed semi-structured interviews with 20 Finnish managers who worked in global careers for multinational corporations. Each participant had completed at least three international expatriate assignments in at least 2 countries. The authors focused on the ‘network of relationships’ concept taken from Nahapiet and Ghoshal’s (1998) definition, further specifying two particular forms of social capital: bonding and bridging. Citing relevant literature, they described bonding social capital as internal

network ties and associated benefits that stem from an individual belonging as a part of a group, and bridging social capital as external ties and associated benefits that stem from linkages between otherwise unconnected social groups. Based on their interviews, the authors concluded these two forms of social capital can be paradoxical in a global leadership context. Forming strong internal ties within the country of assignment can result in weakening ties back home (and vice versa). They went on to suggest that global leaders should mindfully strive to achieve a balance between bonding relationships in their country of assignment and bridging relationships with home-country networks.

Table 8.

Summary of Hypotheses Tested Quantitatively by Espedal et al. (2013)

Hypotheses	T1 Result	T2 Result
Cognitive social capital has a positive impact on relational social capital.	Supported*	Supported*****
Cognitive social capital has a positive impact on knowledge sharing.	Not Supported	Not Supported
Relational social capital has a positive impact on knowledge sharing.	Supported*	Not Supported
Intrinsic rewards for knowledge sharing have a positive impact on relational social capital.	Supported***	Supported**
Local embeddedness of business units has a negative impact on relational social capital.	Supported***	Not Supported
GLD programs have a positive impact on relational social capital.	Not Supported	Not Supported
GLD programs have a positive impact on knowledge sharing.	Not Supported	Contradicted*

Note. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

Within the context of global leadership effectiveness research, two additional studies were reviewed that aimed to evaluate the impact of Global Leadership Development Programs (GLDP) on the creation of social capital. Espedal, Gooderham, and Stensaker (2013) performed a mixed methods study to evaluate the impact of a GLDP on social networks and knowledge sharing in a multinational enterprise (MNE). A sample of 30 GLDP participants employed within

a Scandinavian MNE were surveyed at both the end of the first program session (T1) and then again at the end of the last session 9 months later (T2). Each of the hypotheses shown in the Table 8 was tested at T1 and T2.

Two surprising themes were gleaned from these results: 1) GLDPs did not have a positive impact on relational social capital and 2) GLDPs did not have a positive impact on knowledge sharing, and in fact showed a negative impact by the end of the program. The result that a GLDP may actually have a negative impact on knowledge sharing prompted the authors to supplement their quantitative approach with series of 22 qualitative semi-structured interviews. Through these interviews the authors made two important conclusions. First, the GLDP created a “prima donna” effect among participants who felt they were now part of an exclusive group. Second, and pursuant to the first, the existing social networks held by participants eroded over the course of the GLDP and new relationships were not sufficiently developed. These findings are highly relevant at the intersection of global leadership, social capital, and organizational performance. The authors insightfully pointed out that at the root of these findings is an individualistic conceptualization of leadership, which leads to a separatist culture and weaker organizational relationships. They concluded that global leadership development training aimed at only a select few may have the unintended consequence of actually undermining social capital, knowledge sharing, and ultimately organizational performance.

Stensaker and Gooderham (2015) completed a mixed-methods study over 18 months to evaluate the extent to which a GLDP enhanced social capital and knowledge sharing in a Scandinavian MNE. Interviews were completed with three senior leaders—the CEO, HR Director, and Strategy Director—and 10 divisional managers working in either Norway, Sweden, or Denmark, all of whom had previously participated in the organization’s GLDP. Subsequent to

these interviews, the researchers distributed a survey to a total of 159 managers, all of whom had previously completed the GLDP, and from which they received 103 responses. Results from this analysis suggested that the GLDP was indeed successful in generating a greater degree of social capital within the organization and as a result knowledge sharing was increased. Framing their results in the context of Nahapiet and Ghoshal's (1998) three social capital dimensions, the authors concluded that structural social capital was inherently created by virtue of coming together for a GLDP, cognitive social capital was developed through conversations made during the GLDP, and relational social capital was also facilitated, most notably in a fashion that bridged otherwise disconnected leaders from dispersed geographic areas. Consistent with Espedal et al. (2013), the authors also concluded that GLDPs are more successful in generating social capital (and therefore knowledge sharing) when they are focused on developing overall organizational leadership versus developing individual leaders.

Several consistent themes and key takeaways can be gleaned from this analysis of the intersection between social capital and global leadership. First, although conceptualized and described in different ways, social capital is clearly an important construct in the realm of global leadership. Whether as a definitional element of the global mindset construct, as a personal mechanism that generates social support for leaders working in global positions, or as a cultural instrument for learning and transformational leadership, social capital has a place in the global leadership environment. Second, like global leadership, social capital has long been stymied by the lack of consistent definition and underlying theoretical consistency. This is seen in the variety of conceptualizations utilized in the studies reviewed. Even among these variations, however, there is a consistent theme: connection. The quality and nature of connection matters in a global context, and as Gagnon (2013) concluded, it matters in non-global contexts as well.

Third, because social capital is instrumental in global leadership, a number of organizations and scholars are rightfully concerned with how to best develop it. Evidence suggests that when value is placed on collaboration and teamwork across the organizational system, GLDPs provide an effective opportunity for social capital development. However, if leadership is conceptualized as a more individualized construct, the same programs may contribute to a culture of separation that is counterproductive to the desired outcome. Fourth, the manner in which social capital influences organizational performance, whether in global or non-global contexts, is generally shown to be through increased knowledge sharing. In the non-global focus area of health care in the United States such increased knowledge sharing may be important across the IT/non-IT business relationship. In a global leadership context, such knowledge sharing has been shown to bridge geographically dispersed resources in a manner that fosters entrepreneurship, collaboration, and social support. In both cases social capital drives knowledge sharing which is thought to improve organizational outcomes. Finally, the literature review of GLDPs elucidated an important lesson that applies to leadership development in any setting, including health care in the United States. Namely, when leadership is conceptualized as an individual attribute it presents a risk to organizational social capital and therefore to knowledge sharing and overall organizational performance. In such a reductionistic paradigm, when only select individuals are tapped for training and development, the best of efforts may actually have the unintended consequence of weakening organizational social capital. Therefore, whether developing successful global leaders working abroad or studying the impact of social capital here in the United States health care industry, it is important to remember that the power of human connection appears to be an important lever in the pursuit of organizational effectiveness.

Intellectual Capital

Much like the construct of social capital, intellectual capital has been conceptualized in different ways by different researchers. Inkinen (2015) performed a systematic review of empirical research to evaluate whether or not intellectual capital influences organizational outcomes. He began by employing a six-stage literature review process through which 1,721 initial articles were narrowed down to the 54 studies ultimately included in his analysis, based on three inclusion criteria. Papers were only included if they: (a) examined the relationship between intellectual capital and firm performance; (b) represented empirical research using quantitative data and survey methods; and (c) were published in peer-reviewed journals. Based on this analysis, Inkinen (2015) identified nine different concepts that have been utilized to represent intellectual capital:

1. *Human Capital* – The intelligence of the organizational member, which contains features such as the employees' sheer intelligence, values, attitudes, aptitudes, know-how, skills, capabilities, individual relationships, creativity, education, experience, qualifications, motivation, commitment, loyalty, resolve, interactions, expertise, proactivity, leadership abilities, flexibility, learning capacity, behavior, intellectual agility and risk-taking propensity. All of these attributes stem from the knowledge and skills embedded in the employees.
2. *Structural Capital* – The organizational factors that support the human capital to perform. It includes elements such as employee-supporting mechanisms and structures, organizational know-how, technological elements (such as information systems and databases), routines, procedures and processes, corporate culture, methods, business

development plans, intellectual property (such as patents, copyrights and trademarks), strategy, organizational charts, manuals and programs.

3. *Relational Capital* – Predominantly refers to the knowledge embedded in the firm's external relations. This resides at both the individual and institutional level and includes agents, customers, suppliers, competitors, partners, clients, shareholders, industry associations, members of the community, society, government, the state and informal networks.
4. *Organizational Capital* – A firm's institutionalized knowledge assets which stay behind when the employees go home at night. Examples include organizational culture, databases, information systems, processes, routines, and structures. Addresses the same phenomena as structural capital and is therefore seen as an interchangeable term.
5. *Social Capital* – The sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit.
6. *Customer Capital* – The valuable knowledge embedded in customer relationships and marketing channels, originating from customer-supplier relationships. Overlaps conceptually with relational capital.
7. *Innovation Capital* – The firm's ability to utilize existing knowledge to create new knowledge, ideas, products, and technologies.
8. *Information Capital* – A measure of the quality of the information system in an organization.
9. *Technological Capital* – The level of utilization of technical knowledge and efforts put into research and development. (p. 522-527)

Although the meta-analysis presented by Inkinen (2015) showed multiple instances of studies that empirically demonstrated a positive correlation between intellectual capital and firm performance, the obvious variation and overlapping meanings in these nine conceptualizations is problematic for meaningful analysis of this research. To ensure relevance to this dissertation, an analysis of the operational definition of intellectual capital used in this dissertation is warranted.

Taken from Nahapiet and Ghoshal (1998), the operational definition of intellectual capital used for the purposes of this dissertation is “the knowledge and knowing capability of a social collectivity, such as an organization, intellectual community, or professional practice” (Nahapiet & Ghoshal, 1998, p. 245). In their discussion pertaining to the conceptual formation of this intellectual capital construct, Nahapiet and Ghoshal (1998) covered two key concepts. The first was the debate regarding the types of knowledge that may exist, specifically tacit and explicit. Acknowledging Polanyi (1964) for developing the most cited and influential distinction between tacit and explicit forms of knowledge, Nahapiet and Ghoshal (1998) aligned with the concept that there is a difference between explicit knowledge (e.g., understanding of facts, figures, information) and tacit know-how, which they also referred to as “knowing as action or enactment” (p. 246). Both forms of knowledge were incorporated into the adopted definition of intellectual capital. Notably, the concept of tacit knowledge is also central to situated learning and cognition which was instrumental in the development of Brown and Duguid’s (1989) communities of practice theoretical framework.

The second concept addressed by Nahapiet and Ghoshal (1998) was whether collective knowledge and knowing capability exists as anything more or other than the aggregation of individual knowledge and knowing capability. In the context of social capital research, the authors suggested that the key question is whether or not it is possible to consider collective

knowledge as part of the model. While acknowledging both sides of this argument, the authors concluded that their conceptualization of intellectual capital embraces the idea that knowledge and knowing can and does exist within the social fabric of a collectivity in a way that differs from “the simple aggregation of the knowledge of a set of individuals” (p. 246). In reaching this conclusion the authors cited communities of practice theory as introduced by Brown and Duguid (1991) in which shared learning occurs through constructivism within a complex social network. While acknowledging the existence of both individual and social knowledge, Nahapiet and Ghoshal (1998) ultimately determined that the social form (both tacit and explicit) should be the focus of their social capital model as it would more likely serve as a potential source of organizational advantage.

Further developing the construct of intellectual capital, Nahapiet and Ghoshal (1998) suggested that there are two basic processes through which knowledge is created: combination and exchange. Combination refers to the concept that separate sources of knowledge and knowing capability can be merged and leveraged together in new and different ways (either through new connections or through reconfiguration). This can result in both incremental, step-wise learning and more radical, innovative learning. This distinction is commonly understood using the concepts of single versus double-loop learning as introduced by Argyris and Schon (1978). Exchange, specifically the exchange of knowledge and knowing capability, serves as a prerequisite for combination. While this does, of course, occur through the explicit sharing of knowledge, within the paradigm of social constructivist learning that lies at the foundation of social capital research and communities of practice, the knowledge creation that occurs tacitly through social interaction becomes of particular interest. A detailed review of knowledge and learning is beyond the scope of this dissertation. However, the relevant notion here is that

intellectual capital exists as a function of complex social interactions within a community of practice and that such intellectual capital can serve as a potential form of increased organizational performance and competitive advantage. Evidence to support the relationship between this and related concepts of intellectual capital and organizational performance was included in Chapter 1 (Turner, 2011) and the previous section on organizational benefits of social capital (Karahanna & Preston, 2013; Tsai & Ghoshal, 1998; Wagner et al., 2014).

