

Preface

MANAGEMENT AND LEADERSHIP OF VIRTUAL TEAMS

In thinking about why I wanted to put together this book I realized I had an opportunity as a business and information systems educator to “marry” the two fields of study together and acknowledge the fact that with the advent of computing and telecommunication technologies the way we as humans work with one another has dramatically changed in the last 30 years. Today, rather than punching in on a time clock, many of us are working from our homes, our cars, even the beach now because of major advances computing and telecommunication technologies. This ability to work from anywhere at any time allowed a new type of worker to emerge: *the telecommuter*. According to Neufeld and fang (2005) telecommuters are those individuals that work outside of the conventional workplace. Telecommuters still had to work with other telecommuters to get work done and hence a new type of organizational team emerged next: *The virtual team*. Since the emergence of virtual teams (VTs), their use in organizations has become a very common practice. According to Zivick (2012) organizations are using VTs to accomplish a variety of business goals. Kayworth and Leidner (2000) reported that organizations derive many benefits from the use of VTs. Some of these benefits include: cost reductions, cycle-time reductions, integration of distant members, and improved decision-making and problem-solving skills. Virtual teams over the last several years has had many closely related definitions. According to Brandt, England, and Ward (2011) VTs are made up of individuals working together who may not have ever met and very often do not meet face-to-face during assigned projects. Green and Roberts (2010) add that VTs are individuals separated by time and space, have little face-to-face contact, and are completely dependent upon computers and telecommunication technologies to communicate with one another. Martins, Gilson, and Maynard (2004) defined VTs as “teams whose members use technology to varying degrees in working across locational, temporal, and relational boundaries to accomplish an interdependent task” (p. 808). It should be noted that as computing has become more portable, computer and telecommunication technologies are no longer limited to desktop computers with an Internet or network connection. According to Kock and Nosek (2005) VT members can and are using mobile devices such as smart phones and Internet enabled tablets with texting capability, email, and social networks to accomplish organizational tasks and assigned projects as well.

A very important contribution acknowledged in the research literature related to virtual teams is their adaptability. According to Brandt, et al (2011) organizations have reported that VTs must have the ability to be assembled quickly and be adaptable enough to meet each projects goals. Zivick (2012) reported that VTs are brought together to take full advantage of all the organizations human resources

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irrespective of their physical location. This means that organizations can quickly assemble staff possessing the necessary skills and knowledge to complete a specific task or serve an on-going project at any time from any geographic location.

Despite the increased use of VTs in organizations, VTs have not emerged as the definitive solution to all problems in accomplishing organizational tasks. Blackburn, Furst, and Rosen (2003) acknowledged that there is “no guarantee that VTs will reach their full potential and that as many VTs fail as they do succeed in assigned tasks and projects. VTs experience many of the same problems face-to-face teams must contend with. According to Marks, Sabella, Burke, and Zaccaro (2002) a few of these problems include: poor team member composition, incomplete knowledge of project goals, and poor coordination processes. Ongoing research in VTs has found that one problem unique to VTs is the lack of interpersonal skills and human relations. Gonzales, Nardi, and Mark (2009) validated this when they found that while collaborative technology had improved over the years with better human-computer-interaction (HCI) design, approaches on how to “work better” within collaborative environments had still not been sufficiently addressed.

Several other factors contribute to the success or failure of VTs. Brandt et al (2011) stated that VTs have many dynamics contributing to the success or failure of virtual team projects. Some of these are: *Trust, Cultural differences, Communication, Social skills, Mission and goal clarity, Rewards and recognition, Time*.

It's probably obvious that VT members should trust each other if they plan on working well with one another however, *how is trust established* when perhaps team members have never met one another? What role does *cultural differences* play in work strategies, work ethics, and even social etiquette when working in VTs? How do VTs *communicate* within the virtual space? Do all team members communicate at a designated synchronous time or do the team members communicate asynchronously, contributing to discussions at their own time? How are *social skills* conveyed or not conveyed via email, collaborative software, or video-conferencing? Can project managers convey *rewards, recognition, mission, and goal clarity* effectively and efficiently to subordinates in virtual spaces? How do VTs manage *time* when team member can literally be all over the world spread out across several different time zones?

SYSTEMS DEVELOPMENT

While virtual teams can be engaged in any number of types of business projects, the focus of this book was on systems development projects in virtual spaces. What is systems development? In 1990, information systems researchers Nunamaker and Chen described systems development as five stages:

1. **Concept Design:** Which is the adaption and union of technology and theoretic advances into possible practical applications.
2. **Constructing the Architecture of the System:** Meaning what hardware, software, and processes must be in place for the system to work.
3. **Prototyping:** A preliminary model of the system to be built.
4. The actual system being developed (this would be the product development stage). And finally,
5. The system built is transferred into operation within the business or organization that needed the information system (Nunmaker Jr., J.f. and Chen, M., 1990).

More recently, systems development has been defined in the context of information systems development. According to Doolin and McLeod (2012) described information systems development as a “complex organizational activity involving multiple stakeholders who interact with various artifacts in order to facilitate understanding and cooperation across diverse knowledge domains”. Ismail and King (2014) defined information systems development again as a five stage process: 1) *Definition of needs (information requirements)*, 2) *Selection of hardware and software*, 3) *Implementation of major systems*, 4) *System maintenance and problem-solving*, and 5) *Planning of future IT deployment*. Regardless of the definition of systems development / information systems development many information systems researchers report that systems development is wrought with problems. Information systems development is still a difficult process that often times ends in failure. This is not to say that information systems projects don’t get completed, but rather that they “*have failed*” in the sense that these projects often go over the time originally allotted to be completed, they often go over budget, and they often do not do everything that the original planned system requirements had intended the system to do. The many difficulties associated with systems development is now compounded by the use of VTs that often do not have the benefit of physical presence and or centralized leadership.

SYSTEMS DEVELOPMENT AND VIRTUAL SPACES: THE WORLD TODAY

To find evidence that systems development is a difficult process that often ends in failure, one only has to look at the initial roll out of the United States HealthCare.gov website. The website was the result of legislation that was put into place in 2010 called the Affordable Care Act which sought to provide affordable access to healthcare for citizens of the United States through a series of health care insurance exchanges. HealthCare.gov was the primary destination for businesses and citizens to go to review these newly created exchanges and sign up for affordable health care insurance. The HealthCare.gov website was definitely not ready for the amount of traffic that hit it in the first few days! According to Lahm (2013) users of the website experienced the site “freezing and crashing”. What was initially described as a few minor glitches in the system quickly turned to being described as, “a website with severe problems and severe security flaws.” Lahm went on to report that as of November 1st, 2013, while the website had improved, at that time it was only working at about 80% functionality. Even the Whitehouse administration reluctantly admitted in a report titled: “Health insurance exchanges: An update from the administration,” (2013) that the rollout of the HealthCare.gov website was largely a debacle!

What went wrong with the rollout of the website? A lot! According to Venkatesh, Hoehle, and Al-jafari (2014) the website had serious problems with its data storage capabilities, telecommunications, interoperability with other systems, and user interface issues. Additionally, according to the website BALLOTPEDIA, a private consulting firm, McKinsey & Co. reported two other important aspects of the websites failure: 1) *Enough time for testing and revising the website was not provided*, and 2) *the project to build the website did not have one single leader and decision-maker*. Despite decades of telecommuting, virtual teams, and advancements in computing and telecommunication technology combined with the Whitehouse’s and Silicon Valley’s best and brightest, this system development project failed epically! (Healthcare.gov website rollout, 2013).