Summary

Interest in social capital academically and publicly has seen its rise, fall, and resurgence, and over the decades many different authors have approached it from many different perspectives. As a result of so much attention with so little theoretical foundation, social capital has been described and operationalized in numerous ways. Despite this lack of consensus, an integrated review of the associated literature leaves an impression that there is something important about the idea — however it is described — that the manner in which we are connected, and the manner in which relate with one another, matters. The same notion lies at the heart of communities of practice. Connection matters. Thanks to the theoretical work put forth by Nahapiet and Ghoshal (1998) and advanced by other researchers, a conceptual framework for social capital now exists that can be used to study its impact in a variety of organizational settings. However, even among those researchers who have utilized the same theoretical framework (or some form of it), the manner in which each construct is operationalized has continued to vary. New research that leverages both a consistent theoretical framework and a validated tool for assessing the various dimensions of it will serve to further reduce the variability found in social capital research and thus help to increase its value and legitimacy. As will be described in detail in the following chapter, the research design for this dissertation holds

true to these principles. By using the theoretical framework developed by Nahapiet and Ghoshal (1998) and assessing each dimension of social capital using the validated survey instrument developed by Turner (2011), this study further contributes to a theoretical understanding and evidence-based approach to studying social capital. Nesting this investigation within the related theoretical framework of communities of practice further reinforces its theoretical foundation and also provides relevant avenues of interpretation, discussion, and application.

Chapter 3: Research Design and Rationale

Research Design and Rationale

The study was cross-sectional, non-experimental, quantitative, and correlational in nature. Congruent with the guidance of Gray (2013), from a philosophical perspective a quantitative approach was selected to align with the positivist paradigm and deductive approach utilized by the researcher. From a pragmatic perspective, the quantitative approach also enabled the collection of data from a geographically dispersed population and to generate a sample size large enough for statistical purposes.

Structural social capital, cognitive social capital, relational social capital, and intellectual social capital were assessed using a self-reporting on-line survey. Participants rated their overall perceptions over the past year by responding to three to four questions for each variable on a standard five-point Likert scale adapted for organizational context from Turner (2011). For statistical purposes, all Likert response items were averaged into composite scores that were considered interval measures. A number of authors have justified the position that multi-item Likert scale data can be considered interval in nature and that parametric statistics can be used in their analysis (Carifio & Perla, 2007; Norman, 2010; Wigley, 2013). The rationale for selecting a quantitative, cross-sectional survey method was to simplify the data collection process so that it did not require an inordinate amount of time away from work for the IT employees in the health care system being studied. This was a key factor in gaining permission from the health care system to complete the survey. Outcome variables were measured using extant facility data made available to the researcher through operational reports. Hospital quality was measured using facility-based percentile scores from care management reports. Employee productivity was measured using a standard facility-reported percentage score. Length of stay was measured using

facility reported Medicare data. Patient satisfaction was measured using the average HCAHPS “willing to recommend” score for each facility. The rationale for selecting extant data to analyze performance outcomes was both convenience (including availability of data from existing operational reports) and because individual survey responses for facility level outcome variables would not be valid.

Population and Sample

Unit of analysis. The unit of analysis for the relationship between the dimensions of social capital and intellectual capital (H1-H6) was the individual, while for the relationship between intellectual capital and performance outcomes (H7-H10) it was the hospital. Because the hospital serves as the organizational-level business unit in a health care enterprise and thus allows for comparison of outcome data, it was the appropriate level at which to test the proposition that increased intellectual capital would be correlated with performance outcomes.

Sample frame. The sample frame for this study was a health care system which was selected because it is well known to the researcher. The health care system includes 34 acute care hospital facilities geographically divided into eight service areas: Arizona, Nevada, and six in California: Greater Sacramento, Bay Area, Central California, Central Coast, North State, and Southern California. These 34 hospitals are supported by a total of approximately 150 IT field service operations (FSO) team members. FSO team members are those IT employees who provide on-site support to acute care facilities and employees. As the “front line” of IT support, FSO staff have the most face time with on-site acute care facility workers and thus are best positioned to evaluate the quality of relationships and conditions within the facilities that they serve.

As detailed in Chapter 2, the size and complexity of the organization selected for this

study is on par with organizations studied in similar research. In addition, the size and maturity of the organization is congruent with the theoretical framework of communities of practice. In communities of practice theory, increasing domain knowledge (the essence of intellectual capital) is considered to be a social enterprise that occurs within a community that engages together in shared practice. In this case, the desire was to understand the extent to which, if at all, there is a correlation between the quality of the relationship between IT and non-IT employees and performance outcomes in a hospital setting. In order to generate a sufficient sample size to explore these questions without engaging multiple organizations (which would not have been practical), a large scale health system was required. From a statistical perspective, this study would simply not have been possible in a smaller scale organization.

Sampling. For the purposes of this study, a total-population sampling approach was used. Total-population sampling is a form of purposive sampling where participants are selected because of their specific ability to provide answers to the questions being investigated (Etikan, Musa, & Alkassim, 2016). This approach is more commonly used in circumstances where the total number of cases being investigated is relatively small. In this case, the researcher worked with the managerial leader of the IT field service employees to administer the survey to all 150 field service workers who provide services at hospital facilities within the health care system that was chosen for this study. Thus, for individual level variables, the IT field service employees served as both the population and sample. Respondents varied with regard to age (ranging from 20s to 60s) and education (ranging from an associate's to master's degree in IT or a related field). Similarly, total-population sampling was used for facility level variables, with all of the 34 available facilities included in the study. Sample size requirements for both individual and facility level statistics are discussed in the Data Analysis Procedures section below.

Human Subjects Protections

Based on the following factors, this non-experimental study qualified for exempt Institutional Review Board (IRB) review as defined under HHS regulation 45 CFR 46.110 (US Department of Health and Human Services, 2010a): no participants were under the age of 18, no interaction with the researcher was required, the study proposed less than minimal risk to participants, and the study included no sensitive data or quasi-protected populations. After completing the requirements of the preliminary oral exam, the exempt review form and study proposal were submitted to Pepperdine University's Graduate and Professional School IRB to gain its approval prior to continuing the study. Approval from Pepperdine University's IRB is included as Appendix A. Additionally, in collaboration with a research coordinator from the health care organization's research institute, permission to survey the IT field service employees was obtained through the organization's formal IRB review and departmental approval process. Approval from the organization's IRB is included as Appendix B.

The risks of participating in this study were minimal and included distraction from other work duties and minor fatigue while completing the survey. Participating in this study offered no direct benefits. Indirectly the results of this study may serve to provide guidance for organizational leaders that ultimately improves the organizational culture and daily working conditions for participants and their peers. No remuneration was offered for participation in this study. Although no conflicts of interest exist (financial or otherwise), full disclosure requires noting that the researcher has been an employee of the organization used for this study for 17 years.

Measures

The following measures were utilized to collect data for this study. For convenience and

efficiency all survey questions were consolidated and administered as a single online instrument using tools available through surveymonkey.com. Structural social capital, cognitive social capital, relational social capital, and intellectual capital were measured via electronic survey using questions adapted from the survey instrument developed and validated by Turner (2011). All four performance outcomes: hospital quality, employee productivity, length of stay, and patient satisfaction, were measured using extant data from facility-based operational reports. Table 9 shows a summary of facility level performance variables that were included in this study.

Table 9.

Summary of Facility-level Performance Outcome Variables

Variable	Type	Measurement Type	Definition
Hospital quality	DV	Interval/Ratio	This is a facility-based percentile score taken from quality survey results that ranges from 0% to 100%. Higher percentages imply higher hospital quality.
Employee productivity	DV	Interval/Ratio	This is a facility-based percentile score for employee productivity that ranges from 0% to 100%. Higher percentages imply greater employee productivity.
Length of stay	DV	Interval/Ratio	This is a facility-based numeric score for average length of stay for Medicare patients. In terms of organizational performance, a lower length of stay is more desirable.
Patient satisfaction	DV	Interval/Ratio	This is a facility-based numeric score for patient satisfaction based on HCAHPS scores ranging from 0 to 100. A higher number implies greater patient satisfaction.

Note. DV= dependent variable. HCAHPS=Hospital Consumer Assessment of Health Plans Survey.

Turner's social capital instrument. The survey instrument developed and validated by Turner (2011) was designed to measure the relationship between a firm and its supplier. Because the current study instead assessed the relationship between IT and non-IT employees in a

hospital setting, the questions developed by Turner were modified slightly for context. Table 10 shows Turner's original questions and the modified versions that were used for this study. This instrument has not been formally published and therefore no license is required for its use, however permission was received via e-mail from the author for its use in this study. This approval is included as Appendix C.

Table 10.

Social Capital and Intellectual Capital Survey Questions as Modified for Context from Turner (2011)

Variable	Original Question (Turner, 2011)	Modified Question
Structural Social Capital	Our firm knows who to contact with key suppliers to get things accomplished.	Non-IT employees in our hospital know who to contact within the IT department to get things accomplished.
Structural Social Capital	Our firm knows how to reach the right people at our key suppliers.	Non-IT employees in our hospital know how to reach the right people in the IT department.
Structural Social Capital	Our firm works at making sure we know who to call to correct supplier problems.	Our hospital works at making sure non-IT employees know who to call to resolve IT problems.
Structural Social Capital	Our firm has clearly identified people to contact at our key suppliers.	Our hospital has clearly identified people to contact in the IT departments.
Relational Social Capital	Our relationship with key suppliers is characterized by close, personal interaction	The relationship between IT and non-IT employees in our hospital is characterized by close, personal interaction.
Relational Social Capital	Our relationship with key suppliers is characterized by a history of respect	The relationship between IT and non-IT employees in our hospital is characterized by a history of respect.
Relational Social Capital	Our relationship with key suppliers is characterized by a history of trust	The relationship between IT and non-IT employees in our hospital is characterized by a history of trust.
Relational Social Capital	Our firm values our relationships with key suppliers	IT employees value our relationships with non-IT employees in hospital departments.

(continued)

Variable	Original Question (Turner, 2011)	Modified Question
Cognitive Social Capital	Our firm and key suppliers share the same business values	IT and non-IT employees in our hospital share the same business values.
Cognitive Social Capital	Our firm and key suppliers often agree on what is in the best interest of our relationship	IT and non-IT employees in our hospital often agree on what is in the best interest of our relationship.
Cognitive Social Capital	Our firm and key suppliers share our goals for this business	IT and non-IT employees in our hospital share common goals.
Cognitive Social Capital	Our firm and key suppliers agree on how we should do business together	IT and non-IT employees in our hospital agree on how we should do business together.
Intellectual Capital	Our firm effectively learns new opportunities	Our hospital effectively learns new opportunities.
Intellectual Capital	Our firm successfully learns how to better satisfy our customers	Our hospital successfully learns how to better satisfy our customers.
Intellectual Capital	Our firm successfully learns how to be more competitive	Our hospital successfully learns how to be more competitive.
Intellectual Capital	Our firm discovers new ways to be a better firm	Our hospital discovers new ways to be a better hospital.

Turner's (2011) instrument uses a 5-point Likert scale for each question with responses ranging from 1 = *Strongly Agree* to 5 = *Strongly Disagree*. Reliabilities for each construct developed by Turner (2011) were calculated using Cronbach's α and revealed good ($\alpha \geq 0.8$) or excellent ($\alpha \geq 0.9$) internal consistency in each case as follows: Structural Social Capital $\alpha = 0.966$, Relational Social Capital $\alpha = 0.862$, Cognitive Social Capital $\alpha = 0.889$, Intellectual Capital $\alpha = 0.861$. Convergent validity for the following factors factor was determined by calculating the average variance extracted: Structural Social Capital = 0.84, Relational Social Capital = 0.76, Cognitive Social Capital = 0.78, and Intellectual Capital = 0.78. The average variance extracted for each factor was well above the 0.50 cutoff generally accepted for factors showing convergent validity.

Data Collection Procedure

After receiving approval from both the Pepperdine University Graduate and Professional School's IRB and the health care organization's IRB, research institute, and executive leadership, data for all social and intellectual capital variables was collected via an anonymous electronic survey sent via email. The recruitment email is shown in Appendix D and an image of the online survey instrument is shown in Appendix E. At all times the researcher was blind to the identities, names, and emails of the respondents. In an effort to ensure a higher response rate, the Senior Director who oversees all respondents sent the recruitment email and encouraged voluntary participation. Verbal comments from the Senior Director at departmental staff meetings and the email sent with the survey link both conveyed the voluntary and confidential nature of the study and included a description of the study's purpose. Participants had the ability to decline participation by not following the survey link provided. The email also included basic contact information for the researcher including name, email address, and mobile phone number.

The electronic survey was developed in Survey Monkey and was configured to ensure no personally identifiable information (including IP address) was collected. The survey asked only for each respondent's personal perception and basic demographics including gender, age (range), level of education, years spent in their current role, and years of service at the organization. The purpose for collecting these anonymous demographics was to allow for the control of covariates during data analysis. All survey data was protected by virtue of the researcher's log-in credentials to the Survey Monkey website and was deleted once the study results were finalized. Facility level outcome data was collected from standard operational reports made available to the researcher by the health care system leadership.

Data Analysis Procedures

The data was first prepared by conducting invalid case analysis and missing value analysis. The total number of complete, usable surveys collected from individuals was 143. In addition, outcomes data was collected from a total of 34 hospitals. The univariate assumption of normality was tested for all continuous study variables so that valid inferences regarding the results of this analysis could be made. Violations of normality were tested using histograms, pp-plots, qq-plots, skew and kurtosis z-statistics and Shapiro-Wilks and Kolmogorov-Smirnov statistical normality tests. Extreme outliers were also assessed. Reliability testing was completed to ensure all computed continuous subscales had sufficient internal consistency and inter-item correlation was conducted. All of the subscales had strong Cronbach's alpha values ($\alpha > .8$). Lastly, all categorical variables were assessed to ensure that group levels had sufficient proportions (at least 10% of the sample) within each level in order to properly conduct parametric analysis for this study (Field, 2009; Tabachnick & Fidell, 2007). The pre-analysis assumptions testing revealed that there were minimal problems regarding univariate normality of the continuous study variables, there were no extreme outliers present in the data nor issues with skewness or kurtosis. There was only one variable, the hospital quality metric, that failed the Kolmogorov-Smirnov and Shapiro-Wilk tests of normality. However, bootstrapped confidence intervals were conducted to address this (in addition to mitigating the effect of the small sample size). At the individual level, the only categorical variable that did not have sufficient sample within its levels was education, where there only 2.1% and .7% of the sample had a master's or a doctoral degree, respectively. Both levels were combined into a graduate degree category and ultimately this did not prove to be an issue in estimation. In addition, the number of female participants was low (8.4%), but within tolerable limits. After data preparation was complete, it

was observed that out of the final sample of 362 observations there were no missing values in the overall dataset. With no missing data, a missing value assessment was not conducted and Little's MCAR test (Little, 1988) was not administered. This was true for both the individual and hospital level data.

Once the data was prepared for analysis, descriptive statistics including frequencies and percentages of the categorical variables of interest and means and standard deviations of continuous study variables were examined. Finally, the primary analyses were completed to address the research questions and test the study hypotheses using a combination of two primary methodologies: multi-level SEM path analysis and OLS and multivariate linear regression.

Multi-level SEM path analysis. First, a multi-level path analysis utilizing observed Structural Equation Modeling (SEM) was employed to examine the relationship between individual-level survey-based social and intellectual capital variables while controlling for the effect of hospitals (clusters). The relationships between survey-based social and intellectual capital variables were assessed by using SEM to estimate parameters between the observed variables as shown in Figure 17. Parameters estimated are indicated by an asterisk.

The independent variables used in the multi-level SEM study comprise the dimensions of social capital: structural dimension, cognitive dimension, and relational dimension. The dependent variable was intellectual capital. The survey items that comprise these dimensions and intellectual capital were used in the SEM framework to estimate these variables. The higher the scores on these latent factors, the greater the amount of each. Gender, age, education level, years on the job, and years at the organization were also considered important covariates and the latent factors were regressed on these covariates.

A sample of $N = 143$ observations was utilized in this analysis. This exceeds Kline's

(1998) recommended guidelines of 10-20 observations per estimated parameter but falls short of Weston and Gore Jr.'s (2006) general rule-of-thumb recommendation that any SEM have a minimum sample of at least 200. In addition, Maas and Hox (2005) suggest that the number of clusters (hospitals in this study) for a multi-level SEM analysis should be more than 50 in order to estimate the standard errors of the cluster effect with minimal bias. However, 30 – 50 clusters presents an acceptable range of clusters as well with some moderate underestimation of the second level standard errors. As discussed in the limitations section, for these and other reasons, results are interpreted with caution.

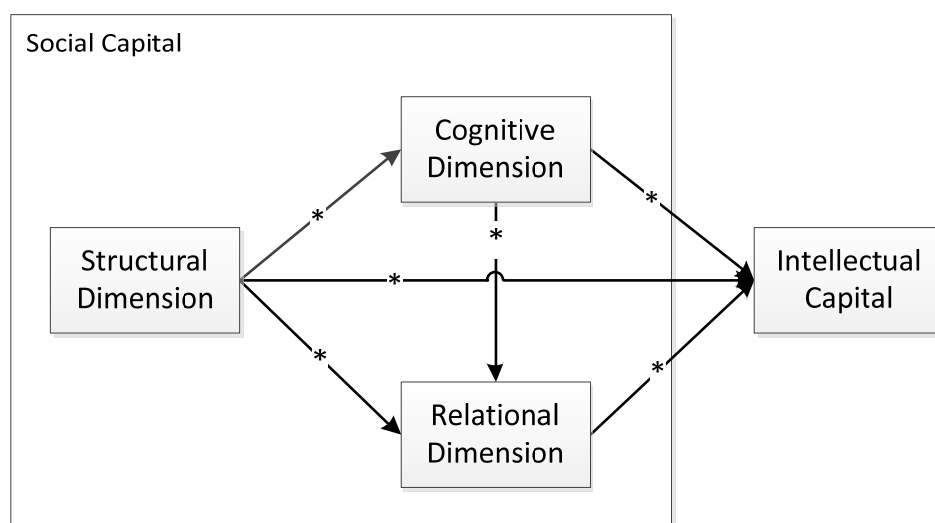


Figure 17. Parameters estimated using observed variable SEM.

Estimates of the parameters were measured using standardized beta coefficients and represent the association between each of the social capital dimensions and intellectual capital. The intra-class correlation (ICC) was also calculated to estimate the proportion of the variance explained in the outcome variables that was attributable to the effect of the hospital. Following the recommendation of (Kline, 1998), the model fit was assessed using the Overall Chi-Square Test, the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Standardized Root Mean Residual (SRMR), and the Tucker-Lewis Index (TLI).

OLS and multivariate linear regression. In the hospital-level study, individual-level intellectual capital was aggregated by hospital and used as the independent variable in ordinary least squares and multivariate linear regression analysis to evaluate correlations with four hospital level dependent variables: hospital quality, employee productivity, length of stay, and patient satisfaction. IBM SPSS AMOS v.25 was used for this analysis, and parameters estimated are shown in Figure 18. For hospital quality, employee productivity, and patient satisfaction, higher scores indicated higher valuation of these organizational metrics. For length of stay, a lower score was more desirable.

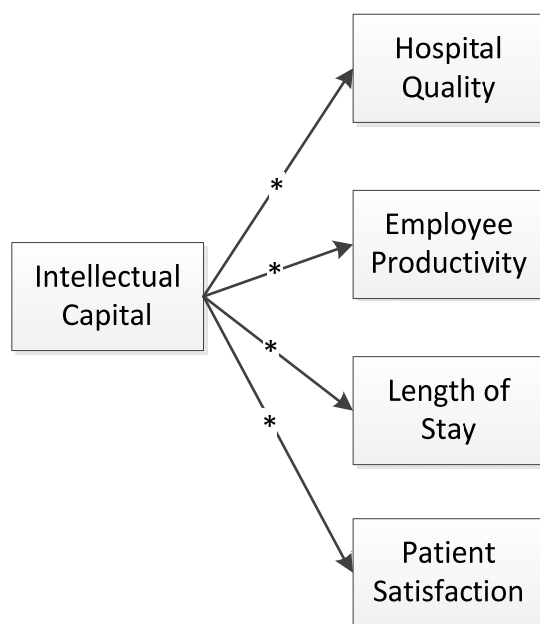


Figure 18. Parameters to be estimated using multivariate and OLS regression.

Aggregation of the individual intellectual capital scores by facility was necessary because the outcome variables were only available at the hospital level. This aggregation was conceptually justifiable considering that each respondent was asked to score their perception of intellectual capital at an overall facility level rather than at an interpersonal level. However, the resultant smaller sample size ($N = 34$) meant that the SEM approach used to examine the

relationship between individual level variables in the first part of the study could not be readily used to evaluate the relationship between those variables and facility-level outcomes. As an alternative, to evaluate the correlation between intellectual capital and performance outcomes, ordinary least squares and multivariate linear regression were used.

A priori power analysis using a medium effect size of $f^2 = .15$, a power level of 0.8, and alpha of 0.05, suggested a minimum required sample size of 54 in a model with a single predictor (in this case, Intellectual Capital) (Soper, 2018). Specific to OLS linear regression, a priori power analysis using G*Power v3.1.9.2 for a medium effect size $f^2 = .15$, power of .80, and an alpha of .05, the recommended minimum sample size was 55 (Faul, Erdfelder, Buchner, & Lang, 2009). The same analysis using a Bonferroni corrected alpha of .0125 resulted in a minimum recommended sample size of 78. Specific to multivariate linear regression, a priori power analysis using G*Power v3.1.9.2 for a medium effect size of $f^2 = .15$, power of .80, and an alpha of .05, gave a minimum recommended sample size of 85. Because the available sample size of $N = 34$ was less than the recommended sample size based on the a priori analyses, results from both the multivariate and the OLS linear regression analyses in this study are also interpreted with caution.

Although a facility-level aggregate of the intellectual capital variable used in SEM was used as the predictor in the second step linear regression analyses, a simultaneous analysis of the complete end-to-end model was not performed. This was due to a lack of individual level scoring on the outcome measures. In essence, outcomes could not be disaggregated nor connected to the independent variables because the independent variables were measured on individuals within facilities and the outcomes were measured on facilities only. Although the individual-level variables could all be aggregated by facility, the limitation of 34 total facilities made it

impossible for end-to-end SEM to have sufficient power for meaningful analysis.

Using the intellectual capital score aggregated by facility as the independent variable, all four performance outcomes were first analyzed individually using OLS linear regression with a Bonferroni correction adjustment applied to significance testing to account for multiple independent hypothesis tests (Dunn 1961). To mitigate any remaining concerns about parametric assumptions in this relatively small sample size, bias-corrected bootstrapped confidence intervals were employed. Bootstrapping statistical methods iteratively sample the observed data with replacement to build a distribution of estimates. This process provides a means of accounting for the distortions that are caused by a small sample size (Hesterberg, Moore, Monaghan, Clipson, & Epstein, 2005) and results in robust estimates of the coefficient standard errors and confidence intervals, accounting for bias. In turn, this aids in more valid hypothesis testing and inference.

As an added analysis, multivariate linear regression was used to simultaneously examine the relationships between the hospital-level intellectual capital and the four hospital-level performance outcome variables. As a generalized linear modeling technique, multivariate linear regression may be used to evaluate the relationship between one or more explanatory variables and one or more outcome variables recorded on at least an interval scale (Afifi, Clark, & May, 2004). The advantage of using multivariate analysis over Ordinary Least Squares (OLS) linear regression is that this procedure controls for the effects of all four regressions simultaneously, adjusting for bias and reducing the likelihood of committing Type II errors (Afifi, Clark, and May 2004) . Because IBM SPSS AMOS v.25 does not allow it, bootstrapping was not employed for the multivariate model.