This brings us to the purpose of this book titled: *Strategic Management and Leadership for Systems Development within Virtual Spaces*. This book addresses from multiple perspectives virtual teams, virtual environments, virtual leadership, project management, and novel new methodologies for systems

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development in virtual spaces. The goal of this book for me was to bring together researchers, scholars, practitioners, and managers to confront and address problems, share best practices, and report novel new strategies and ongoing research that seeks to improve systems development within virtual spaces. My hope is that readers of this book will find useful tools and strategies to work better within virtual spaces, lead better within virtual spaces, and perhaps even build on the research found in this book to develop new theories on strategic management and leadership for systems development in virtual spaces.

BOOK CHAPTERS OVERVIEW

The book, “Strategic Management and Leadership for Systems Development in Virtual Spaces” is organized into three sections. The first section discusses the roles of virtual teams and information technology in global business, reviews virtual leadership and virtual team collaboration, globalized project management, and knowledge creation, sharing, and transfer. The second section of the book discusses the design of global enterprise systems, conceptual framework for innovative strategic thinking, the design of information spaces and retrieval of information using electrostatics in virtual spaces, failure diagnosis and a new formalism for safe development of information systems, and crowdsourced software development. The third section concludes the book by sharing applications of ideas, tools, and games used to improve systems development, leadership, and collaboration within virtual spaces.

Chapter 1, “Examining the Roles of Virtual Team and Information Technology in Global Business,” examines the roles of virtual team and information technology (IT) in global business describing the theoretical and practical overview of the virtual team, the relationships among the virtual team, conflict management, emotion management, the applications of IT, the importance of virtual team in global business, and the importance of IT in global business.

Chapter 2, “The Role of Vertical and Shared Leadership in Virtual Team Collaboration,” reviews current trends in the literature related to the influence of vertical and shared leadership styles in the context of virtual teams, unpacking the influence of team structure and task structure to better understand the mechanisms influencing virtual team effectiveness.

Chapter 3, “Providing a Model for Virtual Project Management with an Emphasis on IT Projects,” presents a study that aimed to develop a model for virtual project management with an emphasis on information technology projects, including several elements in geographically distributed environments. The final model of virtual project management of information technology projects is presented.

Chapter 4, “The Virtual Leader: Developing Skills to Lead and Manage Distributed Teams,” offers a working definition of the concepts of virtual, management, leadership, team, and proposes pragmatic tools and solutions to management and leadership challenges in virtual, distributed team situations.

Chapter 5, “Skill Building for Virtual Teams,” explores virtual teams, their benefits and challenges to organizations, and provide ways to ensure that virtual team members and leaders in their organizations have the skills, competencies and tools needed to succeed. Specific recommendations to improve skills of virtual teams are also provided.

Chapter 6, “E-Tools for E-Team: The Importance of Social Ties and Knowledge Sharing,” provides a general overview of virtual teams; today’s collaborative tools, and discuss expertise necessary for virtual teams to be successful.

Chapter 7, “Knowledge Transfer and Knowledge Creation in Virtual Teams,” focuses on this issue and presents supporting evidence related to tacit knowledge transfer and creation, virtual teams, and how businesses can effectively harness capacity of virtual teams to transfer valuable tacit knowledge and create new knowledge.

Chapter 8, “Electronic Collaboration in Organizations,” provides a literature review of the term that has been coined “the economy of crowds” and new administrative principles and business models now needed to achieve organizational goals.

Chapter 9, “Developing Project Team Cohesiveness in a Virtual Environment,” addresses the dilemma of managers who must have a clear understanding of what communication and relationship-building techniques and management systems are best suited for distributed virtual teams. The results of the research presented in this chapter aims to limit many of the social and human relations problems associated with virtual teams.

Chapter 10, “Designing and Managing ERP Systems for Virtual Enterprise Strategy: A Conceptual Framework for Innovative Strategic Thinking,” aims to examine Enterprise Resource Planning (ERP) systems development and emerging practices in the management of multi-organizational enterprises and identify the circumstances under which the so-called ‘ERP III’ systems fit into the Virtual Enterprise paradigm; and vice versa. An empirical inductive study was conducted using case studies from successful companies in the UK and China.