Chapter 4: Results

This chapter presents a summary of the research questions and hypotheses, a description of the individual sample and hospital sample, and the results of the primary analyses for both the individual level and hospital level aspects of the study.

Summary of Research Questions and Hypotheses

The following research questions and hypotheses were addressed in this study:

Research Question 1 (RQ1): To what extent, if at all, is there a relationship between the structural and cognitive dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?

Null Hypothesis (H1₀): The relationship between the structural and cognitive dimensions of social capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

Research Question 2 (RQ2): To what extent, if at all, is there a relationship between the structural and relational dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?

Null Hypothesis (H2₀). The relationship between the structural and relational dimensions of social capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

Research Question 3 (RQ3): To what extent, if at all, is there a relationship between the cognitive and relational dimensions of social capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?

Null Hypothesis (H3₀). The relationship between the structural and cognitive dimensions of social capital among IT and non-IT employees in a health care setting will be non-positive

while controlling for covariates.

Research Question 4 (RQ4): To what extent, if at all, is there a relationship between the structural dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?

Null Hypothesis (H4₀). The relationship between the structural dimension of social capital and existence of intellectual capital among IT and non-IT employees in a health care setting will not differ significantly from zero while controlling for covariates.

Research Question 5 (RQ5): To what extent, if at all, is there a relationship between the cognitive dimension of social capital and the existence of intellectual capital IT and non-IT employees in a health care setting while controlling for demographic covariates?

Null Hypothesis (H5₀). The relationship between the cognitive dimension of social capital and existence of intellectual capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

Research Question 6 (RQ6): To what extent, if at all, is there a relationship between the relational dimension of social capital and the existence of intellectual capital among IT and non-IT employees in a health care setting while controlling for demographic covariates?

Null Hypothesis (H6₀). The relationship between the relational dimension of social capital and existence of intellectual capital among IT and non-IT employees in a health care setting will be non-positive while controlling for covariates.

Research Question 7 (RQ7): To what extent, if at all, is there a relationship between intellectual capital and hospital quality metrics?

Null Hypothesis (H7₀). The relationship between intellectual capital and hospital quality metrics will be non-positive.

Research Question 8 (RQ8): To what extent, if at all, is there a relationship between intellectual capital and employee productivity in a health care setting?

Null Hypothesis (H8₀): The relationship between intellectual capital and employee productivity will be non-positive.

Research Question 9 (RQ9). To what extent, if at all, is there a relationship between intellectual capital and patient length of stay in a health care setting?

Null Hypothesis (H9₀): The relationship between intellectual capital and patient length of stay will be non-negative.

Research Question 10 (RQ10). To what extent, if at all, is there a relationship between intellectual capital and patient satisfaction in a health care setting?

Null Hypothesis (H10₀): The relationship between intellectual capital and patient satisfaction will be non-positive.

Description of Sample

Table 11 displays frequencies and percentages for the categorical study variables collected at the individual level. The majority of individuals included in the study are male (91.6%). The largest group of participants are aged 40 to 49 years old (30.1%). Additionally, the largest group of participants indicated a high school diploma (40.6%).

Table 12 provides the frequencies and percentages for the individual-level study variables that comprise the latent factors for this study. For the most part, participant responses skew heavily towards agreement on most of the item measures for each dimension of capital.

Table 13 displays descriptive statistics for all individual level continuous variables included in the study. The structural social capital mean scores ranged from 0 to 4 ($M = 2.83$, $SD = .78$), the relational social capital mean scores ranged from 1.5 to 4 ($M = 3.21$, $SD = .59$), the

cognitive social capital mean scores ranged from .75 to 4 ($M = 2.81$, $SD = .72$), and intellectual social capital mean scores ranged from 1 to 4 ($M = 2.90$, $SD = .69$).

Hospital-level descriptives for continuous study variables are presented in Table 14. Hospital quality mean scores ranged from 39.2 to 83.4 ($M = 56.9$, $SD = 8.91$), employee productivity scores ranged from .95 to 1.06 ($M = 1.00$, $SD = .59$), patient length of stay scores ranged from 3.21 to 5.61 ($M = 4.41$, $SD = .54$), and patient satisfaction scores ranged from 12.2 to 95 ($M = 56.28$, $SD = 20.21$). Additionally, structural capital mean scores ranged from 1.94 to 4 ($M = 2.82$, $SD = .78$), relational social capital mean scores ranged from 2.25 to 4 ($M = 3.19$, $SD = .47$), cognitive social capital mean scores ranged from 1.75 to 4 ($M = 2.82$, $SD = .44$), and intellectual social capital mean scores ranged from 2 to 4 ($M = 2.89$, $SD = .38$).

Table 11.

Frequencies and Percentages for Categorical Individual-level Demographic Variables

Variable	<i>n</i>	%
Gender		
Female	12	8.4
Male	131	91.6
Age		
Under 30	15	10.5
30 to 39 years	32	22.4
40 to 49 years	43	30.1
50 to 59 years	41	28.7
60 or over	12	8.4
Education		
High school diploma	58	40.6
Associates degree	47	32.9
Bachelor's degree	34	23.8
Master's degree	3	2.1
Doctoral degree	1	.7

Note. $N = 143$.

Table 12.

Frequencies and Percentages for Categorical Individual-level Study Variables

Variable	<i>n</i>	%
Know who to contact		
Strongly Disagree	1	0.7
Disagree	5	3.5
Neutral	24	16.8
Agree	76	53.1
Strongly Agree	37	25.9
Know how to reach the right people		
Strongly Disagree	4	2.8
Disagree	9	6.3
Neutral	36	25.2
Agree	67	46.9
Strongly Agree	27	18.9
Know who to call to resolve problems		
Strongly Disagree	3	2.1
Disagree	16	11.2
Neutral	28	19.6
Agree	58	40.6
Strongly Agree	38	26.6
Clearly identified people to contact		
Strongly Disagree	5	3.5
Disagree	8	5.6
Neutral	30	21.0
Agree	65	45.5
Strongly Agree	35	24.5
Close personal interaction		
Strongly Disagree	0	0.0
Disagree	4	2.8
Neutral	15	10.5
Agree	80	55.9
Strongly Agree	44	30.8

(continued)

Variable	<i>n</i>	%
History of respect		
Strongly Disagree	7	4.9
Disagree	0	0.0
Neutral	21	14.7
Agree	73	51.0
Strongly Agree	42	29.4
History of trust		
Strongly Disagree	0	0.0
Disagree	5	3.5
Neutral	16	11.2
Agree	73	51.0
Strongly Agree	49	34.3
Value relationships		
Strongly Disagree	0	0.0
Disagree	0	0.0
Neutral	5	3.5
Agree	62	43.4
Strongly Agree	76	53.1
Share the same business values		
Strongly Disagree	0	0.0
Disagree	8	5.6
Neutral	28	19.6
Agree	71	49.7
Strongly Agree	36	25.2
Agree on best interest		
Strongly Disagree	0	0.0
Disagree	18	12.6
Neutral	25	17.5
Agree	75	52.4
Strongly Agree	25	17.5
Share common goals		
Strongly Disagree	0	0.0
Disagree	11	7.7
Neutral	28	19.6
Agree	64	44.8
Strongly Agree	40	28.0

(continued)

Variable	<i>n</i>	%
Agree on how to do business together		
Strongly Disagree	2	1.4
Disagree	11	7.7
Neutral	45	31.5
Agree	65	45.5
Strongly Agree	20	14.0
Learns new opportunities		
Strongly Disagree	0	0.0
Disagree	8	5.6
Neutral	40	28.0
Agree	69	48.3
Strongly Agree	26	18.2
Learns how to satisfy our customers		
Strongly Disagree	0	0.0
Disagree	4	2.8
Neutral	28	19.6
Agree	78	54.5
Strongly Agree	33	23.1
Learns how to be more competitive		
Strongly Disagree	0	0.0
Disagree	3	2.1
Neutral	44	30.8
Agree	68	47.6
Strongly Agree	28	19.6
Discovers new ways to be a better hospital		
Strongly Disagree	0	0.0
Disagree	3	2.1
Neutral	29	20.3
Agree	77	53.8
Strongly Agree	34	23.8

Note. *N* = 143.

Table 13.

Means and Standard Deviations for Continuous Individual-level Study Variables

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Structural social capital	143	2.83	.78	.00	4
Relational social capital	143	3.21	.59	1.50	4
Cognitive social capital	143	2.81	.72	.75	4
Intellectual social capital	143	2.90	.69	1.00	4

Note. *N* = 143.

Table 14.

Means and Standard Deviations for Continuous Hospital-level Variables

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Quality	34	56.90	8.91	39.20	83.40
Productivity	34	1.00	.03	.95	1.06
Length of stay	34	4.41	.54	3.22	5.61
Satisfaction	34	56.28	20.21	12.20	95.00
Intellectual capital	34	2.89	.38	2.00	4.00

Note. *N* = 34.

Primary Analyses

There were two primary analyses in this study. First, multi-level SEM analysis was used to determine individual-level associations and the effect of hospital clusters among the three dimensions of social capital and intellectual capital. Second, hospital-level analysis employed OLS and multivariate multiple linear regression to determine the relationship between hospital-level aggregated intellectual capital and hospital-level outcome metrics. There were a total of ten research questions/hypotheses addressed by these two analyses. The first six research questions/hypotheses were addressed by the multi-level SEM analysis and the remaining four were addressed by the hospital-level multiple linear regression analysis.

Multi-level SEM analysis. The multi-level study began by estimating the four latent factors separately using the observed items that compose each of them. A confirmatory factor analysis (CFA) measurement model was conducted first for each latent factor and model fit was very strong in all four cases with strong and significant path coefficients. Next, the structural model using all four latent factors and their hypothesized associations was estimated for both the within (individual-level) and between (hospital-level) levels - indicating strong model fit. Last, the individual covariates were added to predict demographic associations with each of the latent factors on the within-level for the final model.

Figure 19 displays the structural model that was tested to address RQ1 through RQ6 and the associated hypotheses for the individual level. For the measurement models, all factor loadings showed strong coefficients ($\lambda > .655$) and were statistically significant with all $ps < .001$. Demographic variables (i.e., age, gender, education, years at job, and years at organization) were entered as covariates that predicted additional variance in each latent variable. Goodness-of-fit statistics indicated exceptional fit, with $\chi^2 = 366.18$, $p = .095$, RMSEA = .027, CFI = .981,

TLI = .977, and SRMR = .063. This suggests that the model adequately represented the nature of relationships in the observed data (MacCallum, Browne and Sugawara 1996; Hu and Bentler 1999; and Barret 2007).

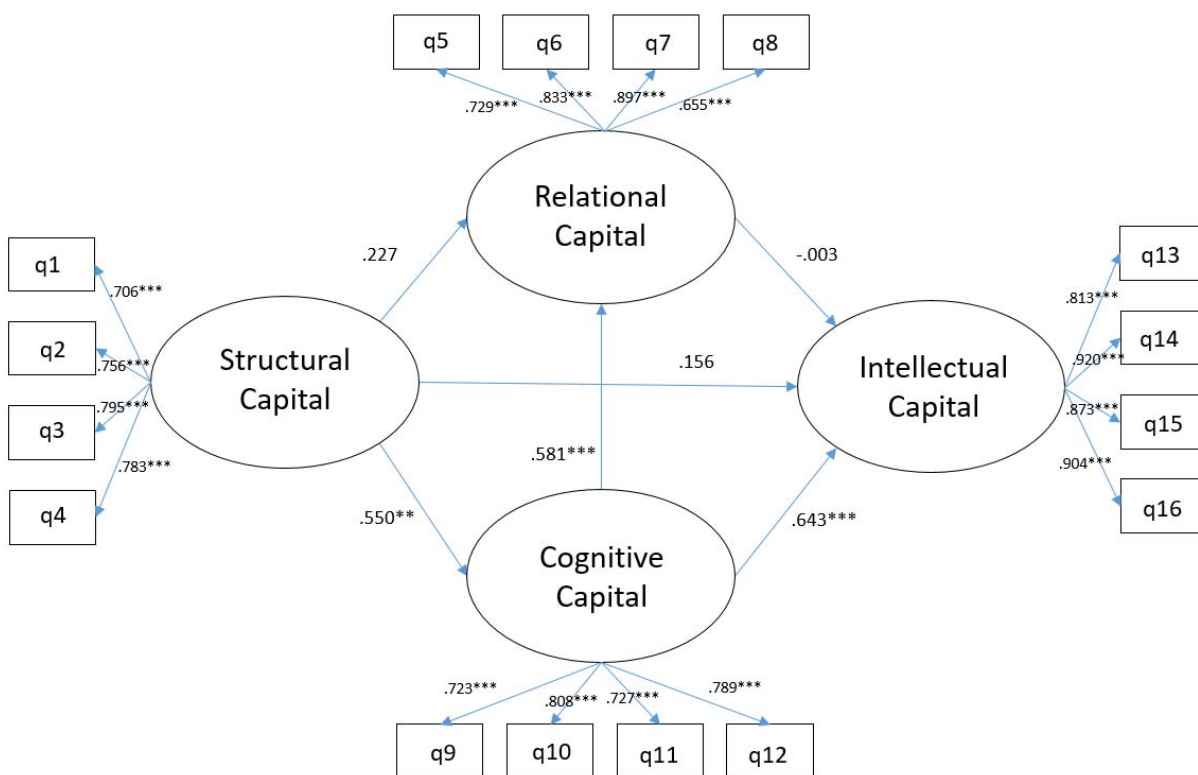


Figure 19. Multi-level SEM analysis of individuals within hospitals. Diagram of path coefficients showing the dimensions of social capital predicting intellectual capital. * $p < .05$, ** $p < .01$, *** $p < .001$.

Standardized path coefficients between latent variables in the structural model were examined to address each research question. In addition, intra-class correlations (ICC) were calculated for each of the latent factors to assess the proportion of variance explained by the effect of the cluster or hospital. The results varied substantially by latent factor. The effect of hospital explained 5.4% (ICC = .054) of the variance in structural capital, 29.3% (ICC = .293) of

the variance in cognitive capital, and 19.0% ($ICC = .190$) of the variance in intellectual capital. However, there was not a contextual effect of hospital on relational capital ($ICC = 0.0$).

Results of the SEM analysis supported RQ1. There was a significant, positive relationship between the structural and cognitive dimensions of social capital, $Std. \beta = .550, p = .003$. Similarly, RQ3 was supported as there was a significant, positive relationship between the cognitive and relational dimensions of social capital, $Std. \beta = .581, p = .001$. Finally, results indicated that RQ5 was supported. There was a significant, positive relationship between the cognitive dimension and intellectual capital, $Std. \beta = .643, p = .001$. However, the model did not support RQ2 (structural to relational), RQ4 (structural to intellectual), and RQ6 (relational to intellectual), all $ps > .05$. None of the demographic variables were significant predictors of any of the four latent factors suggesting that this structural relationship exists regardless of demographic characteristic differences.

As a secondary step, the indirect effects of the social capital latent factors to intellectual capital were also explored. The indirect effect of the structural dimension of social capital through the cognitive dimension of social capital to intellectual capital was strong and statistically significant, $Std. \beta = .353, p = .015$. This suggests that there is a mediating effect of the structural dimension of social capital on intellectual capital through the cognitive dimension of social capital in this sample.

In order to control for the effect of hospital in this study, each latent factor was estimated on the between-level as well. For the between-level results (not shown), the structural, cognitive, and intellectual latent factors showed strong factor coefficients ($\lambda > .900$) and were statistically significant in the measurement model, all $ps < .001$. The only latent factor that did not show strong fit was relational capital, all $ps > .05$. The lack of a strong contextual effect of hospital

(ICC = 0.0) likely explains this poor measurement model fit on the between-level.

To summarize, the results for RQs 1 through 6 (H1 through H6) indicate that the structural dimension of social capital positively predicted the cognitive dimension of social capital, but did not correlate with the relational dimension of social capital or intellectual dimensions capital directly. The cognitive dimension of social capital significantly correlated with both the relational dimension of social capital and intellectual capita, and was the only significant predictor of intellectual capital in the model. Last, an indirect mediating effect of the structural dimension of social capital to intellectual capital was observed through the cognitive dimension of social capital. Overall, the model was able to explain 58% of variance in intellectual capital ($R^2 = .583$). This effect size suggests that the model explained a large proportion of variance in intellectual capital. The null hypotheses 1, 3, and 5 are rejected and null hypotheses 2, 4, and 6 are accepted in this study.

Hospital-level regression analysis. For the hospital-level study, intellectual capital was aggregated at the hospital level and was used to predict each of the outcome variables measured at the hospital-level. First, a preliminary bivariate correlation analysis was conducted to assess the associations between all five hospital-level metrics. Table 15 shows the results of this bivariate test in which there were only two significant findings. There was a negative relationship between hospital quality and length of stay ($r = -.597, p < .001$), indicating that as levels of hospital quality increase, length of stay decreases. In addition there was a positive relationship between intellectual capital and productivity ($r = .381, p < .05$), indicating that as levels of intellectual capital increase, productivity increases. Neither of these results exceeded the limit of .80 as suggested by Tabachnick and Fidell (2007) when testing for multicollinearity. Next, to answer RQ7 through RQ10 and test the respective hypotheses, ordinary least squares

(OLS) was conducted. OLS analysis employed the use of bias-corrected bootstrapped confidence intervals to account for the small sample size. The 95% confidence intervals were bootstrapped using 1000 samples using the bias-corrected and accelerated (BCa) method.

Table 15.

Bivariate Correlations between Hospital-level Study Variables

Variable	Quality	Productivity	Length of stay	Satisfaction
Productivity	.188			
Length of stay	-.597 ***	-.171		
Satisfaction	.026	.303	.002	
Intellectual capital	.121	.381 *	-.243	-.021

Note. * $p < .05$, *** $p < .001$.

Research question 7. RQ7 examined the relationship between the intellectual capital and hospital quality metrics. A simple linear regression was conducted using intellectual capital to predict hospital quality metrics. The overall model was not significant, $F(1, 32) = 1.87, p = .181$ and the results, shown in Table 16, indicate that intellectual capital was not a significant predictor of hospital quality ($Std. \beta = .235, p = .198$). The null hypothesis 7 is accepted.

Research question 8. RQ8 examined the relationship between intellectual capital and employee productivity in a hospital setting. A simple linear regression was conducted to predict employee productivity in a health care setting using intellectual capital. Table 17 outlines the results of this test which reveal that the overall model was significant, $F(1, 32) = 9.00, p = .005$

Table 16.

Summary of Multiple Regression Analysis for Intellectual Capital Predicting Hospital Quality with Bootstrapped Confidence Intervals

Predictor	Hospital Quality						BC Bootstrapped 95% CI	
	β	<i>Std. β</i>	<i>Bias</i>	<i>SE</i>	<i>p</i>	<i>LL</i>	<i>UL</i>	
	Constant	41.15		.58	11.51	.002	19.23	65.61
Intellectual capital	5.45	.235	-.22	3.92	.198	-2.95	12.27	

Note. $F(1, 32) = 1.87, p = .181, R^2 = .055, \text{adjusted } R^2 = .026$. BC is bias corrected and the confidence intervals are based on 1000 bootstrapped samples.

Table 17.

Summary of Multiple Regression Analysis for Intellectual Capital Predicting Employee Productivity with Bootstrapped Confidence Intervals

Predictor	Employee Productivity						BC Bootstrapped 95% CI	
	β	<i>Std. β</i>	<i>Bias</i>	<i>SE</i>	<i>p</i>	<i>LL</i>	<i>UL</i>	
	Constant	.91		.00	.03	.001	.86	.99
Intellectual capital	.03	.468	.00	.01	.005	.01	.05	

Note. $F(1, 32) = 8.99, p = .005, R^2 = .219, \text{adjusted } R^2 = .195$. BC is bias corrected and the confidence intervals are based on 1000 bootstrapped samples.

and that this model accounted for 19.5% of the variance in productivity. Results indicate that intellectual capital was a significant predictor of employee productivity. An increase in intellectual capital was associated with an increase in employee productivity in this health care setting ($Std. \beta = .468, p = .005$). The null hypothesis 8 is rejected.

Research question 9. RQ9 examined the relationship between intellectual capital and patient length of stay in a hospital setting. A simple linear regression was also conducted to predict patient length of stay in a health care setting using intellectual capital. Table 18 provides the results of this test. The overall model was significant, $F(1, 32) = 6.94, p = .013$ and this model accounted for 15.3% of the variance in length of stay. Results indicated that intellectual capital was a significant negative predictor of patient length of stay. An increase in intellectual capital was associated with a decrease in the patient length of stay ($Std. \beta = -.422, p = .032$). The null hypothesis 9 is rejected.

Table 18.

Summary of Multiple Regression Analysis for Intellectual Capital Predicting Length of Stay with Bootstrapped Confidence Intervals

	Length of Stay					BC Bootstrapped 95% CI	
	β	$Std. \beta$	<i>Bias</i>	<i>SE</i>	<i>p</i>	<i>LL</i>	<i>UL</i>
Constant	6.12		-.03	.79	.001	4.63	7.67
Intellectual capital	-.59	-.422	.02	.27	.032	-1.12	-.04

Note. $F(1, 32) = 6.94, p = .013, R^2 = .178, \text{adjusted } R^2 = .153$. BC is bias corrected and the confidence intervals are based on 1000 bootstrapped samples.

Research question 10. RQ10 examined the relationship between intellectual capital and patient satisfaction. A simple linear regression was conducted to predict patient satisfaction based on intellectual capital. The overall model was not significant, $F(1, 32) = .01, p = .923$, this model accounted for none of the variance in patient satisfaction, and the results, shown in Table 19, indicate that intellectual capital was not a significant predictor of patient satisfaction ($Std. \beta = .017, p = .905$). The null hypothesis 10 is accepted.

Table 19.

Summary of Multiple Regression Analysis for Intellectual Capital Predicting Patient Satisfaction with Bootstrapped Confidence Intervals

Predictor	Patient Satisfaction					BC Bootstrapped 95% CI	
	β	$Std. \beta$	$Bias$	SE	p	LL	UL
Constant	53.65		.73	22.49	.021	11.85	104.58
Intellectual capital	.91	.017	-.19	7.58	.905	-13.27	14.56

Note. $F(1, 32) = .01, p = .923, R^2 = .000$, adjusted $R^2 = -.031$. BC is bias corrected and the confidence intervals are based on 1000 bootstrapped samples.

Multivariate linear regression. As an additional step, a multivariate analysis was conducted to explore to what extent there was a relationship between intellectual capital and patient satisfaction, productivity, quality, and length of stay simultaneously. Results are shown in Table 20. The overall model was significant, $F(4, 29) = 3.50, p = .019$ and this model accounted for 2.6% of the variance in hospital quality, 19.5% of the variance in productivity, 15.2% of the variance in length of stay, and 0.0% of the variance in patient satisfaction.

Table 20.