Chapter 11, “Design of Information Spaces and Retrieval of Information Using Electrostatics in Virtual Spaces,” creates ‘Information Spaces’ where people will use their awareness to search, browse and learn. In this chapter the authors present an architecture based on the principles of electrostatics, which presents a model for design of information spaces. Our model gives an easy conceptual framework to reason about how information can be represented as well as secure ways of extracting and storing information leading to a design which is easily scalable in virtual team environments.

Chapter 12, “A New Formalism for Diagnosis and Safe Development of Information Systems,” reports that failure diagnosis in large and complex information systems (LCIS) is a critical task necessary to respect the safe development of these systems. A discrete event system (DES) approach to the problem of failure diagnosis of LCIS is presented in this chapter. The author takes a novel approach to improve failure diagnosis using a modified stochastic Petri net approach that analyzes the foraging behavior of ant colonies. With this new novel approach, the author presents a new model of stochastic Petri net that can contribute to the better diagnosis, performance analysis, and design of information systems.

Chapter 13, “Software Process Paradigms and Crowdsourced Software Development: An Overview,” provides an insight on the transition from the conventional process models of software development to the software development methodology being used to develop software through crowdsourcing.

Chapter 14, “Using Soft Systems Ideas within Virtual Teams,” reviews recent research that adds force to the view that the way that individuals act as part of a virtual group is different from behavior in face-to-face meetings. Specifically researchers have discovered that conflicts are more prevalent within virtual teams as opposed to face to face teams. In this paper the authors reflects upon this position and attempt to discover if these concerns can be overcome through the employment of Systems methods used in organizational inquiry.

Chapter 15, “Empowering Crisis Response-Led Citizen Communities: Lessons Learned from JK Flood Relief.org Initiative,” shares the experiences of researchers and engineers who developed an information system that uses the goodwill and online volunteerism that is an available resource ready to

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be tapped when responding to crises. This chapter discusses the structure and nature of shared leadership in virtual teams and the benefits of channelizing global goodwill into a purposeful and sustained effort to tide over the initial hours when continued flow of reliable information will help in designing a better response to the crisis.

Chapter 16, “Virtual Shipping: Entrepreneurial Leadership Styles in Maritime and Shipping Industry,” discusses the concept of entrepreneurial leadership in any challenging industry involves fusing the concepts of a strategic approach of the management change, enhancing capabilities for continuously, creating and appropriating support, and development of value and competitive advantages in the company with technological growth. The challenge for shipping and transportation industry is to build a compatibility to continuously explore and reduce the threats of secure and safety and enhance new successful and competitive opportunities. The chapter categorizes ten shipping behaviors likely to be expected in loading on the two roles that impede the shipping entrepreneurial leaders’ performance enactment scenario and eight leadership behaviors likely to be facilitated in their roles towered encouraging the team performance.

Chapter 17, “Virtual Strangers No More: Serious Games and Creativity for Effective Remote Teams,” examines how virtual team trust and effectiveness may be improved through the transformative power of serious games and creative process.

CONCLUSION

With the rapid proliferation of virtual teams stakeholders from every industry, from business people and project managers to scholars and academics, are confronting the difficult problems that come from managing the systems development process within virtual spaces. In this context, this book is intended to fill existing gaps in the literature from many different perspectives related to systems development with virtual spaces. The target audience for this book is composed of professionals, researchers, and scholars working in the fields of information systems, information systems development, information science, information management, virtual teams, team effectiveness, leadership, strategic management, sociology, e-collaboration, and information technology. Moreover, this book should provide insights and support executives concerned with the management of virtual teams, leadership and e-collaboration. My hope is that this book will prove to be a valuable resource and comprehensive guide on how to improve strategic management and leadership for systems development within virtual spaces.

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