Summary of Multivariate Multiple Regression Analysis for Intellectual Capital Predicting Hospital Quality, Employee Productivity, Length of Stay, and Patient Satisfaction

Dependent variable by independent variable	β	Std. β	SE	p	95% CIs	
					LL	UL
Hospital quality						
Constant	41.15		11.60	.001	17.52	64.79
Intellectual capital	5.45	.235	3.98	.181	-2.66	13.56
Employee productivity						
Constant	.91		.03	.000	.84	.97
Intellectual capital	.03	.468	.01	.005	.01	.05
Length of stay						
Constant	6.12		.65	.000	4.79	7.45
Intellectual capital	-.59	-.422	.22	.013	-1.05	-.13
Patient satisfaction						
Constant	53.65		27.07	.056	-1.48	108.79
Intellectual capital	.91	.017	9.29	.923	-18.01	19.83

Note. Overall model: $F(4, 29) = 3.50, p = .019$. Hospital quality: $F(1, 32) = 1.87, p = .181, R^2 = .055$, adjusted $R^2 = .026$. Employee productivity: $F(1, 32) = 9.00, p = .005, R^2 = .219$, adjusted $R^2 = .195$. Length of stay: $F(1, 32) = 6.94, p = .013, R^2 = .178$, adjusted $R^2 = .153$. Patient satisfaction: $F(1, 32) = .10, p = .923, R^2 = .000$, adjusted $R^2 = -.031$. Bootstrapped CIs could not be applied for this type of analysis.

These results indicate that intellectual capital was a simultaneous significant predictor of employee productivity and patient length of stay and was not a significant predictor of hospital

quality metrics or patient satisfaction in this model. There was a strong positive relationship between intellectual capital and employee productivity—as intellectual capital increased, employee productivity increased (*Std. β* = .468, *p* = .005). Conversely, there was a strong negative relationship between intellectual capital and patient length of stay—as intellectual capital increased, the patient length of stay decreased (*Std. β* = -.422, *p* = .013). SPSS does not allow bootstrapping options for multivariate tests and therefore bootstrapping was not run for this model. However, these results mirror the individual regressions results (which were completed with the individual bootstrapping test) providing additional confidence in the overall results.

Chapter 5: Discussion, Implications, Conclusions, and Recommendations

This study used social capital theory to investigate the extent to which, if at all, the quality of the relationship between IT and non-IT employees in a hospital setting is correlated with hospital performance outcomes. There were two primary objectives. The first was to examine the extent to which, if at all, hypothesized relationships between the three dimensions of social capital and intellectual capital hold true in a health care setting. For this purpose the study surveyed 143 hospital IT employees and from their perspective assessed perceptions of structural, cognitive, and relational dimensions of social capital amongst IT and non-IT employees along with perceptions of intellectual capital within the hospital overall. Structural equation modeling (SEM) was then used to analyze these results. The second objective was to perform an exploratory investigation regarding the extent to which, if at all, the presence of intellectual capital in a hospital setting is correlated with four hospital performance outcomes. For this purpose, extant outcomes data from a final sample of 34 hospitals was collected and multiple linear regressions were conducted to test the effects and statistical significance of the relationships between intellectual capital (aggregated by facility) and patient length of stay, hospital quality, employee satisfaction, and patient satisfaction at the hospital level. This chapter includes a summary of the findings, discussion of the results, impact of limitations, implications for hospital and IT leaders, contributions and implications for future research, and a conclusion.

Summary of the Findings

The results of the primary analysis are summarized in Table 21. Six of the study's 10 hypotheses were supported (H1, H3, H4, H5, H8, and H9) while four were not (H2, H6, H7, and H10).

Table 21.

Summary of Hypotheses and Results

Hypothesis	Correlation Variables	Hypothesis	Confirmed
H1	Structural→Cognitive	Positive Correlation	Yes
H2	Structural→Relational	Positive Correlation	No
H3	Cognitive→Relational	Positive Correlation	Yes
H4	Structural→Intellectual	No Correlation	Yes
H5	Cognitive→Intellectual	Positive Correlation	Yes
H6	Relational→Intellectual	Positive Correlation	No
H7	Intellectual→Hospital Quality	Positive Correlation	No
H8	Intellectual→Employee Productivity	Positive Correlation	Yes
H9	Intellectual→Length of Stay	Negative Correlation	Yes
H10	Intellectual→Patient Satisfaction	Positive Correlation	No

In summary these results indicate the following:

1. At the individual level, there was a positive relationship between structural dimension of social capital and the cognitive dimension of social capital in this sample. As the structural dimension of social capital increased, the cognitive dimension of social capital increased.
2. At the individual level, there was a positive relationship between the cognitive dimension of social capital and the relational dimension of social capital in this sample. As the cognitive dimension of social capital increased, the relational dimension of social capital increased.
3. At the individual level, there was a positive relationship between the cognitive dimension of social capital and intellectual capital in this sample. As the cognitive dimension of social capital increased, intellectual capital increased.

4. At the individual level, the analysis found that there was a significant positive indirect effect of the structural dimension of social capital through the cognitive dimension of social capital to intellectual capital.
5. There were no other significant relationships between social capital dimensions and intellectual capital in this sample.
6. At the hospital level, intellectual capital was a strong positive predictor of employee productivity, indicating that as intellectual capital increased, employee productivity increased.
7. At the hospital level, intellectual capital was a strong negative predictor of patient length of stay, indicating that as intellectual capital increased, the patient length of stay decreased.
8. At the hospital level, intellectual capital was not a significant predictor of hospital quality metrics or patient satisfaction.

An illustration of the combined individual and hospital-level results is shown in Figure 20. In sum, at the individual level these findings suggest that within this health care setting and among this sample of participants, the structural dimension of social capital positively predicted the cognitive dimension of social capital, the cognitive dimension of social capital positively predicted both the relational dimension of social capital and intellectual capital, and there was a strong positive indirect effect from the structural dimension of social capital to intellectual capital through the cognitive dimension of social capital. These relationships held regardless of demographic characteristics. At the hospital level, intellectual capital was a strong positive predictor of employee productivity and a strong negative predictor of patient length of stay.

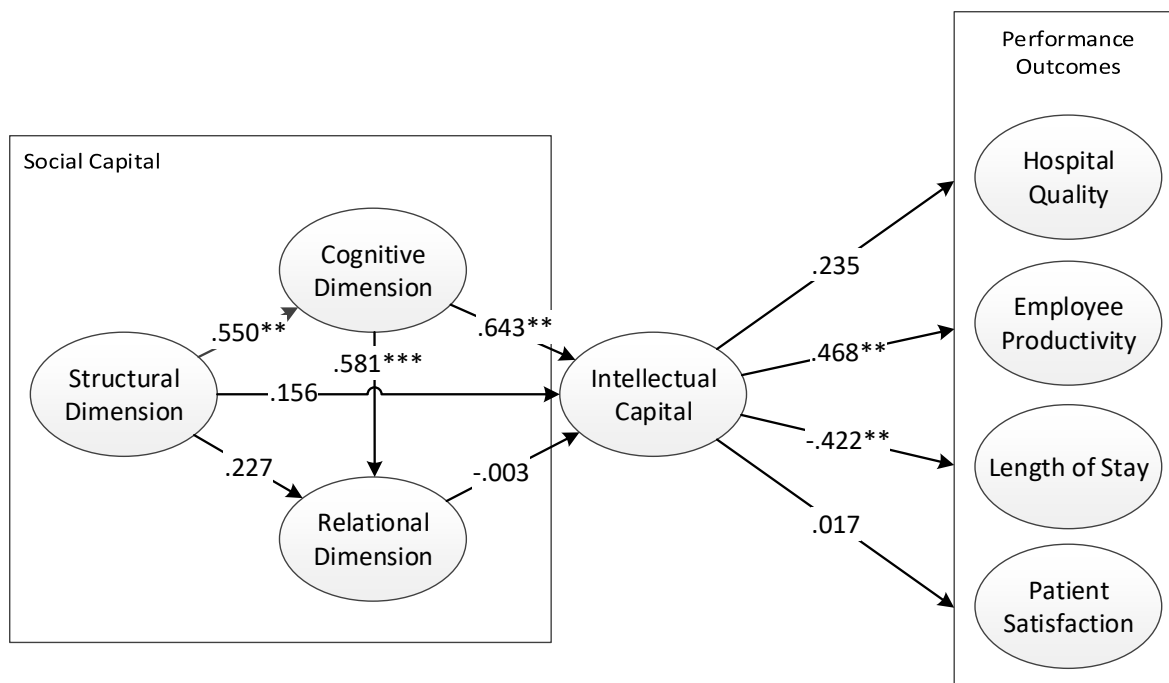


Figure 20. Combined model. Showing path coefficients (*Std. β*) from a multi-level SEM analysis of individuals within hospitals and a separate OLS multiple regression analysis of intellectual capital predicting hospital quality, employee productivity, length of stay, and patient satisfaction at the hospital level. ** $p < .01$, *** $p < .001$.

Discussion of the Results

At the highest level, the results of this study provide validation that in this particular health care setting and among the sample studied, Nahapiet and Ghoshal's (1998) basic theoretical premise holds true: in organizational contexts, social capital coevolves with intellectual capital, and this in turn serves as a basis for organizational advantage. A closer look at the results offers some important insights into the degree and kind of organizational advantage observed as well as the specific path through which the relationship between social capital dimensions and performance outcomes appears to flow in this context. These insights are discussed next, beginning with the relationships between the three dimensions of social capital and intellectual capital which were investigated in the individual-level analysis.

Social capital dimensions and intellectual capital. The basic observation that increased intellectual capital was correlated with increased productivity and lower length of stay is enough to create interest in the potential mechanisms by which intellectual capital can be increased in a hospital setting. For this purpose, it is informative to examine results from the individual-level analysis of the structural, cognitive, and relational dimensions of social capital and their relationship to intellectual capital.

Structural dimension. The positive relationship between the structural dimension and the cognitive dimension of social capital is congruent with the first hypothesis of this study (H1) and is also consistent with the findings of a number of authors (Karahanna & Preston, 2013; Sun et al., 2012; Turner, 2011; Wagner et al., 2014). It also makes intuitive and theoretical sense that greater structural linkages between individuals would positively correlate with greater cognitive alignment and shared meaning among them. This observation implies that enhancing the pattern of overall connections between employees (in this case, specifically between IT and non-IT employees) may result in greater shared interpretations of meaning.

The observation that the structural dimension of social capital did not independently correlate with intellectual capital is congruent with this study's fourth hypothesis (H4) and is also in alignment with at least a portion of previously reviewed research (Karahanna & Preston, 2013; Wagner et al., 2014). In practice, this finding suggests that the overall pattern of connections between IT and non-IT resources in a hospital setting does not, in and of itself, correlate with a greater knowing capability within the organization. Rather, the impact of structural alignment appears to be mediated by the development of cognitive alignment between the individuals involved. In a health care setting this finding suggests that frequent meetings, interpersonal dialogue, and other forms of communication between IT and non-IT employees may not generate

the desired organizational value if they are not conducted in a way that results in greater cognitive alignment between parties. As discussed in Chapter 1, the value of such mutual understanding has been identified by a number of authors who, with respect to IT-business alignment, identified the importance of moving away from transactional relationships and toward greater collaboration (Coughlan et al., 2005; Kettinger et al., 1994; Manfreda & Štemberger, 2014; Powell & Dent-Micallef, 1997). The potential value of such cognitive alignment was also observed in the current study as it was the only independent variable that significantly correlated with greater intellectual capital, which in turn was correlated with increased employee productivity and shorter patient length of stay.

The lack of positive correlation between the structural and relational dimensions of social capital was inconsistent with the second hypothesis of this study (H2) and was also unexpected considering that Wagner et al. (2014), Turner (2011), and Tsai and Ghoshal (1998) demonstrated a strong positive correlation between the two. However, this finding is consistent with that of Karahanna and Preston (2013), who also expected but did not see a positive correlation between the structural and relational dimensions of social capital. (As with the current study, Karahanna and Preston (2013) did also observe a positive relationship between the structural and cognitive dimensions of social capital.) Of note is the fact that both the current study and Karahanna and Preston (2013) were completed specifically in the context of the information technology industry. A logical conclusion may be that in the information technology industry it is, in fact, the *information* that matters most. That is, the value of structured relationships in an IT context may be in the resultant information sharing and cognitive alignment between IT and non-IT personnel. When considered in the context of the next finding (that the cognitive dimension of social capital was also positively correlated with both the relational dimension of social capital

and intellectual capital) the value proposition of investing in high quality structured relationships between IT and non-IT employees becomes clear: the structural dimension of social capital was positively correlated with greater common understanding between IT and non-IT employees (the cognitive dimension of social capital) which in turn was correlated with both better interpersonal relationships (the relational dimension of social capital) and greater overall knowledge and knowing capability in the organization (intellectual capital).

Cognitive dimension. In this study, the cognitive dimension of social capital was positively correlated with both the relational dimension of social capital and with intellectual capital. The positive correlation between the cognitive and relational dimensions of social capital is consistent with the third hypothesis in this study (H3) and with results from a number of previously reviewed studies (Karahanna & Preston, 2013; Sun et al., 2012; Tsai & Ghoshal, 1998; Turner, 2011). When considered together with the previous finding that the structural dimension of social capital did not, in and of itself, show a correlation with the relational dimension of social capital, these results suggest that the path toward strengthening interpersonal relationships between IT and non-IT employees in a hospital setting may be through the fostering of common understanding between them.

The positive correlation between the cognitive dimension of social capital and intellectual capital is consistent with the fifth hypothesis in this study (H5). Prior research has shown mixed results on this specific relationship. For example, Tsai and Ghoshal (1998) observed no statistically significant correlation between the cognitive dimension of social capital and what they termed “resource exchange and combination,” a conceptual variation of intellectual capital. Similarly Turner (2011) observed no correlation between the cognitive dimension of social capital and intellectual capital. However, both Wagner et al. (2014) and Karahanna and Preston

(2013) did observe a positive correlation between these two variables. Notably, both of these studies were also information technology industry related. This observation reinforces the importance of *information* as a driver of value in IT industry settings and provides additional support for the idea that it is the alignment of *understanding* between IT and non-IT individuals that matters most in the effort to increase intellectual capital and ultimately organizational performance.

Relational dimension. As noted above, in this study, the relational dimension of social capital was positively correlated with the cognitive dimension of social capital. However, there were no other correlations between the relational dimension of social capital and any other variable, including intellectual capital. The lack of correlation between the relational dimension of social capital and intellectual capital is inconsistent with the sixth hypothesis in this study (H6) and is also in conflict with several other studies reviewed in Chapter 2 (Karahanna & Preston, 2013; Merlo et al., 2006; Sun et al., 2012; Tsai & Ghoshal, 1998; Turner, 2011; Wagner et al., 2014). Nevertheless, this finding provides directional insight for hospital and health care IT leaders who desire to strengthen the IT-business relationship while also focusing on organizational performance. In this case, the results suggest that the path to both greater relational social capital and greater overall intellectual capital in the hospital setting may be through the facilitation of cognitive alignment. This provides further support for the notion that in IT-related industries in particular, cognitive alignment between IT and non-IT personnel is of paramount importance in driving business value. It should be noted that the lack of correlation between the relational dimension of social capital and intellectual capital does not mean that there is no value in increasing the relational dimension itself. A stronger relationship between IT and non-IT employees may have other positive benefits not considered in this study, such as

impact on organizational culture and morale.

Performance outcomes. The second part of this study sought to understand the extent to which, if at all, increased intellectual capital at the hospital level was correlated with organizational performance. To complete this analysis, intellectual capital survey scores were aggregated by facility and then ordinary least squares and multivariate linear regression were used to examine its relationship to the four defined performance outcomes in the same hospital (hospital quality, employee productivity, length of stay, and patient satisfaction). To interpret these results it is important to recall Nahapiet and Ghoshal's (1998) operational definition of intellectual capital which is: the knowledge and knowing capability of a social collectivity such as an organization, intellectual community, or professional practice. In this study, respondents were asked about the knowledge and knowing capability of the hospital in which they provide IT services. The results revealed a significant correlation with two out of the four outcome variables measured: employee productivity and patient length of stay.

Employee productivity. In this study, intellectual capital had a strong positive correlation with employee productivity. In other words, as intellectual capital increased, employee productivity increased. This finding is consistent with the eighth hypothesis of this study (H8) and offers insight into a potential mechanism for solving a common organizational challenge in health care. As discussed in Chapter 1, the pressure to increase employee productivity can result in high levels of job dissatisfaction, burnout, and concerns over the ability to provide quality care (Aiken, Clarke & Sloane, 2002). The observation that higher levels of intellectual capital correlated positively with increased employee productivity may offer a tool for individuals, teams, hospital leadership, and IT leadership in a health care setting to increase productivity without negatively impacting other factors such as morale.

Length of stay. In this study, intellectual capital had a strong negative correlation with hospital length of stay. In other words, as intellectual capital increased, length of stay decreased. This finding is consistent with the ninth hypothesis of this study (H9), and given the importance that length of stay holds as a measure of hospital efficiency, it should be of interest to organizational leaders as they consider various strategies for decreasing length of stay in the hospital.

Hospital quality and patient satisfaction. Results of this study showed no correlation between intellectual capital and hospital quality and no correlation between intellectual capital and patient satisfaction. This finding is inconsistent with the seventh and tenth hypotheses of this study (H7 and H10) respectively. This lack of relationship may be explained by the fact that both quality and patient satisfaction are impacted by a number of other, more influential factors. For example, nursing care and physician communication skills have both been shown to be critical factors in overall patient satisfaction (Arshad, Shamila, Jabeen, & Fazli, 2012; Cheng, Yang, & Chiang, 2003; Kim, Kaplowitz, & Johnston, 2004; Otani, Herrmann, & Kurz, 2011). With this in mind, increasing intellectual capital may have no bearing on patient satisfaction scores if the quality of nursing care is sub-par or the physician does not communicate effectively. Similarly, hospital quality scores have been shown to be affected by facilities-related and human-factor related considerations (Oswald, Turner, Snipes, & Butler, 1998).

Summary. Taken together these findings suggest that within the health care setting studied and among this sample of participants, it was the structural and cognitive dimensions of social capital between IT and non-IT employees that contributed to the quality of the relationship between them (in the form of the relational dimension of social capital) and the knowing capability of the organization (in the form of intellectual capital), and the knowing capability of

the organization correlated with organizational advantage in the form of greater productivity and shorter length of stay. The quality of interpersonal relationships (relational dimension of social capital) between IT and non-IT employees in this health care setting was correlated only with mutual understanding between them (cognitive dimension of social capital), which in turn was correlated with structural relationships (structural dimension of social capital). Thus, while the quality of the interpersonal relationship between IT and non-IT employees itself did not appear to be a contributing factor to organizational performance, structural and cognitive alignment between IT and non-IT employees was of importance in driving toward intellectual capital and thus organizational advantage.

Impact of Limitations

As initially presented in Chapter 1, this study had several important limitations which limit the generalizability of the results. First, the study was completed in a single health care system, and thus the results cannot be generalized across the industry. Second, all results were correlational and thus neither directionality nor causality can be inferred. Third, for the survey-based analysis of social and intellectual capital variables, only the perceptions of IT employees were solicited. This was a function of the author not being able to procure permission from business leadership to survey non-IT employees in the health system. Thus, the results and any potential implications should be interpreted from the perspective of the IT employee. Fourth, to complete the facility level analysis, individual responses for intellectual capital had to be aggregated by facility. This resulted in a loss of within-facility variance and reduced the total sample size to $N = 34$. Although statistical tools including bootstrapping and power analysis were used to mitigate this issue, correlational results from regression analyses should be interpreted with utmost caution and should be considered as indications for future research rather

than as independently conclusive.

Implications for Hospital and IT Leaders

Limitations notwithstanding, there are several meaningful insights that can be drawn from this study. First, for hospital and IT leadership, the results of this study cautiously offer directional guidance in the effort to increase IT-business alignment as a mechanism for organizational advantage. In particular, the findings suggest that as one part of the effort to increase overall productivity and decrease length of stay, leadership should consider focusing on the development of structured and intentional relationships between IT and non-IT employees. This may take various forms such as standing meetings, email, published communications, digital forums, and/or verbal communications. Within the context of these structural relationships, the results of this study suggest that leaders should consider placing a particular emphasis on developing shared representations, interpretations, and systems of meaning between IT and non-IT personnel. This approach may help to improve both the quality of interpersonal relationships between the IT and non-IT personnel and the overall knowing capability of the organization which, in turn, may positively impact hospital performance. The same leaders may also want to consider strategies for directly and positively impacting the quality of cognitive alignment between IT and non-IT personnel even in the absence of structure. For example, the results of this investigation suggest that for any IT activity in a hospital setting, it is important for non-IT hospital staff to have an accurate understanding with respect to nature and value of the work being done. To accomplish this, IT leaders should consider the importance of explicating the purpose and value of their activities as effectively and frequently as possible.

Contributions and Implications for Future Research

This study contributes to the body of IT-business alignment research in several

meaningful ways. First, it adds to the growing body of research that has applied more consistent operational definitions and a sound theoretical framework to the difficult challenge of understanding the IT-business relationship in the context of organizational value. This study also validates the use of social capital theory as an appropriate lens for the IT-business relationship and in particular provides empirical support in a health care context for Lesser and Storck's (2001) linking of communities of practice, social capital, and business outcomes. In addition, by employing Nahapiet and Ghoshal's (1998) standard operational definitions and employing Turner's (2011) validated survey instrument, this study adds strength to the theoretical foundation and methodological approach for future researchers seeking to advance knowledge in this area.

Although the non-experimental nature, relatively small sample size, and single-organization focus of this study limit the generalizability of its conclusions, the results still present compelling direction for future research by (a) supporting the theoretical notion that the quality of the relationship between IT and non-IT employees is of significance when striving to achieve organizational value through IT-business alignment and (b) further validating the underlying theoretical model, operational definitions, and measurement tools used to assess organizational relationships in this context. As a foremost recommendation and to further strengthen the academic underpinnings of social capital research, future researchers should consider leveraging the same theoretical model, operational definitions, and measurement instrument. In addition, experimental mixed methods studies (in health care and/or other industries) would be of value to further examine causality and directionality in the relationship between social capital, intellectual capital, and organizational performance outcomes. Ideally, such studies should be designed to account for the perceptions of both IT and non-IT employees

and to explore differences between them with respect to social capital dimensions, intellectual capital, and organizational performance.

As compared to the study design by Wagner et al. (2014) as presented and discussed in Chapters 1 and 2, the current study did not explore the mechanisms by which intellectual capital affects organizational performance. In Wagner et al.'s study, the impact that business understanding of IT had on organizational performance was fully moderated by both IT flexibility and IT utilization. In other words, on the path to organizational performance, the extent to which IT was able to quickly adapt to business needs and the extent to which the business actually leveraged IT resources were important factors. In consideration of this finding and approach, it is recommended that future studies in the health care IT context be designed to augment the current study's theoretical model for the purpose of better understanding such moderating factors.

With respect to better understanding social capital theory specifically in technology-related organizational contexts, this study provides additional evidence that cognitive alignment between IT and non-IT personnel may play an important role in the development of intellectual capital and thus organization advantage. Additional research that further explores this theme would be welcome as its results should prove instructive for IT and other organizational leaders across industries. Specific to the health care industry, and in consideration of the economic context set forth in Chapter 1, it would also be valuable for future research to examine the extent to which the quality of the relationship between IT and non-IT personnel in accountable care organizations has an impact on financial performance.

Conclusion

This study applied social capital theory to examine the extent to which the quality of the

relationship between IT and non-IT employees in a health care setting was correlated with hospital-level performance outcomes. First, multi-level SEM path analysis was used to examine the relationships between the three dimensions of social capital (structural, cognitive, and relational) and intellectual capital at an individual level. Results from this portion of the study lend conceptual support to the application of social capital theory in this context, while specifically illuminating the importance of cognitive alignment. The unanticipated result that the cognitive dimension of social capital served as the only stepping stone to both intellectual capital and the relational dimension of social capital is instructive for practitioners and scholars alike.

In the second part of the study, intellectual capital was aggregated by hospital and used as the independent variable in linear regression analyses to evaluate correlations with four hospital level dependent variables: hospital quality, employee productivity, length of stay, and patient satisfaction. The results indicated that greater intellectual capital was correlated with higher employee productivity and lower patient length of stay, while it was not correlated with hospital quality or patient satisfaction. This result lends support to the theoretical supposition that intellectual capital can serve as an antecedent of organizational advantage in certain contexts.

Scholars and practitioners have long sought to understand the path toward achieving organizational value through IT-business alignment. Beginning in the 1970s the theoretical emphasis was on strategic alignment. In the later part of the century scholars focused more intently on operational alignment. In the past two decades, the importance of multi-dimensional relational alignment has risen to the fore. This study lends support to the growing body of contemporary research suggesting that in the search for organizational advantage, it is the quality and nature of relationships between human beings that may be the most important place to invest our time, talent, and resources. In this conclusion one can hear the echoes of truth from

Durkheim, Marx, Weber, and Dewey 100 years before—no matter how hard we try, we simply cannot separate ourselves from one another.

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APPENDIX A

IRB Approval from Pepperdine University



Pepperdine University
24255 Pacific Coast Highway
Malibu, CA 90263
TEL: 310-506-4000

NOTICE OF APPROVAL FOR HUMAN RESEARCH

Date: July 25, 2018

Protocol Investigator Name: Michael Seagraves

Protocol #: 16-06-297

Project Title: Application of Social Capital Theory to Examine the Relationship between IT-Business Alignment and Organizational Performance Outcomes In Health Care

School: Graduate School of Education and Psychology

Dear Michael Seagraves:

Thank you for submitting your application for exempt review to Pepperdine University's Institutional Review Board (IRB). We appreciate the work you have done on your proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. Upon review, the IRB has determined that the above entitled project meets the requirements for exemption under the federal regulations 45 CFR 46.101 that govern the protections of human subjects.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit an amendment to the IRB. Since your study falls under exemption, there is no requirement for continuing IRB review of your project. Please be aware that changes to your protocol may prevent the research from qualifying for exemption from 45 CFR 46.101 and require submission of a new IRB application or other materials to the IRB.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite the best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete written explanation of the event and your written response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the IRB and documenting the adverse event can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* at community.pepperdine.edu/irb.

Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact the IRB Office. On behalf of the IRB, I wish you success in this scholarly pursuit.

Sincerely,

Judy Ho, Ph.D., IRB Chair

APPENDIX B

IRB Approval from Dignity Health Research Institute



Dignity Health Research Institute
 3400 Data Drive
 Rancho Cordova, CA 95670
 direct 916.851.2259
 fax 916.859.7125

Date: July 5, 2018

Michael Seagraves
 Sr. Director, Digital Strategy
 Dignity Health
 3400 Data Drive
 Rancho Cordova, CA 95670

RE: Administrative Approval for *Application of Social Capital Theory to Examine the Relationship between IT-Business Alignment and Organizational Performance Outcomes in Health Care*

Dear Michael:

This letter will serve as a notice of final approval for you to conduct the research project entitled, "*Application of Social Capital Theory to Examine the Relationship between IT-Business Alignment and Organizational Performance Outcomes in Health Care*" ONLY at the Dignity Health Information Technology Field Service Operations Department.

The administrative, IRB/regulatory, and legal approvals of your study are complete, and the research project may proceed in compliance with Dignity Health policy, IRB requirements, federal and state regulations, and the terms of the IRB approval (IRB #BAY-2018-104). Please also refer to the responsibilities of the principal investigator, as defined by FDA GCP guidelines and throughout the Dignity Health Research Institute policies and procedures.

Because this is an observational study which has no bearing on treatment decisions, this is not a qualifying clinical trial; therefore, there are no routine research procedures to be billed to Medicare/insurance. Dignity Health is not required to report an NCT number on any Medicare claim or follow any Medicare research billing requirements, and you do not need to complete a Research Encounter Form upon enrollment of each subject.

A waiver of informed consent/authorization and HIPAA exemption form have been reviewed and approved by the IRB. All data obtained during the conduct of this study will be recorded without any identifiable information.

Should the protocol design change during the conduct of this study, please contact Rae Lynn Stafford, Data Research Analyst, for continuous administrative review to ensure that conduct of this study may continue per the IRB's initial approval under exemption category.

If you have any questions or need any administrative assistance with your study, please contact Rae Lynn Stafford, Data Research Analyst, by phone at [REDACTED] or email a [REDACTED]

Sincerely,

A handwritten signature in black ink, appearing to read "Rae Lynn Stafford".

Rae Lynn Stafford for
 Kim Thomas, Sr. Director Field Service Operations

APPENDIX C

Permission to Use Turner Social Capital Instrument

From: [REDACTED] on behalf of [Tobin Turner](#)
To: [Seagraves, Michael - SAC](#)
Subject: Re: Social Capital Scale - Permission
Date: Tuesday, April 17, 2018 6:25:50 AM

Michael:

Thanks for the email. Absolutely – feel free to use the scale. It worked pretty well for me, so let me know if you have any questions.

The more citations for me the better. Thanks. Enjoy and I hope your research goes well.

Good luck!

Tobin

On Sat, Apr 14, 2018 at 1:41 PM, Seagraves, Michael - SAC
[REDACTED] wrote:

Hi Dr. Turner

Summary Question: May I use your 2011 Social Capital instrument, modified slightly for organizational context, for data collection in my doctoral dissertation?

I am a PhD student in Global Leadership at Pepperdine University and am currently finalizing my dissertation proposal. The purpose to my study is to determine the extent to which Social Capital between Information Technology staff and non-Information Technology staff has an impact on performance outcomes in a Hospital setting.

For data collection on Social Capital, I am planning to use the Social Capital instrument that you developed in your 2011 Dissertation at Clemson. I have slightly modified the verbiage of each item so that it is relevant in my study's context. For example, where your instrument refers to a "Firm" I refer to a "Hospital" and where your instrument refers to "supplier" I refer to Information Technology. The study will be carried out by e-electronic survey of approximately 230 IT Field Service Workers in a large health care system.

May I have your permission, of course with appropriate citation etc., to use your social capital instrument?

Thank you,

APPENDIX D

Recruitment Email

Subject: Social Capital Survey Invitation

Dear IT FSO Team Member:

Because you are a member of Dignity Health's IT Field Services Organization (FSO), you are invited to participate in a brief and anonymous online survey for a research study being conducted by Michael Seagraves, Doctoral Student at Pepperdine University. All FSO Team Members (approximately 230 in total) are being invited to participate. Your participation is voluntary.

PURPOSE OF THE STUDY: The purpose of the study is to investigate the extent to which the quality of the relationship between IT and non-IT employees is correlated with organizational performance outcomes in a hospital setting.

TIME INVOLVEMENT: Your participation will take approximately 5-10 minutes.

RISKS AND BENEFITS: The risks of participating in this study are less than minimal and include distraction from other work duties for 5-10 minutes while completing the survey. Participating in this study offers no direct benefits. Indirectly the results of this study may serve to provide guidance for organizational leaders that ultimately improves the organizational culture and daily working conditions for participants and their peers.

PAYMENTS: You will not be paid to participate.

PARTICIPATION AND WITHDRAWAL: Your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

ALTERNATIVES TO FULL PARTICIPATION: The alternative to participation in the study is to not participate.

CONFIDENTIALITY: There will be no identifiable information obtained in connection with this study. Your name, email, or other identifiable information will not be collected. Anonymous data from survey responses will be stored on a password protected Survey Monkey account for 6 to 12 months or until the study is accepted by Pepperdine University.

CONTACT INFORMATION: Should you have any questions about your rights as a research participant, you may call the Institutional Review Board which is concerned with protection of volunteers in research projects at 415-750-5654 or by writing: Dignity Health Bay Area IRB Institutional Review Board, 450 Stanyan St., San Francisco, CA 94117

CONSENT: By clicking on the link to the survey questions, you are acknowledging you have

read the study information. You also understand that you may end your participation at any time, for any reason without penalty.

If You Agree to Participate: [Click Here](#)

If You Do Not Wish to Participate: No further action is required.

Kim Thomas

Sr. Director IT Field Service Operations

Dignity Health IT

Principal Investigator Contact Information

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APPENDIX E

Social Capital Survey Instrument



Social Capital Survey

1. Study Information and Informed Consent (Page 1 of 3)

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DESCRIPTION: Because you are a member of Dignity Health's IT Field Services Organization (FSO), you are invited to participate in a brief and anonymous online survey for a research study being conducted by Michael Seagraves, Doctoral Student at Pepperdine University. All FSO Team Members (approximately 230 in total) are being invited to participate. Your participation is voluntary.

PURPOSE OF THE STUDY: The purpose of the study is to investigate the extent to which the quality of the relationship between IT and non-IT employees is correlated with organizational performance outcomes in a hospital setting.

TIME INVOLVEMENT: Your participation will take approximately 5-10 minutes.

RISKS AND BENEFITS: The risks of participating in this study are less than minimal and include distraction from other work duties for 5-10 minutes while completing the survey. Participating in this study offers no direct benefits. Indirectly the results of this study may serve to provide guidance for organizational leaders that ultimately improves the organizational culture and daily working conditions for participants and their peers.

PAYMENTS: You will not be paid to participate.

PARTICIPATION AND WITHDRAWAL: Your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

ALTERNATIVES TO FULL PARTICIPATION: The alternative to participation in the study is to not participate.

CONFIDENTIALITY: There will be no identifiable information obtained in connection with this study. Your name, email, or other identifiable information will not be collected. Anonymous data from survey responses will be stored on a password protected Survey Monkey account for 6 to 12 months or until the study is accepted by Pepperdine University.

CONTACT INFORMATION: If you have any questions, concerns, or complaints about this research, you may contact the Protocol Director, Michael Seagraves at 916-212-1493. Should you have any questions about your rights as a research participant, you may call the Institutional Review Board which is concerned with protection of volunteers in research projects at 415-750-5654 or by writing: Dignity Health Bay Area IRB Institutional Review Board, 450 Stanyan St., San Francisco, CA 94117.

CONSENT: By clicking NEXT, you are acknowledging you have read the study information. You also understand that you may end your participation at any time, for any reason without penalty.

Next

2. Demographics (Page 2 of 3)

* 1. Please select your primary work location.

If you work at multiple hospitals, please select the one you work at most frequently and answer all questions for that location only.

To answer questions for additional hospitals, please repeat the survey by following the original email link.

* 2. Gender

- Male
- Female
- Non binary

* 3. Years of Age

- Under 30
- 30-39
- 40-49
- 50-59
- 60 or over

* 4. What is the highest level of education you have completed?

- High School Diploma
- Associate's Degree
- Bachelor's Degree
- Master's Degree
- Doctoral Degree

* 5. About how many years have you been in your current job position?

* 6. About how many years have you been employed at this organization overall?

Prev

Next



3. Survey (Page 3 of 3)

* 7. The following questions concern how well non-IT hospital employees know who to contact in the IT department

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Non-IT employees in our hospital know who to contact within the IT department to get things accomplished.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-IT employees in our hospital know how to reach the right people in the IT department.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our hospital works at making sure non-IT employees know who to call to resolve IT problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our hospital has clearly identified people to contact in the IT department.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 8. The following questions concern the kind of personal relationships you have developed with non-IT employees

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The relationship between IT and non-IT employees in our hospital is characterized by close, personal interaction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The relationship between IT and non-IT employees in our hospital is characterized by a history of respect.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The relationship between IT and non-IT employees in our hospital is characterized by a history of trust.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IT employees value our relationships with non-IT employees in hospital departments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 9. The following questions concern shared goals and values between IT and non-IT employees

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
IT and non-IT employees in our hospital share the same business values.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IT and non-IT employees in our hospital often agree on what is in the best interest of our relationship.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IT and non-IT employees in our hospital share common goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IT and non-IT employees in our hospital agree on how we should do business together.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 10. The following questions concern knowledge capabilities of the hospital

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Our hospital effectively learns new opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our hospital successfully learns how to better satisfy our customers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our hospital successfully learns how to be more competitive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our hospital discovers new ways to be a better hospital.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Prev

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